AFB/PPRC.21/36
30 September 2017

Adaptation Fund Board
Project and Programme Review Committee
Twenty-First Meeting
Bonn, Germany, 10-11 October 2017

Agenda Item 7 i)

PROPOSAL FOR CHILE AND ECUADOR

Background

1. The strategic priorities, policies and guidelines of the Adaptation Fund (the Fund), as well as its operational policies and guidelines include provisions for funding projects and programmes at the regional, i.e. transnational level. However, the Fund has thus far not funded such projects and programmes.

2. The Adaptation Fund Board (the Board), as well as its Project and Programme Review Committee (PPRC) and Ethics and Finance Committee (EFC) considered issues related to regional projects and programmes on a number of occasions between the Board's fourteenth and twenty-first meetings but the Board did not make decisions for the purpose of inviting proposals for such projects. Indeed, in its fourteenth meeting, the Board decided to:

> *(c) Request the secretariat to send a letter to any accredited regional implementing entities informing them that they could present a country project/programme but not a regional project/programme until a decision had been taken by the Board, and that they would be provided with further information pursuant to that decision*
>
> *(Decision B.14/25 (c))*

3. In its eighth meeting in March 2012, the PPRC came up with recommendations on certain definitions related to regional projects and programmes. However, as the subsequent seventeenth Board meeting took a different strategic approach to the overall question of regional projects and programmes, these PPRC recommendations were not included in a Board decision.

4. In its twenty-fourth meeting, the Board heard a presentation from the coordinator of the working group set up by decision B.17/20 and tasked with following up on the issue of regional projects and programmes. She circulated a recommendation prepared by the working group, for the consideration by the Board, and the Board decided:

> *(a) To initiate steps to launch a pilot programme on regional projects and programmes, not to exceed US$ 30 million;*
>
> *(b) That the pilot programme on regional projects and programmes will be outside of the consideration of the 50 per cent cap on multilateral implementing entities (MIEs) and the country cap;*
>
> *(c) That regional implementing entities (RIEs) and MIEs that partner with national implementing entities (NIEs) or other national institutions would be eligible for this pilot programme, and*
>
> *(d) To request the secretariat to prepare for the consideration of the Board, before the twenty-fifth meeting of the Board or intersessionally, under the guidance of the working group set up under decision B.17/20, a proposal for such a pilot programme based on consultations with contributors, MIEs, RIEs, the Adaptation Committee, the Climate Technology Centre and Network (CTCN), the Least Developed Countries Expert Group (LEG), and other relevant bodies, as appropriate, and in that proposal make a recommendation on possible options*

on approaches, procedures and priority areas for the implementation of the pilot programme.

(Decision B.24/30)

5. The proposal requested under (d) of the decision above was prepared by the secretariat and submitted to the Board in its twenty-fifth meeting, and the Board decided to:

(a) Approve the pilot programme on regional projects and programmes, as contained in document AFB/B.25/6/Rev.2;

(b) Set a cap of US$ 30 million for the programme;

(c) Request the secretariat to issue a call for regional project and programme proposals for consideration by the Board in its twenty-sixth meeting; and

(d) Request the secretariat to continue discussions with the Climate Technology Center and Network (CTCN) towards operationalizing, during the implementation of the pilot programme on regional projects and programmes, the Synergy Option 2 on knowledge management proposed by CTCN and included in Annex III of the document AFB/B.25/6/Rev.2.

(Decision B.25/28)

6. Based on the Board Decision B.25/28, the first call for regional project and programme proposals was issued and an invitation letter to eligible Parties to submit project and programme proposals to the Fund was sent out on 5 May 2015.

7. In its twenty-sixth meeting the Board decided *to request the secretariat to inform the Multilateral Implementing Entities and Regional Implementing Entities that the call for proposals under the Pilot Programme for Regional Projects and Programmes is still open and to encourage them to submit proposals to the Board at its 27th meeting, bearing in mind the cap established by Decision B.25/26.*

(Decision B.26/3)

8. In its twenty-seventh meeting the Board decided to:

(e) Continue consideration of regional project and programme proposals under the pilot programme, while reminding the implementing entities that the amount set aside for the pilot programme is US$ 30 million;

(f) Request the secretariat to prepare for consideration by the Project and Programme Review Committee at its nineteenth meeting, a proposal for prioritization among regional project/programme proposals, including for awarding project formulation grants, and for establishment of a pipeline; and

(g) Consider the matter of the pilot programme for regional projects and programmes at its twenty-eighth meeting.

(Decision B.27/5)

9. The proposal requested in (b) above was presented to the nineteenth meeting of the PPRC as document AFB/PPRC.19/5. The Board subsequently decided:

a) With regard to the pilot programme approved by decision B.25/28:

(i) To prioritize the four projects and 10 project formulation grants as follows:

1. If the proposals recommended to be funded in a given meeting of the PPRC do not exceed the available slots under the pilot programme, all those proposals would be submitted to the Board for funding;

2. If the proposals recommended to be funded in a given meeting of the PPRC do exceed the available slots under the pilot programme, the proposals to be funded under the pilot programme would be prioritized so that the total number of projects and project formulation grants (PFGs) under the programme maximizes the total diversity of projects/PFGs. This would be done using a three-tier prioritization system: so that the proposals in relatively less funded sectors would be prioritized as the first level of prioritization. If there are more than one proposal in the same sector: the proposals in relatively less funded regions are prioritized as the second level of prioritization. If there are more than one proposal in the same region, the proposals submitted by relatively less represented implementing entity would be prioritized as the third level of prioritization;

(ii) To request the secretariat to report on the progress and experiences of the pilot programme to the PPRC at its twenty-third meeting; and

b) With regard to financing regional proposals beyond the pilot programme referred to above:

(i) To continue considering regional proposals for funding, within the two categories originally described in document AFB/B.25/6/Rev.2: ones requesting up to US$ 14 million, and others requesting up to US$ 5 million, subject to review of the regional programme;

(ii) To establish two pipelines for technically cleared regional proposals: one for proposals up to US$ 14 million and the other for proposals up to US$ 5 million, and place any technically cleared regional proposals, in those pipelines, in the order described in decision B.17/19 (their date of recommendation by the PPRC, their submission date, their lower "net" cost); and

(iii) To fund projects from the two pipelines, using funds available for the respective types of implementing entities, so that the maximum number of or maximum total funding for projects and project formulation grants to be approved each fiscal year will be outlined at the time of approving the annual work plan of the Board.

(Decision B.28/1)

10. According to the Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat no less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

11. The following project fully-developed project document titled "Reducing climate vulnerability in urban and semi urban areas in cities in Latin America" was submitted by the *Banco de Desarrollo de America Latina* (CAF; Development Bank of Latin America), which is a Regional Implementing Entity of the Adaptation Fund.

12. This is the fifth submission of the proposal. It was first submitted as a pre-concept for the twenty-sixth Board meeting and the Board decided not to endorse it. It was then submitted as a pre-concept for the twenty-seventh meeting, and the Board decided to endorse it. It was then submitted, as a fully-developed project document, bypassing the optional concept stage, to the twenty-eighth meeting, and the Board decided not to approve it. It was submitted again as a fully-developed project document to the twenty-ninth meeting, and the Board decided:

> *(a) Not to approve the project document, as supplemented by the clarification response provided by the* Banco de Desarrollo de America Latina *(CAF) to the request made by the technical review;*
>
> *(b) To suggest that CAF reformulate the proposal taking into account the observations in the review sheet annexed to the notification of the Board's decision, as well as the following issues:*
>
> *(i) The proposal should explain whether vulnerable groups have been involved in interviews and meetings that have represented the main interaction with the community, and present a list of the participants and their specific feedback;*
>
> *(ii) Information on technical designs and specifications should be presented in an accessible format, duly integrated and referenced in the main text of the proposal, with the key information provided in English;*
>
> *(iii) The environmental and social risk identification should provide supporting evidence, and it should be ensured that the stakeholder analysis is up to date, especially with regard to vulnerable groups;*
>
> *(iv) The proposal should provide a comprehensive, evidence-based impact assessment commensurate with the risks;*
>
> *(v) The proposal should explain how technical staff, such as engineers, would be integrated into the project and be included in any training programmes;*
>
> *(vi) The proposal should clarify how the proponent (CAF) would apply its Environmental and Social Management System to ensure compliance with the national and Adaptation Fund policy requirements;*
>
> *(vii) The proposal should elaborate on the financial and project risk mitigation measures of the project; and*

(c) To request CAF to transmit the observations under sub-paragraph (b) to the Governments of Chile and Ecuador.

(Decision B.29/24)

13. The present submission was received by the secretariat in time to be considered in the thirtieth Board meeting. The secretariat carried out a technical review of the project proposal, with the diary number LAC/RIE/DRR/2015/1, and completed a review sheet.

14. In accordance with a request to the secretariat made by the Board in its 10th meeting, the secretariat shared this review sheet with CAF, and offered it the opportunity of providing responses before the review sheet was sent to the PPRC.

15. The secretariat is submitting to the PPRC the summary and, pursuant to decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section. The proposal is submitted with changes between the initial submission and the revised version highlighted.

Project Summary

Chile and Ecuador – Reducing climate vulnerability in urban and semi urban areas in cities in Latin America

Implementing Entity: CAF

Project/Programme Execution Cost: US$ 965,074
Total Project/Programme Cost: US$ 12,880,000
Implementing Fee: US$ 1,030,400
Financing Requested: US$ 13,910,400

Project Background and Context:

The objective of the proposed project would be to reduce vulnerability to climate-related floods, mudflows and landslides in three coastal cities by mainstreaming a risk-based approach to adaptation, building collaboration and networking, and developing a culture of adaptation. The project focus on the hydrometeorological hazards of mudflows in Antofagasta and Taltal, and flooding and landslides in Esmeraldas. The expected mid-term impacts are improved enabling conditions to sustain DRR adaptation in the three cities. In the long-term, it is expected that this will result in improved adaptive capacity. It is also envisioned that the lessons of the project are useful to other countries in Latin America and the Caribbean, and other regions of the world.

Component 1: Priority actions to increase reslience (US$ 9,632,043)

This component would focus on priority actions to increase resilience in the three cities. It would generate four outcomes dealing with building better to withstand climate-related hazards and enhancing disaster preparedness. It would be the largest component of the project, concentrating 74.8 per cent of the budget. The four outcomes would include enhanced plans and green infrastructure that would reduce vulnerability to floods, landslides and mudflows in three coastal cities; reduced vulnerability to floods, landslides and mudflows in two coastal cities; improved climate monitoring and means to alert the local population; and improved means to respond to floods, landslides and mudflows.

Component 2: Strengthen capacities for adaptation (US$ 1,252,011)

The component would focus on strengthen the capacities of local government officers and communities, as well as fortifying connections between communities and local and national government. Two outcomes would be generated by developing an online training course on risk-based adaptation for municipal and government officers, and implementing communication and education strategies to increase local awareness and contribute to build cultural memory. The online course would be open to professionals from other coastal cities of Latin America and the Caribbean.

Component 3: ICTs and partnership between coastal cities in Latin America. (US$ 1,030,874)

The component would focus on nurturing the project´s communities of practice and to document and disseminate the lessons. The backbone of the regional project would be the communities of practice that would allow the development of collective learning on specific topics. Five communities of practice would be developed. This component would include:

i. An electronic platform to facilitate interaction and collaboration among project participants of both countries (e.g. teleconference, webinars), and the dissemination of lessons for the benefit of other coastal cities in the region and the world. According to the proposal, it is expected that this platform would serve to motivate further participation of other coastal cities in the region.

ii. Nurturing the communities of practice and facilitating networking among practitioners.

iii. The systematic documentation of lessons in different formats (e.g. YouTube channel, formal documents) and their world-wide dissemination through various channels (e.g. mailing list server, Twitter, website).

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regional Project

Countries/Region: **Chile, Ecuador**
Project Title: **Reducing climate vulnerability in urban and semi urban areas in cities in Latin America**
Thematic Focal Area: **Disaster risk reduction and early warning systems**
Implementing Entity: **CAF**
Executing Entities: **Ministry of the Environment, Chile and Ministry of the Environment, Ecuador**
AF Project ID: **LAC/RIE/DRR/2015/1**
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): **13,910,400**
Reviewer and contact person: **Mikko Ollikainen**
Co-reviewer(s): **Hugo Remaury**
IE Contact Person: **Carolina Cortés Cardona**

Review Criteria	Questions	Comments on 20 February 2017	Response January 9 - 2017
Country Eligibility	1. Are all of the Participating countries party to the Kyoto Protocol?	Yes.	
	2. Are all of the participating countries developing countries particularly vulnerable to the adverse effects of climate change?	Yes.	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund	Yes.	

	endorsed the project/programme?		
	2. Does the regionalproject / programme support concrete adaptation actions to assist th participating countries in addressing the adverse effects of climate change and build in climate resilience, and do so providing added value through the regional approach,compared to implementing similar activities in each country individually?	**CR1:** Partly addressed. The proponent has further explained the relations of the government-funded interventions and the proposed Adaptation Fund intervention, and provided maps. From the maps it appears that the government interventions in Chile are not physically closely linked (eventhrough their impacts) to the proposed intervention.	The FA intervention will focus on quebrada Bonilla, which is not included in the ARG-MOP agreement (see Table 8 in the PRODOC). The proposed project will be a catalyst that will influence the ARG-MOP project by providing experience on introducing the climate variable in the design and implementation of alluvial control infrastructure.
	3. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Yes.	
	4. Is the project / programme costeffective and does the regional approach support cost-effectiveness?	Yes.	

	5. Is the project / programme consistent with national or subnational sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments? If applicable, it is also possible to refer to regional plans and strategies where they exist.	Yes.	
	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	Yes.	
	7. Is there duplication of project / programme with other funding sources?	**CR2:** Addressed. Information has been included in Annex 18.	
	8. Does the project / programme have a learning and knowledge Management component to capture and feedback lessons?	Yes.	
	9. Has a consultative process taken place, and has it involved all key stakeholders, and	**CR3:** The proponent has clarified, in the response sheet, that additional consultation has taken place between the initial and final workshops, and that consultation has directly	Five additional consultation meetings were organized. Two in Esmeraldas, two in Antofagasta and one in Taltal. Local groups that live in the risk areas were

	vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	involved community members in the form of in-depth interviews and focus group meetings. However, the proposal does not explain (apart from an implicit reference to women) whether vulnerable groups have been involved in those interviews and meetings that seem to represent the most significant feedback from the community. Also, the participants and their specific feedback has not been presented.	invited to participate. The meetings were organized with local organizations (i.e., time of the day, date). The corresponding section was expanded (paragraphs 188 to 215) to include the comments and recommendations from the local groups during the entire consultation process. Annex 4 has the memoirs of all meetings.
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Yes.	
	11. Is the project / program aligned with AF's results framework?	Yes.	
	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Yes.	
	13. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**CR4:** Not addressed. The additional files provided (Annex 11 and 12) contain a large number (several hundreds) of documents, maps, and files in formats other than .docx, .pdf or .jpeg. While the required information may be included in these, it is not readily accessible. This is critical project information that should be provided in an appropriate format, duly integrated and referenced in the main text of the proposal. Key information should be provided in English. The response sheet makes a reference to the location information for the planned activities in Ecuador, however, the information there (p. 13 of the main document) is very general and does not enable understanding the plan well.	Information is included in English and in PDF in Annex 11 and 12.

		CR5: Addressed in terms of relation between the AF-funded and the government-funded infrastructure. The ESP risk finding is still lacking supporting evidence (e.g. generic description of the environment, marginalised and vulnerable groups are not identified beyond broad squatter groups, the location of their 'campamentos' in relation to the infrastructure works is not indicated).	Information on vulnerable groups has been expanded.
		CR6: Not significantly addressed. The Annex with the Environmental and Social Impact Assessment has been revised. The stakeholder analysis (Annex 8) is not up to date. Current figures (http://chile.techo.org/cis/monitor/#) suggest that the number of squatter settlements (campamentos) in Antofagasta has further increased to 56 with 6,229 families (compared to 4,100 families, p. 27, Annex 8).	The environmental and social analysis was redone CAF´s environmental specialists (Annex 15) and a gender analysis of the project was prepared by CAF´s Inclusion and Gender Equity Unit (Annex 18). The PRODOC has included the latest available information about vulnerable groups.
		CR7: Not addressed. The clarification provided by the proponent refers to national regulations but the proposal still does not provide a comprehensive, evidence-based impact assessment commensurate with the risks.	As indicated before the environmental and social analysis was redone. This includes the analysis of compliance with CAF´ environmental and social safeguards and the AF ESP.
		CR8: Not addressed. There is no additional information on how the proponent (CAF) would apply its Environmental and Social Management System to ensure compliance with the national and Adaptation Fund ESP requirements.	The ESMP has been updated and the implementing arrangements focus on this aspect.

		CR9: Partly addressed. See previous CRs for pending issues.	The ESMP has been updated.
		CR10: Please clarify the response in case environmental permits are not obtained or delayed. Not Addressed.	As has been indicated before, there is no risk that the environmental permits are not obtained. The existing designs for the protection works in quebrada Bonilla already include the required Environmental Impact Declaration (DIA). CAF has found that it is complete and adequate. The DIA will be updated together with the designs for the protection works. In Esmeraldas, the construction works requiere an Environmental Registry, which is a process that is done online. However, CAF has requested stringent measures, beyond the requirements of the national legislation, to avoid potential impacts to the local population and the environment.
	14. Does the project promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms?	Yes.	
Resource Availability	1. Is the requested project / programme funding within the funding windows of the pilot programme for regional projects/programmes?	Yes.	
	2. Are the administrative costs (Implementing Entity	Yes.	

	Management Fee and Project/ Programme Execution Costs) at or below 20 per cent of the total project/programme budget?		
Eligibility of IE	3. Is the project/programme submitted through an eligible Multilateral or Regional Implementing Entity that has been accredited by the Board?	Yes.	
Implementation Arrangements	1. Is there adequate arrangement for project / programme management at the regional and national level, including coordination arrangements within countries and among them, and i compliance with the gender policy of the Fund? Has the potential to partner with national institutions, and when possible, national implementing entities (NIEs), been considered, and included in the management arrangements?		
	2. Are there measures for financial and project/programme risk management?	**CR11:** Not addressed. The response sheet mentions that the proponent has its internal processes but has not explained how it would address financial and project risk at the level of the specific project.	In the proposal un B. Describe the measures for financial and project / Programme risk management. Paragraphs 273 – 2778.

	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?		
	4. Is a budget on the Implementing Entity Management Fee use included?	Yes	
	5. Is an explanation and a breakdown of the execution costs included?	Yes.	
	6. Is a detailed budget including budget notes included?	Yes.	
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sexdisaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?		
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	Yes.	
	9. Does the project/programme's results framework align with the AF's results	Yes.	

	framework? Does it include at least one core outcome indicator from the Fund's results framework?		
	10. Is a disbursement schedule with timebound milestones included?	Yes.	

Technical Summary	The project objective is to reduce vulnerability to climate-related floods, mudflows and landslides in three coastal cities by mainstreaming a risk-based approach to adaptation, building collaboration and networking, and developing a culture of adaptation. The project focus on the hydrometeorological hazards of mudflows in Antofagasta and Taltal, and flooding and landslides in Esmeraldas. The expected mid-term impacts are improved enabling conditions to sustain DRR adaptation in the three cities. In the long-term, it is expected that this will result in improved adaptive capacity. It is also envisioned that the lessons of the project are useful to other countries in Latin America and the Caribbean, and other regions of the world. The initial technical review made the following clarification requests: **CR1:** Please explain links between the interventions proposed to be funded by the Adaptation Fund project, and those to be funded by the government-funded project: both in terms of joint impact and in terms of geographical proximity: please provide a map that shows the location of the Adaptation Fund interventions and the government project interventions in the same city. **CR2:** As requested previously, please provide a comprehensive overview of relevant initiatives with which the project might overlap, or that it might complement, and explain complementarity. **CR3:** Please clarify whether additional consultation has taken place. The consultation currently described in Section II.I and especially the inclusion of women has not been adequate. Also, there is not clear information on whether vulnerable groups were meaningfully involved, and these factors would need to be clarified. **CR4:** Please provide a detailed description of the infrastructure elements of the project, with maps and designs and specifications. **CR5:** Please clarify how the AF-funded infrastructure relates to the other components of the broader infrastructure investment to show how these may need to be considered as one in terms of a source of environmental and social risks. **CR6:** Provide further evidence and documentation to support the findings of the risk identification in line with and in terms of the ESP. E.g., para 29 identifies vulnerable groups in function of at-risk of climate-related disasters, which is not the sense of vulnerability intended in the principle of the ESP.

	CR7: For the risks identified in line with the ESP, please provide a comprehensive, evidence-based impact assessment commensurate with the risks. **CR8:** Please clarify how the two sets of national requirements will be integrated with those of the IE (CAF), the EE (UNDP) and the AF ESP. **CR9:** Please update the ESMP to include all environmental and social risks. **CR10:** Please clarify the response in case environmental permits are not obtained or delayed The final technical review found that the proponent had addressed some but not all of the clarification requests: – The proposal should explain whether vulnerable groups have been involved in interviews and meetings that have represented the main interaction with the community, and present the participants and their specific feedback. – Information on technical designs and specifications should be presented in an accessible format, duly integrated and referenced in the main text of the proposal, with key information provided in English. – The environmental and social risk identification should provide supporting evidence, and it should be ensured that the stakeholder analysis is up to date, especially with regard to vulnerable groups. – The proposal should provide a comprehensive, evidence-based impact assessment commensurate with the risks. – The proposal should clarify how the proponent (CAF) would apply its Environmental and Social Management System to ensure compliance with the national and Adaptation Fund policy requirements. – The proposal should elaborate on the financial and project risk mitigation measures of the project –
Date:	20 February 2017

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regional Project

Countries/Region: **Chile, Ecuador**
Project Title: **Reducing climate vulnerability in urban and semi urban areas in cities in Latin America**
Thematic Focal Area: **Disaster risk reduction and early warning systems**
Implementing Entity: **CAF**
Executing Entities: **Ministry of the Environment, Chile and Ministry of the Environment, Ecuador**
AF Project ID: **LAC/RIE/DRR/2015/1**
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): **13,910,400**
Reviewer and contact person: **Mikko Ollikainen**
Co-reviewer(s): **Daouda Ndiaye**
IE Contact Person: **Carolina Cortés Cardona**

Review Criteria	Questions	Comments on 28 August 2017	Comments on 18 September 2017
Country Eligibility	1. Are all of the participating countries party to the Kyoto Protocol?	Yes.	
	2. Are all of the participating countries developing countries particularly vulnerable to the adverse effects of climate change?	Yes.	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes, by both countries.	
	2. Does the regional	Yes, broadly.	

	project / programme support concrete adaptation actions to assist the participating countries in addressing the adverse effects of climate change and build in climate resilience, and do so providing added value through the regional approach, compared to implementing similar activities in each country individually?		
	3. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Yes.	
	4. Is the project /	Yes.	

	programme cost-effective and does the regional approach support cost-effectiveness?		
	5. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments? If applicable, it is also possible to refer to regional plans and strategies where they exist.	Yes.	
	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	Yes.	

	7. Is there duplication of project / programme with other funding sources?	No.	
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Yes.	
	9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	At its 29th meeting, when discussing the proposal, the Board noted that proposal should explain whether vulnerable groups have been involved in interviews and meetings that have represented the main interaction with the community, and present a list of the participants and their specific feedback. The current proposal has sufficiently addressed this finding.	
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Yes.	
	11. Is the project / program aligned with AF's results framework?	Yes.	

	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Yes.	
	13. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	At its 29th meeting, when discussing the proposal, the Board noted that the proposal should present information on technical designs and specifications in an accessible format, duly integrated and referenced in the main text of the proposal, with the key information provided in English; the environmental and social risk identification should provide supporting evidence, and it should be ensured that the stakeholder analysis is up to date, especially with regard to vulnerable groups; the proposal should provide a comprehensive, evidence-based impact assessment commensurate with the risks; the proposal should explain how technical staff, such as engineers, would be integrated into the project and be included in any training programmes; the proposal should clarify how the proponent (CAF) would apply its Environmental and Social Management System to ensure compliance with the national and Adaptation Fund policy requirements. The review of the current version of the proposal finds that providing	

		comprehensive and detailed feedback on all the environmental and social policy (ESP) issues related to this application and the IE's demonstration of compliance with the ESP is very difficult considering the amalgamated nature of the application, the internal contradictions and the lack of progress. The review process is further hampered by the lack of the requested tracked changes to the proposal. The issues mentioned here should therefore not be considered an exhaustive listing of issues, but illustrations of similar issues to be addressed. The environmental and social information included in the proposal is overall inadequate or absent. In particular, information that would enable the identification of social risks is lacking. The information provided in both Annexes 15 and annex 12 are not in line with the ESP. In general, the information provided is not evidence-based, the safeguard measures are not commensurate to the risks, and the risks have not adequately been identified according to the 15 principles of the ESP. The risks identification is inconsistent between the summary table of section II.K of the template and the substantiation of the findings that is added. E.g. involuntary resettlement: the	**CR1: Partially addressed.** An additional document "*Environmental and Social Risk Analysis using the Adaptation Fund Principles. Ancillary document to CAF's Environmental and Social Report (ESR)*" has been provided and some of its information added to the application document. It is an addendum to one of the 20-odd annexes to the funding application. The justification of risks findings, now presented by ESP principles, remains inadequate, additional information is not provided and there are internal contradictions. (E.g., para 256, on Core labour rights, information is presented about (very) serious labour rights issues in

		table on p. 67 states: “No risks or adverse impacts”. On p. 73, the following is stated under Principle 8: “In cerro Gatazo (Esmeraldas), the hillsides where construction works will be executed are also unpopulated and not used for economic or recreational activities. However, the final designs for the protection works will define if it will be necessary to relocate a few families for their protection.” If the latter statement is accurate, the risk for involuntary resettlement does exist, and needs to be assessed and managed accordingly. Similar issues are found for other principles. For many of the other principles the risks identification starts by stating a total absence of risks, while further on in the justification clear risk elements are identified. The risk identification in this sense lacks substantiation, and many of the statements do not address the issues defined in the principles (e.g. principle on natural habitats: the statement of no risk is supported by a statement that “The project will not intervene in protected areas or high value conservation areas.” (p. 72). The principle, however, is not about intervening in protected or high value conservation areas, and the risk identification should be done according to the principle. The mangroves protected area is within the logical impact area of the project.)	both countries. Yet, the conclusion is ‘no risk’, without further substantiation. The same is stated on p. 8 of Annex 14, and repeated throughout. One other example: the risk of involuntary resettlement is at the time said to be low (p. 72, Table 11, application document), medium (p. 26, Table 4, Annex 14, the ESMP) and high (p. 30, Annex 15.2).) The proposal should identify the risks of unnecessary environmental and social harms in line with the ESP, present the evidence-based findings of impacts assessments for those principles for which risks have been identified, and formulate management or mitigation measures accordingly, in a manner commensurate to the risks. The relevant information should be included in the main application document in a concise but adequate way. Any necessary additional documentation should be consistent with the information in the application document. **CR2: Not addressed**. The submission includes 21 annexes. E.g. p. 75, para 254 of the application document refers to: “The assessment is presented in Appendix 2 of Annex 15.” Three of the documents included in the submission are: (1) “Annex 15. CAF´s environmental and social impact assessment ver.4 English”; (2) “Annex 15. CAF´s SCREENING OF AF’S ENVIRONMENTAL AND SOCIAL PRINCIPLES ver.4”; and (3) “Annex 15.2.

		CR1: Please identify environmental and social risks for the project in compliance with the ESP. The application now contains a number of documents that are mutually contradicting (e.g. annex 14 and both versions of annex 15). **CR2:** Please ensure consistency of information provided in various documents, and clarify which is the prevailing information regarding sections II.K and III.C of the application form. Please integrate the relevant information in the application form.	Environmental and Social Risk Assessment for Compliance with AF's ESP-1" (sic). The proponent should consolidate the proposal and its components, following the application template, in a concise, coherent and clear manner, focusing on relevant information. There is e.g. no need for the proponent to provide extensive information and reports on its internal ESMS in relation to this project. The proponent is reminded that accreditation does *not* imply an acknowledgement of equivalence of its ESMS to the requirements of the ESP.
	14. Does the project promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms?	Yes.	
Resource Availability	1. Is the requested project / programme funding within the funding windows of the pilot programme for regional projects/programmes?	Yes.	
	2. Are the administrative costs (Implementing Entity Management Fee	Yes.	

	and Project/ Programme Execution Costs) at or below 20 per cent of the total project/programme budget?		
Eligibility of IE	3. Is the project/programme submitted through an eligible Multilateral or Regional Implementing Entity that has been accredited by the Board?	Yes.	
Implementation Arrangements	1. Is there adequate arrangement for project / programme management at the regional and national level, including coordination arrangements within countries and among them, and in compliance with the gender policy of the Fund? Has the potential to partner with national institutions, and when possible, national		

	implementing entities (NIEs), been considered, and included in the management arrangements?		
	2. Are there measures for financial and project/programme risk management?	At its 29th meeting, when discussing the proposal, the Board noted that the proposal should elaborate on the financial and project risk mitigation measures of the project. The review of the current proposal finds that this has been sufficiently addressed.	
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	Partially. The information provided in section III.C of the application – measures for environmental and social management in line with the ESP – is limited to obtaining environmental permits, only using native plants and some generic gender promotion intentions. It does not at all reflect the needs for environmental and social safeguarding identified elsewhere in the application. The funding application and its annexes on the other hand contain now a number of environmental and social management plans or statements of intent to develop ESMPs (e.g. Annex 15, p. 28, p. 31-41, Annex 14, Annex 12, p.69 onwards, Annex 11, p. 13, Annex 18 as part of the Gender Action plan etc.). These should all be integrated, in a concise and coherent manner, to become the project Environmental and Social Management Plan, based on the comprehensive,	**CR3: Partially addressed**. Section III.C of the application form is limited to a number of mitigation and management actions the

		evidence-based environmental and social risks identification following the 15 ESP principles only. **CR3:** Please complete section III.C in accordance with the findings related to environmental and social safeguarding identified elsewhere in the application, in an integrated, concise and coherent manner, and ensure that the project Environmental and Social Management Plan is based on the comprehensive, evidence-based environmental and social risks identification following the 15 ESP principles only.	project intends to undertake in response to risks identified but does not provide information on implementation arrangements. The risk identification table along AF ESP principles has been added to Annex 14 and further elaborated for each activity. However, there remain issues with the risks identification as mentioned earlier, undermining the effectivity of the ESMP as described in Annex 14. The proposal should include implementation arrangements for the environmental and social management measures that are required to comply with the ESP, reflecting a consolidated and integrated ESMP.
	4. Is a budget on the Implementing Entity Management Fee use included?	Yes.	
	5. Is an explanation and a breakdown of the execution costs included?	Yes.	
	6. Is a detailed budget including budget notes included?	Yes.	
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the	Yes.	

	Gender Policy of the Fund?		
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	Yes.	
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	Yes.	
	10. Is a disbursement schedule with time-bound milestones included?	Yes.	

Technical Summary	The project objective is to reduce vulnerability to climate-related floods, mudflows and landslides in three coastal cities by mainstreaming a risk-based approach to adaptation, building collaboration and networking, and developing a culture of adaptation. The project focus on the hydrometeorological hazards of mudflows in Antofagasta and Taltal, and flooding and landslides in Esmeraldas. The expected mid-term impacts are improved enabling conditions to sustain DRR adaptation in the three cities. In the long-term, it is expected that this will result in improved adaptive capacity. It is also envisioned that the lessons of the project are useful to other countries in Latin America and the Caribbean, and other regions of the world. The initial review made the following clarification requests: **CR1:** Please identify environmental and social risks for the project in compliance with the ESP. **CR2:** Please ensure consistency of information provided in various documents, and clarify which is the prevailing

	information regarding sections II.K and III.C of the application form. Please integrate the relevant information in the application form. **CR3:** Please complete section III.C in accordance with the findings related to environmental and social safeguarding identified elsewhere in the application, in an integrated, concise and coherent manner, and ensure that the project Environmental and Social Management Plan is based on the comprehensive, evidence-based environmental and social risks identification following the 15 ESP principles only. The final technical review finds that the revised proposal does not adequately address these areas. - The proposal should identify the risks of unnecessary environmental and social harms in line with the ESP, present the evidence-based findings of impacts assessments for those principles for which risks have been identified, and formulate management or mitigation measures accordingly, in a manner commensurate to the risks. The relevant information should be included in the main application document in a concise but adequate way. Any necessary additional documentation should be consistent with the information in the application document. - The proponent should consolidate the proposal and its components, following the application template, in a concise, coherent and clear manner, focusing on relevant information. - The proposal should include implementation arrangements for the environmental and social management measures that are required to comply with the ESP, reflecting a consolidated and integrated ESMP.
Date:	18 September 2017

ADAPTATION FUND

REGIONAL PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America
Countries:	Chile and Ecuador
Thematic Focal Area[1]:	Disaster risk reduction and early warning systems
Type of Implementing Entity:	Regional Implementing Entity (RIE)
Implementing Entity:	CAF, Development bank of Latin America
Executing Entities:	Ministry of the Environment (Chile) Ministry of the Environment (Ecuador)
Amount of Financing Requested:	13.910.400 (in U.S Dollars Equivalent)

Project / Programme Background and Context:

1. Weather-related disasters have a major impact worldwide. Between 1995 and 2015, 90% of disasters were weather-related and claimed 606,000 lives and affected about 4.1 billion people (UNISDR, 2015). Over the past 20-year period, floods and storms, respectively, accounted for 47% and 40% of all weather-related disasters (UNISDR, 2015).
2. In Latin America, the most obvious risk factor is El Niño Southern Oscillation (ENSO), a recurrent planetary climate phenomenon. El Niño (ENSO´s warm phase) produces an extreme increase in rain and floods in the Pacific coast and central part of South America (i.e., Argentina, Bolivia, south Brazil, Ecuador, Paraguay, Peru, and Uruguay), and a rain deficit and severe drought in Colombia, Venezuela, the Bolivian Andes, the Caribbean and northeast Brazil. The 1997 – 1998 El Niño, one of the strongest in record, produced USD7.5 billion in losses in five Andean countries[2] (CAF, 2000a; CAF, 2000b; OPS, 2000). The most affected countries, at that time, were Ecuador (14.6 % of GDP), Bolivia (7% of GDP) and Peru (4.5% of GDP).
3. The projected climate change will be a major driver that will exacerbate hazards and disaster risk (Figure 1). Latin America and the Caribbean (LAC) is a very vulnerable area. Out of 33 countries, 10 are extremely vulnerable (30%) and eight are highly vulnerable (24%) to the impacts of climate change (CAF, 2014).
4. Coastal areas are more exposed and vulnerable to the negative effects of climate change and the impacts of weather-related disasters. Future sea level rise could severely impact coastal populations by inundation, flooding, coastal erosion and saltwater intrusion

[1] Thematic areas are: Food security; Disaster risk reduction and early warning systems; Transboundary water management; Innovation in adaptation finance.

[2] i.e., Bolivia, Colombia, Ecuador, Peru, and Venezuela.

(Neumann et al., 2015). Hallegatte et al., (2013) estimated that flood-related loses in the world´s 136 largest coastal cities could increase from ca., USD 6 billion / year in 2005 to USD 52 billion / year by 2050 with projected socio-economic change alone. Climate change could further increase losses to about one trillion per year. In addition, it is anticipated that climate change will produce stronger and more frequent coastal storms and ENSO events (Cai et al., 2014; Cai et al., 2015).

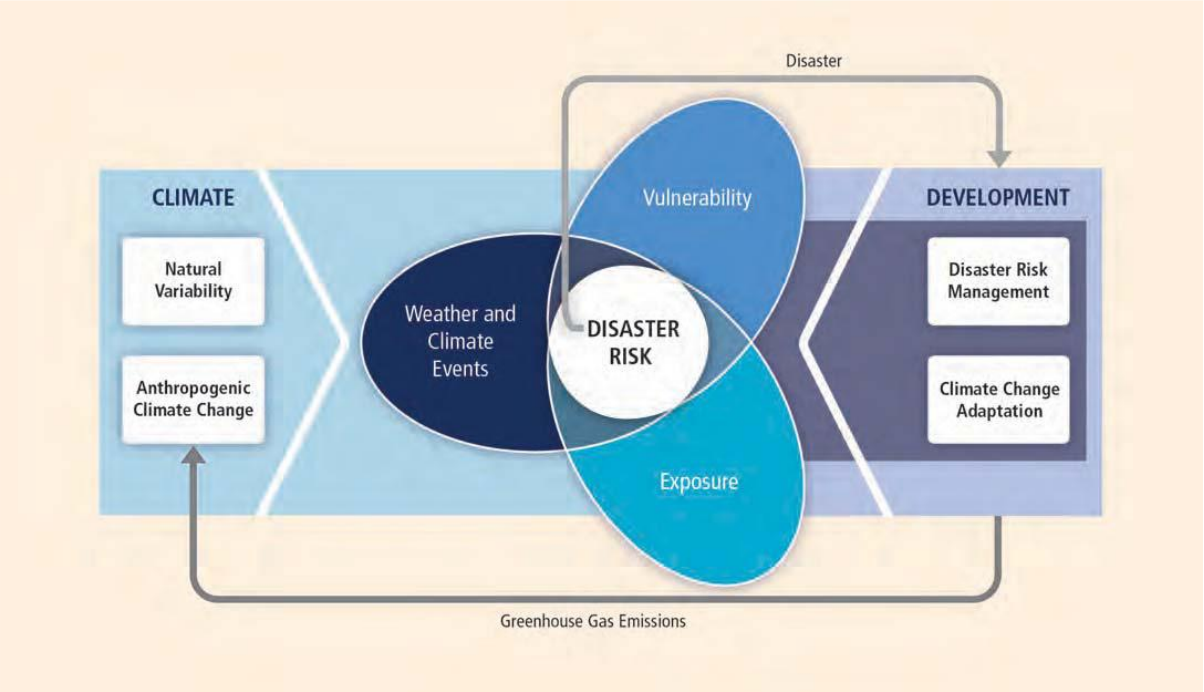

Figure 1. Relationship between disaster risk and climate and development factors (IPCC, 2012).

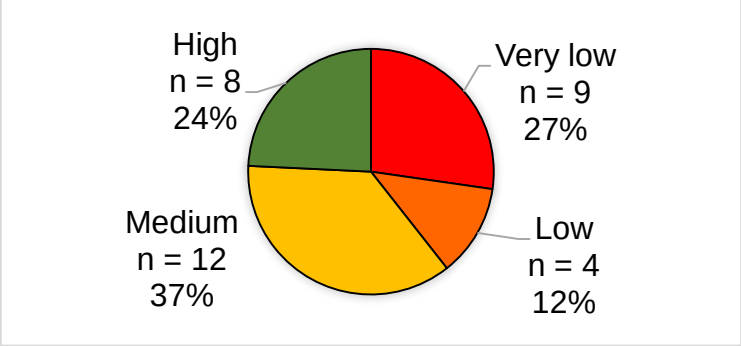

Figure 2. Number of LAC countries according to their adaptive capacity index (CAF, 2014).

5. LAC is the most urbanized region of the world, about 80% of the population live in cities (Escamilla et al., 2008; Hayes-Mitchell & Godfrey, 2008; UN-HABITAT, 2012). Half of the urban population live in cities with less than 500,000 inhabitants, and 14% live in megacities (UN-HABITAT, 2012). A major portion of the population live in coastal areas. About 42% of the population live within a maximum distance of 100 km from the coast (UN-HABITAT, 2012). However, there are extreme cases in the Caribbean, where countries like Montserrat and Aruba have, respectively, 100% and 99.1% of its population living along five kilometres of the seafront (CEPAL, 2012). Four of the eight largest cities

of south America (≥ 5 million people) are coastal, and together house about 55 million people.

6. LAC coastal cities (e.g., Buenos Aires, Guayaquil, Lima, Montevideo, Panama, Rio de Janeiro, San Juan, Sao Paulo and Tijuana) are exposed to the impacts of climate change. Reguero et al., (2015) estimated that, without adaptation, more than four million people will be exposed to flooding from relative sea-level rise by the end of this century, and that El Niño increases the threat on the Pacific-coast countries. Sepulveda & Petley (2015) identified that ENSO is a key factor in the initiation of landslides in LAC
7. Adaptation measures are crucial to reduce the risk of severe human and property losses in the coastal areas. However, in LAC the adaptation capacity is quite diverse (Figure 2). Thirteen out of 33 countries (39%) have very low and low adaptation capacity. Also, the population of coastal cities tend to be more vulnerable to climate change. Three of the four largest coastal cities of LAC have very high vulnerability index[3], and the other has a high vulnerability index[4] (CAF, 2014). But the same occurs in smaller cities like Cartagena (1.48 vulnerability index = very high), Panama (2.7 vulnerability index = high) and Montevideo (2.91 vulnerability index = high).
8. The present project focus on the impacts of climate-related risk in coastal cities of LAC. The projected climate change will increase the sea level, modify and intensify the seasonal periods of rain and drought, and result in stronger and more frequent weather events like coastal storms and ENSO. This will in turn, intensify hydro-meteorological hazards and disasters like floods, mudflows and landslides, and produce casualties and economic and infrastructure losses.

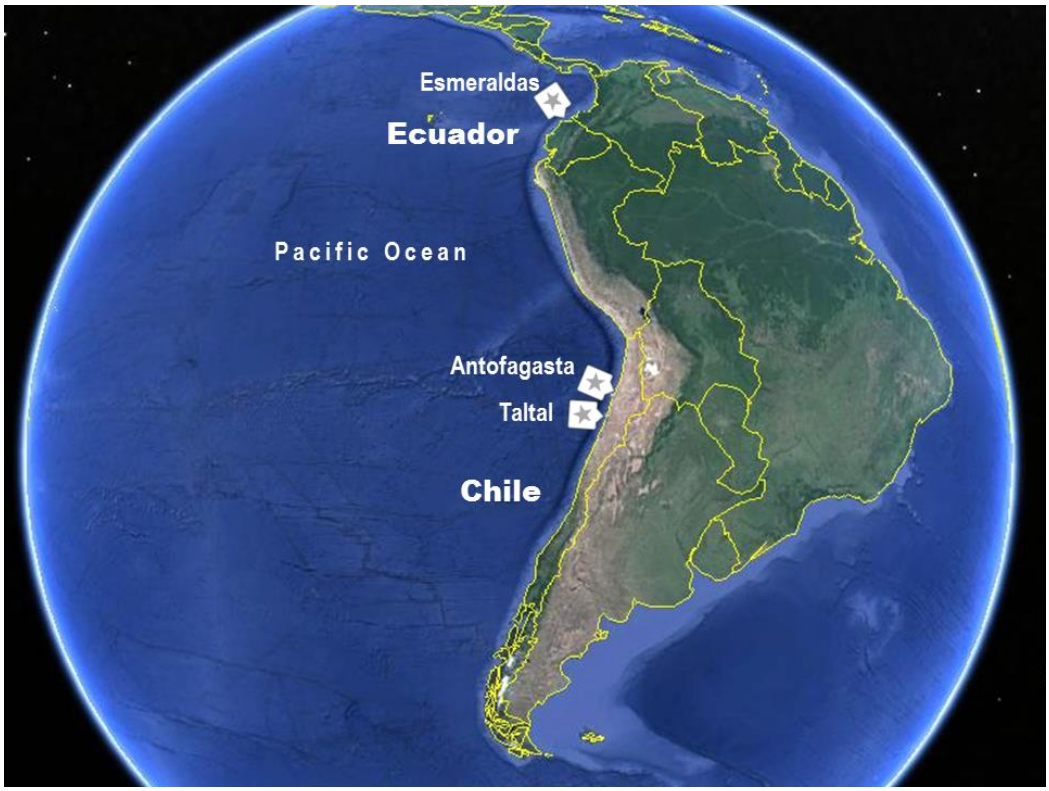

Figure 3. Location of Esmeraldas, Antofagasta and Taltal.

[3] This index takes into consideration human factors like poverty, education level, access to health services, enforcement of land-use regulations, and displacement. See CAF (2014).

[4] Lima has a 1.65 vulnerability index (very high), Rio de Janeiro has 2.12, Sao Paulo has 2.3, and Buenos Aires has 2.55 (high).

9. The purpose of this regional project is to generate lessons on increasing adaptive capacity to be useful in coastal cities of Latin America and the Caribbean. The governments of Chile and Ecuador have agreed to collaborate and jointly implement an action learning approach to address the issues of climate change adaptation in coastal cities.
10. For this, the governments of Chile and Ecuador have decided to develop practical actions in three small coastal cities (less than 500,000 inhabitants): Antofagasta and Taltal in Chile, and Esmeraldas in Ecuador.
11. These cities were chosen because they:
    a) reflect different conditions in terms of population size[5] and adaptive capacity (Table 1 and Table 2);
    b) face climate-related disaster risks that are typical to coastal cities across Latin America and the Caribbean; and
    c) represent adaptation challenges that are common along LAC.

Table 1. Impact of weather-related disasters and adaptive capacity and vulnerability indexes in Chile and Ecuador.

Country	Number of weather-related disasters (1980-2013) [a]	Number of people affected by weather-related disasters (1980-2013) [a]	Adaptive capacity to climate change index (2014) [a]	Vulnerability to climate change index (2014) [a]	Population within 5 km of the seafront (%)[b]
Chile	30	1,110,352	9.40 (high)	9.54 (low)	6.7
Ecuador	30	915,104	4.44 (low)	3.76 (high)	4.3

[a] CAF (2014)

[a] CEPAL (2012)

Table 2. Vulnerability to climate change in the cities of Antofagasta and Esmeraldas (CAF, 2014).

City	Vulnerability to climate change index (2014)	Exposure to climate change index (2014)	Sensibility to climate change index (2014)	Adaptive capacity to climate change index (2014)
Antofagasta	8.48 (low)	9.31 (low)	5.76 (medium)	9.40 (high)
Esmeraldas	1.94 (very high)	3.61 (high)	2.34 (very high)	4.44low)

12. It is anticipated that climate change will produce stronger and more frequent coastal storms and ENSO events (Cai et al., 2014; Cai et al., 2015), which are a key triggering factor of flooding, mudflows and landslides. The impacts from climate change could be devastating even in countries with high adaptive capacity like Chile (Table 2). The 2015 anomalous mudflows in the Atacama Desert increased Chile´s Climate Risk Index and

[5] Antofagasta is the largest of the three cities with ca., 320 thousand inhabitants. Esmeraldas has about half of the population of Antofagasta (ca., 161 thousand people), and Taltal is a very small city of about 10 thousand people.

placed the country among the 10 most affected countries[6] (Kreft et al., 2016). The three chosen cities, like others in the region, face the common challenge of protecting their population and assets from the impacts of extreme weather events, that will become stronger and frequent in the foreseen future.

13. The project will facilitate interaction among practitioners and stakeholders of the three cities to learn from each other, and to develop common knowledge on how to adapt to climate change and to reduce the associated disaster risk. For this purpose, thematic communities of practice[7] (Lave & Wenger, 1991; Wenger, 1998; Wenger et al., 2002) will be established to allow the development of collective learning on specific topics among the three cities. An electronic platform (Figure 16) will facilitate collaboration among project participants, and to share lessons in LAC. It is envisioned that the electronic platform will motivate interest and involvement on risk-based adaptation in coastal cities in the region.

Table 3. Exclusive and non-exclusive functions of Chilean municipalities (Letelier, 2006).

Exclusive functions	Non-exclusive functions
(1) Preparation, approval, and modification of the municipal development plan according to the legal norms in force	(1) Education and culture
(2) Local planning, regulation, and design of the building regulation according to the legal norms in force	(2) Public health and environmental protection
(3) Promotion of community development	(3) Legal and social assistance
(4) Enforcement of norms on transportation and public transit on the basis of the general laws defined by the corresponding ministry	(4) Job training, employment, and productive promotion
(5) Implementation of local arrangements for construction and urbanization on the basis of general laws defined by the corresponding ministry	(5) Tourism, sport, and recreation
(6) Community cleaning and adornment	(6) Urbanization and urban and rural roads
	(7) Construction of social housing and sanitary infrastructure
	(8) Public transportation and transit
	(9) Risk prevention and assistance in emergencies or catastrophic situations
	(10) Support, promotion, and enforcement assistance for town security measurements
	(11) Promotion of equity between men and women
	(12) Development of common interest local activities

National and local situation in Chile

14. The Republic of Chile is located in the southern cone of South America. It has a continental land surface of 756,096 km^2 (i.e., the seventh largest nation in South America). In addition, Chile has a large extent of islands and islets (the most conspicuous are the Juan Fernandez archipelago and Pascua Island) and Antarctic territory. The country has a long coastline stretching for about 6,435 km (the world´s 20^{th} largest coastline). The coastal plain extends from the seafront inland until the Chilean Coast Range.

[6] The impacts from the anomalous rainfall in the Atacama Desert increased Chile´s climate risk index ranking from number 62 in 2014 to number 10 in 2015 (Kreft et al., 2016).

[7] Communities of practice are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger et al., 2002).

15. The country has a wide range of climate conditions, ranging from warm and cold deserts in the far north, to tundra in the far south. The climate is mainly influenced by the Pacific Anticyclone, the southern circumpolar low-pressure area, the cold Humboldt current, the Chilean Coast Range[8] and the Andes Mountains.
16. In 2002, Chile had 15,116,435 people[9]. Women and ethnic groups constituted 50.7% and 4.6% of the population, respectively. Most people lived in cities; 86.6% was urban population. It is projected that Chile´s population in 2020 will be 18.896.684 people. The largest cities are Santiago (ca., 6.1 million people), Concepción and Valparaiso (ca., 1 million people each).
17. The country has a Global Gender Gap Index of 0.698[10] (Annex 10), there is almost complete equality in educational attainment and health and survival, but major gaps in political empowerment and economic participation and opportunities (WEF, 2015).

1. Parque Nacional La Chimba / 2. Parque Nacional Morro Moreno

Figure 4. Location of the city of Antofagasta.

18. The territory is organized into 15 regions, 54 provinces and 346 communes. They are administered in the following way:
    - Regions are headed by an Intendent, who is appointed by the President of the Republic. Ministries have regional secretaries (SEREMI) which together constitute a regional cabinet that advise the Intendent. The Regional Government prepare and implement the Regional Development Strategy.
    - The provinces are headed by a governor, also appointed by the President of the Republic. The provincial government coordinate the central government decentralized services.
    - The communes are administered by a municipality, headed by an alcalde (i.e., mayor) and a communal council who are elected by public vote. The Municipal government

[8] This is a range which runs along the coast, parallel to the Andes for about 3,000 km. It extends from Morro de Arica in the north (Región de Arica y Parinacota or 15th Region) to Taitao Peninsula (Región de Aysén or 11th Region) in the south. The highest point is cerro Armazones (ca., 3.064 m altitude) in the Antofagasta region.

[9] Source: XVII National Population Census and VI Housing Census. The 2012 census was considered deficient and the information was not published by the Instituto Nacional de Estadísticas (INE). A new census was organised and executed on 19 April 2017. The results of the 2017 census have not been made public, it is anticipated that the information will be available on August 2017.

[10] 0.00 = inequality / 1.00 = equality.

has a set of exclusive and non-exclusive functions (Table 3) and prepare and implement the Communal Development Plan (PLADECO).

- At the local level neighbours can form "juntas de vecinos" (neighbourhood councils). These are not-for-profit community organizations (regulated by Law 19,418 of 1997), that promote community development, defend the interests and rights of the neighbours and collaborate with government authorities and municipalities.

19. The city of Antofagasta is (a) the capital of the Antofagasta Region[11] (Region II) and the Antofagasta province, and (b) the seat of the Antofagasta commune[12]. The city has about 390 thousand people and is the country´s sixth largest city[13]. It is located in the coastal plain of the Atacama Desert, annual rainfall is about 1.7 mm / year. The economy is centred in copper mining. Antofagasta has the country's highest per capita income, about USD 23,000 per year. The poverty level is low (ca., 5%) and houses have almost full access to potable water, sanitation and electricity[14].
20. Antofagasta has developed bordering the seafront along a narrow strip (Figure 4). The inland limit is a set of coastal hills (part of the Chilean Coast range) that are cutted by 17 gorges (called "quebradas") which drain into the city.
21. Despite the general high living conditions, Antofagasta has informal neighbourhoods (called campamentos[15]) mainly on the upper hillsides (Figure 5). These are unplanned illegal occupations of public land with deficient infrastructure and services, and roughly constructed houses. Access to affordable housing is a national issue. On this respect, the Ministry of Housing and Urban Development (MINVU) implements a national policy to provide housing solutions to campamento dwellers. Complementary, the Antofagasta Regional Government (ARG) implements a plan to confront the key factors that motivate the appearance and expansion of campamentos (GORE Antofagasta, 2015).
22. The number of people living in campamentos has increased in the recent years. Until May 2014, there were 17 campamentos (608 families) (TECHO, 2013; TECHO, 2014). The oldest was established in 1975 (campamento Juanita Cruchaga), and the most recent in 2012 (campamento Génesis) (TECHO, 2014). The latest figures, from the 2016 cadastre, indicate 44 campamentos[16], where 4,593 families lived (TECHO, 2016) (Figure 5).
23. In the 2015 poll, it was found that women and persons with disabilities constituted, respectively 52.4% and 3.2% of the population of the campamentos (GORE Antofagasta, 2015a). Fifty-one percent were female-headed households. On average, settles had lived 1.5 years in the campamentos.
24. Most of the settlers were South American immigrants[17] (GORE Antofagasta, 2015a; Santana, 2015; TECHO, 2015), and most had migrated to Chile seeking working opportunities (72.6%); 5.9% had migrated because of security reasons. About half of them

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[11] The Antofagasta Region contain three provinces (i.e., Antofagasta, El Loa and Tocopilla) and nine communes.

[12] In the present document, the term "Antofagasta" will be used to refer to the city of Antofagasta, unless otherwise indicated.

[13] Antofagasta is Chile´s most urbanized region. In 1960 the region had 94.8% of urban population, this figure increased to 97.7 in 2002 (INE, 2008).

[14] In 2010, the urban population of Antofagasta region had 100% cover of potable water and 99.7% cover of sewage system. In 2013, 7.1% of houses of the Antofagasta commune had a deficit in sanitation (MDS, 2014a).

[15] The illegal occupation of land is called toma, and the irregular settlement is called campamento. The official definition of campamento used by the Ministry of Housing and Urban Development (MINVU) is "'settlements, usually found in urban areas, of more than eight families living on an irregular land tenure, lacking at least one of the three basic services (electricity, drinking water and sewage system) whose homes are closely grouped together'" (MINVU, 2012). The development of tomas and campamento is a common issue along Chile. It is common that the campamentos develop on unstable hillsides like in Valparaiso (Pino & Ojeda, 2013). The national cadastre of 2016 recorded 660 campamentos, where 38,770 families lived (ca., 116,310 persons) (TECHO, 2016).

[16] This is 78.6% of the campamentos of the Antofagasta region. The campamentos of this region are found mostly in three communes (i.e., Antofagasta, Taltal and Calama) and are located mostly in urban areas (92.9%) (TECHO, 2016).

[17] GORE Antofagasta (2015a) and Santana (2015) report: 40,2% Chileans, 18.8% Colombians, 14.7% Peruvians, 14.4% Bolivians, 2.6% Ecuadorians, and 8.8% other.

did not know for how long they will stay in the country[18] (51.3%) and send remittances to their countries of origin (48.7%). A small number of immigrants had an irregular condition (3.4%), and 0.1% were refugees (GORE Antofagasta, 2015a). Campamento dwellers have indicated that a key factor is the difficulty to access affordable housing.

25. In the Antofagasta region, people settle in campamentos mostly because of the high cost of house rental and limitations to access affordable housing (TECHO, 2015). Because of their irregular land-tenure, campamento dwellers cannot formally access public services. TECHO (2015) found that, in the campamentos of the Antofagasta region, 20.6% of the houses have individual water meters (i.e., formal access), 41.2% have informal connections to the public water network, and the others get water from different sources (e.g., tankers, wells). Similarly, only 1.5% of the houses have individual electricity meters, 7.3% of the houses have communal electricity meters, 89.8% have clandestine electricity connections, and 1.5% do not have electricity. Finally, only 6.3% of the houses are connected to the public sewage system, 51.7% use septic tanks, 39.5% use pit latrines, and 2.4% do not have toilets.

[18] The other indicated time spans up to 10 years.

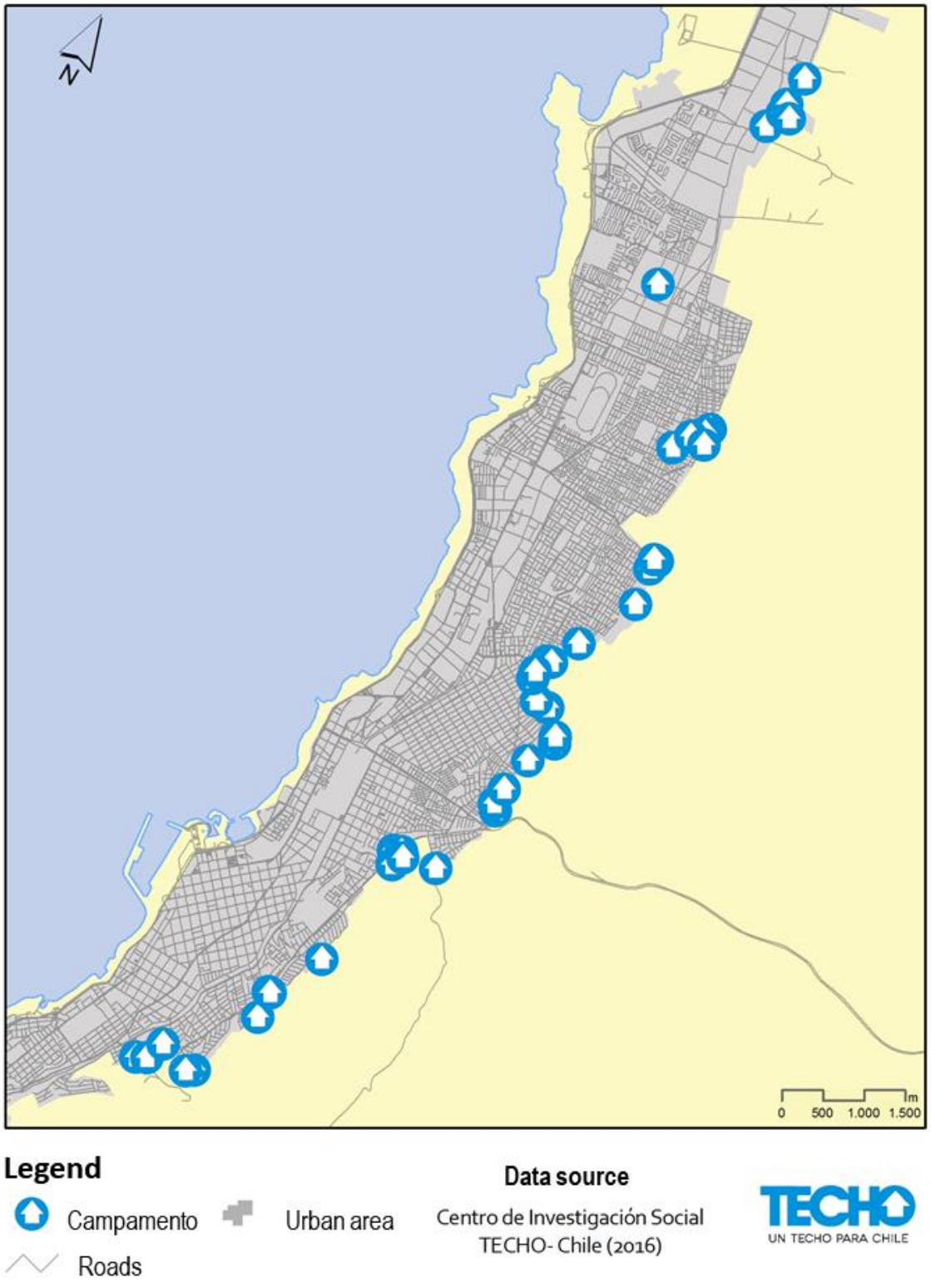


Figure 5. Campamentos in the city of Antofagasta. Source: 2016 national cadastre.

26. Taltal is a small city (ca., 10,400 people in 2013) located about 195 km south of Antofagasta. It is also located in the coastal plain of the Atacama Desert, at the end-point of a large canyon (Figure 6). In 2011 the poverty level was very low (2.7%), well below the national average (INE, 2014b). About 25.1% of houses have sanitation deficit, which is well above the national and regional deficits (i.e., 17.0% and 13.7%) (INE, 2014b).
27. Taltal also has campamentos, though the information available is not as detailed as for Antofagasta. Until May 2014, there were two campamentos with 67 families, one established in 2004 (Tiro al Blanco, 55 families) and the other in 2005 (Eusebio Lillo, 12 families) (TECHO, 2013; TECHO, 2014). The most recent information, from the 2016 cadastre, indicate six campamentos with 400 families (TECHO, 2016) (Figure 7, Table 4).
28. Both cities are located in the Atacama Desert, and consequently have very dry conditions. However, the entire region has been affected by intense mudflows caused by flash floods generated by unusual heavy rain. The area is extremely dry and devoid of vegetation; therefore, the hard ground cannot absorb unusual rain.
29. The strongest mudflow recorded was in 1991[19] and was caused by unexpected and sporadic heavy rain (recorded rainfall about 42 mm). The balance was 91 dead,16 missing persons, 8,000 refugees and about USD 71 million in losses (ONEMI, 1994; Melin, 2011). The most recent mudflows occurred in March 2015 in Taltal, and August 2015 in Tocopilla[20]. The March 2015 event affected southern Peru and northern Chile. Campamentos are more vulnerable to mudflows because they tend to locate on the hillsides.
30. Vargas & Ortlieb (1997) found records of seven events of heavy and intense rain between 1916 and 1991. In all cases Antofagasta was flooded, but five times mudflows developed[21]. Garreud & Rutllant (1996) and Vargas et al., (2000) found that the unusual rain episodes which produce mudflows are linked to ENSO conditions. Liberto (2015) explain the conditions that generated the 2015 event.
31. After the 1991 mudflow, protection works were built in priority gorges of Antofagasta[22] and in Taltal. Taltal was supposed to be protected with the existing infrastructure. However, in March 2015 the structural measures were insufficient to withhold the strong alluvial flows. A key issue is that existing infrastructure do not incorporate the climate change factor.
32. The present project contributes to implement Chile´s national environmental policy expressed in the National Adaptation Plan (MMA, 2014) and the Climate Change National Action Plan 2017-2022[23] (PANCC-II). These national plans provide strategic guidance for the preparation of nine sectoral plans. Two sectoral plans are related to the present project: (i) the Climate Change Adaptation plan for Cities (to be ready during 2017), and (ii) the Climate Change Adaptation Plan for Infrastructure (under development). The present project will be the first initiative to contribute to implement the adaptation plan for cities.

[19] There were mudflows in three coastal cities of the Antofagasta region: Antofagasta, Taltal and Tocopilla.

[20] A coastal city located about 200 km north of Antofagasta. The 2015 mudflow killed three people and 830 people had to be evacuated.

[21] i.e., August 1930, June 1940, May 1982, July 1987 and June 1991.

[22] Infrastructure has been built in four gorges (quebradas in Spanish): Salar del Carmen, La Cadena, El Ancla and Baquedano. Infrastructure for six additional quebradas is included in the Antofagasta´s Regional Government – MOP project (i.e., Farellones, La Chimba, El Toro, Jardines del Sur, Riquelme, Uribe). The other five quebradas do not have a source of funding: Club Hípico, Bonilla, Caliche, Universidad de Antofagasta, and El Huáscar.

[23] The PANCC-II is currently under consultation. The process will finish on 4 August 2016. The consultation workshop in Antofagasta was held on 12 July 2016.

Figure 6. Location of Taltal.

Table 4. Campamentos in Taltal. Source: TECHO (2016).

Campamento name	Year established	Number of families
Tiro al Blanco	2004	55
Eusebio Lillo	2005	15
22 de enero	2013	65
Luchando por nuestro hogar	2015	210
Vida nueva	2015	30
Salvador Allende	2015	25

Source: Monitor de Campamentos. TECHO-Chile. Online: http://chile.techo.org/cis/monitor/

Figure 7. Location of campamentos in Taltal.

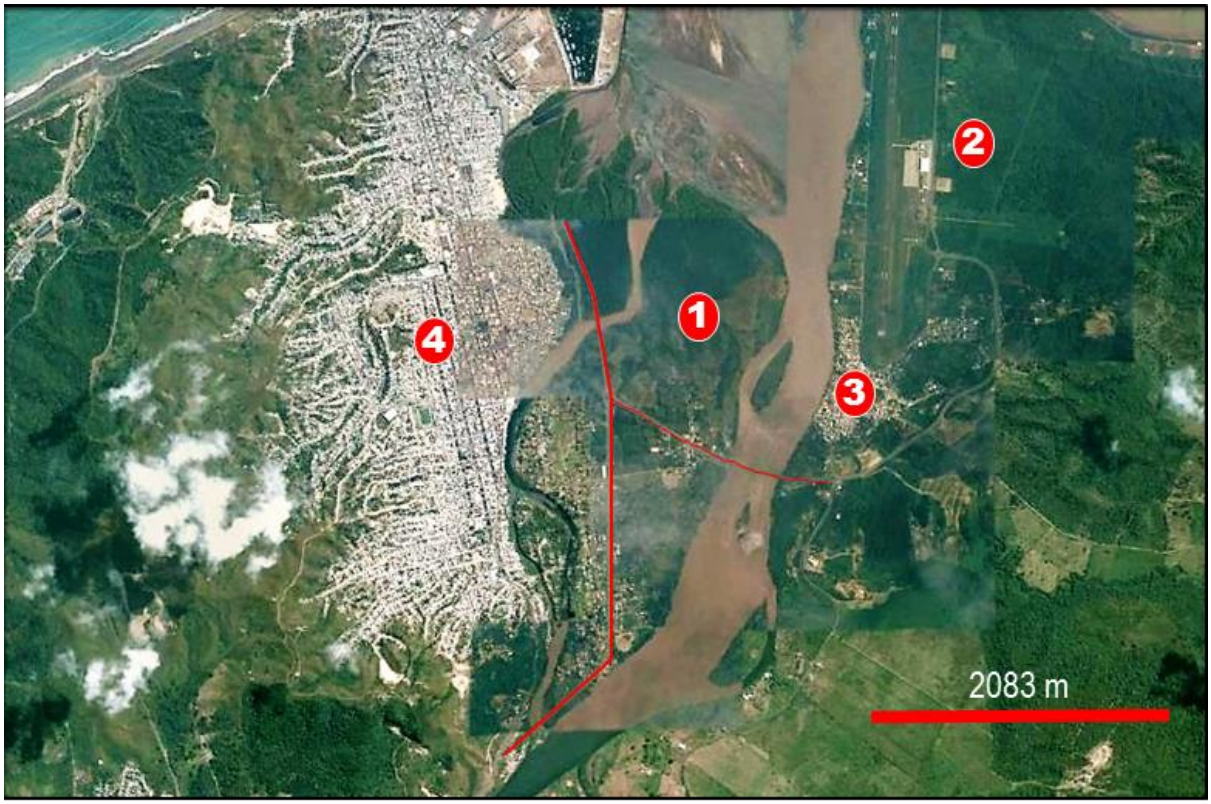
National and local situation in Ecuador

33. The Republic of Ecuador is located on the northwest of South America. It has a land surface of 257,217 km^2, including the Galapagos archipelago (i.e., the ninth largest nation in South America). The country has 2,859 km of continental coastline. The most notable coastal geographical feature is the Gulf of Guayaquil, an estuarine system, which houses the largest concentration of mangroves in the country and numerous islands and islets.
34. The country has four natural regions markedly different in topography, climate and biota. The coast, are the lowlands located between the Andes Mountain Range and the Pacific Ocean, a main feature is the Coastal Range which runs 600 km along from the provinces of Esmeraldas to Guayas.

35. The coast has two distinctive seasons, a rainy season (locally known as “invierno”) from January to April, and a dry season from May to December (locally known as “verano”). The coastal climate is greatly influenced by the oceanographic conditions (Moreano, 1983; Cucalon, 1989). Four climates are found in the coast (Pourrut, 1983), humid to the north and drier to the south. Most of the Esmeraldas province has a tropical megathermic humid climate (annual rainfall between 1000 and 2000 mm), except for the northernmost part of the province (close to the border with Colombia), were uniform megathermic very humid climate is found (annual rainfall >3000 mm). The ENSO has a very strong impact in coastal weather conditions.
36. In 2010, Ecuador had 14.306.876 people (INEC, 2011), of which 62.8% was urban population (Annex 10). About 50% of the population live in the coast. The three largest cities are Guayaquil (2.6 million people), Quito (1.9 million people) and Cuenca (0.9 million). The country has a high Global Gender Gap Index of 0.738, there is almost complete equality in educational attainment and health and survival, and a high level in economic participation and opportunities, but a major gap in political empowerment (WEF, 2015). Also, the country has a low OECD´s Social Institutions and Gender Index[24] (i.e., 0.0422), which indicates low level of gender discrimination in social institutions.

[24] See http://www.genderindex.org.

Figure 8. Location of Esmeraldas city.



1. Luis Vargas Torres Island / 2. Airport / 3. Tachina / 4. Esmeraldas

Figure 9. Luis Vargas Torres Island.

Figure 10. Direction of cerro Gatazo in Esmeraldas.

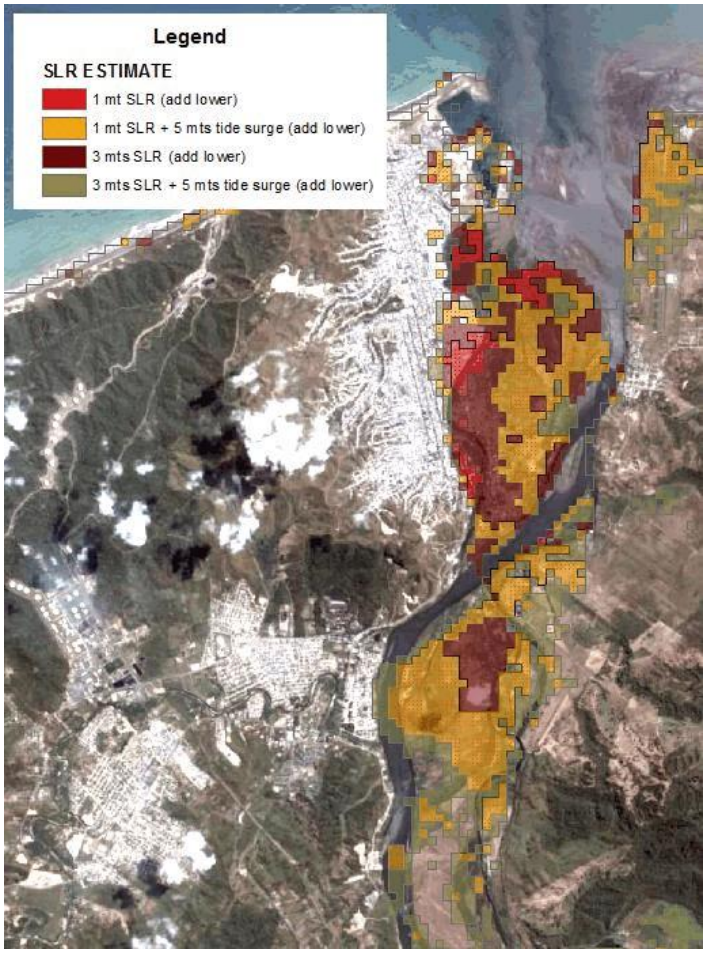


Figure 11. Exposure to sea level rise (SLR) in the City of Esmeraldas (Sierra et al., 2009).

Figure 12. Location of the largest landslide of January 2016.

37. The territory is organized into 24 provinces, 221 cantons, and 1,500 rural parishes. They are administered in the following way:
    - Provinces are headed by a prefecto and a provincial council, who are elected by public vote. Provincial governments (also called Prefecturas) are responsible for constructing and maintaining the provincial road network, and for environmental management, and the administration of water basins and irrigation systems. They also promote farming production.
    - The cantons are administered by a municipality, headed by an alcalde and a municipal council, who are elected by public vote. The municipal government has a set of competences established by law, those relevant to the present project are (i) to prepare and implement the Development and Land Use Plan (PDOT), (ii) to manage and control land use, (iii) to provide public sanitation services (potable water, garbage collection, sewers and drainage), and (iv) to administer civil defence and fire brigades. The mayor heads and coordinates the canton´s Risk Management Committee (CGR) and the Emergency Operations Committee (COE)[25].
    - The rural parish council (elected by public vote) plan the development and land-use planning of the parish in coordination with the municipal and provincial governments. They also encourage citizen organization and the development of community productive activities.
38. The city of Esmeraldas is the capital of the Esmeraldas province. In 2010, the city had 161,868 people (52.1% women). The majority were afro-ecuadorians (56.5%), the second ethnic group were mestizos (37%); indigenous groups constituted 0.7% of the population. The local economy is very diverse. In the 2010 census, the three main activities were commerce, teaching and agriculture[26]. The city has a major port with cargo, oil and fisheries terminals, and Ecuador´s main oil refinery. However, the poverty level is high. In 2010, 57% of the population had unsatisfied basic needs (NBI) (national 60.1%). The access to water, sewage system, electricity and waste disposal was, respectively, 75.3%, 56.6%, 79.5%, and 77.6%. Esmeraldas has a major issue of informal and un-planned expansion. In 2014, about 70% of the urban area was not in the cadastre.
39. Afro-ecuadorians are considered a vulnerable group. At the national level, this group has lower development indicators than other ethnic groups (with the exception of indigenous people). For example, in 2014 the living conditions survey (ECV) registered for afro-ecuadorians: (i) mean years of schooling 9 years (country level 9.8%), (ii) adult illiterate population $\geq$15years 7.5% (country level 7.2%), and (iii) functional illiteracy 13.4% (country level 12.7). In 2015, the urban survey of employment and unemployment, registered for afro-ecuadorians income poverty 31.6% (country level 23.3%) and NBI poverty 35.8% (country level 32.9%).
40. The city is located on the west bank of the Esmeraldas estuary (Figure 8). The seafront is a sandy beach, and along the riverside there are a series of sedimentary islands that have been heavily intervened. The most conspicuous is Luis Vargas Torres island which has been populated by informal un-planned neighbourhoods. The island is connected to the east bank of the river and the city by bridges and a main road (Figure 9). The remnant mangroves located in the northern tip of the island were declared a protected area in 2008 (i.e., Wildlife Refuge Mangroves of Esmeraldas[27]).

[25] The CGE is a permanent committee focused on risk reduction. The COE functions to attend emergencies and disasters. The Ecuadorian risk management and emergency response system (including early warning) is managed by the Risk Management Secretariat (SGR).

[26] Includes, agriculture, animal husbandry and fishing.

[27] This national protected area, created in 2008, encompasses the remnant mangroves of the city; it has an area of 242 ha of which ca., 37% are mangroves and tropical dry scrubland.

41. Esmeraldas is divided by cerro Gatazo (a 260 m height hill) which forms a natural barrier (Figure 8 and Figure 10). Further south the city has developed on the sides of the Teaone river. This river runs northward and makes an eastward turn to join the Esmeraldas river.
42. The area is very humid, annual rainfall in the city is about 800 mm[28]. The Esmeraldas river drains a 21,553 km^2 watershed, it is the country´s fourth largest watershed. The main tributaries are the rivers Guayllabamba and Toachi (which originate in the Andes) and Quininde (which originates in the coastal ridge). It has a flow rate of ca., 300 m^3/s and a sediment discharge of ca., 13,000 t/day. The inter-annual mean discharge is 8.5 billion m^3. The Teaone river drains a 504,89 km^2 watershed with an inter-annual mean discharge of 370 million m^3.
43. The main weather-related risks are flooding by overflow of the Esmeraldas and Teaone rivers, and landslides on the unstable hillsides. Exposure is aggravated by informal and illegal occupation of land along the riverbanks, the sedimentary islands, and the hillsides (Perrin et al., 1998). By 2007, about 60% of the population lived in areas with medium to high risks of floods or landslides (Sierra et al., 2009).
44. The predicted climate change points to hotter and more humid conditions and stronger and more frequent ENSO. In the past, El Niño has aggravated floods and landslides. El Niño 1997 / 1998 destroyed public infrastructure like roads and the water system (CAF, 2000a), and the landslides destroyed about 300 houses (Perrin et al., 1998). The most recent impact was during El Niño 2015 / 2016, between January and April 2016 the city was flooded 20 times, about 16,000 people had to be evacuated (Bonilla, 2016a). Only in January 2016, about 2,600 people had to be evacuated when the Luis Vargas Torres island was flooded (Bonilla, 2016b). The heavy rain also produced landslides. The largest one was in January 2016, in cerro Gatazo at the end of El Oro street (calle El Oro) (Figure 12), but the sustained rain produced that earth continued to move downhill until February.
45. Cerro Gatazo has been a main concern for years. The slopes are intervened, showing a mixture of eroded and barren areas and vegetated areas with grasses and trees. At the beginning of the 2000s, the risk factors were studies and recommendations made (MAE, 2002), and a one-year vegetation trial using vetiver (*Chrysopogon zizanioides*) was executed in four sites of Cerro Gatazo (PNUD, 2005). It was found that vetiver was useful to stabilise the hillsides, but the local population showed low involvement in addressing the hazard. In 2010, the Risk Management Secretariat prepared the baseline studies and a project to build the infrastructure needed to stabilise the hillsides and channel rainwater. The project was presented to CAF as part of a loan to the Government of Ecuador, but was later withdrawn[29].
46. In addition to flooding and landslides, sea level rise could produce that between three and six percent of the city would be temporarily or permanently under water (Sierra et al., 2009). The sedimentary islands and Tachina (where the airport is located) would be the most affected areas (Figure 11).
47. The present project contributes to implement Ecuador´s National Climate Change Strategy (MAE, 2012) and Esmeraldas´ Municipal Climate Change Adaptation and Mitigation Strategy (ONU-HABITAT, 2011).

[28] The 1949 – 1984 annual average recorded in the local weather station (Esmeraldas – INOCAR) was 827.3 mm / year. The 1943-1991 annual average in the airport (Esmeraldas - Tachina) was 800.2 mm / year.

[29] Ecuador´s Risk Management Secretariat contracted the baseline studies and design of the infrastructure to stabilize cerro Gatazo hillsides and to channel rainwater to prevent landslides. The project was submitted to CAF as part of a large infrastructure loan request of the Ecuadorian government. But latter the Ministry of Finance modified the loan constituents and took out cerro Gatazo and other elements, because CAF´s available line of credit was insufficient to cover all the investments that Ecuador required.

Vulnerable groups and gender situation

48. According to the Adaptation Fund (AF, 2016), marginalized and vulnerable groups[30] include children, women and girls, the elderly, indigenous people, tribal groups, displaced people, refugees, people living with disabilities, and people living with HIV/AIDS, as well as any groups identified additionally such as seasonal migrants or illegal aliens. The population characteristics in the three cities is summarised in Table 5.

Table 5. Vulnerable groups in Antofagasta, Taltal and Esmeraldas.

Population group	Antofagasta commune	Taltal commune	Campamentos	Esmeraldas (canton)
Total population	389,812[a]	13,296 [a]	Antofagasta 4,593 families [g] (ca., 13,779 persons) Taltal 400 families [g] (ca., 1,200 persons)	154,035 [j]
Children (≤15 years)	22.6% [a] ♂45,065 ♀43,294	23.4%[a] ♂1,577 ♀1,536	32.9% Antofagasta (≤18 years)	32.3% [j] (≤14 years)
Women	47.8% [a]	44.6% [a]	52.4% [h] Antofagasta	52.1 [j]
Older persons (≥65)	8.6% [a] ♂14,959 ♀18,566	9.7% [a] ♂711 ♀581	1.2% [h] Antofagasta	5.5% [j]
Disabled (%)	7.9% [b] (≥2 years) 9.3%[c] (≥18 years)	NA	3.2% [h] Antofagasta	6.5% [k]
Indigenous people (%)	1.81% [d]	1.05% [d]	NA	0.7% [l]
Poverty (%)	5.1% income poverty [e] 14.0% multidimensional poverty	6.3% income poverty [f]	NA	57.0% [l] income poverty 28.4% [l] unsatisfied basic needs

a. Projected population to 2017. Source: INE. Comunas: Población estimada al 30 de junio por sexo y edad simple 2002-2020. Base de datos.
b. Population with disabilities (≥2 years) in 2015 in the Antofagasta region (SENADIS, 2016). For reference, the total national population with disabilities (≥2years) in 2015 was 16.7%
c. Adult population with disabilities in 2015 in the Antofagasta region. Source: SENADIS (2016a). Adult female and male population with disabilities, respectively, 11.8% and 6.7%.
d. 2002 Census (INE, 2005).
e. Estimates for 2015 (MDS, 2016).
f. Estimate for 2013 (MDS, 2015).
g. 2016 cadastre (TECHO, 2016)
h. 2015 (GORE Antofagasta, 2015a).
j. Urban population. 2010 Census.
k. Urban population. 2010 Census. There were, respectively, 10,036 and 529 persons with disabilities in the urban and rural areas of the Esmeraldas canton. Up to June 2017, in the Esmeraldas canton, there were 6,633 persons with disabilities registered in the National Council for Equality of Disabilities (CONADIS). Of this group, 43.8% were female.
l. Esmeraldas canton. 2010 Census.

[30] The definitions of marginalized and vulnerable groups can be found in Annex 2 of the present document.

49. During project preparation stakeholder analyses were prepared for Antofagasta, Taltal and Esmeraldas (Annexes 8 and 9). This allowed to identify that, for the purpose of the present project which is to reduce vulnerability to climate-related floods, mudflows and landslides, the more vulnerable groups are people living on risk areas in the three coastal cities:
    i. In Antofagasta, this is people living along the areas where the runoff flows from the quebradas through the city into the sea[31].
    ii. In Taltal, this is the entire city which is located on an alluvial fan (Figure 6, Figure 7).
    iii. In Esmeraldas, this is:
        - the people living in flood-prone areas along the banks of Teaone and Esmeraldas rivers, and
        - the people living on unstable slopes and downhill of cerro Gatazo.
50. The most vulnerable groups are people living in (i) campamentos located in hazard areas in Antofagata and Taltal, and (ii) informal settlements in Esmeraldas. In various degrees, these people have poor-quality housing, limited access to basic services, and low-income.
51. From the latest available information, the most vulnerable groups have the following characteristics:
    - In Antofagasta and Taltal, campamento dwellers are mostly South American immigrants (see paragraph 24), about 51% are female-headed households, about a third are young people (≤18 years), and persons with disabilities and older persons are about 3.2% and1.2%, respectively. Immigrants are not familiar with the territory and its associated risks (Annex 8).
    - In Esmeraldas, the population is mostly afro-ecuadorian. About 52% are women and a third are young people (≤15 years). Persons with disabilities and older persons are, respectively, about 6.5% and 5.5% of the population. About 24% of the urban families are female-headed households (ODNA, 2009).
52. In Antofagasta and Taltal, campamento dwellers form *de facto* organizations with committees that represent their interests. Similarly, in Esmeraldas the "barrios" (neighbourhoods) form *de facto* organizations with elected committees. Women actively participate in these organizations. In Antofagasta and Taltal, the juntas de vecinos and campamento organizations are headed mostly by women (there is strong women leadership). Also, in Esmeraldas, women actively participate in neighbourhood and local organizations. The analyses did not find factors that will impede or limit women´s participation in project activities.
53. In Esmeraldas, two important elements that the project will have to take in consideration are:
    - Afro-ecuadorian women have serious limitations to access the labour market and experience domestic violence. Afro-ecuadorian women have better education indicators than afro-ecuadorian males (PNUD, 2008). However, they have serious limitations to access the labour market. The 2006 ECV recorded that afro-ecuadorian women had the highest unemployment rate (i.e., 16.75%, the national female unemployment rate was 9.91%). In 2013, this situation improved, but still afro-ecuadorian women had poor employment conditions (Table 6). In addition, a 2011 survey[32], found that in the Esmeraldas province 58.2% of women had experience violence (national average 60.6%); 78.3% of them experienced intimate partner violence (CNIG, 2014).

[31] The maps that show the mudflow risk areas for the quebradas of the city of Antofagasta are found in the following link: http://www.onemi.cl/mapas/region/antofagasta/.

[32] The 2011 National Survey on Family Relations and Gender Violence Against Women, prepared by the National Institute of Statistics and Censuses (INEC).

- In flood-prone areas, families (in particular female-headed households) are reluctant to evacuate because they are afraid of (i) looting of houses, and (ii) unsafe conditions in shelters.

54. The project will intervene in the Luis Vargas Torres island to implement a pilot flood warning system with six informal afro-Ecuadorian neighbourhoods. An important element that the project will have to take in consideration is that there are about 60 Chachi families in the island.

55. Chachis are an indigenous group that live in the tropical forests of the Esmeraldas province, where they reside in family-related communities (called centros Chachi). The national population is about 8000 people, located in 46 centros. Their territory is ca., 105 thousand hectares and is included into three national protected areas. The Chachi families in Luis Vargas Torres island are settlers that came to the city of Esmeraldas to study and work (Bonilla, 2014); they have been affected by former floods (Bonilla, 2016c).

Table 6. Unemployment and underemployment of afro-ecuadorian females. Source: Encuesta Urbana de Empleo y Desempleo - INEC 2013.

Type	Afro-ecuadorian female	National females	Afro-ecuadorian males	National males
Unemployment	9.0%	5.4%	5.8%	3.4%
Underemployment	60.7%	59.0%	50.7%	49.0%

The adaptation challenge and barriers

56. Adaptation to climate change in coastal cities is a main challenge for both countries. On the short term, the three major risks are mudflows in Antofagasta and Taltal, and flooding and landslides in Esmeraldas. These risks are common to other coastal cities in the two countries and other countries of the region, therefore the lessons from the present project could be useful to all LAC. Sea level rise will not be addressed in this project, during project preparation it was obvious that local groups are concerned about the disaster risks that they already face and have produced severe damage.

57. The main barriers that limit adaptive capacity in the three cities are:

    1. Protection works do not incorporate the climate change variable. Existing infrastructure to manage stormwater and mudflows in Antofagasta and Taltal was designed and constructed without incorporating climate change considerations. Antofagasta´s storm water management plan (plan maestro de aguas lluvias[33]) was prepared in 2004 and focus on the 15 gorges that were identified as a priority after the 1991 mudflow. It is clear that the current scenario is different and that future conditions could be even harsher. The severe storms of March 2015 produced heavy rain and mudflows that overpassed the capacity of the existing infrastructure measures in Taltal. The predicted climate change indicates stronger and more frequent storms in the area. Antofagasta and Taltal are affected differently. Antofagasta is mostly affected by coastal storms

[33] Stormwater management plans are required by Law 19525 of 1997. This instrument defines the primary network and mechanisms to evacuate and drain rainwater to protect the local population. MOP is responsible for its preparation, and is compulsory for cities with population >50,000 people.

that influence the coastal range on which the city has developed. In contrast, Taltal is mostly affected by precipitation from the Andes.

In Esmeraldas, the designs to manage landslides in cerro Gatazo were prepared in 2010 but did not considered the future scenario of increased rainfall and stronger and more frequent El Niño. There are no detailed plans to address flooding in Esmeraldas.

2. Early warning systems have limited information to alert people at risk with sufficient time to evacuate. Existing meteorological stations provide rainfall information with short time to act in case of emergency. The situation is critical in Antofagasta because coastal storms affect the gorges that cross the city. In addition, there is very little information about the coastal gorges, which limit the capacity to design effective structural and non-structural measures to protect the population. The same situation occurs in Esmeraldas, the existing meteorological stations[34] do not permit to detect rain build-up in the watershed with sufficient time to alert the local residents of probable flooding and landslides.

   In addition, there are limited means to alert the population and to guide them to secure locations. The three cities have well developed means to alert people from tsunamis[35], but there are no evacuation maps and signalled evacuation routes for mudflows and flooding.

3. Limited capacity to address informal occupation of land in high risk areas. About 24% of Latin America's urban population live in informal settlements (UN-HABITAT, 2015). Informal occupation of land in urban areas is a complex issue with intricate social, cultural, political and economic root causes (Vargas Llosa, 2004; Fernandes, 2011). Dealing with illegal occupation of land is a complex and delicate issue in both countries. In Chile, the competence belongs to the Ministry of Housing and Urban Development, who has a long-term programme focused on improving living conditions of people inhabiting campamentos[36]. In 2011, 70% of people living in campamentos were in areas with risk of flooding and landslides. People in risk areas would have to be relocated, which has a high social and political cost (Anon, 2015; Muñoz, 2015). The ARG implements a plan to increase the number of affordable houses and build temporary neighbourhoods to relocate families situated in high risk areas (GORE Antofagasta, 2015; Muñoz, 2016).

   In Esmeraldas, the situation is more complex because of the high level of informality in land tenure. The municipality has applied administrative measures, like not allowing regularization of lots located in risk areas, but this does not address the root causes nor reduce hazard exposure. Over the years, there has been political resistance to enforce zoning regulations and deal with informal land tenure.

4. Local technical staff with limited capacities to mainstream climate change adaptation and disaster risk reduction (DRR). The municipal staff do not have sufficient skills to integrate DRR in the development planning process and their workplans and daily activities, nor to link actions of DRR and adaptation to climate change. Current development plans for Antofagasta and Taltal do not incorporate climate change adaptation, also weather-related risk is mentioned but not addressed. The municipality of Esmeraldas has incorporated climate change and risk management into the development plan (GAD Esmeraldas, 2012a) and has strategies for risk and disaster

[34] There are two coastal stations in the seafront of the city and the airport. Two additional stations are located on Sagüe (on the Esmeraldas river) and Teanone – Tabiazo (on the Teaone river).

[35] Antofagasta and Taltal have sirens to alert of tsunamis.

[36] MINVU (2012) recorded in 2011 a national total of 657 campamentos hosting 27,378 families (i.e., 83,862 people, 39% were under 18 years of age). e[ad] (2010) summarize the strategies to address campamentos. The most recent campamento cadastre was prepared in 2016 (TECHO, 2016).

management[37] (GAD Esmeraldas, 2012b) and adaptation to climate change[38] (ONU-HABITAT, 2011). However, implementation of this plans has been very limited. Municipal officers have not been able to engage and motivate political decision-makers to advance on DRR.

5. Local population not fully aware of climate-related risks. The interviews with local stakeholders revealed that there is no clear understanding of the link between the weather-related disasters and climate change (Annexes 8 and 9). The future climate scenarios and the probable worsening of existing risks are not in the common dialogue. Sea level rise is perceived as a very far risk factor and therefore is not seen as a short-term priority. This contributes to the fact that local population does not demand that elected authorities address adaptation as a priority matter.

   An additional factor is that the major events are not frequent. Therefore, the impetus of the response and interest after a disaster, decreases and gets diluted with time. Also, memory of past events faints with time, currently there are no mechanisms to encourage the transmission of knowledge to new generations. Major events are anecdotally remembered, like the 1991 mudflow in Antofagasta or El Niño 1982 / 1983 and 1997 / 1998 in Esmeraldas, but the lessons learned are not passed to younger groups.

58. The present regional project will contribute to address these barriers by developing practical adaptation actions under a learning approach. A key element will be to establish communities of practice (Lave & Wenger, 1991; Wenger, 1998; Wenger et al., 2002) among practitioners and key stakeholders of the three cities. Women will be motivated to form part of the communities of practice to ensure that their perspectives and experience are mainstreamed in the learning process. It is expected that these communities of practice will mature during project implementation and become a catalyst of change. Lessons will be disseminated within each country, between countries and in LAC, to motive action on climate change adaptation in coastal cities. Specific project actions to address the main barriers are listed in Table 7.

Table 7. Project actions to address the main barriers that limit adaptive capacity in Antofagasta, Taltal and Esmeraldas.

Barrier	Project action
1. Protection works do not incorporate the climate change variable	Update Antofagasta´s stormwater management plan incorporating the climate change factor (output 1.1) to guide future investments to cope with foreseeable stronger and more frequent coastal storms. Prepare green infrastructure plan for Esmeraldas (output 1.2) to protect the city from flooding and landslides caused by the foreseeable increase in rainfall associated with stronger and more frequent El Niño. Update protection infrastructure designs and constructions incorporating the climate change factor for quebrada Bonilla[39] (output 2.1) and cerro Gatazo (output 2.2) to reduce vulnerability of local population and

[37] This strategy was prepared with support from OXFAM and the European Commission.

[38] This strategy was prepared with support from ONU-HABITAT within the framework of UN-HABITAT 's Cities in Climate Change Initiative (ONU-HABITAT, 2010).

[39] The experience on mainstreaming the climate factor into quebrada Bonilla mudflow protection works and Antofagasta´s stormwater plan will be used by ARG to improve protection works in the region.

Barrier	Project action
	develop methodology and experience for mainstreaming the climate factor in infrastructure works.
2. Early warning systems have limited information to alert people at risk with sufficient time to evacuate.	Increase capacity to forecast hydrometeorological hazards and strengthen early warning systems. Install meteorological radar in Esmeraldas, storm detection system in Antofagasta, and meteorological stations in both Antofagasta and Esmeraldas (outputs 3.1 and 3.2). Expand public warning systems in Antofagasta and Taltal to alert and evacuate the local population in case of mudflows (output 4.1). Prepare and implement a pilot community-based flood warning system in Luis Vargas Torres Island (Esmeraldas) (output 4.2), prepare climate-adjusted flood and landslide risk maps for the city and signal the evacuation routes and safe areas (output 4.3)
3. Limited capacity to address informal occupation of land in high risk areas.	Raise awareness of local population about the danger of setting on high-risk areas through the implementation of communication and education strategies (output 6.1) and an initiative to invigorate cultural memory (output 6.2).
4. Local technical staff with limited capacities to mainstream climate change adaptation and disaster risk reduction.	Develop and implement an online course on risk-based adaptation in coastal cities for local governments´ officers (output 5.1).
5. Local population not fully aware of climate-related risks.	Develop and implement communication and education strategies (output 6.1) and an initiative to invigorate cultural memory (output 6.2).

Project / Programme Objectives:

59. The project objective is to reduce vulnerability to climate-related floods, mudflows and landslides in three coastal cities by mainstreaming a risk-based approach to adaptation, building collaboration and networking, and developing a culture of adaptation. The project focus on the hydrometeorological hazards of mudflows in Antofagasta and Taltal, and flooding and landslides in Esmeraldas. The expected mid-term impacts are improved enabling conditions to sustain DRR adaptation in the three cities. In the long-term, it is expected that this will result in improved adaptive capacity. It is also envisioned that the lessons of the project are useful to other countries in Latin America and the Caribbean, and other regions of the world.

60. The project is organised into three components:

    a. Component 1 will focus on priority actions to increase resilience in the three cities. Four outcomes will be generated by mainstreaming DRR into local planning, building infrastructure which incorporate climate-related variables, improving climate monitoring, and strengthening the existing early warning and response systems.

    b. Component 2 will focus on strengthen the capacities of local government officers and communities, as well as fortifying connections between communities and local and national government. Two outcomes will be generated by developing an online training course on risk-based adaptation for municipal and government officers, and implementing communication and education strategies to increase local awareness

and contribute to build cultural memory. The online course will be open to professionals from other coastal cities of Latin America and the Caribbean.

c. Component 3 will focus on nurturing the project´s communities of practice and to document and disseminate the lessons. The backbone of the regional project are the communities of practice that allow the development of collective learning on specific topics. Five communities of practice will be developed. This component includes:
   i. An electronic platform to facilitate interaction and collaboration among project participants of both countries (e.g., teleconference, webinars), and the dissemination of lessons for the benefit of other coastal cities in the region and the world. It is expected that this platform will serve to motivate further participation of other coastal cities in the region.
   ii. Nurturing the communities of practice and facilitating networking among practitioners.
   iii. The systematic documentation of lessons in different formats (e.g., YouTube channel, formal documents) and their world-wide dissemination through various channels (e.g., mailing list server, twitter, website).

61. The rationale of the regional project is to generate practical lessons on risk-based adaptation in coastal cities with different adaptive capacities and disseminate the lessons to Latin America and the Caribbean to motivate interest and involvement of other cities of the region.

Project / Programme Components and Financing:

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (USD)
1. Priority Actions to increase resilience	Outcome 1. Enhanced plans and green infrastructure reduces vulnerability to floods, landslides and mudflows in two coastal cities	1.1. Stormwater management plan for Antofagasta [USD 418,472]	Chile	9,632,043 (74.78% of A+B)
		1.2. Green infrastructure plan for Esmeraldas [USD 323,392]	Ecuador	
	Outcome 2. Reduced vulnerability to floods, landslides and mudflows in two coastal cities	2.1. Mudflow control infrastructure in Antofagasta [USD 4,637,592]	Chile	
		2.2. Landslide mitigation works in Esmeraldas [USD 2,440,392]	Ecuador	
	Outcome 3. Improved climate monitoring and means to alert the local population .	3.1. Weather radar in Esmeraldas and a storm detection system in Antofagasta [USD 1,136,937]	Chile and Ecuador	
		3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas	Chile and Ecuador	

		[USD 166,937]		
	Outcome 4. Improved means to respond to floods, landslides and mudflows	4.1. Enhanced public warning system in Antofagasta and Taltal [USD 250,392]	Chile	
		4.2. Pilot flood warning system in Esmeraldas [USD 120,992]	Ecuador	
		4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas [USD 136,937]	Chile and Ecuador	
2. Strengthen capacities for adaptation.	Outcome 5. Local governments with improved capacity to design and implement adaptation measures	5.1. Course on risk-based adaptation in coastal cities [USD 229,937]	Chile and Ecuador	1,252,011 (9.72% of A+B)
	Outcome 6. Local population and government personnel with increased awareness of climate-related risks (floods, landslides, mudflows)	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile and Ecuador	
		6.2. Narrators´ initiative initiated [USD 585,937]	Chile and Ecuador	
3. ICTs and partnership between coastal cities in Latin America .	Outcome 7. Lessons and best practice on reducing vulnerability to climate related flooding, landslides and mudflows in coastal cities have been shared in the region.	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice [USD 440,937]	Chile and Ecuador	1,030,874 (8.0% of A+B)
		7.2. Lessons and best practice documented and disseminated [USD 589,937]	Chile and Ecuador	
Subtotal project activities cost [A]				11,914,926
6. Project Execution cost [B] [7.49% of A+B]				965.074
7. Total Project/Programme Cost [A+B]				12,880,000
8. Project/Programme Cycle Management Fee charged by the Implementing Entity [C] [8% of A+B]				1,030,400
Amount of Financing Requested [A+B+C]				13,910,400

Projected Calendar

Milestones	Expected Dates
Start of Project/Programme Implementation	March 2018
Mid-term Review (if planned)	March 2021
Project/Programme Closing	March 2023
Terminal Evaluation	December 2022

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities, how these activities would contribute to climate resilience, and how they would build added value through the regional approach, compared to implementing similar activities in each country individually. For the case of a programme, show how the combination of individual projects would contribute to the overall increase in resilience.

62. The project strategy is based on active learning and sharing knowledge to empower local authorities and communities, and contribute to build resilient cities. The project will cultivate communities of practice among practitioners and stakeholder of both countries to foster the development of collective learning. The main elements of the strategy are:
    a. Develop experience on how to build better to withstand climate- related hazards. This includes (i) updating the designs of Antofagasta´s stormwater plan and protection works for quebrada Bonilla, and Esmeraldas´ construction works to stabilize cerro Gatazo, and (ii) building the public works in quebrada Bonilla and cerro Gatazo. These actions will facilitate learning on incorporating the climate variable into protection works. In addition, a green infrastructure plan will be prepared for Esmeraldas, and a first element will be implemented in cerro Gatazo to complement grey infrastructure.
    b. Enhance disaster preparedness by (i) using a weather radar in Esmeraldas, a storm detection system in Antofagasta, and an increased number of meteorological stations to anticipate risk situations and gain time to alert the local population, and (ii) strengthen involvement of local groups, including installing sirens to alert of danger, publicize evacuation maps, and establish public emergency drills to promote rapid and effective response to floods and mudflows.
    c. Prepare an on-line regional training course on risk-based adaptation for municipal officers of coastal cities. This will contribute to strengthen local capabilities and empower municipal officers to mainstream DRR at the local level.
    d. Increase awareness and empower local communities through public communication and education strategies and develop a narrators' initiative to strengthen cultural memory for climate-related DRR.
    e. Share lessons by systematically document, exchange and disseminate experience and learning within each country, between both countries and with other coastal cities of LAC.
63. The project is organized into three components and seven outcomes. Fourteen outputs will be produced. The results framework is on page 84, and the multiyear workplan is found in Annex 6.

Component 1. Priority actions to increase resilience

64. This component will generate four outcomes dealing with building better to withstand climate-related hazards and enhancing disaster preparedness. It is the largest component of the project, concentrating 74.78% of the total project cost.

Outcome 1. Enhanced plans and green infrastructure reduces vulnerability to floods, landslides and mudflows in three coastal cities

65. To generate this outcome, the stormwater management plan for Antofagasta[40] will be updated, and a green-infrastructure plan for Esmeraldas will be prepared.

Antofagasta´s stormwater management plan

66. The stormwater management plan is the tool which identify priority alluvial control infrastructure, the primary and secondary routes to direct the flows, and the public works needed to conduit the runoff to the sea. Antofagasta´s current plan (i.e., Plan Maestro de Evacuación y Drenaje de Aguas Lluvias de Antofagasta) was prepared in 2004 and does not incorporate the climate-variable. Based on the experience of updating Antofagasta´s stormwater management plan, guidelines will be prepared on introducing the climate variable in these plans[41]. The guidelines will be published in digital format and disseminated. It is foreseen that the lessons from mainstreaming the climate variable into Antofagasta´s stormwater management plan will be useful to other cities in Chile, Ecuador and the region.
67. This plan is crucial for the design and implementation of future public works to protect the population from mudflows. It will be a pivotal element for the on-going public investments in alluvial control works. On this respect, it is important to highlight that:
    - There is a regional infrastructure plan which includes targets for 18 alluvial control works (11 in Antofagasta´s gorges and seven in the cities of Taltal and Tocopilla) (MOP, 2012).
    - In response to the impacts of the March 2015 anomalous climate events, the Antofagasta Regional Government and MOP signed an agreement (hereon the ARG – MOP agreement) to expand the infrastructure to protect from mudflows the cities of Antofagasta, Taltal and Tocopilla[42] (DOH, 2015). The total investment will be about USD 84.2 million.
68. The ARG - MOP agreement[43] "mudflow disaster mitigation and evacuation of rainwater, Antofagasta Region 2015-2020" was signed on 30 July 2015, as approved by Decree 232 of the Ministry of Finance of 27 July 2015 (Annex 16). It will be funded with resources from the National Fund for Regional Development (40%) and MOP (60%), and will be executed by the MOP´s Directorate of Hydraulic Works (DOH). The total investment between 2015 and 2020 will be CLP 56,152,340,000 (about USD 84.2 million). The agreement and Executive Decree 232 are included in Annex 16.
69. The purpose of the ARG – MOP agreement is to extend mudflow protection in the region, by building pending protection works and preparing pre-feasibility studies for stormwater management. The agreement explicitly states "the objective of the agreement is to expand the execution of the Plan for Alluvial control of Antofagasta, Taltal and Tocopilla, from a 40.4% expected net maximum flow coverage for 15 gorges with urban risk in 2014, to a 82% coverage in 2020; in Taltal coverage will expand from 79.6% in 2014 to 100% in 2020; in Tocopilla coverage will expand from 81.8% in 2014 to 100% in 2020. The plan also includes advancing the design of several works of the stormwater management plans

[40] Chile´s rainwater law (Law 19,525) establish that stormwater plans are prepared for cities with more than 50,000 inhabitants.

[41] i.e., guidelines to update stormwater management plans to cope with climate-related mudflows in coastal cities

[42] The aim is to reach, by 2020, 100% cover in Taltal and Tocopilla (2014 cover was 79.6% in Taltal and 81.8% in Tocopilla) and 82% in Antofagasta (2014 cover was 40%) (DHO, 2015).

[43] This is a second ARG – MOP agreement to cover mudflow protection. The first one was signed in 1999, it funded the construction of mudflow protection works in the four gorges that produced most of the damage during the 1991 mudflow (i.e., quebradas Salar del Carmen, La Cadena, El Ancla y Baquedano). Construction works were executed between 1999 and 2008.

of the cities of Antofagasta, Calama, San Pedro de Atacama, Sierra Gorda, among other works" (Annex 16).

70. In Antofagasta and Taltal, the ARG – MOP agreement will fund 10 projects (Table 8):
    I. Two designs:
        - Antofagasta - Design for stormwater primary evacuation ways.
        - Taltal - Redesign of stormwater primary evacuation ways.
    II. Eight Construction works:
        - Antofagasta - Mudflow protection works in six gorges: (1) Farellones, (2) La Chimba, (3) El Toro, (4) Jardines del Sur, (5) Riquelme, and (6) Uribe.
        - Taltal - (1) mudflow protection works in via baja and quebrada Cortaderas, and (2) construction of new decantation ponds to increase retention capacity.
71. The present project will be a catalyst in the implementation of the ARG-MOP agreement, by facilitating mainstreaming climate-change considerations into the process of updating Antofagasta´s stormwater management plan (output 1.1) and therefore influencing the design of alluvial control works in the region. The experience gained by DOH will be useful to other regions of Chile. The ARG has issued letter endorsing the present project proposal; in the last paragraph, it is indicated that “the results of this project will be inputs to internalize the climate variable in future designs of alluvial control works of projects in the region” (Annex 17).

Table 8. Projects to be implemented in Antofagasta and Taltal as part of the ARG-MOP agreement (2015-2020).

	Project	Phase	Milestone for completion	Total cost (thousand CLP of 2015)
1.	Alluvial control works in quebrada Farellones (Antofagasta)	Execution	2017	5,424,121
2.	Alluvial control works in quebrada La Chima (Antofagasta)	Execution	2019	11,176,830
3.	Alluvial control works in quebrada El Toro (Antofagasta)	Execution	2020	7,487,790
4.	Alluvial control works in quebrada Jardines del Sur (Antofagasta)	Execution	2020	8,174,807
5.	Alluvial control works in quebrada Riquelme (Antofagasta)	Execution	2020	3,035,639
6.	Alluvial control works in quebrada Uribe (Antofagasta)	Execution	2020	4,978,739
7.	Alluvial control works in Taltal (via Baja and quebrada Cortaderas)	Execution	2015	3,255,000
8.	Construction of primary routes for the evacuation of rainwater in Antofagasta, Calama and Sierra Gorda	Design	2017	805,000
9.	Redesign of alluvial way in Taltal	Design	2016	150,000
10.	Emergency works in Taltal and construction of new decantation ponds	Execution	2016	4,932,000
			Total (CLP)	49,419,926,000
			About USD	74.1 million

Esmeraldas green infrastructure plan

72. To prepare a green infrastructure plan for Esmeraldas (output 1.2), technical staff from the Municipality of Esmeraldas (GADE) and other local entities will be trained on the use of green infrastructure for DRR, and a situation analysis will be prepared. The plan will focus mainly on protection from flooding and landslides and will operationalize the municipal strategies for risk and disaster management (GAD Esmeraldas, 2012b) and adaptation to climate change (ONU-HABITAT, 2011). Both strategies mention the use of mangroves and urban vegetation, but do not indicate practical forms to implement their utilization.
73. The green infrastructure plan will be socialized with local stakeholders and formally adopted. To facilitate implementation, municipal regulations will be updated to mainstream the use of green infrastructure in local land use planning. This will be pioneer work, since green infrastructure is still a relatively new area of work in Ecuador. In addition, it is foreseen that the lessons and experience acquired will be useful to other cities in Chile, Ecuador and the region.
74. Finally, a demonstration pilot will be designed and implemented to stabilize hillsides by revegetating cerro Gatazo. This will complement the grey infrastructure intervention (see output 2.2), and will facilitate the comprehension of the practical application of green infrastructure in the city. It is estimated that ca., 100 ha will be revegetated, but the exact figure and location will be decided during project implementation in close coordination with the team that update the infrastructure designs to stabilise the slopes (output 2.2). Four plant species have been recommended for use on the hillsides: (i) guarango (*Caesalpinia spinosa*), (ii) algarrobo (*Prosopis juliflora*), (iii) huaje (*Leucaena leucocephala*), and (iv) vetiver (*Chrysopogon zizanioides*) (MAE, 2002). The species to be used in specific sites will be decided during project execution.
75. The project will motivate that the revegetated areas (including the stabilised hillside in Cerro Gatazo, output 2.2) will be declared protected forests by the GADE in collaboration with MAE.

Outcome 2. Reduced vulnerability to floods, landslides and mudflows in two coastal cities

76. To generate this outcome, infrastructure will be built in quebrada Bonilla in Antofagasta (output 2.1) and cerro Gatazo in Esmeraldas (output 2.2).

Mudflow control infrastructure in quebrada Bonilla

77. The quebrada Bonilla flows through Antofagasta. It has two branches (Bonilla norte and Bonilla sur) (Figure 13 and Figure 14). In 1991, the mudflows from Bonilla sur caused severe damage in the city.
78. Protection works on this gorge are not included in the previously mentioned ARG – MOP project to build alluvial control infrastructure (Table 8). After Antofagasta´s 1991 mudflow, the gorges that cross the city were ranked according to the size of the watershed and the number of people located in the alluvial fan (hazard area). The quebrada Bonilla is number 11 on this rank. The first ARG - MOP agreement of 1999, funded protection works on the four gorges with the highest priority. The second ARG - MOP agreement of 2015 (Annex 16; Table 8) will fund protection works in the following six gorges. Therefore, the works in quebrada Bonilla could not be executed until financial resources are available, most probably after 2020.
79. The quebrada Bonilla has a total drainage area of 6.7 km^2 (3.4 km^2 in Bonilla norte and 3.3 km^2 in Bonilla sur). About 12,840 people live in the mudflow hazard area (Figure 14). There are three campamentos on the risk area, where 125 families live (TECHO, 2016) (Table 9, Figure 15).

Figure 13. Location of quebrada Bonilla in Antofagasta.

Table 9. Campamentos located in the mudflow risk area of quebrada Bonilla.

Campamento	Established	Number of families
Víctor Jara	2001	25
Mujeres Unidas	2007	56
Nueva Esperanza – Villa Esperanza	2013	34

Source: TECHO (2016). Online: http://chile.techo.org/cis/monitor/

80. The required infrastructure for quebrada Bonilla was designed ca., 14 years ago (Annex 11). It comprises a series of 14 decantation ponds[44] and 36 concrete retaining walls (31 in Bonilla norte and five in Bonilla sur) and had an estimated cost of USD 18 million. The infrastructure was designed with a 50-year return period horizon, but did not consider the influence of climate change.

[44] Seven decantation ponds in Bonilla norte, designed to retain 41,959 m^3, and seven decantation ponds in Bonilla sur, designed to retain 82.300 m^3.

81. The present project will finance updating the designs, including climate change considerations, and the construction of part of the infrastructure[45]. This experience will generate methods and tools that will be directly used in the other public works planned until 2020 within the ARG – MOP agreement (Annex 16) and protection infrastructure in other parts of Chile and LAC.

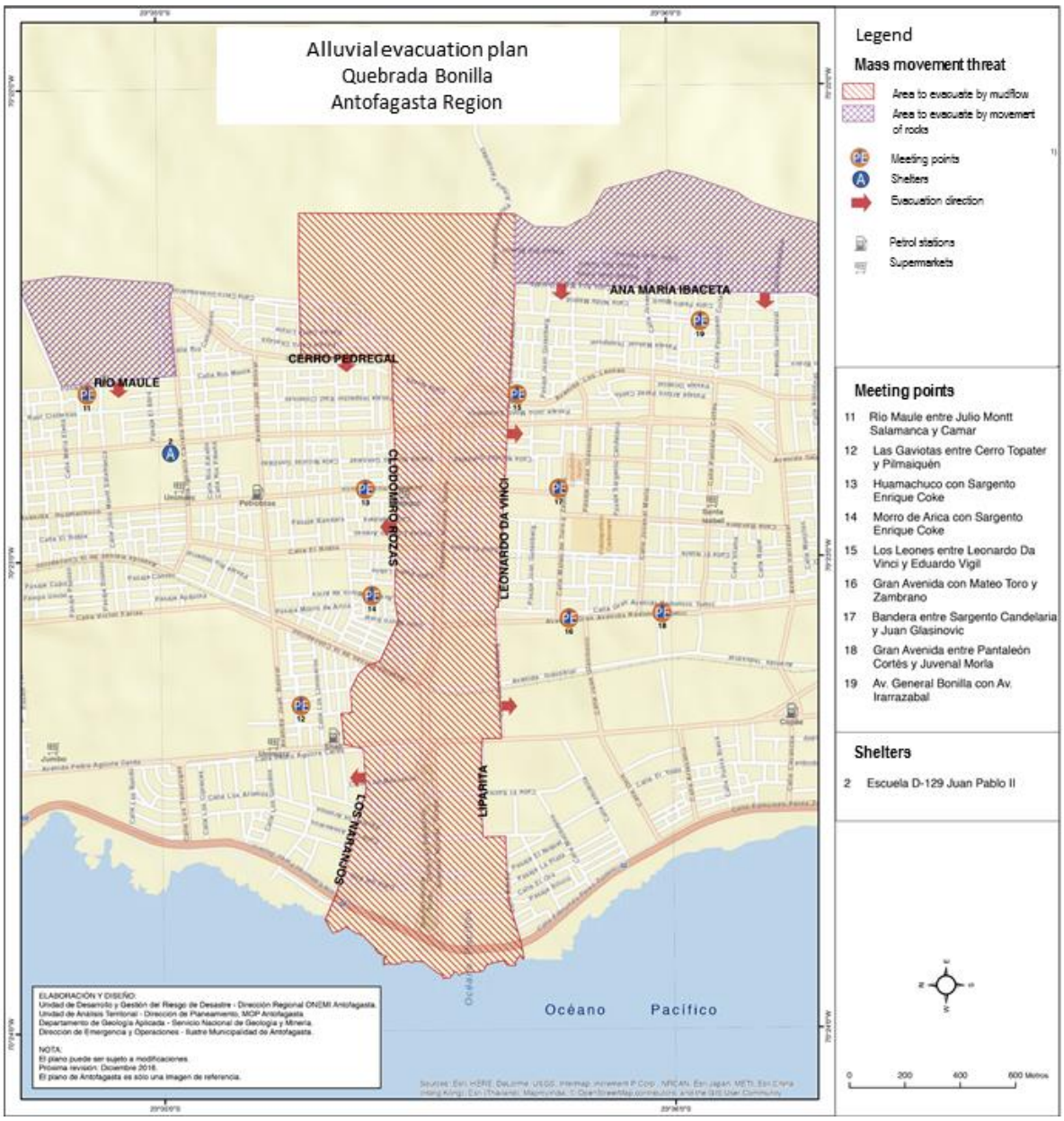


Figure 14. Area of mudflow risk in quebrada Bonilla (Antofagasta). Source: ONEMI.

[45] The project budget includes USD 4.3 million for infrastructure in quebrada Bonilla (budget note 16). This will not be sufficient to cover all the infrastructure required, which was estimated in about USD 18 million, without considering the climate change factor. MOP will prioritize the investment.

Source: Monitor de Campamentos. TECHO-Chile. Online: http://chile.techo.org/cis/monitor/

Source: Monitor de Campamentos. TECHO-Chile. Online: http://chile.techo.org/cis/monitor/
Note. Villa Balmaceda is a large campamento (900 families) that is outside of the mudflow risk area of quebrada Bonilla.

Figure 15. Location of campamentos on the mudflow risk area of quebrada Bonilla.

Landslide mitigation infrastructure in cerro Gatazo

82. The infrastructure to stabilize cerro Gatazo was designed in 2010, the estimated budget was USD 2.6 million (Annex 12). The design includes a combination of control and restraint works, which includes (i) profile conformation of slopes, (ii) construction of collection and drainage channels, (iii) construction of retaining walls where necessary, (iv) anchor works were necessary, and (v) vegetation of slopes.
83. The present project will finance updating the designs to include the climate variable and the control and restrain works (grey infrastructure). GADE will update the basic studies with counterpart resources. The terms or reference for these studies are found in Annex 19. The grey infrastructure works will match the use of vegetation to stabilize the hillsides (output 1.2) (paragraph 74). The experience in cerro Gatazo will generate lessons to mainstream climate change consideration into landslide control works. The experience will be documented and disseminated to be useful in the country and LAC.
84. The protection works, both grey and green infrastructure, will guard the Barrio 20 de Noviembre, where the 2016 landslide destroyed 38 houses (Figure 12). This is an old settlement, the neighbourhood was established on 20 November 1971 by migrants from the northern part of the Esmeraldas province. There is a *de facto* committee that represent the neighbourhood interests and needs.

Outcome 3. Improved climate monitoring and means to alert the local population

85. To generate this outcome, climate monitoring equipment (outputs 3.1. and 3.2) and early warning systems (outputs 4.1 to 4.3) will be enhanced.
86. A meteorological doppler radar will be installed in Esmeraldas and a storm detection system in Antofagasta (output 3.1) to improve storm monitoring and extend the window of time to alert the population of probable heavy rain and risk of hydrometeorological hazards.
87. The project will finance (i) the analysis to identify the best location both for the radar (Esmeraldas) and the storm detection system´s sensors (Antofagasta), (ii) the equipment, (iii) a set of spare parts, and (iv) training in the equipment´s use and maintenance. Counterpart resources will be used to install the infrastructure (e.g., radar tower) and communication links.
88. The Storm Detection System consists in lightning detectors, devices that detect, count and measure lightning produced during thunderstorms. The measure includes three main components: optical, magnetic and electrostatic pulses and the devices work connected to a network. The system allows a high temporal and special resolution monitoring that substantially improves the immediate forecast of the impact of a storm by issuing meteorological warnings, with a few hours in advance and a precision of minutes in terms of data arrival time. A forecast of this nature would allow the authorities to focus their resources in a specific area, without wasting time and capacities, and to alert the community regarding the danger of flood, alluvium and lightning. The proposal includes the acquisition and putting into operation of four storm sensors and contract services of the Storm Detection System for the area. The new sensors will strategically be located in zones along the area. The selection of sites, installation and commissioning of the surface and high-altitude sensors will be carried out under the standards used by the Meteorological Directorate of Chile (DMC) for these types of actions.
89. In Chile, the Meteorological Directorate of Chile will manage Antofagasta´s Storm Detection System and feed the information to the National Emergency Office' s (ONEMI) early warning system[46]. In Ecuador, the radar will be managed by the Provincial

[46] At project start, an agreement will be signed between MOP, DMC and ONEMI to establish operational procedures, information flow, and to guarantee that the information from the storm detection system and meteorological stations (paragraph 90) is expedited to the national weather forecast and early warning systems.

Government of Esmeraldas (GADPE) in collaboration with the National Meteorological and Hydrological Institute[47] (INAMHI). The information will feed the Risk Management Secretariat´s (SGR) early warning system.

90. To complement and validate the radar and storm detection system information, additional automatic meteorological stations will be installed in the watersheds of Antofagasta, Taltal and Esmeraldas (i.e., Teaone and Esmeraldas rivers). MOP -- through its Directorate of Waters (DGA) -- and GADPE, respectively, will operate and maintain the meteorological stations in Chile and Ecuador.
91. Ecuador has interesting experience using meteorological radars that could be useful for DMC in future projects. INAMHI manage a set of three radars to monitor rainfall in Quito, and another set of three radars operate in the south of Ecuador, managed by local entities[48]. The project will foster collaboration and exchange of experiences among the organizations of both countries.

Outcome 4. Improved means to respond to floods, landslides and mudflows

92. To generate this outcome, public warning systems will be expanded.

Enhanced public warning system in Antofagasta and Taltal

93. In Antofagasta and Taltal sirens will be installed to alert the local population of mudflow danger (output 4.1). This will be complemented with evacuation maps, on-site signals to mark the evacuation routes, and annual evacuation drills (output 4.3). Local inhabitants are familiar with the use of sirens and evacuation procedures for tsunamis[49]. However, people living on risk areas will have to be trained to recognise the mudflow alert and the corresponding evacuation procedures.
94. Local community leaders from juntas de vecinos and campamento committees will be identified on each gorge and trained to facilitate community action, to guide people to safe areas, and to contribute to guard the sirens and on-site signals. Evacuation plans and procedures will consider the special needs of women, children, older persons and people living with disabilities. Given the role of women in campamentos organizations and their leadership in their communities, it is expected that women can have an active role in this activity.
95. The drills will integrate early-warning, communication and evacuation to allow people and local authorities to practice their actions in case of mudflows. ONEMI will coordinate and implement all these actions in close collaboration with the two municipalities and relevant entities[50] (e.g., Carabineros, fire brigades).
96. The present project will support ONEMI´s current efforts. On 16 July 2016, for the first time, there was a mudflow evacuation drill in Antofagasta (quebradas Uribe and

[47] GADPE has no previous experience managing climate monitoring. However, GADPE is committed to develop a provincial weather monitoring system. The present project will be an opportunity to develop a decentralised monitoring system based on INAMHI´s former experience. INAMHI will oversee the installation and operation of the radar (paragraph 85) and the meteorological stations (paragraph 90) to ensure they comply with the required standards to guarantee data quality, adequate equipment performance and integration with the national meteorological network. An agreement will be signed between GADPE and INAMHI to establish operational procedures, information flow, and to guarantee that the information from the radar and meteorological stations is expedited to the national weather forecast and early warning systems.

[48] This is part of the project "operational rainfall monitoring in southern Ecuador" (BE 1780/31-1 (short name RadarNet-Sur), sponsored by the German Research Foundation. One radar is managed by the Provincial Government of Loja, the other by Technical University of Loja (UTPL), and the last by Cuenca´s Empresa de Telecomunicaciones, Agua Potable y Alcantarillado (ETAPA).

[49] ONEMI manage a nationwide tsunami evacuation alert siren system which includes Antofagasta and Taltal.

[50] To manage the alert system, ONEMI will require to have technical information from pertinent entities - e.g., DMC´s North Regional Meteorological Centre (CMR Norte), MOP - which have the means to generate and validate information about the condition of rainfall in the gorges and other contingencies. During project implementation, this operation will be aligned with ONEMI´s requirements with respect to alert operations.

Baquedano, about 18,500 people live in the area) (Anon, 2016a; Anon, 2016b). Also, ONEMI is preparing and disseminating mudflow evacuation maps for each gorge that indicate the evacuation routes, and the location of meeting points and shelters[51].

Pilot flood warning system in Esmeraldas

97. In Esmeraldas, a pilot flood warning system will be implemented in collaboration with six neighbourhoods of Luis Vargas Torres island[52]. The pilot will serve as a learning exercise and demonstration (output 4.2). It is anticipated that this experience will catalyse the development of a flood warning system for the entire city.
98. Luis Vargas Torres island is a high risk area. In January 2016, 95% of the island was flooded and the population had to be evacuated. There are no precise figures, but it is estimated that about 6,000 families live in the island. The pilot will cover ca., 700 families from the six neighbourhoods previously mentioned. These neighbourhoods are located on the southwestern part of the island, and are integrated mostly by afro-Ecuadorians and some mestizos.
99. The pilot will include the use of sirens to alert the local community, and annual drills to test the plan and to prepare local groups. ONEMI´s experience using sirens and preparing evacuation procedures will serve to develop the pilot in Esmeraldas.
100. Like in Chile, local leaders will be trained to facilitate evacuation of vulnerable groups and take community action to guard the sirens and private property. Women will be encouraged to partake as evacuation guides.
101. The pilot will be implemented by GADE, in close coordination with SGR and relevant entities (e.g., police, fire brigades). There will be close coordination with the police to implement actions to prevent looting during emergencies, and to have secure shelters suitable to accommodate the needs of women, children, older persons and people living with disabilities.
102. In addition, the project will:

- Assess the condition and provide maintenance to the existing footbridges that will be the main route to be used to evacuate the island during a flood.
- Prepare a flooding evacuation map for the Luis Vargas Torres island, based on an updated climate-adjusted flood hazard map. The evacuation routes and procedures will take into account the needs of vulnerable groups like older persons, children, and the Chachi families that live in the island (see page 21).

Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas

103. The project will contribute to update the mudflow evacuation maps for Antofagasta and Taltal (output 4.3). The maps, in large format (e.g., banners or large posters), will be placed in high-transit areas to sensitise and inform people living in risk areas. The maps will also be available in digital from through pertinent websites and social media. In addition, signals will be installed to guide local people through evacuation routes and into shelters.
104. In Esmeraldas, the project will contribute to prepare a flooding evacuation map and a landslide risk map. These maps will (1) be placed in high-transit areas to inform people living in risk areas (large format to be used), and (2) be available in digital form through

[51] The maps are found in the following link: http://www.onemi.cl/mapas/region/antofagasta/

[52] Six neighbourhood committees: 12 de mayo, Cordero Crespo, 20 de noviembre, Pianguapi, 29 de agosto, and Habana.

pertinent websites (e.g., GADE, GADPE, SGR) and social media. In addition, signals will be installed to mark the flooding evacuation routes and landslide risk areas.

105. In all cases, the preparation of the evacuation maps will take into account the needs of vulnerable groups like children, older persons and people living with disabilities.

Component 2. Strengthen capacities for adaptation

Outcome 5. Local governments with improved capacity to design and implement adaptation measures

106. To generate this outcome, a regional online course will be developed (output 5.1). The Civil Protection Academy[53] of Chile (APC) will lead this action, in coordination with Ecuadorian partners. The course will focus on mainstreaming risk-based adaptation in coastal cities, with a module dedicated to explain linkages between gender, climate change and adaptation measures, and will be aimed at officers from local governments.

107. Former experience with similar online training will be analysed (e.g., NOAA´s digitalcoast) and partners (e.g., local universities, international cooperation) will be identified and invited to participate. The course will have a blended approach, combining self-paced activities with online group sessions to interact with trainers and other participants.

108. The project will finance (i) the development of the course, (ii) the training of trainers, and (iii) three courses to be open in years 3, 4 and 5. The courses will be open to personnel from the local governments of Antofagasta, Taltal and Esmeraldas, and other cities of the region. It is expected that after project end, the course will be maintained and updated by APC or another partner.

Outcome 6. Local population and government personnel with increased awareness of climate-related risks (floods, landslides, mudflows)

109. To generate this outcome, public communication and education strategies will be implemented in the three cities (output 6.1) and an initiative to strengthen cultural memory will be developed (output 6.2).

Public communication and education strategies

110. The communication and education strategies will be inclusive, gender-sensitive and aimed at (i) strengthen community awareness and ownership of climate-related risks, and (ii) engage local groups into risk-based adaptation. These strategies will be a network to articulate messages across project actions, and will motivate and encourage networking among stakeholders to cultivate social capital. The aim will be that key stakeholders get in contact and develop communication channels and constructive relationships.

111. Social inclusion will be at the core of the communication and education strategies. Therefore, actions will:

i. consider the needs and concerns of the range of vulnerable groups, such as limited reading capabilities or media literacy, and the need of large print or braille; and

ii. foster ample participation (e.g., disadvantaged children, older people) and dialogue.

These strategies will also be gender-sensitive, since it has been proven that the lack of a gender perspective in dissemination and communication exacerbates the negative impacts that a disaster can have (UNISDR 2009). This entails using appropriate communication channels, that reach both men and women (and may be different

[53] APC develop and offer in-person and online training courses (/www.onemi.cl/historia/).

depending on who is targeted) and ensuring that messages are understandable and accessible for everybody.

112. In the Luis Vargas Torres island, the communication and education strategies will include actions to support the conservation of the Wildlife Refuge Mangroves of the Esmeraldas River (located in the northern tip of the island) and to inform and engage the Chachi families that live in the island.

113. Implementation of the strategies will be based in the municipalities, in close coordination with climate change officers of the ministries of environment. The local strategies will be articulated to larger scale initiatives on climate change adaptation communication and education.

114. The strategies will be jointly assessed and reviewed every year by project partners. This will allow for exchange of lessons among project partners of the three cities, and to adjust to incorporate views and interests from local communities and vulnerable groups. It is expected that after project end, this kind of work will be embedded into the actions of the municipalities and local interest groups.

Narrators´ initiative

115. The project will support adapting the concept of "narrators" used in Japan to local conditions in Chile and Ecuador. Narrators is a tool to maintain a living memory of past events and to transfer knowledge to new generations (i.e., build cultural memory). It was developed and applied in the city of Nishinomiya after the devastating 1995 Great Hanshin Earthquake. A pilot of the narrators' methodology was tested in Valdivia (Chile) between 2012 and 2014 in cooperation with the Japan International Cooperation Agency (JICA) (Rosales, 2014).

116. To adapt the narrators' concept, local and international experience will be compiled and analysed. There is interesting experience in strengthening cultural memory for climate-related DRR (EDUCEN, 2015). Also, key partners and communication channels will be identified, like storytelling, music or street theatre. Local partners (e.g., dance groups, actors, musicians) will be identified, and if needed will be assisted by more experienced external partners[54] to initiate and catalyse local efforts of the narrators' initiative.

117. The narrators´ initiative will be grounded on social inclusion. Therefore, women, children, older people and people living with disabilities will be encouraged to integrate this initiative. Also, their particular needs (e.g., wheelchair access, sign language) will be taken into consideration for the design of the various activities. The capabilities and experience of older persons will be crucial for the narrators´ initiative. They are a repository of knowledge and preservers of cultural and social identity. The project will promote the preservation and use of oral history, and traditional tales and songs.

118. A learning by doing approach will be used, with continuous exchange of experience among the groups working in the three cities. A first two-year round will be implemented and evaluated. Afterwards, the strategy will be adjusted and tested in a final two-year round of actions. At project end, it is envisioned that the narrators´ initiative will be anchored in local groups and the municipalities.

119. The Ministry of Environment of Chile (MMA) will lead the narrators´ initiative in both countries, in close coordination with Ecuador´s Ministry of Environment (MAE). The initiative will be executed from within the three municipalities, and will be closely articulated with the communication strategies (output 6.1), and the other adaptation actions (e.g.,

[54] For example, Latin Latas is a Colombian collective of musicians which works with local groups to promote environmental protection. Also, the International Storytelling Network has members in both countries. Finally, dance groups of the Luis Vargas Torres island had expressed their interest to participate.

mudflow control works, pilot flood warning system in Esmeraldas). Local partners, the municipalities and the ministries of environment will form a community of practice to strengthen cultural memory on disaster-risk adaptation.

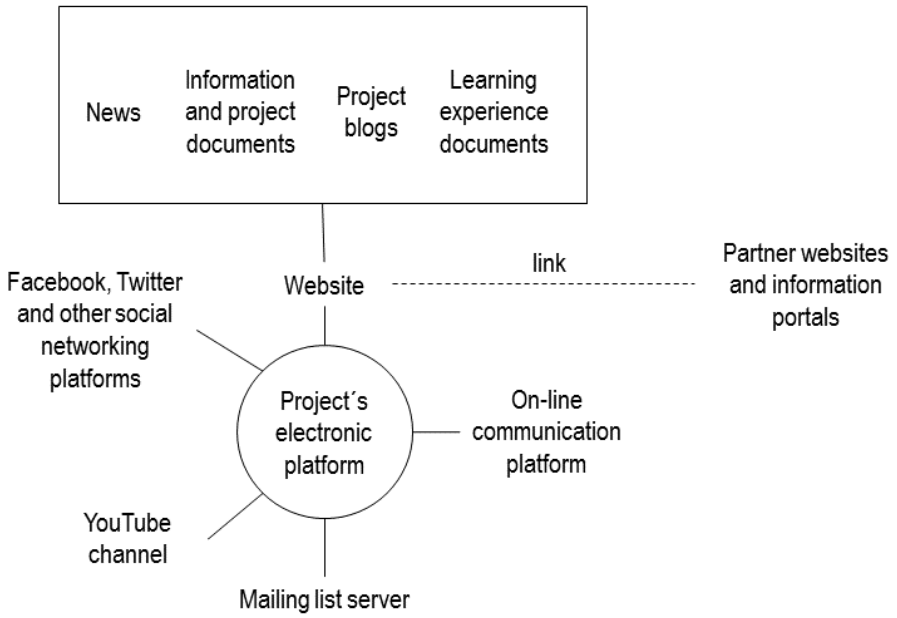


Figure 16. Electronic platform of the project.

Component 3. ICTs and partnership between coastal cities in Latin America

Outcome 7. Lessons and best practice on reducing vulnerability to climate related flooding, landslides and mudflows in coastal cities have been shared in the region

120. This outcome is the backbone of the project´s learning process. To generate this outcome:

- a set of communities of practice will be established and nurtured,
- a regional electronic platform will be developed (output 7.1) (Figure 16), and
- the lessons and best practice will be documented and disseminated (output 7.2).

121. The project team will systematically work with the communities of practice, document experiences and lessons and disseminate them through the electronic platform and complementary media. It is envisioned to have five communities of practice:

a. Introducing the climate-variable in the design and construction of adaptation infrastructure (outcomes 1 and 2).
b. Climate monitoring to strengthen early warning systems (outcome 3).
c. Early warning and response systems (outcome 4).
d. Raising public awareness and engagement (outputs 5.1 and 6.1).
e. Narrators as a tool to cultivate cultural memory (output 6.2).

Gender and social inclusion will be cross-cutting topics in all communities of practice. Women and other vulnerable groups (e.g., older people) will be encouraged to be part of the communities of practice.

122. Cultivating and supporting the communities of practice is a critical element of the project. On-line blogs will be maintained by project partners to serve as field journals and

document advances and lessons. Learning experience documents[55] (for a wide audience) will be prepared to systematize lessons and best practice, and propose recommendations for future action. Also, technical documents will be prepared for professional audiences. Along this process, female scientists will be invited to participate and analyse the experiences and lesssons.

123. The regional on-line platform has two elements:

a. A web-based communication platform (e.g., SKYPE for business / WebEx) and other electronic media (e.g., Twitter, WhatsApp, Facebook) to facilitate interaction and virtual meetings and webinars among project participants.

b. An array of media to document and disseminate information and lessons. This includes:

i. A mailing list server to distribute messages, news and information.

ii. A YouTube channel to post a set of short videos (<5 minutes/video) to present experience, lessons, best practice and anecdotes. This channel will be rooted in the concepts of participatory video (Lunch, 2004; Lunch & Lunch, 2006), whereby practitioners and community members use video to document their experiences and knowledge and to express their ideas and perspectives (i.e., tell their own story).

iii. A set of social network accounts (e.g., Twitter, Facebook, Instagram) to distribute messages and allow interaction among project participant and interested groups.

iv. A website dedicated to adaptation in coastal cities. The website will be linked the partners' portals and relevant information sites, and will contain:

- News.
- Project information and documents.
- Blogs that document specific experience. It is foreseen to have one blog for each output.
- Learning experience documents.
- Technical documents.

124. To complement virtual communication, there will be in-person meetings between project partners of both countries. Women will be encouraged to participate in these meetings. It is planned to have four thematic exchange visits:

- pilot stabilization of cerro Gatazo to control landslides (in Ecuador),
- early warning and response systems to climate-related events (in Chile),
- public awareness strategies (in Chile), and
- narrators' initiative (in Ecuador).

Exchange visits will be open to participants from other countries.

125. The mid-term Review (MTR) and Terminal Evaluation (TE) will contribute to the project´s learning process and will be inputs to the communities of learning.

126. To close the project there will be public events in Antofagasta, Taltal and Esmeraldas. These will include technical talks and informal activities to present results and learnings to stakeholders and general public. A final memoir will be prepared and disseminated with executive summaries in Spanish, English, French and Portuguese.

[55] Nine learning experience documents are planned: 1. incorporating the climate change factor into stormwater management plans in Chile, 2. preparation of green infrastructure plan in Esmeraldas, 3. incorporating the climate change factor into mudflow control infrastructure in Antofagasta, 4. incorporating the climate change factor into landslide control in cerro Gatazo (Esmeraldas), 5. Use of weather radar/ storm system to enhance early warning systems, 6. mudflows warning system in Antofagasta and Taltal, 7. pilot flood warning system in Esmeraldas, 8. communication and education strategies to increase public awareness of climate-related disaster risk, and 9. contribution of narrators to sustain cultural memory on climate-related risks and disasters.

127. After project end, CAF will maintain the regional on-line platform. It is envisioned that it will develop into a working space to promote risk-based adaptation in coastal cities of Latin America and the Caribbean.

Alternative approaches that were considered and not adopted

128. Annex 13 summarise the alternative approaches that were analysed but not adopted.

B. Describe how the project /programme would promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms.

129. The project has three main elements of innovation:

a. First, the development of tools and methods to incorporate climate change into infrastructure design and construction. As mentioned before (paragraph 57), the existing protection infrastructure does not incorporate climate considerations and it is very likely that new infrastructure will be built without considering the foreseen conditions of stronger and more frequent rainfall to be caused by climate change. Therefore, it is necessary that new infrastructure is climate resilient to the potential increases in extreme weather events. However, there is limited experience on how to implement this adaptation measure.

   The project will support the development of three pieces of pioneer practical experience:

   i. To update Antofagasta´s stormwater management plan to channel and evacuate the larger volumes of water generated by the expected increase in extreme weather events. It is very probable that the plan will require to upgrade the existing stormwater system and the construction of new stormwater facilities.

   ii. To update the design of mudflow control infrastructure in quebrada Bonilla (Antofagasta). With 2015´s Taltal mudflow it became evident that existing structural measures will be insufficient to cope with the projected impact of the climate change. Therefore, it is probable that the existing design and size of the decantation ponds and retaining walls (Annex 11) need to be changed.

   iii. To update the design of landslide mitigation works in cerro Gatazo (Esmeraldas) to cope with stronger and more frequent El Niño conditions. The design will combine grey and green infrastructure.

   In all cases, the existing designs will be analysed and adjusted considering the foreseen conditions associated with future changes in climate. The experience and lessons of each case will be documented and systematised in guidelines that will be published in electronic format. The guidelines will have a prompt direct application. In Chile, there are 33 cities with more than 50,000 people that already have stormwater management plans; none of them consider the future changes associated with climate change and will need to be upgraded to be climate resilient. Similarly, the guidelines will contribute to introduce climate change considerations into the new mudflow protection infrastructure that is planned to be built in the Antofagasta region.

b. Second, to develop hands-on practice on the preparation of the green infrastructure plan for Esmeraldas. As mentioned before, urban green infrastructure is a new field in both countries. The work in Esmeraldas will explore forms to use elements like vegetated slopes to control landslides and mangrove swamps, permeable pavers and rain gardens to manage urban flood risk.

c. Third, to adapt the narrators' concept to local conditions and use it to fortify cultural memory. The existing experience in Chile indicate that the core concept is valid, but

actions need to be inclusive and culturally appropriate. Therefore, the project will support:

i. Documenting from different perspectives (e.g., older persons, women, children, campamento dwellers, emergency services) the existing memory of climate-related disasters (e.g., Antofagasta´s 1991 mudflow, Taltal´s 2015 mudflow, El Niño associated floods in Esmeraldas).

ii. Supporting that local groups explore forms to transmit messages about climate-related hazards and disasters to the public and the new generations. It is anticipated that multiple channels will be explored, like street theatre, music and dance.

This will be a completely new approach to contribute to climate change adaptation by cultivating cultural memory. The lessons from this initiative have a high potential of application and replication in both countries and the entire region.

C. Describe how the project / programme would provide economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme would avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

Social benefits

130. The main benefits from the project will be (i) to protect the population of the three cities, and (ii) to reduce the risk of casualties.

Protected population in Chile

131. In Chile, the project will benefit the entire population of Antofagasta and Taltal, which is at risk of mudflows caused by extreme weather events (ca., 403 thousand people in 2017, Table 5). These people will benefit by having early warnings, information and knowledge to act in case of emergency and expedite evacuation, when necessary.

132. The direct beneficiaries are the people living in hazard areas. This is the population that will have to be evacuated in case of emergency: (i) about 116 thousand people from Antofagasta´s 17 gorges (Saavedra, 2016), and (ii) the entire population of Taltal (ca., 13,000 people). This includes people living in campamentos, which are the most vulnerable groups. The project intervention will contribute to protect the estimated 4,593 families that live in campamentos in Antofagasta (TECHO, 2016) (Figure 5), and the estimated 400 families living in campamentos in Taltal[56] (Figure 7, Table 4).

133. The population of Antofagasta will also benefit from weather-proof protection infrastructure that will be built / strengthened in the near future based on the updated stormwater management plan.

134. The protection works in quebrada Bonilla will directly benefit about 12,840 people that live in the mudflow hazard area, including the three campamentos[57] (ca., 125 families) located there (Figure 15, Table 9). These people will benefit from weather-proof protection infrastructure that will mitigate the impact from mudflows.

[56] The latest census of campamentos executed by TECHO in 2016 recorded 44 campamentos in Antofagasta (4,593 families) and 6 campamentos in Taltal (400 families) (TECHO, 2016).

[57] i.e., Víctor Jara (25 families), Mujeres Unidas (56 families) and Villa Esperanza (34 families).

135. The experience gained in Antofagasta and Taltal[58] will indirectly benefit a much larger population, since it can be applied in other parts of Chile.

Protected population in Ecuador

136. In Ecuador, the entire population of Esmeraldas will benefit from the project; this is about 161 thousand people. These people will benefit by having early warnings, information and knowledge to act in case of emergency and expedite evacuation, when necessary.
137. Direct beneficiaries will be the people that live in flood and landslide hazard areas (ca., 60% of the city´s population). The works in cerro Gatazo will directly benefit ca., 500 people that live in the hazard area (Barrio 20 de Noviembre). The direct beneficiaries of the pilot flood warning system will be ca., 700 families living in six neighbourhoods of Luis Vargas Torres island[59].
138. Coverage of the weather radar comprise most of the Esmeraldas and Teaone river areas within the province. Therefore, radar information will provide valuable inputs to the province-level early warning system and benefit the population located in flood-prone areas.
139. The experience gained in Esmeraldas[60] will indirectly benefit a much larger population, since it can be applied in other parts of the country.

Social inclusion

140. The project has mainstreamed social inclusion in key actions (e.g., outcomes 4, 6 and 7). This will provide additional social benefits in both countries and generate lessons that will be useful for the entire region.

Economic benefits

141. The main economic benefits will be to safeguard public and private assets in the three cities. A proxy of the economic value is the losses recorded in previous events:
    a. Antofagasta´s 1991 mudflow produced ca., USD71 million in losses, 493 houses were destroyed, and 2,464 houses had serious damages (ONEMI, 1994; Melin, 2011).
    b. Taltal´s 2015 mudflow, which surpassed the existing protection infrastructure, damaged 27 houses. The municipality invested USD 1.3 million in rehabilitation works. In addition, MOP invested USD 4 million to rehabilitate and strengthen protection structures, and USD 4.5 million to build additional protection structures (Rojas, 2015; Santana, 2016).
    c. In Esmeraldas, the landslides generated by El Niño 1997 / 1998 destroyed about 300 houses (ca., 2000 – 3000 people lost their properties) (Perrin et al., 1998). Also, the water system was damaged and did not operate for 45 days, the cost of this damage was ca., USD 1.3 million (CAF, 2000a). Also, a landslide broke a main oil pipeline close to the refinery, producing a spill of 8,700 barrels of crude oil and 3,500 barrels of diesel (CAF, 2000a).

[58] For example, introducing the climate variable in Antofagasta´s stormwater management plan and quebrada Bonilla´s protection infrastructure, use of a storm detection system to forecast rainfall and feed early warning systems, build cultural memory through the narrators´ initiative.

[59] Six neighbourhood committees: 12 de mayo, Cordero Crespo, 20 de noviembre, Pianguapi, 29 de agosto, and Habana.

[60] For example, use of a weather radar to forecast rainfall and feed early warning systems, introducing the climate variable cerro Gastaso protection works, preparing a green-infrastructure plan for the city, implementing a community-based flood early warning system, build cultural memory through the narrators´ initiative.

Environmental benefits

142. The main environmental benefits are related to the impacts of flooding, mudflows and landslides in local biodiversity. But these impacts have not been assessed.
143. In Ecuador, an additional long-term benefit will be the implementation of a green infrastructure plan in Esmeraldas. In the short-term, an area will be revegetated on cerro Gatazo to contribute to stabilize the hillsides (output 2.2). The exact area will be defined during project execution, but it is estimated that it will be about 100 ha. At the moment, the hillsides are highly intervened, therefore introducing new vegetation will have a positive impact.

Gender considerations

144. Men and women have different roles and responsibilities within their communities. Gender inequality is present in access and control over assets, natural resources, knowledge, capacities and opportunities, and can lead to different levels of vulnerability.
145. A study of 141 countries over 20 years on disasters impact over women's and men's life expectancy shows a gendered disparity in mortality rates from natural disasters and their aftermaths (Neumayer & Plümper, 2007). Results presented include: (i) natural disasters lower women's life expectancy more than men's (either more women are killed or they are killed at a younger age than males); (ii) the greater natural disaster's death toll, the greater gender gap in life expectancy; and (iii) the higher women's socio-economic status, the weaker the effect on the gender gap in life expectancy.
146. In this view, the Hyogo Framework for Action (2005 – 2015) calls for an integration of a gender perspective "into all disaster risk management policies, plans and decision-making processes, including those related to risk assessment, early warning, information management, and education and training". Sendai Framework for Disaster Risk Reduction (2015 – 2030) goes further, and calls upon relevant stakeholders, at the national and local level, to "invest in, develop, maintain and strengthen people-centred multi-hazard, multisectoral forecasting and early warning systems, disaster risk and emergency communications mechanisms, social technologies and hazard-monitoring telecommunications systems; develop such systems through a participatory process; tailor them to the needs of users, including social and cultural requirements, in particular gender; promote the application of simple and low-cost early warning equipment and facilities; and broaden release channels for natural disaster early warning information".
147. Project design has taken into consideration gender differences and has identified outputs and activities where women can have more of a leading role. Also, gender perspective has been mainstreamed in a number of project actions like evacuation plans, education and communication strategies, and the narrators' initiative, to ensure that both women and men's needs are addressed. Paragraph 280 list project action in support of gender equality and women´s empowerment.

Measures to avoid / mitigate negative impacts

148. The environmental and social impact assessment of the present project (Annex 15) includes a set of environmental and social measures established by CAF (section VII of Annex 15) and an action plan with a set of conditions to be fulfilled by the executing entities (section X of Annex 15). The required measures have been mainstreamed in the present project document and into the Environmental and Social Management Plan (ESMP) (Annex 14).
149. The key issues to attend are (i) the impacts from the construction of infrastructure in quebrada Bonilla and cerro Gatazo, and (ii) the potential impacts from revegetating cerro Gatazo.

Impacts from the construction of infrastructure in quebrada Bonilla and cerro Gatazo

150. Like any public works, the constructions in quebrada Bonilla and cerro Gatazo will produce temporary impacts like increased noise, and emission of dust and combustion gases. In addition, there will be risk of personnel accidents and contamination from waste and spills. Similarly, there will be temporary impacts during maintenance of the infrastructure. In quebrada Bonilla, the decantation ponds and drainage ways will have to be cleaned annually (i.e., remove garbage). After a mudflow, the sediment and debris will be removed from the decantation ponds, the retaining walls and the drainage ways. The cerro Gatazo´s infrastructure will require recurrent cleaning of debris and vegetation from the storm and surface water drains.

151. To prevent impacts and manage risks, MOP and GADE will obtain the corresponding environmental permits, and will prepare and implement an Environmental and Social Action Plan (PAAS) required by CAF (Annexes 14 and 15). The PAAS will contain: i) environmental management plan, ii) measures for prevention, mitigation and control, iii) contingency plan, iv) closure plan for the construction phase, v) compensation for damages plan, vi) citizen participation plan, and vii) industrial safety and occupational health plan.

Potential impact from revegetation of cerro Gatazo

152. The plant species to be planted in cerro Gatazo will have to contribute to hold and consolidate the ground. Four species have been recommended for use on the hillsides, including vetiver and huaje (MAE, 2002), which are introduced species widely used in Ecuador.

153. Vetiver is a perennial grass native from India, but widely used worldwide for slope stabilization. It is a non-invasive species (Joy, 2009) that was used, with positive results, in trials to stabilize the hillsides of cerro Gatazo in the early 2000s (PNUD, 2005).

154. Huaje is native from Mexico and central America, it is widely used in Ecuador´s mainland for various purposes (e.g., fodder, wood, revegetation) (Aguirre, 2012; Grijalva et al., 2012), but considered an invasive species in the Galapagos archipelago. It is listed as one of the '100 of the World's Worst Invasive Alien Species' for its spread in several countries (GSID, 2016).

155. The plant species to use will be decided during project implementation. However, to prevent impacts, the selection criteria will include:
    a. Preference to use native species.
    b. If a non-native species is a best choice, no species listed on IUCN´s Global Invasive Species Database[61] could be used.

156. Before execution, GADE will provide a written report indicating the list of plant species to be used for slope stabilization and the criteria used for their selection.

D. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme and explain how the regional approach would support cost-effectiveness.

157. The AF investment will benefit about 557 thousand people in the three cities which are highly vulnerable to climate-related disasters. The project will contribute to strengthen the adaptive capacity in these cities, reducing the level of future impacts.

158. The project will also serve as a catalyst to the planned investment of ca., USD 84,5 million to build infrastructure to protect from mudflows the cities of Antofagasta, Taltal

[61] www.iucngisd.org

and Tocopilla (DOH, 2015; Saavedra, 2016) by providing practical guidelines to incorporate the climate variable in new construction works.

159. At the moment, the municipality of Esmeraldas has financial limitations. Therefore, this project will make possible to execute actions that could not be financed in the short-term. The public works in cerro Gatazo is a long waited initiative that has not been possible to finance before.

160. The project will ensure the cost-effectiveness of resources by allocating AF funds to activities and products with high catalytic potential, such as:

    a. Participatory learning process based in communities of practice to generate lessons and best practice on disaster-risk adaptation.
    b. Systematic documentation and dissemination of lessons.
    c. Design and implement a communication strategy focused on specific interests and channels of key stakeholders.
    d. Use of an electronic platform to: (i) disseminate lessons learned and outcomes of the project, and (ii) facilitate communication and articulation among stakeholders and interest groups.
    e. Support the development of lessons and best practice that are highly replicable worldwide.

161. The regional approach will facilitate south-south cooperation and the foreseeable future application of learnings in other coastal cities of the region. The backbone of the project is the exchange of know-how, experience and lessons among local and national authorities and stakeholders in both countries. The main tool will be communities of practice to facilitate horizontal collaboration.

162. Some examples of the benefits of a regional approach are:

    a. Exchange of experience and learnings on:
        i. the use of meteorological radar and the storm detection system between INAMHI, GADPE, DMC, and MOP,
        ii. early warning systems among ONEMI, DMC, INAMHI, SGR and the three municipalities, and
        iii. mainstreaming risk-based adaptation in coastal cities between MMA and MAE.
    b. Expanding the narrators' concept that was first applied in Chile to be useful in a new cultural setting in Esmeraldas, and the possibility to applying it in other coastal cities of the region.

163. The regional approach also opens the opportunity to make available experience and lessons to a wider community of interested groups in Latin America and the Caribbean.

164. CAF will be a catalyst of this process by facilitating access to worldwide experiences and encouraging partnerships among the project participants.

E. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist. If applicable, please refer to relevant regional plans and strategies where they exist.

165. At the international level, the project is in line with the Sendai Framework for Disaster Risk Reduction 2015 – 2030. It also includes elements of the former Hyogo Framework for Action 2005-2015. The focal points for this matter are ONEMI in Chile and SGR in Ecuador. Also, the project will contribute to enhance knowledge and understanding, and to strengthen dialogue and coordination on line with the Warsaw International

Mechanism for Loss and Damage associated with Climate Change Impacts and article 8 of the Paris Agreement under the United Nations Framework Convention on Climate Change (under ratification).

166. The project is in line with CAF´s climate change adaptation programme (CAF, 2013). This programme has five lines of action; the present project is in line with:
    a. Line of action 2. To strengthen institutional capacity of public and private sectors of the region on climate change adaptation. The project will contribute to the following actions:
        i. Action 2. Implementation of training of public and private sector to promote the importance of planned climate adaptation and the development of policies, plans and strategies to adapt to climate change. The present project will contribute to this action by implementing a regional online course on risk-based adaptation in coastal cities for local government officers.
        ii. Action 3. To strengthen hydrometeorological data collection to feed climatic models. The project will contribute to this action by improving weather monitoring in the three selected cities.
    b. Line of action 3. To promote on the ground concrete adaptation measures in response to pressing needs of Latin America and Caribbean countries. The project will contribute to action 7, which is to further the funding of infrastructure which is resilient to climate change. The present project will contribute to this action by mainstreaming the climate factor into Antofagasta´s stormwater management plan, and the designs and construction of protection infrastructure in quebrada Bonilla (Antofagasta) and cerro Gatazo (Ecuador).
    c. Line of action 4. To support knowledge generation and management on adaptation to climate change. Component 3 of the present project is in line with this line. It will facilitate documenting and disseminating knowledge and best practice on risk-based adaptation in coastal cities.

167. At the national level, the project is in line and will contribute to the following Chilean instruments:
    a. The National Adaptation Plan (MMA, 2014). The plan has eight strategic lines of action. The present project is in line with the following lines:
        i. Line 7. Incorporate climate change in regional and local environmental management. This line focus on articulating sectoral and national adaption policies with local and regional development policies. The project contributes to the following activities:
            1. A21. Incorporate climate change adaptation and mitigation actions into municipal and local environmental management through instruments such as municipal environment certification (SCAM) and national environmental certification of education establishments. This action seeks to incorporate the climate factor into municipal policy, planning and management. The project will contribute to this action by working directly with the municipalities of Antofagasta and Taltal. Project adaptation specialist will be based within the municipalities (Figure 18) and the public communication and education strategies will be executed by the municipalities (output 6.1).
            2. A22. Incorporate climate change adaptation and mitigation actions into sustainable community or sustainable neighbourhood programmes. The project will contribute to this action by implementing public communication and education strategies and the narrators´s initiative (outputs 6.1 and 6.2).
        ii. Line 8. Information for decision making on disaster risk management. The project contributes to the following activities:
            1. A24. Incorporate information of extreme hydrometeorological events (present and foreseen) in the preparation and updating of risk maps,

including climate change threat, vulnerability and exposure variables. The project will contribute to this action by preparing and disseminating evacuation route maps and installing evacuation signals (output 4.3).

2. A26. Develop a training programme for public entities and other stakeholders at national, regional and local levels, on disaster risk reduction adaptation to climate change, which includes, among other topics, climate change impacts, adaptation, risk perspective, and non-traditional adaptation alternatives such as green infrastructure and ecosystem-based adaptation. The project will contribute to this action by developing and executing a regional course on risk-based adaptation in coastal cities (output 5.1).

The project will also contribute to implement the Climate Change National Action Plan 2017-2022 (currently under public consultation), and the sectoral adaptation plans for cities and infrastructure that are under development.

b. National Plan for Civil Protection (Decree 156 of 12 March 2002). This plan set the foundations, organizational structure, responsibilities and procedures to address emergencies in Chile. The project is in line with this plan and will contribute by improving weather monitoring and strengthening the mudflows early warning system (outputs 3.1, 3.2, 4.1, and 4.3).

c. The National Policy for disaster risk management (ONEMI, 2014). This policy sets five strategic axes, the project is in line with the following elements:

   i. Strategic axis 2. Strengthen monitoring and early warning systems. This axis focusses on providing to the civil protection national system adequate information to properly assess risks and take sound decision. The project will contribute to the following specific objectives:

      1. Specific objective 1. Strengthen the monitoring systems to promptly detect threats, within the competences of each actor, on a continuous 24/7 system. The project will contribute to this objective by upgrading weather monitoring with a meteorological radar in Esmeraldas, storm detection system in Antofagasta and meteorological stations in both sites (outputs 3.1 and 3.2).
      2. Specific objective 4. Support the development of technical agencies that have human and technical resources to monitor diverse threats and fulfil their specific functions. The project will contribute to this objective by strengthening local functions. DMC will manage Antofagasta's storm detection system and DGA will manage the meteorological stations (outputs 3.1 and 3.2). The data and information will feed the early warning systems.

   ii. Strategic axis 3. Promote a prevention and self-protection culture. The project will contribute to the following specific objectives:

      1. Specific objective 1. To include disaster risk reduction concepts and approach into formal, non-formal and informal education. The project will contribute to this objective through the public communication and education strategies and the narrators´ initiative (outputs 6.1 and 6.2).
      2. Specific objective 3. Contribute to train professionals on disaster risk reduction. The project will contribute to this objective through the regional online course on risk-based adaptation in coastal cities (output 5.1).
      3. Specific objective 6. To promote the disaster risk reduction approach into public and private sectors. The project will contribute to this objective through the public communication and education strategies and the narrators´ initiative (outputs 6.1 and 6.2).

d. Antofagasta´s Regional Plan for Infrastructure and Water Resources Management to 2021 (MOP, 2012). This plan includes strategic action B2 which is to protect the

population from mudflows or floods. The plan includes a set of targets for construction of mudflow protection works in Antofagasta and Taltal, and six projects to build new protection works (i.e., projects 31, 33, 34, 35, 62, and 63). The present project will complement the planned activities by updating Antofagasta´s stormwater management plan and building climate-proof mudflow protection infrastructure in quebrada Bonilla (outputs 1.1 and 2.1). In addition, the lessons and experience from these two actions will serve to guide the incorporation of the climate factor into other protection works.

e. The project is consistent with Antofagasta´s Communal Development Plan 2013 – 2022 (MdA, 2012) and Taltal´s Communal Development Plan 2022 (MdT, 2015). In both cases, the project will contribute to mainstream risk-based adaptation concepts and approach into municipal work. A project´s adaptation specialist will be based within each municipality (Figure 18). This will allow for day-to-day interaction with municipal officers during the five years of project implementation. In addition, municipal execution of the public education and communication strategies will contribute to build interest and familiarity with risk-based adaptation. Finally, municipal officers will take course on risk-based adaptation in coastal cities, this will contribute to increase technical capacities and to interact with peers from other cities.

f. The project will contribute to Antofagasta´s and Taltal´s communal plans for civil protection (MdT, 2012) by advancing on practical actions to address mudflows (e.g., evacuation maps, evacuation drills, signal of evacuation routes, enhanced early warning and alert system and increased public awareness).

168. The project is in line and will contribute to the following Ecuadorian instruments:

a. National Climate Change Strategy (MAE, 2012), in particular specific objectives 7 and 8. The national strategy covers the period 2012 – 2025. It defines eight priority sectors for climate change adaptation, two of them are human settlements (number 7) and risk management (number 8) which is transversal to all the other sectors. The present project is in line with two specific objectives of the adaptation line of work:

i. Specific objective 7. To include integrated risk management to weather related extreme events in public and private sectors. Within this objective, the project will contribute to three key actions:

1. Action 2. Integrate risk management in present and future infrastructure plans and programmes, motivating innovation and continuous improvement of infrastructure quality and safety. The project will contribute to this action by developing experience on mainstreaming the climate change factor into the design and construction of protection infrastructure in cerro Gatazo (output 2.2), complemented with green infrastructure (output 1.2). The development of a green infrastructure plan for Esmeraldas will allow to explore the use of natural elements to cope with climate change adaptation. In addition, the lessons and experience in cerro Gatazo will be useful to other infrastructure projects.

2. Action 4. Encourage the generation and updating of early warning systems, which include the risks of extreme weather events from possible climate change scenarios, for the priority sectors. The project will contribute to this action by improving weather monitoring (outputs 3.1 and 3.2) and the existing Esmeraldas´ early warning system. In addition, the pilot flood warning system in Luis Vargas Torres island (output 4.2) will generate experience and lessons to be replicated in other areas.

3. Action 6. Promote public participation and social organization as mechanisms to support implementation of responses to climate change related extreme weather events as part of integrated risk management. The

project will contribute to this action by preparing evacuation route maps (output 4.3) and implementing public education and communication strategies (outputs 6.1 and 6.2).

ii. Specific objective 8. To implement measure to increase the response capacity of human settlements to cope with the impacts of climate change. Within this objective the project will contribute to three key actions:

1. Action 2. Promote public participation and social organization to facilitate implementation of response measures to cope with extreme climate events linked to climate change. The project will contribute to this action by preparing evacuation route maps (output 4.3) and implementing public education and communication strategies (outputs 6.1 and 6.2).
2. Action 3. Promote the generation of specific information and its access to GADs about possible impacts from extreme climate events under possible climate change scenarios. The project will contribute to this action by improving weather monitoring (outputs 3.1 and 3.2) and the existing Esmeraldas´ early warning system

b. National Comprehensive Security Plan (MCS. 2014), in the policy framework assigned to SGR. This plan covers the period 2014 – 2017 and establishes the overall policies and assign responsibilities within the national security framework. The project contributes to implement the public policies related to risk management.

c. Sectoral Agenda for Risks Management (SGR, 2014), in particular policy 2 aimed at promoting a risk management culture, policy 3 aimed at coordinate and articulate the decentralised national system for risks management, and policy 4 aimed at strengthening international cooperation. The present project is in line with policy 3: to coordinate and articulate the national decentralized risk management system to protect people, communities and nature from natural and anthropic threats. Under this policy, the project will contribute to the following strategies:

i. Strategy 3.7. To promote programmes for risk-reduction and mitigation and adaptation to climate change, with emphasis on priority sectors, priority groups and fragile ecosystems. The entire project will contribute to this strategy. A key element will be to improve local capacity to design and implement adaptation measures in Esmeraldas (outcomes 5 and 6).

ii. Strategy 3.3. To improve and integrate the monitoring and early warning systems to identify and mitigate social and environmental threats and vulnerabilities from natural and anthropic risks. The project will contribute to this strategy by improving weather monitoring (outputs 3.1 and 3.2) and the existing Esmeraldas´ early warning system.

d. Esmeraldas´ Municipal Development and Land Use Plan (GAD Esmeraldas, 2012a), in particular environmental section, strategic line 10 to strengthen the municipal system for risk management. This plan covers the period 2012 – 2022. Strategic line 10 is to advance the operation of the municipal integrated risk management system. Within this strategic line, the present project contributes to the following actions:

i. PYSA 49. Strengthen organisms for emergency coordination. The project contributes to this action by strengthening weather monitoring and the early warning system (outputs 3.1, 3.2, 4.2 and 4.3).

ii. PYSA 50. Permanent education, communication and prevention campaigns. The project contributes to this action by implementing public communication and education strategies (output 6.1) and the narrators´ initiative (output 6.2).

iii. PYSA 52. Institutional strengthening, through COE´s technical working groups. The project contributes to this action by strengthening weather monitoring and the early warning system (outputs 3.1, 3.2, 4.2 and 4.3).

iv. PYSA 53. Strengthening of the early warning system. The project contributes to this action by strengthening weather monitoring and the early warning system (outputs 3.1, 3.2, 4.2 and 4.3).

v. PYSA 55. Execution of works to reduce and mitigate risks in vulnerable settlements. The project contributes to this action by designing a green infrastructure plan for Esmeraldas (output 1.2), constructing landslide mitigation works in cerro Gatazo (output 2.2), executing a pilot flood warning system in Luis Vargas Torres island (output 4.2), and preparing and disseminating evacuation route maps and installing evacuation signals (output 4.3).

e. Esmeraldas´ Municipal Strategy for Risks and Disaster Management (GAD Esmeraldas, 2012b). in particular:

i. Strategic objective 2. To reduce disaster risk in medium and high vulnerability human settlements. The project will contribute to the following action lines:

1. Action line 3. To promote the design and construction of mitigation works on hillsides with landslide risk. The project contributes to this action by revegetating cerro Gatazo as part of the green infrastructure plan for Esmeraldas (output 1.2) and complementing the landslide mitigation works (output 2.2),
2. Action line 5. To identify, adequate and extend evacuation routes and safe areas, in accordance with existing threats. The project contributes to this action by preparing and disseminating evacuation route maps and installing evacuation signals (output 4.3).
3. Action line 6. To design, implement and strengthen early warning systems to allow a better reaction to the multiple threats that have been identified. The project contributes to this action by strengthening weather monitoring and the early warning system (outputs 3.1, 3.2, 4.2 and 4.3), including the pilot flood warning system in Luis Vargas Torres island.
4. Action line 7. To promote the execution of biannual evacuation drills in coordination with community, and public and private organizations. The project contributes to this action by implementing flood emergency drills as part of the pilot flood warning system in Luis Vargas Torres island (output 4.2).

ii. Strategic objective 3. To strengthen institutional capacities to implement a risk management approach in planning and land use processes (institutional strengthening). The project will contribute to action line 13 that is to train personnel from public and private institutions on risk management, including preparation of contingency plans, evacuation plans, interior signage, protection / safety elements, and evacuation routes (train personnel on risk management). The project will contribute to this action by hands-on training as part of the pilot flood warning system in Luis Vargas Torres island (output 4.2) and through the regional online course on risk-based adaptation in coastal cities (output 5.1).

iii. Strategic objective 4. To reduce economic, social and environmental vulnerability of the human and natural systems to mitigate and adapt to climate change. (reduce vulnerability). The project will contribute to action line 17, which is to develop hillside reforestation plans to prevent landslides. The project contributes to this action by revegetating cerro Gatazo as part of the green infrastructure plan for Esmeraldas (output 1.2) and complementing the landslide mitigation works (output 2.2),

iv. Strategic objective 8. To implement non-structural works to reduce social vulnerability, through linking the Risk Management and Climate Change Unit and the Municipal Risk Management Committee with organized civil society. The project will contribute to the following action lines:

1. Action line 35. Form neighbourhood and parish emergency committees. The project will contribute to this action with the pilot flood warning system in Luis Vargas Torres island (output 4.2)
2. Action line 36. Form and train a network of neighbourhood and parish community leaders for risk management and adaptation to climate change. The project will contribute to this action by hands-on training as part of the pilot flood warning system in Luis Vargas Torres island (output 4.2)
3. Action line 37. Establish recreational spaces for collective learning on disaster risk reduction. The project will contribute to this action with the narrators´ initiative (output 6.2) which will develop capacities of local groups to use recreational activities, like dance or story-telling, to cultivate collective memory on disaster risk reduction.
4. Action line 39. Communication campaigns on preventive measures to cope with adverse events, through public media (radio, press, television). The project contributes to this action by implementing public communication and education strategies (output 6.1) and the narrators´ initiative (output 6.2).
5. Action line 41. Establish spaces linking community - local government to reduce vulnerability of the organizational fabric. The project contributes to this action by implementing public communication and education strategies (output 6.1) and the narrators´ initiative (output 6.2).

v. Strategic objective 9. Consolidate the decentralized national risk management system in Esmeraldas canton with participation of authorities, institutions and community. The project will contribute to action line 42, which is to promote the permanent functioning of the canton´s integrated risk management system. The project will contribute to this line by strengthening weather monitoring and the early warning system (outputs 3.1, 3.2, 4.2 and 4.3), including the pilot flood warning system in Luis Vargas Torres island.

f. Esmeraldas´ Municipal Climate Change Adaptation and Mitigation Strategy (ONU-HABITAT, 2011). The project is in line with strategic objective 2, which is to reduce social, economic and environmental vulnerability of the human and natural systems to cope with the climate change. In particular, with action line 1 on planning and land use. Within this action line, the project will contribute to:
   i. Specific objective1.3. To reforest hillsides and form natural barriers to protect riversides. The project will contribute to this objective by revegetating cerro Gatazo as part of the green infrastructure plan for Esmeraldas (output 1.2).
   ii. Specific objective 1.4. To build green spaces within the urban area. The project will contribute to this objective by preparing Esmeraldas´ green infrastructure plan and revegetating cerro Gatazo (output 1.2).

F. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

Construction works

169. The update of Antofagasta's stormwater plan will comply with Law 19525, published on 10 November 1997. It establishes that the primary network for rainwater evacuation and drainage will be under MOP´s responsibility and the secondary network will be under MINVU´s responsibility. MOP will prepare these plans, that are compulsory for cities with more than 50,000 inhabitants. Stormwater plans will be approved by Executive Decree signed by the ministries of public works and of housing and urban development. There

are no specific guidelines or technical standards for the preparation of the stormwater plans.

170. The design and construction of infrastructure in quebrada Bonilla will comply with pertinent Chile´s building standards. Mandatory and referential standards are available in MINVU´s website[62]. MOP will approve the designs and infrastructure for quebrada Bonilla. This will ensure compliance with national technical standards and building codes.

171. The design and construction of infrastructure in cerro Gatazo will comply with the Ecuadorian norm of construction, adopted by Ministerial Agreement 0028 of 19 August 2014 and updated by Ministerial Agreement 0047 of 15 December 2014[63]. The Directorate of Public Works of the Municipality of Esmeraldas will approve the designs and infrastructure to ensure compliance with national technical standards and building codes and local regulations.

Environmental permits

172. In Chile, the construction works in quebrada Bonilla will require an Environmental Qualification Resolution. In Ecuador, the works in cerro Gatazo, and the installation and operation of the weather radar and the meteorological stations will require an Environmental Registry.

173. Chile´s environmental regulatory framework is based on the Environmental Law (Law 19,300[64]) amended by Law 20,417[65] of 2010, and Supreme Decree 40/2012[66] of 2012 (regulation for the environmental impact assessment system). Article 10 of Law 19,300 list the types of activities that will be subject to the environmental impact evaluation system (SEIA). Two types of environmental permits exist: Environmental Impact Study (EIA) and Environmental Impact Declaration (DIA). An EIA applies to projects that may generate high-level impacts; article 11 of Law 19,300 establishes that a project with any of the following characteristics has to present an EIA:

    a. Risk to the health of the population, due to the quantity and quality of effluent, emissions and waste.
    b. Significant adverse effects on the quantity and quality of renewable natural resources, including soil, water and air.
    c. Resettlement of human communities, or significant alteration of the systems of life and customs of human groups.
    d. Location at or near populations, resources and protected areas, priority conservation sites, protected wetlands, glaciers, that may be affected, as well as the environmental value of the territory in which it is intended to deploy.
    e. Significant change in terms of magnitude or duration, of the scenic or tourism value of an area.
    f. Alteration of monuments, sites with anthropological, archaeological, historical value and, in general, belonging to the cultural heritage.

    Projects included in the categories of article 10, but which do not have the characteristics listed in article 11, must present a DIA.

[62] http://proveedorestecnicos.minvu.cl/normas-tecnicas-obligatorias/

[63] The elements of the norm of construction are found at http://www.habitatyvivienda.gob.ec/norma-ecuatoriana-de-la-construccion/

[64] http://bcn.cl/1uywi

[65] http://bcn.cl/1vze7

[66] http://bcn.cl/1uvqa

Both EIA and DIA are subject to public consultation. The Environmental Evaluation Service (SEA) has established guidelines to conduct the public consultation process (SEA, 2013).

174. The existing designs for the protection works in quebrada Bonilla already include the DIA. However, because the designs will be updated to incorporate the climate variable, the DIA will be updated. Therefore, MOP will prepare and submit the updated DIA to the SEA. SEA will conduct the review process, which is managed online, and issue an Environmental Qualification Resolution (RCA). For a DIA, the review process takes ca., 60 working days and has no cost. Existing mudflow protection works presented DIAs and obtained RCAs. The cost of preparing the DIA is included in the project budget (see budget note 14).
175. Ecuador´s environmental regulatory framework is based on the Environmental Management Law (Law 37 of 1999, coded in 2004), the environmental impact evaluation system (Ministerial Agreement 061 of 2015) and complementary regulations. Article 14 of Ministerial Agreement 061 established two types of environmental permits: (i) Environmental Registry, and (ii) Environmental Licence. There is an online catalogue[67] which list the projects, works and activities that require an environmental permit and the corresponding permit type (article 22 of Ministerial Agreement 061). Article 24 indicates that the Environmental Registry is issued to projects, works and activities with low environmental impact and risk. Article 25 indicates that the Environmental Licence is issued to projects, works and activities with medium or high environmental impact and risk. To obtain an Environmental Licence, an Environmental Impact Assessment (EIA) must be submitted, and the review process is subject to public consultation.
176. The construction of cerro Gatazo´s protection works (output 2.2) and the installation and operation of the weather radar and the meteorological stations (outputs 3.1 and 3.2) will require an Environmental Registry. The process to obtain the Environmental Registry is managed online (suia.ambiente.gob.ec), and consists on completing an online formulary and paying a fee of ca., USD180; the permit is issued automatically. For the construction works in cerro Gatazo, GADE will obtain the corresponding environmental registry. For the weather radar and meteorological stations, GADPE will obtain the corresponding environmental registries. CAF has requested more stringent measures and will require the preparation of environmental impact assessments and the implementation of environmental management plans for these three project elements.

Meteorological equipment and data

177. The weather radar, the storm detection system and meteorological stations will comply with technical and operational specifications and requirements stipulated by the corresponding national authorities, DMC in Chile and INAMHI in Ecuador. This will ensure that the equipment comply with required specifications and is integrated into the national weather monitoring systems.
178. To ensure compliance, interinstitutional agreements will be signed. The signature of these agreements will be a pre-requisite before purchasing the radar, the storm detection system and the meteorological stations.
    a. In Chile, an agreement will be signed between MOP (who will operate and maintain the meteorological stations), DMC (who will operate the storm detection system) and ONEMI to establish operational procedures, information flow, and to guarantee that the information is expedited to the national weather forecast and early warning systems.

[67] The catalogue is found at http://suia.ambiente.gob.ec/catalogo_ambiental;jsessionid=TXc7k+eULLCzbtscHz6RsykX

b. In Ecuador, an agreement will be signed between GADPE (who will operate and maintain the radar and meteorological stations) and INAMHI to establish operational procedures, information flow, and to guarantee that the information from the radar and meteorological stations is expedited to the national weather forecast and early warning systems.

179. The information from meteorological monitoring will feed the early warning systems within the existing operational framework and institutional arrangements.
    a. In Chile, DMC and MOP will feed the data to ONEMI within the framework of the National Plan for Civil Protection (Decree 156 of 2002) which includes the Communal Committees for Civil Protection and Emergency and the COEs of Antofagasta and Taltal.
    b. In Ecuador, GADPE will feed the information to INAMHI and SGR within the framework of the national integrated system which includes the municipal and provincial Risk Management Committees and COEs.

Early warning systems

180. The actions to strengthen the early warning systems in Antofagasta and Taltal (e.g., mudflow evacuation maps, emergency sirens) will be administered by ONEMI to ensure compliance with existing specifications, integration with the national framework and articulation with the communal civil protection plans.

181. The actions to strengthen the early warning systems in Esmeraldas will be administered by GADE to ensure compliance with the municipal strategy for risks and disaster management (GAD Esmeraldas, 2012b) and the national framework.

G. Describe if there is duplication of project / programme with other funding sources, if any.

182. No duplication with other funding sources was found. However, the project will have synergies with the following projects:
    - Third National communication (3NC) and First Biennial Update Report (BUR). This is a GEF funded project (GEF ID 5478) under implementation in Ecuador. The executing agency is MAE, and the GEF implementing agency is UNDP. The project objective is to prepare the third national communication on climate change and the first biennial update report. The investment is USD 852,000. The present project will use the results of 3NC, in particular the outcomes of the climate change models and the guidelines for climate change adaptation.
    - ARG - MOP agreement "mudflow disaster mitigation and evacuation of rainwater, Antofagasta Region 2015-2020". This is a government project under implementation (Annex 16). The executing agency is DOH. The project will build mudflow control works in Antofagasta and Taltal (DOH, 2015; Saavedra, 2016) (paragraph 70, Table 8 and Annex 16). The total investment is CLP 56,152,000,000 (about USD 84.5 million). The present project will provide practical guidelines to incorporate the climate variable in new construction works.

183. The project will seek collaboration with UNISDR´s Regional Platform for Disaster Risk Reduction of the Americas[68] and the Resilient Cities Campaign[69].

[68] http://www.unisdr.org/we/coordinate/regional-platforms

[69] http://www.unisdr.org/we/campaign/cities

H. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

184. Component 3 of the project focus on learning and knowledge management. It comprises one outcome (i.e., outcome 7) and two outputs (i.e., outputs 7.1 and 7.2).

185. The backbone is the regional platform that will facilitate communication and collaboration among project partners and dissemination of information and lessons (Figure 16).

186. The main tool will be communities of practice (Lave & Wenger, 1991; Wenger, 1998; Wenger et al., 2002) among practitioners and key stakeholders. The communities of practice will facilitate common learning and the development of social capital. It is envisioned to have five communities of practice:
    a. Introducing the climate-variable in the design and construction of adaptation infrastructure.
    b. Climate monitoring to strengthen early warning systems.
    c. Early warning and response systems.
    d. Raising public awareness and engagement.
    e. Narrators as a tool to cultivate cultural memory.

187. The main instruments will be:
    a. Project blogs. These will be on-line and will serve as field journals to document experience and lessons. It is envisioned to have one blog per output.
    b. YouTube channel. It will contain short videos prepared mostly by project participants and local stakeholders. However, it will also include videos prepared by the project team and partners.
    c. Learning experience documents. These will be concise communication documents (i.e, accessible to a wide audience) that systematize lessons and best practice. Each document will include executive summaries in Portuguese, French and English to be useful to all countries in the region. It is anticipated to produce nine documents.
    d. Technical documents. These will be documents aimed at practitioners and professionals to present, in a formal format, experience, results, guidelines and recommendations. Each document will include executive summaries in Portuguese, French and English to be useful to all countries in the region. The number and nature of these documents will be decided during project execution.
    e. Memories of exchange visits. Four thematic exchange visits are planned. A memoir of each visit will be prepared to record discussions, joint analyses and recommendations. The memoirs will be communication documents to be accessible to a wide audience.
    f. Mid-term review report. The project will use the independent mid-term evaluation as part of the learning process. The full document will be shared will all partners, and accessible through the regional on-line platform. A brief will be prepared for the use of the general public, decision makers and other stakeholders.
    g. Terminal evaluation report. The independent final evaluation will also nurture the project´s learning process. The full document will be shared will all partners, and accessible through the regional on-line platform. Also, a brief will be prepared for the use of the general public, decision makers and other stakeholders.
    h. Project memoirs. This will be a communication document that summarise the project´s achievements and lessons, as well as opinions and anecdotes from project partners and stakeholders. It will include executive summaries in Portuguese, French and English to be useful to all countries in the region

I. Describe the consultative process, including the list of stakeholders consulted, undertaken during project / programme preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

188. During project preparation, there were inception and validation workshops, and stakeholder analysis in Antofagasta, Taltal and Esmeraldas. Following the request from the Adaptation Fund, there was additional consultation to local groups in the three cities.

Inception workshops

189. Before the inception workshops, MMA, MAE and the consultants in charge of the stakeholder analyses made a quick survey to identify local organizations and stakeholders to be invited. National and local entities and main stakeholders were invited by MMA in Chile and MAE in Ecuador.
190. The inception workshops were aimed to present the pre-concept, have feedback and initiate the project preparation process. In both workshops a roadmap was prepared, outlining the milestones to prepare the project proposal. The memoirs of the workshops (including list of participants) were distributed to all participants and are found in Annex 4.
191. The Antofagasta inception workshop was held on 4 May 2016. It included the stakeholders from Taltal; transportation was provided to bring the persons from Taltal to Antofagasta (a two-hour trip). Thirty-five people from Antofagasta and Taltal participated; 14 were females (40%). Participants included representatives of neighbourhood organizations, the two municipalities, and national entities (e.g., MOP, ONEMI, MINVU).
192. The Esmeraldas inception workshop was held on 16 May 2016. Twenty-eight people participated; three were females (10.7%). Participants included representatives of neighbourhood organizations, GADE, GADPE and national entities (e.g., INOCAR).
193. The inception workshops had the following elements:
    a. Presentation of the project concept (as approved by the Adaptation Fund). Participants were introduced to the project concept and were able to provide comments and recommendations.
    b. In group sessions, a participatory situation analysis was prepared. Participants identified key issues and suggested their root causes and constraints.
    c. Using maps of the cities, participants located the most critical sites and analysed the situation on priority sites. The result was a preliminary list of intervention sites to be analysed afterwards.
    d. Finally, participants analysed the proposed project elements (outcomes and outputs) and proposed adjustments and changes. For example, at this stage the idea of a weather radar for Esmeraldas was first discussed.

Stakeholder analyses

194. After the inception workshops, stakeholder analyses were prepared, covering each of the three cities (Annexes 8 and 9). In-depth interviews and focus groups were used to obtain perceptions, views and recommendations about the project proposal and its elements. These studies included a review of information on the social and economic situation of the cities and the identification of gender issues to be taken into account in the project.

195. The focus groups and in-depth interviews included (i) juntas de vecinos[70] (neighbourhood councils) and campamentos in risk areas of Antofagasta and Taltal, (ii) residents of flood-prone areas (riversides along Teaone and Esmeraldas rivers and Luis Vargas Torres island) and landslide risk areas in Esmeraldas, and (iii) civil society organizations. In the focus groups and in-depth interviews local groups were presented the project concept and asked to comment the proposed actions, as well as to suggest modifications. This allowed to assess the options to work with specific groups. The campamentos and neighbourhood organizations of the main risk areas where the project will intervene[71], where visited and consulted.

196. In the focus groups and interviews with juntas de vecinos and campamentos in Antofagasta and Taltal, participants ranked high the proposed actions and provided recommendations that were incorporated into the project:

- Ensure that the education strategies include children (9 – 12 years old) and people that live in the risk areas.
- In alluvial risk areas, use means / media to facilitate that the local community identify and remember the risks[72].
- Campamentos are illegal settlements, therefore these groups have limited access and influence in the decisions of the local authorities (e.g., municipalities, ARG).
- Unlike local residents, the immigrants in campamentos are not familiar with the natural history of the area (e.g., former mudflows) nor are aware of the mudflow impacts. Also, they seem unwilling to move to safer areas.
- The municipality is perceived as the key entity to address mudflow emergencies.

197. In Esmeraldas, the focus groups and interviews included a range of barrios located on landslide and flood risk areas (Annex 9). There was support to the proposed actions and recommendations / comments that were incorporated into the project:

- The families that live in the risk areas have household and community vulnerability. They consider that cannot access / afford living in safer areas. Therefore, relocation will be traumatic, unless appropriate support is provided.
- There is limited comprehension of hydrometeorological hazards and the impacts from climate change.
- There is dissatisfaction with the emergency response from the municipality and pertinent public entities.
- Many households do not evacuate to guard their property. Pillage has been common in former emergencies. Measures need to be taken to safeguard the population and prevent looting of houses.
- Women, mostly in female-headed households, are concerned about the safety and security of their families in strange environments or improvised shelters.
- There are no maps that show the risk areas for floods and landslides, nor evacuation maps / procedures that indicate safe routes and shelters.
- Sirens and other related equipment must operate under extreme situations. Power failures are common during floods. Also, this equipment has to be protected from stealing and vandalism.

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[70] Juntas de Vecinos are community organizations that represent the people that reside in a neighbourhood. Their purpose is to defend the rights of the neighbours and collaborate with the State and the municipality. The neighbourhood councils are regulated by Law 19,418 of 1997 and its subsequent updates and modifications. The municipalities maintain lists of the Juntas de Vecinos of their territory.

[71] In quebrada Bonilla (Antofagasta): campamentos Víctor Jara, Mujeres Unidas and Villa Esperanza. In cerro Gatazo (Esmeraldas): barrio 20 de noviembre. In Isla Luis Vargas Torres: neighbourhood committees 12 de mayo, Cordero Crespo, 20 de noviembre, Pianguapi, 29 de agosto, and Habana.

[72] This recommendation motivated the action to install evacuation route maps in large format in high-transit areas (see page 36).

Validation workshops

198. The second round of consultation (validation workshops) focused on the analysis of the final project draft. These workshops served to confirm partner engagement and contributions. The Antofagasta workshop was held on 19 July 2016; like in the inception workshop, transportation was also arranged to bring the persons from Taltal to Antofagasta. The Esmeraldas workshop was held on 22 July 2016. The memoirs of the workshops (including list of participants) were distributed to all participants and are found in Annex 4.
199. Twenty-four people participated in the Antofagasta validation workshop; eleven people were females (45.8%). The key elements of the agenda were: (i) presentation of the draft PRODOC, (ii) presentation of the results of the stakeholder analysis, (iii) group work, and (iv) preparation of a roadmap to finalise the PRODOC. Two groups were formed, one analysed components 1 and 3, and the other components 2 and 3. The group work focused on reviewing the proposed outcomes, and present recommendations for adjustments and to solve pending issues.
200. Ten people participated in the Esmeraldas validation workshop. The only female present was CAF´ climate change officer. The key elements of the agenda were: (i) presentation of the draft PRODOC, (ii) group work, and (iii) preparation of a roadmap to finalise the PRODOC. Participants analysed the proposed outcomes and budget, and proposed recommendations for adjustments and to solve pending issues. Finally, contributions and participation of local organizations in the various project outcomes were confirmed. On this meeting, it was confirmed that six neighbourhoods of Luis Vargas Torres island and the barrio 20 de Noviembre will participate and contribute, respectively, to actions in the pilot flood warning system and the landslide mitigation in cerro Gatazo.

Meetings of project partners

201. There were also in-person and virtual meetings with the project partners:
    a. In Chile, the project partners are MMA, MOP, DMC, ONEMI, the Municipality of Antofagasta, and the Municipality of Taltal. A meeting was organised with the Chilean Agency for International Cooperation for Development (AGCID) to obtain their input to the project proposal. AGCID is the National Implementing Entity (NIE) of the Adaptation Fund in Chile.
    b. In Ecuador, the project partners are MAE, the Municipality of Esmeraldas, GADPE and INAMHI.

Additional consultation to local groups

202. Five consultation meetings were organised with local groups during June and July of 2017. The purpose of the meetings was to have contributions and comments from local groups that might not have participated in the inception and validation workshops.
203. The meetings were organised in collaboration with MMA in Chile and MAE in Ecuador. The date, time and place were consulted with local groups to make sure that women and men could attend the meetings.
204. On each meeting, the project proposal was presented. Participants were provided with copies of the results framework (including budget allocations). Afterwards, there was a plenary to answers questions and have initial comments. Later, there was group work to analyse the elements of the project proposal. Finally, there was a plenary where groups presented their results and there was an open discussion. The meetings were managed to ensure that women could openly express their ideas.

Meeting with Barrio 20 de Noviembre

205. The meeting was held on the afternoon of 23 June 2017, in the barrio´s community house. Thirty-eight people participated, including women and older people.

206. There was support to the proposed actions and recommendations / comments that have been incorporated into the project:
    - Promote that the municipality take immediate action to advance the works in cerro Gatazo (e.g., baseline studies). This will shorten the time for implementation of the protection works.
    - Ensure that communication actions and warning alerts use the radio stations with most local audience.
    - The evacuation plans must take into account the needs of people with disabilities.
    - Make sure that there are secure meeting points and shelters to accommodate people during emergencies.
    - To motivate women participation on risk training, include complementary activities that suit their interests.
    - People live in risk areas because they have no means to move somewhere else.

Meeting in Luis Vargas Torres island

207. The meeting was held in the morning of 24 June 2017, in Leonidas Grueso George School. Forty-four people participated, including women, older persons and differently-abled people.

208. There was support to the proposed actions and recommendations / comments that have been incorporated into the project:
    - Include mangrove forestation and reforestation within Esmeralda´s green infrastructure plan.
    - Ensure that the people is alerted with sufficient time to evacuate or take protective measures.
    - Establish local women´s groups to support emergency actions.
    - Women can coordinate and support community activities.
    - It is valuable to pass experience to the new generations.
    - The sirens have to be guarded against vandalism and must operate under extreme conditions like electricity failure.
    - During past floods, there were power outages and communication failures. Cell phones and text messages may not be available during emergency.
    - The footbridges are in poor state. They are the main evacuation way to cross to the mainland.

Meetings in Antofagasta

209. There were two meetings in Antofagasta in juntas de vecinos located in the mudflow risk area of quebrada Bonilla.

210. The first meeting was held in the afternoon of 6 July 2017, in the community centre of the Junta de Vecinos Villa Irarrazabal. Twelve people participated, all neighbours were women.

211. There was support to the proposed actions and recommendations / comments that have been incorporated into the project:
    - Ensure that the sound of mudflow sirens is different from the existing tsunami sirens.
    - Evacuation protocols must consider the needs of children, older persons and people with disabilities.
    - People need to be trained how to correctly evacuate during mudflows.

212. The second meeting was held in the afternoon of 7 July 2017, in the community centre of the Junta de Vecinos Esperanza Nuestra. Twenty neighbours participated, 17 were women.

213. There was support to the proposed actions and recommendations / comments that have been incorporated into the project:
    - People are not aware of climate change and its impacts.
    - It is important to build the alluvial control infrastructure in quebrada Bonilla.
    - Campamento dwellers are more vulnerable to mudflows because of their low-quality constructions.
    - The narrators´ initiative is interesting. It will need to promote participation of children and older people.
    - It is necessary to ensure the grant from the Adaptation Fund, and start the project in 2018.

Meeting in Taltal

214. The meeting was held in the morning of 7 July 2017, in the cultural centre of Taltal. Sixteen neighbours participated, including Taltal city mayor[73].

215. There was support to the proposed actions and recommendations / comments that have been incorporated into the project:
    - It will be very valuable to have means to alert people with sufficient time to evacuate. The last mudflow was devastating, it ran through the city and isolated the population.
    - The cost and effort of recovery and reparations is very high. The removal of debris from the retaining pools is still ongoing.
    - Campamentos are vulnerable, but their informal condition limit public action.
    - The evacuation procedures must consider the needs of children, older citizens and people with disabilities.
    - It is laudable to have included culture into the project. It is necessary to cultivate and develop cultural manifestations and to strengthen collective memory. It is advisable that communication actions and the narrators´ initiative foster participation of diverse local groups and artists.

J. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

Component 1

Baseline

216. Antofagasta and Taltal have high risk of mudflows, the most recent were in 2015. Antofagasta's stormwater management plan was prepared in 2004 and does not include the climate change variable. The existing infrastructure does not cover all the gorges that cross Antofagasta, and Taltal´s protection infrastructure was not able to contain the flows of the extreme weather event of 2015.

217. The ARG – MOP project will invest about USD 84.5 million to build additional infrastructure in the region, including Antofagasta and Taltal (see page 29 and Table 8). However, there is no guarantee that the climate change variable will be introduced in the designs and construction works. The ARG – MOP project does not include quebrada Bonilla, which contains about 12,840 people along the hazard area.

[73] It is important to highlight that Taltal city mayor has personally participated in all meetings during the preparation of the presente project.

218. Esmeraldas has high risk of flooding and landslides. Cerro Gatazo is an area of main concern, but the municipality has not been able to finance actions to stabilize the hillsides. The most recent landslide occurred in January 2016 after heavy rain associated with El Niño. Infrastructure designs were prepared in 2010 but funding could not be secured.

219. Esmeraldas´ Municipal Strategy for Risks and Disaster Management includes the use of vegetation to contribute to stabilize hillsides and to protect the riverbanks. However, the use of urban green infrastructure is a new matter, and there is no experience on the development of a comprehensive approach. Also, the municipality has financial limitations to advance on this front.

220. The areas of Antofagasta, Taltal and Esmeraldas have weather monitoring systems operated by DMC and MOP in Chile and INAMHI in Ecuador. This information is passed, respectively, to ONEMI and SGR to support decision making within the early warning systems. A main limitation is that rainfall information from weather stations gives short time to warn the population of events that might cause mudflows, floods or landslides. This in turn, affect the efficiency of the early warning systems. In addition, there are limited means to alert the population and guide them to secure areas. The cities do not have evacuation maps and marked routes for mudflows and floods.

Scenario with AF contribution

221. The AF investment will allow to update Antofagasta's stormwater management plan introducing the climate change variable. This will be a major catalyst that will influence the ARG - MOP investment in protection works. Also, the project will finance updating the design for quebrada Bonilla´s infrastructure, introducing the climate change variable, and construct part of the protection works. This exercise will provide hands-on experience that will be useful for the other infrastructure to be built in the cities.

222. The present project will enable the construction of grey and green infrastructure in cerro Gatazo incorporating the climate change variable. This will greatly reduce the future risk of landslides in the city. In addition, the AF contribution will make possible to advance in the preparation of a green infrastructure plan to further advance Esmeraldas´ Strategy for Risks and Disaster Management.

223. With the AF investment weather radar and storm detection system will be installed in Esmeraldas and Antofagasta, respectively. This will expedite to have information about the location and velocity of precipitation that could affect the cities, and to anticipate anomalous situations. Having more time to decide the best course of action and to alert the population will greatly improve the adaptive capacity of Antofagasta, Taltal and Esmeraldas. This will be complemented with actions to enhance the public awareness systems. The project will allow to have sirens to alert the population, evacuation maps and marked evacuation routes. The investment in Esmeraldas will aid to implement a participatory pilot flood warning system with local residents. This experience will be valuable for future development in the city.

Component 2

Baseline

224. Current development plans for Antofagasta and Taltal do not incorporate adaptation, and in Esmeraldas, despite having specific strategies, implementation is very limited. A key barrier is that municipal officers have limited capacities to mainstream adaptation and DRR.

225. In addition, the local population of the three cities is not fully aware of the climate-related risks, nor engaged into advance adaptation to climate change. Lessons and experience from previous weather-related disasters faints with time and is not being passed to new generations.

Scenario with AF contribution

226. The AF investment will allow to develop an on-line regional course on risk-based adaptation in coastal cities. The course will contribute to enhance the skills of local officers and facilitate networking among practitioners that face similar challenges. Two additional benefit are that the course (i) will include a module to explain the linkages between gender, climate change and adaptation measures, and (ii) will be open to officers from other countries.
227. The project contribution will allow to engage local stakeholders into climate change adaptation action. This will be a valuable catalyst to reduce vulnerability and to build social capital.
228. Finally, the contribution of the AF will support ground-breaking work to develop forms to build cultural memory in support of DRR. The existing narrators experience will be expanded and adapted to local conditions. This has a high potential for replication in other parts of both countries and the entire region.

Component 3

Baseline

229. Despite the urgent need to advance climate change adaptation in coastal cities, there is no mechanism to promote networking and exchange of experience and tools. The existing platforms are general in the areas of climate change adaptation or coastal zone management. For example, the SPINCAN[74] project in which Chile and Ecuador participate within the framework of the Permanent Commission for the Southeast Pacific (CPPS) does not include climate change adaptation.

Scenario with AF contribution

230. The AF investment will make possible to develop a regional platform specialized in adaptation and DRR in coastal cities. The platform will be initiated with the experience from Antofagasta, Taltal and Esmeraldas, but it is envisioned to be further expanded with facilitation from CAF.

K. Describe how the sustainability of the project / programme outcomes has been taken into account when designing the project / programme.

Environmental sustainability

231. In general, the project will have positive environmental impacts. However, to guarantee environmental sustainability, the public works will obtain the pertinent environmental permits to ensure compliance with corresponding regulations and requirements (see paragraphs 172 and 176).

Social sustainability

232. The project includes a participatory and inclusive approach, and emphasizes the involvement of key stakeholders.
233. Four key elements that have been incorporated in the project design to ensure social sustainability are:
    a. Establish and cultivate communities of practice to facilitate that practitioners collaborate to address common problems and develop relationships based on trust.

[74] Southeast Pacific data and information network in support to integrated coastal area management (SPINCAM) is a regional project funded by the Flemish Government of the Kingdom of Belgium. The second phase is under implementation.

These communities of practice will include gender and social inclusion as cross-cutting issues.

b. Implement inclusive public communication strategies to empower and engage local communities.
c. Foster local initiatives to build cultural memory through various means.

234. The public communication strategies and narrators´ initiative will contribute to develop the basis to sustain risk-based adaptation after project closure. It is intended that local groups and stakeholders internalise the importance and need to implement adaptation measures and introduce it into the social agenda of the three cities.

Institutional sustainability

235. The project is anchored in the pertinent national and local authorities responsible for climate change adaptation and DRR.
236. In Chile, the project is grounded in the Ministry of Environment. MMA has the mandate to promote climate change adaptation and has the capacity to work at the national and local levels. MMA will be able to sustain and capitalise project results.
237. MOP has the mandate to implement protection works, including the management of stormwater. Also, it has sufficient capacity to sustain and capitalise project results. MOP (through DGA) has agreed to operate and maintain the meteorological stations to be installed in the area.
238. DMC -- part of the General Directorate of Civil Aviation -- is the national meteorological authority and the meteorological service provider for civil aviation. DMC has agreed to operate and maintain the storm detection system to be installed in the area.
239. ONEMI has the mandate to coordinate the early warning and response systems. It has agreed to capitalise on the project to advance the work on DRR.
240. The municipalities of Antofagasta and Taltal head the COE in case of emergency. They have agreed to execute the public communication and education strategies and to mainstream climate change adaptation into their programmes.
241. In Ecuador, the project is grounded in the Ministry of Environment. MAE has the mandate to promote climate change adaptation and the capacity to work at national and local levels.
242. INAMHI is responsible for weather and climate monitoring and has long experience managing the national meteorological network and feeding information to the early warning systems. It will provide advice and technical support to GADPE to develop local capacities for weather monitoring. GADPE is willing to develop a provincial meteorological network that support early warning. During project implementation, GADPE will develop its capacities to operate and maintain the weather radar and meteorological stations on the long term.
243. The municipality of Esmeraldas has technical and operational capacities to contribute to execute project activities and to sustain them after project end.

Financial sustainability

244. Project partners have agreed to sustain the elements they will manage. For example, DMC and GADPE will, respectively operate and maintain the weather radar and the storm detection system as part of their routine operation. The post-project sustainability of actions is ensured by integration into institutional budgets of the project partners.

Replication

245. There is high probability of replicating the lessons and best practice from the project. AF resources have been strategically assigned to activities with high potential to catalyse

learnings. For this purpose, experience and lessons will be systematically documented and disseminated through an electronic platform accessible worldwide.

246. The narrators´ initiative, grounded on local culture, might be a useful tool for Latin America and the Caribbean.

L. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

247. The project was screened and assessed as required by the Adaptation Fund´s Environmental and Social Policy (ESP).

Screening

248. Screening was done using CAF´s environmental and social risk analysis matrix, which is part of CAF´s environmental and social management system. As stated in ESP´s article 8 ""implementing entities that use a different but functionally equivalent system of categorization can continue to use that system and still meet the requirements of the policy".

249. The project was classified as 1C according to CAF´s procedure.

- The number 1, refers to context sensitivity. It has three ranks: “1” high sensitivity, “2” moderate sensitivity, and “3” low sensitivity. The present project has a high context sensitivity because there will be works in areas with steep slopes, with high potential for erosion, and vulnerable to extreme weather events.
- The letter C, refers to project type. CAF´ screening instrument It has three categories: “A” projects known to generate multiple and complex environmental and social impacts, “B” projects with medium impacts, and “C” projects with low or negative environmental and social impacts.

250. Complementarily, the project was screened using AF´s screening matrix. The project corresponds to Category B (i.e., projects with potential adverse impacts that are less adverse than Category A projects/programmes), the screening matrix is included in Table 10 and the detailed results are presented Annex 14 and Annex 15.

Table 10. Screening matrix to verify compliance with the Adaptation Fund´s Environmental and Social Policy

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
1. *Compliance with the Law*	No risk or adverse impacts. The project is in compliance with domestic and international law	Construction works in Antofagasta and Esmeraldas will have to obtain the corresponding environmental permits[75].
2. *Access and Equity*	No risk or adverse impacts. The project intervention will contribute to protect the inhabitants of three coastal cities from climate-related risk. The project will not	Ensure that local population and stakeholders are adequately informed and engaged in project actions.

[75] The Project workplan and budget include this requirement. In Chile, MOP will submit the environmental impact statement to the Environmental Evaluation Service (SEA) for approval (this has already been done for exiting mudflows control infrastructure). In Ecuador, GADE will submit information to MAE to obtain and environmental registry.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
	impede / limit access to essential services and rights. Communication and public awareness activities will be open to everyone.	
3. *Marginalized and Vulnerable Groups*	No risk or adverse impacts to marginalized and vulnerable groups. The project intervention will contribute to protect the lives and possessions of any vulnerable group present in the area of work[76]. Given that women tend to be more vulnerable to climate change, they could especially benefit if their needs are addressed properly.	Ensure that families living in informal neighbourhoods in risk areas are adequately informed and engaged in project actions, special female-led households.
4. *Human Rights*	No risk or adverse impacts. Both countries are parties of the core human rights treaties. The project intervention does not imply any sort of violation of human rights.	
5. *Gender Equity and Women's Empowerment*	No risk or adverse impacts. The project interventions in early warning and protection will be gender-sensitive, so both men and women can benefit equally. Also, communication and public awareness activities will be gender sensitive, so they can effectively reach all the population.	Ensure that project actions (i.e., outputs 4.1 to 7.2) are gender-sensitive, age and culturally-sensitive, and consider special needs of persons with disabilities.
6. *Core Labour Rights*	No risk or adverse impacts. The project intervention has no implication with the four fundamental principles and rights at work[77].	
7. *Indigenous Peoples*	No risk or adverse impacts. The project intervention will not affect indigenous groups or territories. Indigenous population in Antofagasta and Taltal is minimal. In Esmeraldas, the majority of the population is afro-Ecuadorian.	
8. *Involuntary Resettlement*	No risk or adverse impacts. The project intervention does not imply involuntary resettlement. Construction works will be done in unpopulated gorges and hillsides.	

[76] The most vulnerable groups are families that live in informal neighbourhoods on risk areas.

[77] i.e., child labour, discrimination at work, forced or compulsory labour, and freedom of association.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
9. Protection of Natural Habitats	No risk or adverse impacts. The project will not intervene in protected areas or high value conservation areas.	In Esmeraldas, ensure that mangroves and the existing protected area[78] are considered in the green infrastructure plan (output 1.2).
10. Conservation of Biological Diversity	Low risk in Esmeraldas. Vegetation will be used in Esmeraldas for slope stabilization in cerro Gatazo. The priority will be to use native species. However, there is an option to use vetiver[79] a non-native grass widely used worldwide for slope stabilization. There is no risk in Chile.	Report the species used for slope stabilization in Esmeraldas. Invasive species will not be used.
11. Climate Change	No risk or adverse impacts. The project will not increase greenhouse gas emissions or the main drivers of climate change indicated in principle 11.	
12. Pollution Prevention and Resource Efficiency	No risk or adverse impacts. The project does not imply major use of energy or the production of wastes and pollutants. Emissions and residues during construction works will be managed.	Ensure that residues and waste from construction works are properly managed.
13. Public Health	No risk or adverse impacts. The project does not imply negative impacts on public health.	
14. Physical and Cultural Heritage	No risk or adverse impacts. The project will not intervene in cultural / archaeological sites or sites with unique natural values. On the contrary the narrators´ initiative will build on traditions (e.g., marimba, tales) to potentiate cultural memory of climate-related disasters.	
15. Lands and Soil Conservation	No risk or adverse impacts. The project does not imply soil conversion or degradation. The areas affected by construction works are no productive lands nor high value conservation sites. In Esmeraldas, vegetation will be used to cover barren land to prevent erosion and landslides.	

[78] Wildlife Refuge Mangroves of Esmeraldas. This protected area encompasses the remnant mangroves of the city; it has an area of 242 ha of which ca., 37% are mangroves and tropical dry scrubland.

[79] One of the plants under consideration is vetiver (*Chrysopogon zizanioides*), a perennial grass from India. This plant is non-invasive (Joy, 2009), and has already been used in Esmeraldas (PNUD, 2005). Vetiver is extensively used for slope stabilizations (Truong et al., 2008).

Assessment of compliance with the Adaptation Fund´s Environmental and Social Policy

251. The project was assessed using CAF´s methodology and instruments, which includes verification of compliance with its nine environmental and social safeguards (CAF, 2016). CAF safeguards have equivalencies with AF´s environmental and social principles. The results of the analysis are presented in the Environmental and Social Report (IAS), which is included in Annex 15.

252. The assessment found compliance with all safeguards in the Chilean component of the project, and non-compliance with six safeguards in the Ecuadorian component. The results of this analysis is summarised in Table 11. Therefore, additional measures were included in the project design and the Environmental and Social Management Plan

Table 11. CAF safeguards activated during the environmental and social analysis of the project proposal.

CAF safeguard	AF principle	Note	Measures
S01. Evaluation and management of environmental and social impacts.	Principle 1. Compliance with the law.	The analysis of environmental impact and risks, included in the existing designs for cerro Gatazo[80] are deficient. The impact of the installation of the radar and meteorological stations has not been assessed. It will be necessary to prepare a strategic environmental assessment of the interventions that have occurred and will occur in Esmeraldas[81].	Prepare an environmental impact assessment and environmental management plan for the final design for cerro Gatazo. Assess the environmental impact on the radar and meteorological stations sites and their access routes. Prepare a strategic environmental assessment.
S03. Conservation of biological diversity.	Principle 9. Protection of natural habitats.	There is a natural protected area in the northern tip of the Luis Vargas Torres island (paragraph 40).	Include actions in support of the protected area.
S04. Prevention and management of pollution.	Principle 12. Pollution prevention and resource efficiency.	There will be temporary impacts during the construction of protection works in cerro Gatazo (e.g., construction noise, increased vehicle movement, disposal of rubble and other debris)	Implement an environmental management plan for the construction works to prevent pollution and mitigate impacts to local residents

[80] The existing designs for cerro Gatazo, prepared in 2008, are available in Annex 12.

[81] The strategic environmental assessment is not a formal instrument required by the Ecuadorian legislation.

S05. Cultural patrimony.	Principle 14. Physical and cultural heritage.	Archaeological remains might be found during construction of protection works in cerro Gatazo	Implement an environmental management plan for the construction works to manage the situation the event that archaeological remains are found.
S06. Ethnic groups and cultural diversity.	Principle 7. Indigenous peoples.	There are Chachi families in Luis Vargas Torres island (paragraphs 54 and 55).	Promote involvement and to share the benefits from the present project.
S07. Resettlement.	Principle 8. Involuntary resettlement.	It might be necessary to relocate families in Cerro Gatazo, but this will be known once the updated designs are finalized.	Prepare intervention actions if necessary as a result of the final designs for protection works in cerro Gatazo.

253. CAF has outlined a set of conditions on each country (Annex 15). These conditions are equivalent to the risk management plan indicated in article 9 of the ESP.

254. In addition, compliance of the project proposal with the 15 principles of the Adaptation Fund´s Environmental and Social Policy was verified using the "Guidance document for Implementing Entities on compliance with the Adaptation Fund Environmental and Social Policy"[82].

255. As stated in the guidance document previously mentioned, there are two categories of principles:
    - those that always apply, and always have to be assessed (i.e., principles 1, 4 and 6); and
    - those that may or may not be relevant to a particular project/programme.

256. The assessment of the core principles generated the following results:
    - Principle 1: Compliance with the Law. The only element of the project that will require a specific permit is the construction of protection works in quebrada Bonilla (Antofagasta) and cerro Gatazo (Esmeraldas). As explained previously (section Environmental permits), the works in quebrada Bonilla will require and Environmental Qualification Resolution issued by SEA on the basis of an Environmental Impact Declaration. Also, in Ecuador, the works in cerro Gatazo, the radar and the meteorological statins will require an Environmental Registry which is issued online after filling a formulary and paying a fee. According to the Chilean and Ecuadorian environmental regulations, both works are categorised as having low environmental and social impact.

      To comply with national regulations MOP, GADE and GADPE will obtain the corresponding environmental permits. This will be done after the engineering designs have been updated to be climate resilient, and before initiation of construction (Annex 6). The cost of preparing the environmental studies is included in the project budget. CAF has stipulated more stringent conditions that are indicated in Annexes 14 and 15.
    - Principle 4. Human Rights. Both countries have ratified the core international human rights treaties. The US Department of State Country Reports on Human Rights Practices for 2015 indicate that principal human rights problems are:

[82] https://www.adaptation-fund.org/document/guidance-document-implementing-entities-compliance-adaptation-fund-environmental-social-policy/

- In Chile, harsh prison conditions; violence and discrimination against women, children, and lesbian, gay, bisexual, transgender and intersex (LGBTI) persons; and societal conflict and discrimination against indigenous populations
- In Ecuador, excessive force and isolated unlawful killings by security forces; arbitrary arrest and detention; and delays and denial of due process. Violence and discrimination against women, children, minority groups, and the lesbian, gay, bisexual, transgender, and intersex (LGBTI) community; trafficking in persons; and child labour persisted.

Despite the general context, in the areas of work no specific issues concerning human rights were identified that could be exacerbated by the project intervention.

- Principle 6. Core Labour Rights. Both countries have ratified the eight core labour conventions. The project intervention has no implication with the four fundamental principles and rights at work.

257. The assessment of the remaining principles generated the following results:

- Principle 2. Access and Equity. A stakeholder analysis was prepared for each city (Annexes 8 and 9). Key stakeholders were identified, as well as existing or potential conflicts that might affect project execution. The analyses found no evidence of opposition to the project proposal, or conflicts that could affect project execution. The most vulnerable groups are people living in hazard areas in campamentos in Antofagata and Taltal and informal settlements in Esmeraldas (see section Vulnerable groups and gender situation). Project activities will not exacerbate their condition, nor impede / limit access to essential services and rights. On the contrary, project actions will contribute to reduce the risk of damages caused by extreme weather events. In addition, the public communication and education strategies and the narrators´ initiative will address all the population (independent of gender, age, race, ethnicity or nationality) and will be open to everyone who wish to contribute and participate. In Esmeraldas, the pilot community-based early warning system will be implemented together with the informal settlers who live in Luis Vargas Torres island. Leaders of these groups participated in the consultation process (Annex 4), contributed to design project actions and pledged to participate in the project[83].
- Principle 3. Marginalized and Vulnerable Groups. The stakeholder analyses found that the most vulnerable groups are families that live in informal neighbourhoods on risk areas (section Vulnerable groups and gender situation). Women are active in local organizations and there was no evidence of barriers that will impede or limit women´s participation in project activities. Project activities will not impact negatively these groups. On the contrary, project actions will contribute to reduce their exposure to impacts from extreme weather events.
- Principle 5. Gender Equality and Women's Empowerment. Both countries rank high in the Global Gender Gap Index. Chile has almost complete equality in educational attainment and health and survival, but major gaps in political empowerment and economic participation and opportunities (WEF, 2015). Ecuador almost complete equality in educational attainment and health and survival, and a high level in economic participation and opportunities, but a major gap in political empowerment (WEF, 2015). The stakeholder analyses found that there is strong women leadership in neighbourhood and local organizations in the three cities. The analyses did not find factors that will impede or limit women´s participation in project activities. The project will implement a set of actions in support of gender equality and women´s empowerment (section Gender considerations).

[83] The organizations that have agreed to contribute are 12 de mayo, Cordero Crespo, 20 de noviembre, Pianguapi, 29 de agosto, and Habana.

- Principle 7. Indigenous Peoples. ILO convention 169[84] is in force in both countries. In Antofagasta and Taltal, the indigenous population is very small. The 2002 Census found that, in Antofagasta and Taltal the indigenous population was, respectively, 1.8% and 1.0%. 4.7% of Antofagasta region´s populations were indigenous groups (INE, 2005). On the contrary, the majority of Esmeraldas´ population is afro-ecuadorian (52.1%). The project intervention will not affect indigenous groups or territories. The areas where construction works will be executed are not part of indigenous territories. The work in Luis Vargas Torres island (Esmeraldas) will be done with six neighbourhoods of local settlers (about 11% of the families that live in the island), mostly afro-Ecuadorians. Because a group of Chachi families reside in the island, the evacuation map and its procedures (outputs 4.2 and 4.3), and the communication and education strategies (output 6.1) will take into account the needs of this indigenous group.
- Principle 8. Involuntary Resettlement. The project intervention does not imply displacement of local population.
    - In quebrada Bonilla (Antofagasta), the sites where construction works will be executed are barren, unpopulated and not used for economic or recreational activities.
    - In cerro Gatazo (Esmeraldas), the hillsides where construction works will be executed are also unpopulated and not used for economic or recreational activities. However, the final designs for the protection works will define if it will be necessary to relocate a few families for their protection.
    - In Luis Vargas Torres island, the project will not affect the situation of the existing informal neighbourhoods.
- Principle 9. Protection of Natural Habitats. The project will not intervene in protected areas or high value conservation areas.
    - In quebrada Bonilla (Antofagasta), the sites where construction works will be executed are barren desert and does not contain the endemic high-value biodiversity present in certain areas of the Atacama Desert.
    - In cerro Gatazo (Esmeraldas), the hillsides where construction works will be executed are devoid of original vegetation. Some hillsides will be revegetated (output 1.1) and the project will encourage that these areas are declared protected forests (paragraphs 74 and 75).
    - There is a small protected area in the northern tip of Luis Vargas Torres island. The Wildlife Refuge Mangroves of the Esmeraldas River Estuary was established in 2008. It covers 242 ha of water and land area; about 37% of this area is mangrove and tropical dry scrubland. The project will not intervene in this area. The community-based flooding early warning system will be implemented together with six neighbourhoods that are located on the south-west of the island. Nonetheless, the communication and education strategies will include actions to support the conservation of the protected area (output 6.1). In addition, the project will ensure that protected areas are part of the green infrastructure plan for Esmeraldas (output 1.2; page 31).
- Principle 10. Conservation of Biological Diversity. Both countries are parties of the Convention on Biological Diversity and have National Biodiversity Strategies. Ecuador is a party of the Cartagena Protocol; Chile is not a party of this protocol. The project will not intervene areas with high value biodiversity. However, in cerro Gatazo, it will be needed to use plant species that are appropriate to stabilise the hillsides. As mentioned before (paragraph 74), two recommended species are vetiver and huaje that are non-indigenous species; huaje, despite being widely used in Ecuador, is

[84] i.e., Convention concerning Indigenous and Tribal Peoples in Independent Countries.

considered an invasive species. To prevent negative impacts, the following criteria will be used as part of the selection process for plant species: (i) preference to native species, and (ii) If a non-native species is a best choice, no species listed on IUCN´s Global Invasive Species Database could be used. CAF will require that GADE provide a report indicating the plant species to be used and the criteria used for their selection.

- Principle 11. Climate Change. The project does not include activities with large greenhouse emissions.
- Principle 12. Pollution Prevention and Resource Efficiency. The project does not include activities that will use large quantities of energy, water or other natural resources. Nor they will generate large quantities of residues, emissions and discharges. Nonetheless, CAF will require that building contractors implement an Environmental and Social Action Plan to prevent negative impacts during construction works.
- Principle 13. Public Health. The project does not imply negative impacts on public health.
- Principle 14. Physical and Cultural Heritage. Both countries are parties of the World Heritage Convention. The project will not affect or intervene physical and cultural heritage. However, as a preventive measure, the environmental management plan for the construction works will include actions in case archaeological remains are found.
- Principle 15. Lands and Soil Conservation. The project will not intervene valuable land. The areas affected by construction works are no productive lands nor high value conservation sites. In Esmeraldas, the project will contribute to reduce erosion and soil loss in cerro Gatazo. There, vegetation grey infrastructure will be used to prevent erosion and landslides.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme management at the regional and national level, including coordination arrangements within countries and among them. Describe how the potential to partner with national institutions, and when possible, national implementing entities (NIEs), has been considered, and included in the management arrangements.

258. CAF will be the **implementing entity**. The project will be implemented following CAF's administrative and financial regulations as agreed with the Adaptation Fund. CAF will designate an officer from the Environment and Climate Change Directorate to be the focal point for project coordination (i.e., **CAF´s focal point**).

259. The Republic of Chile and the Republic of Ecuador will be the beneficiaries of the project. The **responsible entities** in Chile an Ecuador will be, respectively, MMA and MAE. The responsible entities will be accountable for the implementation of agreed national activities. This includes the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of AF resources.

260. The United Nations Development Programme (UNDP) will be the executing agency. UNDP will be responsible for project execution, while ensuring collaborative and coherent regional action. Project execution includes, among other tasks, financial management, personnel contract and management, and procurement of goods and services. UNDP will execute the project in accordance with the purpose and activities agreed with the implementing agency.

261. In Chile, the **project partners** are DMC, MOP, MMA, ONEMI, the Municipality of Antofagasta, and the Municipality of Taltal. In Ecuador, the project partners are INAMHI, MAE, the Municipality of Esmeraldas and the Provincial Government of Esmeraldas. The project partners will contribute to project execution and will ensure post-project sustainability (Figure 17).

262. The project organisation structure has a **Project Board** and a Project Unit (PU) (Figure 17). The Project Board is responsible for making by consensus, management decisions when guidance is required by the Project Manager, including recommendation for approval of project plans and revisions. In order to ensure CAF's ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case a consensus cannot be reached within the Board, final decision shall rest with CAF´s Climate Change Coordinator. The terms of reference for the Project Board are contained in Annex 5. The Project Board is comprised of the following individuals: Undersecretary of Environment (MMA, Chile), Undersecretary of Climate Change (MAE, Ecuador), and CAF´s Climate Change Coordinator.

263. The **project assurance** role will be provided by CAF´s Principal Environment Executives in Chile and Ecuador. Project assurance will provide objective and independent oversight of the project and monitoring. The project assurance team will review and analyse project reports and the draft annual work plan and budget before they are submitted to the Project Board and will make recommendations to optimize project performance.

264. Strategic guidance will be provided by an **Advisory Committee** integrated by the Chilean Agency for International Cooperation for Development (AGCID) and the Technical Secretariat of International Cooperation of Ecuador (SETECI).

265. On each country, there will be a **National Coordinator**. These will be high ranking officers designated by MMA and MAE (the responsible entities). National coordinators will monitor the execution of national activities of the project and will sustain close coordination among the project partners, the Project Manager, UNDP and CAF. To ensure regional coordination, National Coordinators will maintain permanent communication and will have quarterly virtual meetings. These meetings will include the Project Manager and CAF´s focal point.

266. The **Project Unit** is headed by a Project Manager and includes eight specialists (Figure 18). These personnel will be contracted by UNDP. The Project Manager will run the project on a day-to-day basis on behalf of the Project Board within the constraints laid down in the annual workplan. The Project Manager function will end when the terminal evaluation report, and other documentation required by the Adaptation Fund and CAF, has been completed and submitted to CAF (including operational closure of the project). The Project Manager will promote coordination among project partners.

267. There will be three thematic coordinators:

    a. An Electronic Media Specialist, who will be responsible to develop and maintain the project´s electronic platform (Figure 16).

    b. A Lead Adaptation Specialist, who will be responsible for the implementation of the project´s adaptation measures and the development of communication and education on project activities.

    c. A Monitoring and Evaluation Specialist, who will be responsible for monitoring the progress of the project and to document and systematize project experience and learning.

268. Three local Adaptation Specialists will be responsible for implementation of the public communication and education strategies and the narrators´ initiative in Antofagasta, Taltal, and Esmeraldas.

269. Finally, two Accounting and Administration Assistants will provide on-site administrative and accounting support.

270. The Project Manager, Electronic Media Specialist, Lead Adaptation Specialist, and Monitoring and Evaluation Specialist will be based in office space arranged by UNDP. Their precise location will be decided at project start. The local adaptation specialists will be based in the municipalities and will maintain close collaboration and coordination with the local offices of MMA and MAE (i.e., responsible entities) as well as with the corresponding project partners (Figure 17 and Figure 18). One Accounting and Administration Assistant will be based in the Municipality of Antofagasta and will provide support to the work in both Chilean cities. The other Accounting and Administration Assistant will be based in the Municipality of Esmeraldas.

Audit

271. The project will be audited according to CAF´s financial regulations and rules and applicable audit policies. The audit would be performed under the CAF´s financial regulations and rules applicable to audit policies on AF projects.

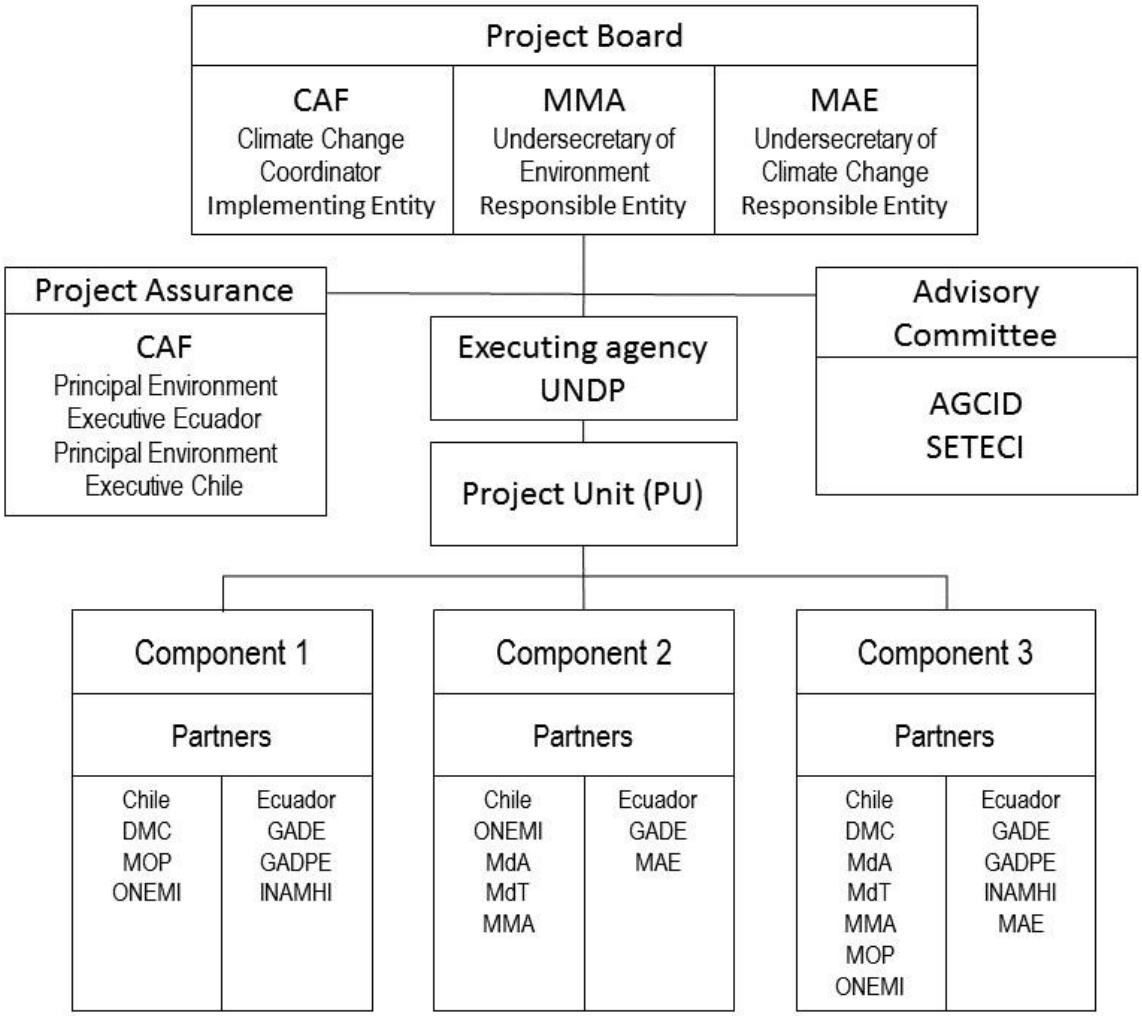

Figure 17. Project organization structure.

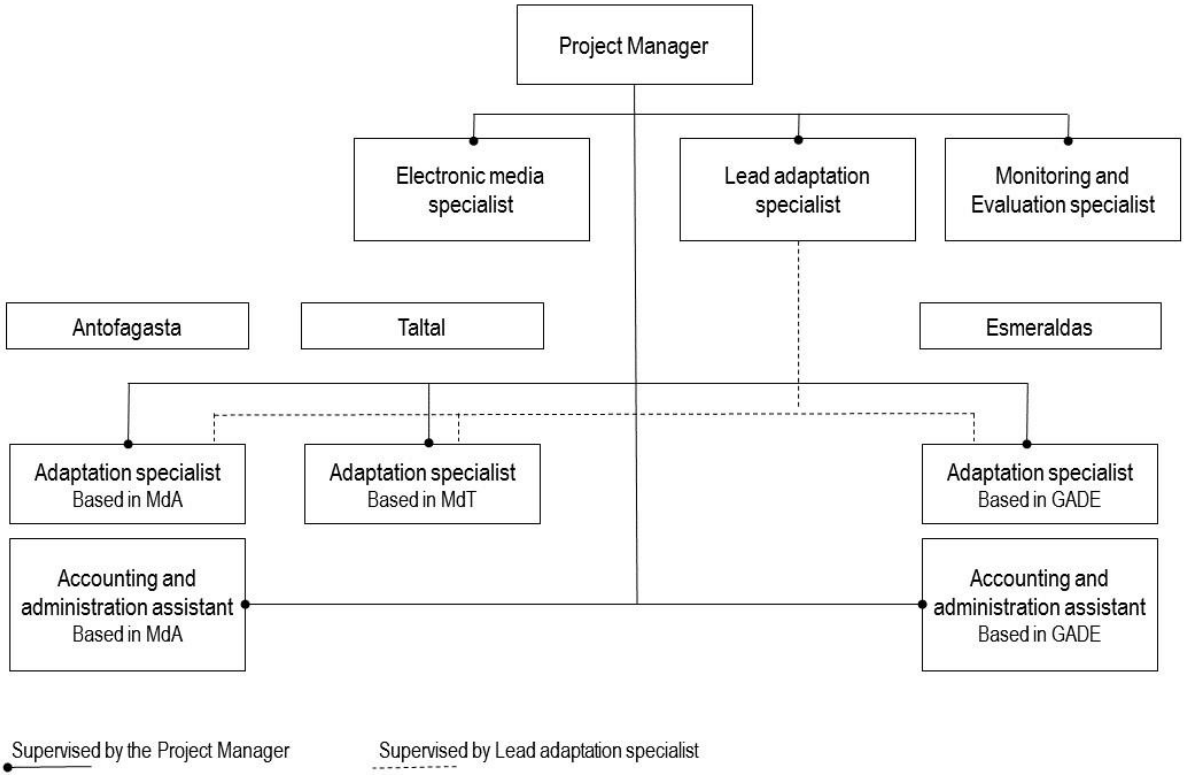

Figure 18. Project Unit.

Agreement on intellectual property rights and use of logo on the project's deliverables

272. In order to accord proper acknowledgement to the Adaptation Fund for providing funding, the AF logo will appear together with the CAF logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the Adaptation Fund will also accord proper acknowledgement to the AF.

B. Describe the measures for financial and project / programme risk management.

273. CAF's risks management consists on two structures: internal (CAF) and external (clients). A robust strategy for internal risks identification and mitigation is in place since 2015 and is executed by the Risks Management Direction. The external strategy is implemented in operations financed by CAF, both in the public and in the private sector. For this project, the structure that applies in terms of risks analysis is the external one. In this case, CAF studies projects from a holistic perspective: political, institutional, financial, operational, technological, social and environmental risks are assessed and addressed with mitigation measures. The status of these risks will be monitored quarterly by the Project Manager. The former will report on the status of the risks to CAF office in Quito, who will record progress in a risk log. Risks will be reported as critical when the impact and probability are high (i.e., 5). Management responses to critical risks will be reported to the Adaptation Fund in the annual project implementation report.

274. In terms of financial risks, CAF's assessment methodology focuses on financial statements, shareholders' information, bonds records, and currency performance, among others. In this project, CAF will regard as financial risks those related to the possibility of the grant not being delivered and/or not being delivered on time; to a possible increase in the budget due to inaccuracies in costs calculations, or due to overprices during project implementation.
275. CAF's social and environmental policies require that every operation in which the organisation participates include an in-depth analysis of the social and environmental risks. The environmental and social risk classifies operations in terms of high, medium, low or no risk. During evaluation phase, the review process seeks to identify vulnerable areas, critic aspects, necessary measures for the prevention, control, mitigation and compensation of identified impacts, so they can be included in the cost structure in order to ensure their viability. The results of the evaluation and the definition of the environmental and social conditions and recommendations to which the operation is subject, are recorded in an Environmental and Social Report, which is part of the documentation that must be presented to the different internal committees.
276. The project will be audited as per CAF's financial policies, and applicable audit guidelines. The audit would be performed under the CAF's financial regulations and rules applicable to audit policies on AF projects.
277. Potential risks for the development of the proposed project are limited, and mitigation measures have been identified in the following matrix:

Project Risks			
Type	**Description**	**Mitigation measure**	**Impact & Probability Level[85]**
Political	Change of central government in Chile. New president and congress will take office in 2018[86]	Present the project to new authorities in MMA	P = 5 I = 3
	Change of municipal governments in Antofagasta and Taltal. The new authorities will take office in December 2020[87].	Present the project to new municipal authorities in Antofagasta and Taltal	P = 5 I = 3
	Change of municipal and provincial governments in Esmeraldas. The new authorities will take office in 2019[88].	Present the project to new municipal authorities in Esmeraldas. Bailment agreement between CAF and GADPE[89]	P = 5 I = 3
Institutional	Support withdrawal from local counter-parts, taking into account the change of Governments.	Letters of endorsements by national authorities.	P = 3 I = 3

[85] 1 = low / 5 = high

[86] During the second year of project implementation.

[87] Before project closure.

[88] In the mid-term of Project execution.

[89] CAF will sign a bailment agreement with GADPE for the use and maintenance of the radar and meteorological stations. It is foreseen that the equipment will be transferred to GADPE on year 4, after the new provincial government ratifies the commitment to maintain and operate on the long-term the radar and meteorological stations.

Project Risks			
Type	**Description**	**Mitigation measure**	**Impact & Probability Level[85]**
	The change of Governments could eventually lead to staff re-structuration, meaning that there could possibly be a knowledge gap between the newcomers.	Online training course on risk-based adaptation measures for municipal officers of coastal cities.	P = 5 I = 3
Financial	Lower economic activity in both countries and impact of April´s earthquake in Ecuador[90].	Support project partners to incorporate and assign required resources in their institutional plans and budgets.	P = 5 I = 3
	Grant not being delivered and/or not being delivered on time.	CAF's cash flow would allow to respond to disbursements in case of delays.	P = 2 I = 3
	Increase in budget due to costs miscalculations, and/or due to overprices during project implementation.	Agreement signed with local counterparts to guarantee the project execution.	P = 2 I = 4
Operational	GADPE has no experience with meteorological monitoring.	Agreement between GADPE and INAMHI[91]	P = 5 I = 3
	Baseline studies are not up to date	Adjustment of existing designs, incorporating the climate change factor.	P = 5 I = 4
	Inaccuracy in radar and storm detection system implementation	An agreement will be signed between MOP, DMC and ONEMI (Chile), and GADPE and INAMHI (Ecuador) to ensure technical and geographical accuracy.	P = 3 I = 3
Technological	Misuse of the online platform created to share best practices between coastal cities.	In-person meetings between project partners of both countries. Four thematic visits are forecasted.	P = 3 I = 2
Social	Lack of understanding of the project, and hence opposition from the local inhabitants.	The communication strategy contemplates socialisation of the project with the local communities.	P = 3 I = 3
Environmental	Effect of El Niño / La Niña in precipitation and local weather conditions.	Monitor information and alerts in national meteorological entities, NOAA, and World Meteorological Organization.	P = 4 I = 1

278. The status of this risks will be monitored quarterly by the Project Manager. The Project Manager will report on the status of the risks to CAF office in Quito, who will record progress in a risk log. Risks will be reported as critical when the impact and probability are high (i.e., 5). Management responses to critical risks will be reported to the Adaptation Fund in the annual project implementation report.

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

279. Based on the results presented in Part II, section L of the present document, the following measures will be applied:

[90] The economies of both countries have been affected by international commodities prices decline. The reduced public resources may limit the intended contributions from central al local governments.

[91] A pre-condition for the purchase of the radar and meteorological stations will be to have a signed agreement between GADPE and INAMHI to establish operational procedures. INAMHI will provide technical assistance and oversight of the operation.

a. The construction works in Antofagasta (quebrada Bonilla) and Esmeraldas (cerro Gatazo) will obtain the corresponding environmental permits and will comply with the pertinent standards, regulations and requirements. MOP and GADE will provide written quarterly reports of the status of obtaining the permits and implementing the mandatory requirements (e.g., environmental and social management plan) during construction.
b. Revegetation in cerro Gatazo will use preferably native plant species. If an introduced species will be the best choice, it cannot be an invasive alien species. No species listed on IUCN´s Global Invasive Species Database[92] could be used. GADE will provide a written report indicating the list of plant species used for slope stabilization.

280. The project will implement the following actions in support of gender equality and women´s empowerment:
    a. Gender equality will be taken into consideration when sourcing staff and consultants. Gender-sensitive language will be used in hiring procedures and documents.
    b. Training courses will be gender sensitive in terms of participation, instructional design, and use of language.
    c. Communication materials, project documents and publications will use gender sensitive language and will be made equally accessible to men and women. The process of documenting project´ lessons will be keen to record the contribution and role of women and men on each exercise.
    d. The communities of practice and participatory processes will facilitate equal participation, mutual respect, and collective decision making by women and men.
    e. Participation in meetings, training courses and other events will be documented using gender disaggregated data.
    f. To the extent possible, women will be motivated to participate in all project activities.

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

281. The project results as outlined in the project results framework (Part III, section E) will be monitored annually and evaluated periodically during project implementation to ensure the project effectively achieves these results. Supported by component three (i.e., includes knowledge Management and monitoring and evaluation), the project monitoring and evaluation plan (Table 12) will also facilitate learning and ensure knowledge is shared and widely disseminated to support the scaling up and replication of project results.
282. Project-level monitoring and evaluation will be undertaken in compliance with standard CAF requirements as agreed with the Adaptation Fund. Though these CAF requirements are not detailed in this section of the project document, CAF´ Ecuador country office will ensure that the monitoring and evaluation (M&E) requirements are met in a timely fashion and to high quality standards. The additional and mandatory monitoring and evaluation requirements as outlined in this section will be undertaken in accordance with the agreement with the Adaptation Fund. In addition to these mandatory CAF and AF monitoring and evaluation requirements, other M&E activities deemed necessary to support project-level adaptive management, and the exact role of project target groups and other stakeholders in project M&E activities, will be finalized during the Inception Workshop and will be detailed in the Inception Report.

[92] www.iucngisd.org

Oversight and monitoring responsibilities

283. The primary responsibility for day-to-day project implementation and regular monitoring rests with the Project Manager. The Project Manager will develop annual work plans based on the multi-year work plan included in the present project document, including annual targets at the output level to ensure the efficient implementation of the project. The Project Manager will ensure that the standard CAF and Adaptation Fund M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for reporting, and reporting to the Project Board at least once a year on project progress. The Project Manager will inform the Project Board and CAF Country Office in Ecuador of any delays or difficulties as they arise during implementation, including the implementation of the M&E plan, so that the appropriate support and corrective measures can be adopted. The Project Manager will also ensure that all project staff maintain a high level of transparency, responsibility and accountability in monitoring and reporting project results.

284. CAF Country Office in Ecuador will support the Project Manager as needed, including through annual supervision missions. This Country Office is responsible for complying with all CAF project-level M&E requirements. This includes ensuring (i) that quality assurance assessment during implementation is undertaken annually, and (ii) that annual targets at the output level are developed, and monitored and reported using CAF corporate systems. Any quality concerns flagged by the process must be addressed by project management. Additional M&E and implementation quality assurance and troubleshooting support will be provided by the CAF Country Office in Ecuador. The project target groups and stakeholders will be involved as much as possible in project-level M&E.

Monitoring and reporting requirements

285. Inception Workshop and Report A project inception workshop will be held after the project document has been signed by all relevant parties to: a) re-orient project stakeholders to the project strategy and discuss any changes in the overall context that influence project implementation; b) discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms; c) review the results framework and discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E plan; d) review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit; e) plan and schedule Project Board meetings and finalize the first year annual work plan. The Project Manager will prepare the inception report no later than one month after the inception workshop. The final inception report will be cleared by CAF Country Office in Ecuador and will be approved by the Project Board.

286. Adaptation Fund Project Performance Report (PPR). The Project Manager and CAF Country Office in Ecuador will provide objective input to the annual PPR as outlined in Document AFB/EFC.9/.4/Rev.1 approved at the 18th meeting of the Adaptation Fund Board. The Project Manager will ensure that the indicators included in the project results framework are monitored annually well in advance of the PPR submission deadline and are reported on accordingly in the PPR. The PPR that is submitted to the Adaptation Fund each year must also be submitted in English and shared with the Project Board. The CAF Country Office in Ecuador will coordinate the input of project partner and stakeholders to the PPR. The quality rating of the previous year's PPR will be used to inform the preparation of the subsequent report. The first PPR should be submitted one year after the start of project implementation (date of inception workshop). The project's terminal PPR along with the terminal evaluation report and corresponding management response will serve as the final project report package or project completion report. The

final project report package shall be discussed with the Project Board during an end-of-project review meeting (i.e., Project Board closure meeting) to discuss lesson learned and opportunities for scaling up.

287. Adaptation Fund Results Tracker. This instrument is used by the Adaptation Fund to track specific indicator across its portfolio. The results tracker is an integral part of the PPR and will be completed based on the guidance and requirements of the Adaptation Fund.

288. Mid-term Review (MTR). An independent mid-term review process will begin after the second PPR has been submitted to the GEF, and the final MTR report will be submitted to the Adaptation in the same year as the third PPR. The MTR findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the final MTR report will follow the standard templates and guidance established by the Adaptation Fund. The final MTR report will be available in English and will be cleared by the CAF Country Office in Ecuador, the Principal Environment Executives in Ecuador and Chile, and approved by the Project Board.

289. Terminal Evaluation (TE). An independent terminal evaluation (TE) will take place before operational closure of the project. The Project Manager will remain on contract until the TE report and management response have been finalized. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance established by the Adaptation Fund. The final TE report will be cleared by the CAF Country Office in Ecuador, the Principal Environment Executives in Ecuador and Chile, and approved by the Project Board.

290. The CAF Country Office in Ecuador will retain all M&E records for this project for up to seven years after project financial closure in order to support ex-post evaluations that might be undertaken.

Table 12. Budgeted monitoring and evaluation plan.

Monitoring and Evaluation action	Primary responsibility	Indicative cost [93] (USD)	Time frame
1. Inception Workshop	CAF	20,000	Within two months of project document signature
2. Inception Report	Project Manager	None	Within two weeks of inception workshop
3. Monitoring progress of project indicators	Monitoring and Evaluation specialist	None	Measured biannually
4. Quarterly and annual reports (PPR)	Project Manager Responsible Entities CAF	None	PPR submitted every year (no later than two months after the end of the reporting year). First PPR must be submitted one year after the start of project implementation (date of inception workshop). The last PPR shall be submitted no later than two months after the end of the reporting year.

[93] Does not include personnel.

Monitoring and Evaluation action	Primary responsibility	Indicative cost [93] (USD)	Time frame
5. Oversight missions	CAF	None[94]	Annually
6. Audit	CAF	50,000	Annually
7. Independent mid-term review	CAF Project team	30,000	Year 3
8. Independent terminal evaluation	CAF Project team	40,000	Year 5. Three months before project closure
9. Translation of mid-term review and terminal evaluation reports into English	CAF	6,000	
10. Final project report	Project team CAF	None	One month before project closure
11. Project Board closure meeting	CAF	20,000	Last month of project execution
Total indicative cost		166,000	

[94] Charged to the project cycle management fee.

E. Include a results framework for the project / programme proposal, including milestones, targets and indicators.

	Objective and Outcome Indicators	Baseline	Mid-term and end of project targets	Means of verification	Assumptions
Project Objective: To reduce vulnerability to climate-related floods, mudflows and landslides in three coastal cities by mainstreaming a risk-based approach to adaptation, building collaboration and networking, and developing a culture of adaptation	Number of men and women protected by improved risk-reduction measures in Antofagasta, Taltal and Esmeraldas.	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	End of project Antofagasta = 380,000 (ca., 50% women) Taltal = 10,000 (ca., 50% women) Esmeraldas = 161,000 (ca., 50% women)	▪ Project Performance Report	▪ Political support from local and national authorities. ▪ Entities responsible for building relevant infrastructure and early warning systems are willing to mainstream adaptation measures in their plans and actions. ▪ Interest and collaboration from local population and stakeholders.
Component 1. Priority Actions to increase resilience.					
Outcome 1. Enhanced plans and green infrastructure reduces vulnerability to floods, landslides and mudflows in two coastal cities	Number of plans that incorporate provisions for adaptation to climate change with gender perspective.	Stormwater management plan[95] Antofagasta = 0 Green infrastructure plan[96] Esmeraldas = 0	Mid-term: 1 End of project: 2	▪ Antofagasta´s stormwater management plan ▪ Esmeraldas´ green infrastructure plan ▪ Legal instruments adopting the plans	▪ Interest and support from local authorities. ▪ Local and national authorities committed to fund and implement the plans.
Outcome 2. Reduced vulnerability to floods, landslides and mudflows in two coastal cities.	Number of physical assets constructed to withstand conditions resulting from climate variability and change.	Antofagasta = 0 Esmeraldas = 0	Mid-term: 1 End of project: 2	▪ Designs and construction report of mudflow control infrastructure for Bonilla gorge (Antofagasta)	▪ Local and national authorities warrant quality assurance of designs and construction works. ▪ Pertinent local and national authorities incorporate in their

[95] Antofagasta has a stormwater management plan, prepared in 2004, which does not consider the climate change factor. In Chile, stormwater management plans are compulsory for cities >50,000 people.

[96] The adaptation and mitigation strategy (ONU-HABITAT, 2011) and the risks and disasters management strategy (GAD Esmeraldas, 2012) include elements for mangrove enhancement and reforestation of hillsides. However, there is no comprehensive plan to operationalise a grid of green spaces that contribute to flood and landslide protection and generate additional benefits (i.e., a green infrastructure plan).

	Objective and Outcome Indicators	Baseline	Mid-term and end of project targets	Means of verification	Assumptions
				▪ Designs and construction report of landslide control infrastructure in Cerro Gatazo (Esmeraldas)	financial plans the resources for future maintenance of the new infrastructure.
	Number of men and women protected by improved infrastructure to withstand climate change and variability-induced stress.	Antofagasta = 0 Esmeraldas = 0	End of project: 12,840 Antofagasta = (ca., 50% women) Esmeraldas = 500 (ca., 50% women)	▪ Survey report of people living in areas protected by improved infrastructure (Bonilla gorge and Cerro Gatazo) ▪ Percentage of women in Antofagasta and Esmeraldas from national statistics.	
Outcome 3. Improved climate monitoring and means to alert the local population	Number of weather radar in Esmeraldas and Storm detection system in Antofagasta to monitor precipitation, linked to gender-sensitive early warning systems.	Antofagasta = 0 Esmeraldas = 0	Mid-term Antofagasta = 1 Esmeraldas = 1	▪ Radar/storm system siting analysis reports. ▪ Radar/storm system installation reports. ▪ Quarterly radar/storm system operation reports. ▪ Agreements to ensure flow of radar/storm system information to early warning systems[97]. ▪ Long-term agreements for operation and maintenance[98]. ▪ Bailment agreements[99]	▪ Responsible Entities promptly execute complementary works to house and operate the equipment (e.g., radar tower, radio link). ▪ Pertinent entities incorporate in their financial plans the resources for future operation and maintenance of the new meteorological equipment. ▪ Risk management authorities incorporate the new information

[97] In Chile, agreement among MOP, DMC and ONEMI. In Ecuador, agreement between GADPE and INAMHI. These agreements will establish operational procedures, information flow, and guarantee that the information from the storm detection system and meteorological stations is expedited to the national weather forecast and early warning systems.

[98] In Chile, DMC and MOP, and in Ecuador, GADPE will be responsible for installation, operation and maintenance of the radar/ storm detection system and meteorological stations.

[99] CAF will sign bailment agreements with DMC, MOP and GADPE for the use and maintenance of the radar/ storm detection system and the meteorological stations.

	Objective and Outcome Indicators	Baseline	Mid-term and end of project targets	Means of verification	Assumptions
	Number of meteorological stations to monitor precipitation which affect the cities, linked to gender-sensitive early warning systems.	Antofagasta[100] = 4 Taltal = 1 Esmeraldas[101] = 5	Mid-term Antofagasta = 6 Taltal = 2 Esmeraldas = 7[102]	▪ Installation reports. ▪ Quarterly operation reports. ▪ Agreements to ensure flow of information to early warning systems. ▪ Long-term agreements for operation and maintenance. ▪ Bailment agreements	into their early warning systems to alert the local population.
Outcome 4. Improved means to respond to floods, landslides and mudflows	Number of men and womencovered by alert and evacuation route signs to respond to floods (Esmeraldas), landslides (Esmeraldas) and mudflows (Antofagasta and Taltal) The early warning systems in Antofagasta, Taltal, cerro Gatazo and Isla Luis Vargas Torres are gender and culturally sensitive and consider the special needs of persons with disabilities.	Number of people Antofagasta = 0 Taltal = 0 Esmeraldas (floods) = 0 Esmeraldas (landslides) = 0 Number of early warning systems Antofagasta = 0 Taltal = 0 Cerro Gatazo = 0 Isla Luis Vargas Torres = 0	End of project: Antofagasta = 380,000 people (ca., 50% women) Taltal = 10,000 people (ca., 50% women) Esmeraldas (floods) = 161,000 people (ca., 50% women) Esmeraldas (landslides) = 161,000 people (ca., 50% women) Four early warning systems are gender and culturally sensitive and	▪ Reports on installation of sirens and evacuation route signs. ▪ Evacuation maps are easily accessible. ▪ Evacuation route signs installed. ▪ Citizen evacuation procedures and guides are easily accessible. ▪ Early warning system designs (four)	▪ Risk management authorities integrate the new tools into their early warning systems to alert the local population. ▪ Pertinent entities incorporate in their financial plans the resources for future operation and maintenance of sirens and evacuation route signs.

[100] MOP has three automatic stations in Antofagasta (Liceo Científico Humanista La Chimba, Escuela Fundación Minera Escondida, and Universidad de Antofagasta) and one in Taltal.

[101] INAMHI has three meteorological stations that are relevant for the present project: La Concordia (M0025), Sague (San Mateo) (M0441), and Teaone - Tabiazo (M0444). Two additional stations are located in the city of Esmeraldas (operated by INOCAR) and at Tachina´s airport.

[102] The project will provide two meteorological stations and one hydrological station. These stations will be managed by GADPE under the supervision of INAMHI.

	Objective and Outcome Indicators	Baseline	Mid-term and end of project targets	Means of verification	Assumptions
			consider the special needs of persons with disabilities.		
Component 2. Strengthen capacities for adaptation.					
Outcome 5. Local governments with improved capacity to design and implement adaptation measures	Number of staff (men and women) of local governments and pertinent entities trained on risk-based adaptation with a gender perspective in coastal cities.	Antofagasta = 0 Taltal = 0 Esmeraldas = 0 Other coastal cities Chile = 0 Other coastal cities Ecuador = 0	End of project: Antofagasta = ≥50 Taltal = ≥10 Esmeraldas = ≥20 Other coastal cities Chile = ≥10 Other coastal cities Ecuador = ≥10 About 40% will be women	▪ Course plan and training materials on risk-based adaptation in coastal cities. ▪ Report of training of trainers. ▪ Report of each training event (including list of participants).	▪ Officers from local governments and pertinent entities are willing to participate in training and to mainstream risk-based adaptation into their work.
Outcome 6. Local population and government personnel with increased awareness of climate-related risks (floods, landslides, mudflows)	Number of men and women who have participated in awareness activities and events.	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	End of project: Antofagasta = ≥30,000 (ca., 50% women) Taltal = ≥1,000 (ca., 50% women) Esmeraldas = ≥16,000 (ca., 50% women)	▪ Public communication and education strategies for Antofagasta, Taltal and Esmeraldas. ▪ Report of each awareness activity and event (including list of participants). ▪ Quarterly progress reports of implementation of each communication and education strategy.	▪ Local population is sensible to messages about climate-related risks and adaptation to climate change. ▪ Pertinent entities are willing to sustain long-term public awareness strategies and the narrators´ initiative.
	Number of narrators (men and women) trained to maintain cultural memory of climate-related disaster and risks.	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	End of project: Antofagasta = 10 (ca., 50% women) Taltal = 5 (ca., 50% women)	▪ Training materials. ▪ Long-term signed agreements to sustain narrators' initiative in the three cities.	

	Objective and Outcome Indicators	Baseline	Mid-term and end of project targets	Means of verification	Assumptions
			Esmeraldas = 10 (ca., 50% women)	▪ Quarterly progress reports of implementation of the narrators´ initiative	
Component 3. ICTs and partnership between coastal cities in Latin America.					
Outcome 7. Lessons and best practice on reducing vulnerability to climate related flooding, landslides and mudflows in coastal cities have been shared in the region.	Number of men and women (by nationality) who have participated in events for dissemination of lessons and best practice (e.g., workshops, exchange visits, seminars)	0	Mid-term >100 people ≥ 50% women End of project: >200 people ≥ 40% women	▪ Memoirs / reports of virtual and in-person events (including list of participants)	▪ The information is attractive, useful and accessible to key stakeholders and interest groups
	Number of visitors per month (annual average) recorded in the network of electronic channels of the regional on-line platform used to disseminate project´ learnings and best practice	Visits 0 Unique visits 0	Mid-term Visits ≥2000 Unique visits ≥1600 End of project: Visits ≥4000 Unique visits ≥3200	▪ Monthly reports from electronic platform administrator	▪ Coastal communities have adequate internet access

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

291. The project is comprehensive and aligns with four of the seven outcomes of the Adaptation Fund´s results framework.

Project Objective(s)[103]	**Project Objective Indicator(s)**	**Fund Outcome**	**Fund Outcome Indicator**	**Grant Amount[104] (USD)**
To reduce vulnerability to climate-related flooding in three coastal cities by mainstreaming a risk-based approach to adaptation, building collaboration and networking, and developing a culture of adaptation.	Number of people (men and women) protected by improved risk-reduction measures in Antofagasta, Taltal and Esmeraldas.	Outcome 1: Reduced exposure to climate-related hazards and threats	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	1,812,195[105]
		Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	229,937[106]
		Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	1,022,074[107]
		Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	7,819,848[108]
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Outcome 1. Enhanced plans and green infrastructure reduces vulnerability to floods, landslides and mudflows in three coastal cities	Number of plans that incorporate provisions for adaptation to climate change.	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change	4.1.2. Number of physical assets strengthened or constructed to withstand conditions resulting from climate	7,819,848

[103] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

[104] The allocations listed below do not sum the total project Budget. Component 3 (i.e., outputs 7.1 and 7.2) deal with knowledge management and dissemination of lessons and best practice. The AF´s results framework does not have a specific outcome or output dealing with knowledge management.

[105] Correspond to project outputs 3.1, 3.2, 4.1, 4.2 and 4.3. See project budget.

[106] Correspond to project output 5.1. See project budget.

[107] Correspond to project outputs 6.1 and 6.2. See project budget.

[108] Correspond to project outputs 1.1, 1.2, 2.1, and 2.2. See project budget.

Outcome 2. Reduced vulnerability to floods, landslides and mudflows in two coastal cities	Number of physical assets constructed to withstand conditions resulting from climate variability and change. Number of people (men and women) protected by improved infrastructure to withstand climate change and variability-induced stress.	impacts, including variability	variability and change (by sector and scale)	
Outcome 3. Improved climate monitoring and means to alert the local population	Number of weather radar/storm system to monitor precipitation, linked to early warning systems. Number of meteorological stations to monitor precipitation which affect the cities, linked to early warning systems.	Output 1.2: Targeted population groups covered by adequate risk reduction systems	1.2.1. Percentage of target population covered by adequate risk-reduction systems	1,812,195
Outcome 4. Improved means to respond to floods, landslides and mudflows	Number of people (men and women) covered by alert and evacuation route signs to respond to floods (Esmeraldas), landslides (Esmeraldas) and mudflows (Antofagasta and Taltal)			
Outcome 5. Local governments with improved capacity to design and implement adaptation measures	Number of staff (men and women) of local governments and pertinent entities trained on risk-based adaptation in coastal cities.	Output 2: Strengthened capacity of national and subnational centres and networks to respond rapidly to extreme weather events	2.1.1. Number of staff trained to respond to, and mitigate impacts of, climate-related events (by gender)	229,937
Outcome 6. Local population and government personnel with increased awareness of climate-related risks (floods, landslides, mudflows)	Number of people (men and women) who have participated in awareness activities and events. Number of narrators (men and women) trained to maintain cultural memory of climate-related disaster and risks.	Output 3: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1 Number of news outlets in the local press and media that have covered the topic	1,022,074

G. Include a detailed budget with budget notes, broken down by country as applicable, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

Budget

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
1.1. Stormwater management plan for Antofagasta	MOP	CHI	Contractual services company	350.000					350.000	1
	MOP	CHI	Travel	10.000	5.080				15.080	2
	MOP	CHI	Contractual services individual		10.000				10.000	3
	MOP	CHI	Meetings		20.000				20.000	4
	MOP	CHI	Audiovisual & print production costs		3.000				3.000	5
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	364.078	42.158	4.078	4.078	4.078	418.472	
1.2. Green infrastructure plan for Esmeraldas	GADE	ECU	Contractual services company	18.000					18.000	8
	GADE	ECU	Contractual services company	60.000					60.000	9
	GADE	ECU	Contractual services company		50.000				50.000	10
	GADE	ECU	Meetings		20.000				20.000	11
	GADE	ECU	Audiovisual & print production costs		5.000				5.000	12

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	GADE	ECU	Contractual services company		70.000	50.000	30.000		150.000	13
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
			Subtotal	82.078	149.078	54.078	34.078	4.078	323.392	
2.1. Mudflow control infrastructure in Antofagasta	MOP	CHI	Contractual services company		200.000				200.000	15
	MOP	CHI	Contractual services company			4.333.200			4.333.200	16
	MOP	CHI	Contractual services company		30.000				30.000	17
	MOP	CHI	Miscellaneous expenses		10.000	30.000			40.000	18
	MOP	CHI	Equipment and furniture	14.000					14.000	19
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	18.078	244.078	4.367.278	4.078	4.078	4.637.592	
2.2. Landslide mitigation works in Esmeraldas	GADE	ECU	Contractual services company		50.000	150.000			200.000	20
	GADE	ECU	Contractual services company			2.200.000			2.200.000	21
	GADE	ECU	Miscellaneous expenses			20.000			20.000	22
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
			Subtotal	4.078	54.078	2.374.078	4.078	4.078	2.440.392	

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
3.1. Weather radar in Esmeraldas / acquire a storm detection system with 4 sensors and contract storm detection services for 5 years.	DMC	CHI	Contractual services company	25.000	25.000	25.000	25.000	25.000	125.000	23
	DMC	CHI	Equipment and furniture	405.000					405.000	24
	INAMHI	ECU	Contractual services company	30.000					30.000	25
	GADPE	ECU	Equipment and furniture		500.000				500.000	26
	INAMHI	ECU	Miscellaneous expenses		20.000	10.000	10.000	10.000	50.000	27
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	65.387	1.025.387	15.387	15.387	15.387	1.136.937	
3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas	MOP	CHI	Equipment and furniture	70.000					70.000	28
	GADPE	ECU	Equipment and furniture	70.000					70.000	29
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	145.387	5.387	5.387	5.387	5.387	166.937	
4.1. Enhanced public warning system in Antofagasta and Taltal	ONEMI	CHI	Equipment and furniture		230.000				230.000	30
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	4.078	234.078	4.078	4.078	4.078	250.392	

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
4.2. Pilot flood warning system in Esmeraldas	GADE	ECU	Contractual services company	10.000					10.000	31
	GADE	ECU	Equipment and furniture	10.000	50.000				60.000	32
	GADE	ECU	Meetings	2.000	6.600	2.000			10.600	33
	GADE	ECU	Miscellaneous expenses		5.000	5.000	5.000	5.000	20.000	34
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
			Subtotal	26.078	65.678	11.078	9.078	9.078	120.992	
4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	ONEMI	CHI	Contractual services company	10.000					10.000	35
	ONEMI	CHI	Audiovisual & print production costs		3.000				3.000	36
	ONEMI	CHI	Audiovisual & print production costs		40.000				40.000	37
	ONEMI	CHI	Miscellaneous expenses		6.000	6.000	6.000	6.000	24.000	38
	GADE	ECU	Contractual services company	10.000					10.000	39
	GADE	ECU	Audiovisual & print production costs		3.000				3.000	40
	GADE	ECU	Audiovisual & print production costs		20.000				20.000	41
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
			Subtotal	25.387	77.387	11.387	11.387	11.387	136.937	
5.1. Course on risk-based adaptation in coastal cities	APC	Regional	Local consultants	25.000	50.000	25.000			100.000	42
	APC	Regional	Meetings	8.000					8.000	43
	APC	Regional	Grant		30.000				30.000	44
	APC	Regional	Meetings		20.000				20.000	45
	APC	Regional	Grant			15.000	15.000	15.000	45.000	46
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	38.387	105.387	45.387	20.387	20.387	229.937	
6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	MdA	CHI	Contractual services company	15.000					15.000	47
	UNDP	CHI	Local consultants	12.000	12.000	12.000	12.000	12.000	60.000	48
	MdA	CHI	Miscellaneous expenses		40.000	30.000	20.000		90.000	49
	MdA	CHI	Equipment and furniture		3.400				3.400	50
	MdT	CHI	Contractual services company	15.000					15.000	51
	UNDP	CHI	Local consultants	10.800	10.800	10.800	10.800	10.800	54.000	52
	MdT	CHI	Miscellaneous expenses		20.000	15.000	10.000		45.000	53
	MdT	CHI	Equipment and furniture		3.400				3.400	54
	GADE	ECU	Contractual services company	15.000					15.000	55
	UNDP	ECU	Local consultants	12.000	12.000	12.000	12.000	12.000	60.000	56

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	GADE	ECU	Miscellaneous expenses		20.000	15.000	10.000		45.000	57
	GADE	ECU	Equipment and furniture		3.400				3.400	58
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	85.187	130.387	100.187	80.187	40.187	436.137	
6.2. Narrators´ initiative initiated	UNDP	CHI	Local consultants	12.000	12.000	12.000	12.000	12.000	60.000	59
	UNDP	CHI	Local consultants	10.800	10.800	10.800	10.800	10.800	54.000	60
	MMA	CHI	Meetings	8.000					8.000	61
	MMA	CHI	Contractual services company		25.000	15.000	10.000		50.000	62
	MMA	CHI	Grant		50.000	60.000	50.000	40.000	200.000	63
	MMA	CHI	Local consultants			6.000			6.000	64
	UNDP	ECU	Local consultants	10.800	21.600	21.600	21.600	10.800	86.400	65
	MAE	ECU	Contractual services company		10.000	10.000	5.000		25.000	66
	MAE	ECU	Grant		15.000	25.000	15.000	10.000	65.000	67
	MAE	ECU	Local consultants			4.600			4.600	68
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	46.987	149.787	170.387	129.787	88.987	585.937	
7.1. Electronic platform to facilitate communication	UNDP	Regional	Equipment and furniture	28.000					28.000	69

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
among stakeholders and dissemination of lessons and best practice	UNDP	Regional	Contractual services company	8.600	8.600	8.600	8.600	8.600	43.000	70
	UNDP	Regional	Local consultants	22.800	22.800	22.800	22.800	22.800	114.000	71
	UNDP	Regional	Local consultants	24.000	24.000	24.000	24.000	24.000	120.000	72
	UNDP	Regional	Supplies	1.800	1.800	1.800	1.800	1.800	9.000	73
	UNDP	Regional	Audiovisual & print production costs	10.000	10.000	10.000	10.000	10.000	50.000	74
	UNDP	Regional	Travel	10.000	10.000	10.000	10.000	10.000	50.000	75
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	110.587	82.587	82.587	82.587	82.587	440.937	
7.2. Lessons and best practice documented and disseminated	UNDP	Regional	Local consultants	24.000	24.000	24.000	24.000	24.000	120.000	76
	UNDP	Regional	Miscellaneous expenses	13.000	15.000	15.000	15.000	15.000	73.000	77
	UNDP	Regional	Meetings	20.000					20.000	78
	UNDP	Regional	Meetings	5.000					5.000	79
	UNDP	Regional	Meetings	5.000					5.000	80
	UNDP	Regional	Travel		20.000	20.000	20.000	20.000	80.000	81
	UNDP	Regional	Travel			10.000	10.000	10.000	30.000	82
	UNDP	Regional	International consultants			30.000		40.000	70.000	83
	UNDP	Regional	Audiovisual & print production costs					30.000	30.000	84
	UNDP	Regional	Audiovisual & print production costs					50.000	50.000	85
	UNDP	Regional	Meetings					20.000	20.000	86

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	UNDP	Regional	Meetings					25.000	25.000	87
	UNDP	Regional	Meetings					10.000	10.000	88
	UNDP	Regional	Meetings					25.000	25.000	89
	UNDP	Regional	Local consultants	2.769	2.769	2.769	2.769	2.769	13.846	6
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	14
	UNDP	Regional	Local consultants	1.309	1.309	1.309	1.309	1.309	6.545	7
			Subtotal	72.387	64.387	104.387	74.387	274.387	589.937	
Project execution cost	UNDP	Regional	Equipment and furniture	4.500					4.500	90
	UNDP	Regional	Miscellaneous expenses	1.300	1.300	1.300	1.300	1.300	6.500	91
	UNDP	Regional	Administration fee	87.518	194.492	588.086	38.422	45.558	954.074	92
			Subtotal	93.318	195.792	589.386	39.722	46.858	965.074	

Total project cost	**1.181.487**	**2.625.641**	**7.939.155**	**518.691**	**615.027**	**12.880.000**

Budget notes

1 Engineer company contract to update stormwater management plan for Antofagasta.

2 Travel (including airplane tickets, board and lodging) of MOP personnel for contract supervision

3 Consultant to prepare guidelines to update stormwater management plans to cope with climate-related mudflows in coastal cities

4	Two-day workshop (ca., 20 people) in Antofagasta to validate guidelines. Cost includes materials, locale, board and lodging.
5	Prepare publication of guidelines. Digital document (PDF format) for distribution through websites.
6	Project Manager. USD3,000/month. Allocation of time to this output. Annex 5 has the terms of reference for this post.
7	Accounting and administration assistant, USD1200/month. Time allocation to this output. To be based in Antofagasta.
8	Prepare and implement a training event on green infrastructure planning in coastal cities. Three-day workshop (ca., 30 people) in Esmeraldas. Participants will be technical staff from GADM and relevant entities. Cost includes course development, training materials, locale, and board.
9	Situation analysis of climate-related risks and options to enhance green infrastructure in the city of Esmeraldas. Consultant team must include a botanist, a zoologist, a geographer, a lawyer and a coastal management specialist. The work will include a characterization of the urban area, identify local needs and deficiencies in existing green infrastructure and detailed recommendations of priorities to enhance green infrastructure.
10	Prepare green infrastructure plan for the city, with emphasis on protection from flooding and landslides. The plan will be prepared through a highly participatory process with local stakeholders. A detailed regulation framework must be developed to anchor green infrastructure development into municipal planning. The cost includes personnel, workshops, materials, and travel. The consultant team must include a botanist, a geographer, a lawyer, an urban planner and a coastal management specialist.
11	Cost of meetings and events to socialise the green infrastructure plan to the community and stakeholders
12	Prepare publication of green infrastructure plan. Digital document (PDF format) for distribution through websites, and a communication brief for wider distribution.
13	Design and implement intervention to vegetate cerro Gatazo hillside to reduce the risk of rainfall-induced erosion and landslides. Cost includes the design of the intervention (in close coordination with the team that will develop landslide mitigation infrastructure in cerro Gatazo), obtaining the pertinent environmental permits, nursery production of plants, planting and care for two years (i.e., watering, weeding, fertilization, pest and disease control). Reference cost USD1,200 ha-1 to establish the plantation, USD400 ha-1 year-1 for maintenance of the plantation.
14	Accounting and administration assistant, USD1200/month. Time allocation to this output. To be based in Esmeraldas.

15	Engineer company to update the designs of mudflow control infrastructure in quebrada Bonilla (Antofagasta) incorporating future climate scenarios.
16	Construction company to build mudflow control infrastructure in quebrada Bonilla (Antofagasta).
17	Prepare Environmental Impact Declaration and obtain pertinent environmental permits
18	Various expenses (e.g., airplane tickets, lodging, consumables) for MOP´s supervision of construction works.
19	Purchase of AQUAVEO WMS software and network server to model and analyse watersheds. About USD 7000 to purchase WMS premium edition for five network users. About USD 7000 to purchase a high capacity server to run the software and two computer terminals.
20	Engineer company to update the designs of landslide mitigation infrastructure in cerro Gatazo incorporating future climate scenarios. This work will closely collaborate with the team which design the intervention to vegetate cerro Gatazo hillside.
21	Construction company to build landslide mitigation infrastructure in cerro Gatazo. The cost includes obtaining the pertinent environmental permits.
22	Various expenses for supervision of construction works.
23	Study to identify best location for storm sensors and design supporting infrastructure and facilities. DMC will prepare terms of reference and oversee the study. UNDP will contract the study.
24	Purchase of Storm Detection System of the DMC, including 4 sensors, installation and training of personnel in operation and maintenance. The equipment will be purchased by UNDP. DMC will be responsible for installation, operation and maintenance. For this purpose, a bailment agreement will be signed between DMC and CAF. The equipment will be transferred to DMC during year 4 of the project. A pre-condition for the purchase of the equipment will be to have a signed agreement between MOP, DMC and ONEMI to establish operational procedures, information flow, and to guarantee that the information from the Storm Detection System and meteorological stations is expedited to the national weather forecast and early warning systems.
25	Study to identify best location for weather radar and design supporting infrastructure and facilities. INAMHI will prepare terms of reference and oversee the study. UNDP will contract the study.
26	Purchase of weather radar, including installation and training of personnel in operation and maintenance. Rough distribution of investment: radar USD300,000, spare parts USD100,000, training USD20,000, and installation USD80,000 (e.g., power plant, lighting protection). INAMHI will provide technical specifications. UNDP will purchase the equipment. GADPE will be responsible for installation, operation and maintenance. INAMHI will oversee the

	installation, operation and maintenance of the radar. A pre-condition for the purchase of the equipment will be to have a signed agreement between GADPE and INAMHI to establish operational procedures, information flow and to guarantee that the information from the radar and meteorological stations is expedited to the national weather forecast and early warning systems. CAF will sign a bailment agreement with GADPE for the use and maintenance of the radar and meteorological stations. It is foreseen to transfer the equipment to GADPE during year 4 of the project. However, if GADPE cannot guarantee its long-term operation, the equipment will be transferred to INAMHI.
27	Various expenses to cover INAMHI´s (i) training of GADPE personnel, and (ii) supervision of installation, operation and maintenance of radar and meteorological stations.
28	Purchase of meteorological stations, including installation. MOP will be responsible for installation, operation and maintenance. For this purpose, a bailment agreement will be signed between MOP and CAF. The equipment will be transferred to MOP during year 4 of the project. A pre-condition for the purchase of the equipment will be to have a signed agreement between MOP, DMC and ONEMI.
29	Purchase of two meteorological stations and one hydrological station (including installation). INAMHI will provide technical specifications and will oversee the installation, operation and maintenance of the equipment. UNDP will purchase the equipment. GADPE will be responsible for installation, operation and maintenance. CAF will sign a bailment agreement with GADPE.
30	Purchase and install mudflows public warning equipment (e.g., sirens, communication network, control centre). It is foreseen to use omni-directional outdoor warning sirens with one kilometre radius coverage. Nine sirens will be needed in Antofagasta and one in Taltal. ONEMI will provide technical specifications and will be responsible for the installation, operation and maintenance. UNDP will buy the equipment and transfer it to ONEMI.
31	Design flooding early warning system for trial testing. Design will combine community-based actions coordinated with municipal and national authorities. The pilot will be implemented in Isla Luis Vargas Torres. The system will be designed with the participation of key organisations of island´s residents. The organizations that have agreed to contribute are 12 de mayo, Cordero Crespo, 20 de noviembre, Pianguapi, 29 de agosto, and Habana.
32	Purchase and installation of equipment for pilot flood early warning system. It is foreseen to use two omni-directional outdoor warning sirens with one kilometre radius coverage. GADE will be responsible for the installation, operation and maintenance. UNDP will buy the equipment and transfer it to GADE.
33	Meetings and workshops socialize and train local groups on flooding alert and emergency procedures. The cost includes production of handouts and communication material.
34	Flood emergency drills with local groups of the pilot area.

35	Update mudflows evacuation maps for Antofagasta and Taltal. Digital files (PDF format) will be posted in local websites and social media to facilitate public access.
36	Print evacuation maps in large format and locate in high-transit areas for public display in both cities.
37	Production and placing of mudflow evacuation route signs in Antofagasta and Taltal
38	Various expenses to hold annual mudflow evacuation drills in Antofagasta and Taltal
39	Prepare flooding evacuation map and landslide risk evacuation map for Esmeraldas. Digital files (PDF format) will be posted in local websites and social media to facilitate public access.
40	Print flooding evacuation map and landslide risk evacuation map in large format and locate in high-transit areas for public display.
41	Production and placing of signals for flooding evacuation routes and landslide risk areas
42	Two consultants to coordinate and prepare course on risk-based adaptation in coastal cities. Lead consultant will be based in Chile; the other consultant will be in Ecuador. They will prepare the analysis of existing experience, prepare the joint workshop to delineate the training course, identify and take contact with key partners, contribute and oversee the preparation of the course, organize the training of trainers and oversee the delivery of the first training course. Lead consultant USD 60,000, local consultant USD 40,000.
43	Joint workshop to delineate training contents and structure, and agree working procedures. Three-day workshop. Travel cost for three persons USD6000 (airplane tickets, food and lodging, terminal expenses) and USD2000 for locale, materials and board. Travel cost includes one of the consultants.
44	Grant to partner organization (e.g., university with on-line training capabilities) to develop course and training materials, including training of trainers.
45	One-week workshop to train trainers. Cost includes travel.
46	Grant to partner organization to offer three training courses.
47	Prepare needs assessment and communication and public education strategy for Antofagasta

48	Local adaptation specialist to coordinate and catalyse implementation of the project´s adaptation actions and the communication and public education strategy in Antofagasta. This person will also oversee the specialist responsible for activities in Taltal. Monthly salary USD2,000, 50% time dedicated to coordinate implementation of project´s adaptation actions and public education strategy. This person will be based within the Municipality of Antofagasta, under the supervision of the project´s Lead Adaptation Specialist. With respect to the public education strategy, this person together with municipal staff will assess the progress in reaching the goals, adjust the strategy and prepare the workplan for the following year. Annex 5 has the terms of reference for this post.
49	Production of communication materials and events to implement the communication and public education strategy in Antofagasta. This also includes office materials and consumables for the work of the consultant.
50	Purchase of computer, printer, furniture and office supplies for the consultant to be based within the municipality
51	Prepare needs assessment and communication and public education strategy for Taltal
52	Local adaptation specialist to coordinate and catalyse implementation of the project´s adaptation actions and the communication and public education strategy in Taltal. Monthly salary USD1,800, 50% time dedicated to coordinate implementation of project´s adaptation actions and public education strategy. This person will be based within the Municipality of Taltal. With respect to the public education strategy, this person together with municipal staff will assess the progress in reaching the goals, adjust the strategy and prepare the workplan for the following year. Annex 5 has the terms of reference for this post.
53	Production of communication materials and events to implement the communication and public education strategy in Antofagasta. This also includes office materials and consumables for the work of the consultant.
54	Purchase of computer, printer, furniture and office supplies for the consultant to be based within the municipality
55	Prepare needs assessment and communication and public education strategy for Esmeraldas
56	Local adaptation specialist to coordinate and catalyse implementation of the project´s adaptation actions and the communication and public education strategy in Esmeraldas. Monthly salary USD1,800, 50% time dedicated to coordinate implementation of project´s adaptation actions and public education strategy. This person will be based within the Municipality of Esmeraldas, under the supervision of the project´s Lead Adaptation Specialist. With respect to the public education strategy, this person together with municipal staff will assess the progress in reaching the goals, adjust the strategy and prepare the workplan for the following year. Annex 5 has the terms of reference for this post.

57	Production of communication materials and events to implement the communication and public education strategy in Esmeraldas. This also includes office materials and consumables for the work of the consultant.
58	Purchase of computer, printer, furniture and office supplies for the consultant to be based within the municipality
59	Local adaptation specialist based in Antofagasta, will lead the narrators´ initiative in the two countries, under the supervision of the project´s Lead Adaptation Specialist. This person will coordinate and catalyse implementation of the initiative in Antofagasta and Taltal, and will supervise the adaptation specialist based in Esmeraldas. Monthly salary USD2,000, 50% of time dedicated to the narrators´ initiative. This person will be based within the Municipality of Antofagasta, but will have close coordination with MMA office in Antofagasta for the narrators´ initiative. Together with the Taltal´s adaptation specialist, this person will compile stories, anecdotes, and factual information to be used by narrators. This person will oversee the development of activities executed by local partners sponsored by the project. Jointly with project partners and the project´s Lead Adaptation Specialist, every year, this person will assess the progress in reaching the goals, adjust the strategy and prepare the workplan for the following year. Annex 5 has the terms of reference for this post.
60	Local adaptation specialist based in Taltal, under the supervision of Antofagasta´s adaptation specialist and the project´s Lead Adaptation Specialist. This person will coordinate and catalyse implementation of the initiative in Taltal. Monthly salary USD1,800, 50% of time dedicated to the narrators´ initiative. This person will be based within the Municipality of Taltal, but will have close coordination with MMA office in Antofagasta for the narrators´ initiative. Together with the Antofagasta´s adaptation specialist, this person will compile stories, anecdotes, and factual information to be used by the narrators. This person will oversee the development of activities executed by local partners sponsored by the project. Jointly with project partners and the project´s Lead Adaptation Specialist, every year this person will assess the progress in reaching the goals, adjust the strategy and prepare the workplan for the following year. Annex 5 has the terms of reference for this post.
61	Joint workshop to share national and international experience and convene work strategy. Three-day workshop. Travel cost for three persons USD6,000 (airplane tickets, food and lodging, terminal expenses) and USD2,000 for locale, materials and board. Travel cost includes one of the consultants. International experts and potential partners will be invited to present their experience (e.g., JICA, EDUCEN) through web-based link.
62	Technical assistance to local groups in Antofagasta and Taltal which are interested in developing narrators´ activities. In year 2 training to develop skills and messages. In years 3 and 4 mentoring.
63	Small grants to sponsor local groups in Antofagasta and Taltal. The allocations will sponsor local partners / groups to execute activities (e.g., children shows, street theatre, puppetry, music displays) to enhance / develop local collective memory about climate-related risks and adaptation to climate change.
64	Independent assessment of narrators´ initiative in Antofagasta and Taltal. The report will contribute to the mid-term review of the project.

65	Local adaptation specialist based in Esmeraldas to implement the narrators´ initiative. This person will coordinate and catalyse implementation of the initiative in Esmeraldas, under the supervision of the adaptation specialist to be based in Antofagasta. Monthly salary USD1,800 for 48 months. This person will be based within the Municipality of Esmeraldas, but will have close coordination with MAE´s office in Esmeraldas for the narrators´ initiative. This person will compile stories, anecdotes, and factual information to be used by the narrators. Also, this person will oversee the actions executed by the local partner sponsored by the project. Jointly with project partners and the project´s Lead Adaptation Specialist, every year this person will assess the progress in reaching the goals, adjust the strategy and prepare the workplan for the following year. Annex 5 has the terms of reference for this post.
66	Technical assistance to local groups interested in developing narrators´ activities. In year 2 training to develop skills and messages. In years 3 and 4 mentoring.
67	Small grant to sponsor local groups in Esmeraldas. The allocations will sponsor local partners / groups to execute activities (e.g., children shows, street theatre, puppetry, music displays) to enhance / develop local collective memory about climate-related risks and adaptation to climate change.
68	Independent assessment of narrators´ initiative in Esmeraldas. The report will contribute to the mid-term review of the project.
69	Equipment for web-based communication platform. One server + five teleconference sets (Antofagasta, Taltal, Esmeraldas, Santiago, Quito) + software. USD15,000. Equipment and software for project website and social media platforms. Three servers (USD6,000) + three multi-function printers (USD2,100) + three video cameras (USD1,500) + three audio recorders (USD300) + video, audio and image editing software (USD1,000) + website management software (USD1,000) + sundries 1,900. Total USD28,000.
70	Web-based communication service (e.g., WebEx, SKYPE for business) - USD200/month, plus high-speed internet access in three locations (Antofagasta, Taltal and Esmeraldas) - USD100/month per location, plus webhosting USD200/year.
71	Electronic media specialist, to administer and maintain the electronic platform for communication and hosting. USD1,900/month. This person will be based in CAF. Annex 5 has the terms of reference for this post.
72	Lead Adaptation Specialist, USD2,000/month. Based in CAF. Supervises the adaptation specialists based in Antofagasta, Taltal and Esmeraldas. This person coordinate the implementation of the project´s adaptation actions. In collaboration with the Electronic Media Specialits, maintains the project website, the social networking platforms, and the mailing list server to disseminate information to stakeholders and interest groups. Annex 5 has the terms of reference for this post.
73	Office supplies for electronic platform (e.g., paper, toner, pens)

74	Production videos, images and other communication media for the project´s web platform and news.
75	National and international travel of Lead Adaptation Specialist.
76	Monitoring and evaluation specialist, USD2,000/month. Responsible to document the project experience, including providing support to blogs. Annex 5 has the terms of reference for this post. This person will prepare learning experience documents. Nine learning experience documents are planned: 1. incorporating the climate change factor into stormwater management plans in Chile, 2. preparation of green infrastructure plan in Esmeraldas, 3. incorporating the climate change factor into mudflow control infrastructure in Antofagasta, 4. incorporating the climate change factor into landslide control in cerro Gatazo (Esmeraldas), 5. Use of weather radar/ storm system to enhance early warning systems, 6. mudflows warning system in Antofagasta and Taltal, 7. pilot flood warning system in Esmeraldas, 8. communication and education strategies to increase public awareness of climate-related disaster risk, and 9. contribution of narrators to sustain cultural memory on climate-related risks and disasters.
77	Allocation for monitoring of project development. The value includes international and local travel of Monitoring and Evaluation specialist, consumables, meetings and other various expenses.
78	Project inception workshop. Participate members of the Project Board, responsible entities, and the project team. The allocation includes international travel, locale, board and materials. Two-day workshop to update project strategy, update first year workplan and budget, and fine-tune administration procedures and agreements.
79	National workshop to launch the project in Chile. Event to be held in Antofagasta. Cost includes locale, board and local travel costs.
80	National workshop to launch the project in Ecuador. Event to be held in Esmeraldas. Cost includes locale, board and local travel costs.
81	Travel cost for exchange visits. The allocation includes international and local travel, accommodation, materials and consumables. Four exchange visits are planned, one per year: 1. pilot stabilization of cerro Gatazo to control landslides (in Ecuador), 2. early warning and response systems to climate-related events (in Chile), 3. public awareness strategies (in Chile), 4. narrators' initiative (in Ecuador).
82	Travel cost to present project results in national or international events and fora. The use of these resources will be decided by the Project Board.
83	Mid-term review and terminal evaluation of the project. Lump sum to cover contract of international consultant and national consultants (one on each country), airplane tickets (international and national), accommodation, board and lodging.

84	Prepare and edit technical documents with results and lessons of the project. The documents will include executive summaries in Spanish, English, French and Portuguese. The documents will be in high-quality PDF format for download.
85	Prepare and disseminate project´s memoirs. Prepare and edit document in format for general public with executive summary in Spanish, English, French and Portuguese. 5,000 printed copies and high-quality PDF for download.
86	Project Board closure meeting. Participate members of the Project Board, responsible entities, and the project team. The allocation includes international travel, locale, board and materials. Two-day meeting to review project outcomes and analyse terminal evaluation and final project report.
87	Public event in Antofagasta to close the project. It will include technical talks and informal activities to present results and learnings to stakeholders and general public. It will be desirable to have video link with the other project sites or pre-recorded video to have summaries of their results and lessons. The cost includes locale, consumables, catering, travel, rental of equipment (e.g., sound amplification).
88	Public event in Taltal to close the project. It will include technical talks and informal activities to present results and learnings to stakeholders and general public. It will be desirable to have video link with the other project sites or pre-recorded video to have summaries of their results and lessons. The cost includes locale, consumables, catering, travel, rental of equipment (e.g., sound amplification).
89	Public event in Esmeraldas to close the project. It will include technical talks and informal activities to present results and learnings to stakeholders and general public. It will be desirable to have video link with the other project sites or pre-recorded video to have summaries of their results and lessons. The cost includes locale, consumables, catering, travel, rental of equipment (e.g., sound amplification).
90	Three computers and printers for project manager and accounting and administration assistants.
91	Office supplies and consumables (e.g., paper, toner, folders)
92	UNDP project administration and services

Budget on the Implementing Entity management fee use

292. The project cycle management fee will be used by CAF to cover the indirect costs of administering and supporting project implementation and to provide project assurance. This table contain indicative costs of the main categories of project services.

Category	Indicative cost (USD)
Technical support and backstopping by personnel from headquarters and the offices in Quito and Montevideo[109].	300,000
Financial administration of project funds and accounting services.	150,000
Procurement of goods, works and services and contract administration. Including management of project personnel and consultants.	230,400
Project oversight. Including visits to project sites to verify quality of deliverables, and overseeing independent evaluations.	150,000
Reporting. Including technical, administrative and financial reports to the Adaptation Fund. Preparation of annual Project Performance Report (PPR)	100,000
Provide office space and support services to the project´s management unit within CAF	100,000
Total	1,030,400

H. Include a disbursement schedule with time-bound milestones.

Description	First disbursment (at signature of agreement)	Year 1	Year 2	Year 3	Year 4	Total
Project funds	1.181.487	2.625.641	7.939.155	518.691	615.027	12.880.000
Implementing Entity management fee	206.080	206.080	206.080	206.080	206.080	1.030.400
Total	1.387.567	2.831.721	8.145.235	724.771	821.107	13.910.400
Estimated date	15 June 2017	15 June	}	15 June	15 June	

[109] There is no country office in Chile. The Montevideo office manage Chile´s projects and matters.

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PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[110]

Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project / programme. Add more lines as necessary. The endorsement letters should be attached as an annex to the project/programme proposal. Please attach the endorsement letters with this template; add as many participating governments if a regional project/programme:

Full Proposal Project: **Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America. Chile – Ecuador.**	
GLADYS SANTIS G. *Adaptation Officer* *Air Quality and Climate Change Division* *Ministry of Environment* *Government of Chile*	Date: *July 29, 2016*
MARIA VICTORIA CHIRIBOGA *National Designated Authority* *Climate Change Undersecretary* *Ministry of Environment - Ecuador*	Date: *July 29, 2016*

6. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

B. Implementing Entity Certification

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans of Chile and Ecuador. Also it will be taken into account the; Adaptation and Mitigation Strategy Climate Change for the canton Esmeraldas, cities in climate change initiative of Ecuador and the Guidelines for the implementation of the adaptation of the national action plan on climate change and the Plan for adaptation to climate change for cities of Chile (which is actually in construction) and subject to the approval by the Adaptation Fund Board, commit to implementing the project "Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America. Chile – Ecuador" in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.
 ***LIGIA CASTRO*** *Environmental and Climate Change Chief Executive* *CAF Latin American development bank*
Date: *July 29, 2016* / Tel. +57 (1) 7447355 Email: lcastro@caf.com
Project Contact Person: Carolina Cortés Cardona
Tel. +593 (2) 398-8437 Email: acortes@caf.com

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[1] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Full Proposal Project: **Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America. Chile – Ecuador.**	
GLADYS SANTIS G. *Adaptation Officer* *Climate Change Division* *Ministry of Environment - Chile*	Date: August 2, 2017
TARSICIO GRANIZO *National Designated Authority* *Ministry of Environment of Ecuador*	Date: *August 04, 2017*

[1] Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

B. Implementing Entity certification

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans of Chile and Ecuador. Also it will be taken into account the; Adaptation and Mitigation Strategy Climate Change for the canton Esmeraldas, cities in climate change initiative of Ecuador and the Guidelines for the implementation of the adaptation of the national action plan on climate change and the Plan for adaptation to climate change for cities of Chile (which is actually in construction) and subject to the approval by the Adaptation Fun Board commit to implementing the project "Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America" in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.
 *LIGIA CASTRO DE DOENS* Environmental and Climate Change Chief Executive CAF Latin American development bank. Implementing Entity Coordinator
Date: *august 04, 2017* | Tel.: +57 (1) 7447355 Email: lcastro@caf.com
Project Contact Person: Carolina Cortés Cardona
Tel.:+593 (2) 398-8437 Email: acortes@caf.com

Annex 1. Abbreviations

AF	Adaptation Fund
AFB	Adaptation Fund Board
AGCID	Chilean Agency for International Cooperation for Development
APC	Civil Protection Academy of Chile
ARG	Antofagasta Regional Government
CBD	Convention on Biological Diversity
CLP	Chilean Peso
COE	Emergency Operations Committee
DGA	Directorate of Waters of the Ministry of Public Works of Chile
DMC	Meteorological Directorate of Chile
DOH	Directorate of Hydraulic Works of the Ministry of Public Works of Chile
ESMP	Environmental and Social Management Plan
ESP	Adaptation Fund´s Environmental and Social Policy
GADE	Municipality of Esmeraldas
GADPE	Provincial Government of Esmeraldas
INAMHI	National Meteorological and Hydrological Institute of Ecuador
INE	National Institute of Statistics of Chile
INEC	National Institute of Statistics and Censuses of Ecuador
LAC	Latin America and the Caribbean
M&E	Monitoring and Evaluation
MAE	Ministry of Environment of Ecuador
MdA	Municipality of Antofagasta
MdT	Municipality of Taltal
MINVU	Ministry of Housing and Urban Development of Chile
MMA	Ministry of Environment of Chile
MOP	Ministry of Public Works of Chile
NIE	National Implementing Entity
ONEMI	National Emergency Office of Chile
PAAS	Environmental and Social Action Plan
PDOT	Development and Land Use Plan
PLADECO	Communal Development Plan

PPR	Project Performance Report
PRODOC	Fully Developed Project/Programme Document
PT	Project team
RIE	Regional Implementing Entity
SETECI	Technical Secretariat of International Cooperation of Ecuador
SGR	Risk Management Secretariat
UNDP	United Nations Development Programme
USD	United States Dollar

Annex 2. Definitions

Adaptation	The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects (IPCC, 2014).
Adaptive capacity	The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences (IPCC, 2014).
Alien species	Refers to a species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce (Decision VI/23 of the Conference of the Parties to the CBD).
Campamento	Settlements, usually found in urban areas, of more than eight families living on an irregular land tenure, lacking at least one of the three basic services (electricity, drinking water and sewage system) whose homes are closely grouped together (MINVU, 2012).
Cultural memory	It refers to the recording and handing down meanings and interpretation from generation to generation. The consideration of cultural memory as an asset in disaster risk reduction (DRR) focus on how to recognize and use accumulated experience and knowledge from past crises and disasters to inform and enhance present and future DRR and disaster risk management (EDUCEN, 2015)
Disaster	A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources (UNISDR, 2009).
Disaster risk	The likelihood within a specific time period of disaster (IPCC, 2014). The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period (UNISDR, 2009).

Disaster risk reduction	The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events (UNISDR, 2009).
Early warning system	The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss (UNISDR, 2009).
El Niño-Southern Oscillation (ENSO)	A complex interaction of the tropical Pacific Ocean and the global atmosphere that results in irregularly occurring episodes of changed ocean and weather patterns in many parts of the world, often with significant impacts over many months, such as altered marine habitats, rainfall changes, floods, droughts, and changes in storm patterns (UNISDR, 2009).
Executing entity	Executing Entities are organizations that execute adaptation projects and programmes supported by the Adaptation Fund under the oversight of the Implementing Entities (AF, 2012).
Exposure	People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses (UNISDR, 2009).
Female-headed households	A household in which an adult female is the sole or main income producer and decision-maker. In most countries, women are not usually considered as heads of households unless no adult male is living permanently in the household. The assumption that the head of a household is always an adult man, even if a woman's economic contribution to the household's maintenance is the same or greater than that of a man, is a form of gender bias. In developing countries, there is a general trend of more and more women being the primary source of economic support for their families (ILO, 2007).
Green infrastructure	Refers to interventions to preserve the functionality of existing green landscapes (including parks, forests, wetlands, or green belts), and to transform the built environment through phytoremediation and water management techniques and by introducing productive

	landscapes (Revi et al., 2014). Green infrastructure refers to an interconnected network of multifunctional green-spaces that are strategically planned and managed to provide a range of ecological, social, and economic benefits (Matthews et al., 2015).
Hazard	A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydrometeorological and biological) or induced by human processes (environmental degradation and technological hazards). Hyogo Framework for Action.
Hydrometeorological hazard	Process or phenomenon of atmospheric, hydrological or oceanographic nature that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNISDR, 2009).
Implementing Entity	Implementing Entities are the national legal entities and multilateral organizations that have been identified ex ante by the Adaptation Fund Board (AFB) as meeting the criteria adopted by the Board, in accordance with decision 1/CMP.3, paragraph 5 (c), to access funding to implement concrete adaptation projects and programmes supported by the Fund (Rules of procedure of the Adaptation Fund Board)
Invasive alien species	It is an alien species whose introduction and/or spread threaten biological diversity (Decision VI/23 of the Conference of the Parties to the CBD).
Marginalized groups	These are groups of people who are excluded from the normal economic and social fabric of societies, thus lacking access to basic essential services and facilities. Furthermore, they lack the means to improve themselves (motivation, social capital, skills and knowledge) and have low resilience (AF, 2016).
National Implementing Entity	National Implementing Entities (NIE) are those national legal entities nominated by Parties that are recognized by the Board of the Adaptation Fund as meeting the fiduciary standards approved by the Board. When implementing a project / programme, The NIEs will bear the full responsibility for the overall management of the projects and programmes financed by the

	Adaptation Fund, and will bear all financial, monitoring, and reporting responsibilities (modified from AF, 2012).
Outcome	The change in conditions, or intended effects of an intervention, usually brought about by the collective efforts of partners. Outcomes are achieved in the short to medium term (AF, 2012).
Output	The product, capital goods and services which result from a development intervention relevant to the achievement of outcomes (AF, 2012).
Public awareness	The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken individually and collectively to reduce exposure and vulnerability to hazards (UNISDR, 2009).
Regional Implementing Entity	Regional Implementing Entities (RIE) are those legal entities, recognized by the Board of the Adaptation Fund, that meet the fiduciary standards approved by the Adaptation Fund Board. When implementing a project / programme, The RIEs will bear the full responsibility for the overall management of the projects and programmes financed by the Adaptation Fund, and will bear all financial, monitoring and reporting responsibilities (modified from AF, 2012).
Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions (UNISDR, 2009).
Responsible Entity	Responsible Entities are organizations that execute parts of the adaptation project under the supervision and oversight of the corresponding Executing Entity and Implementing Entity
Social inclusion	The process of improving the terms for individuals and groups to take part in society. The process of improving the ability, opportunity, and dignity of people, disadvantaged on the basis of their identity, to take part in society (World Bank, 2013).
Vulnerability	The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. Hyogo Framework for Action.

Vulnerable groups	These are groups of people unable or with diminished capacity to anticipate, cope with, resist and recover from the impacts of (external) pressures, facing a higher risk of poverty and social exclusion than the general population. Vulnerability can stem from belonging or being perceived to belong to a certain group or institution, and is a relative and dynamic concept (AF, 2016).

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Annex 4. Memoirs of inception and validation workshops

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Memoria

Taller inicial de formulación

Ciudad de Esmeraldas

República del Ecuador

16 de mayo de 2016

Tabla de contenido

Anexos

Introducción

El Ministerio de Medio Ambiente de Chile (MMA) y el Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - banco de desarrollo de América Latina - presentaron al Fondo de Adaptación la iniciativa del Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina. Esta iniciativa regional cual incluye tres ciudades costeras: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador. El Fondo de Adaptación fue establecido en 2001 para financiar proyectos y programas concretos de adaptación en los países en desarrollo. El fondo es un mecanismo financiero de la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Protocolo de Kioto.

La iniciativa en mención fue presentada a consideración del Fondo de Adaptación a nivel de pre-concepto, el cual fue aprobado por dicho fondo a finales del mes de marzo de 2016. A efectos de avanzar en la aprobación final, se requiere formular en detalle el proyecto en colaboración con los actores claves públicos y privados. Consecuentemente, se organizó el taller inicial en la ciudad de Esmeraldas con el objetivo de presentar el pre-concepto a los socios clave, recibir retroalimentación e iniciar el proceso de desarrollo de la propuesta de completa para ser presentada hasta el 01 de agosto de 2016[1]. El taller se realizó en el centro de capacitación del Cuerpo de Bomberos de Esmeraldas.

Agenda

La reunión tuvo los siguientes elementos:

08:30 Registro de participantes

09:00 Bienvenida

09:15 Presentación de participantes

09:30 Revisión de la agenda

09:45 Adaptación al cambio climático y medidas planteadas en el concepto

10:30 Receso

11:00 Estrategia de adaptación al cambio climático de la ciudad de Esmeraldas

11:30 El Fondo de Adaptación

12:00 Presentación del concepto regional de proyecto

12:40 Mesas de trabajo. Análisis de situación en Esmeraldas

14:00 Almuerzo

15:00 Mesas de trabajo. Acciones para el proyecto

16:30 Próximos pasos

17:00 Cierre del evento

[1] Fecha límite para ingresar propuestas a ser consideradas en 28 reunión de la junta directiva del Fondo de Adaptación que se realizará el 4 de octubre de 2016 en Bonn (Alemania).

Bienvenida

La bienvenida estuvo a cargo de Guillermo Oleas de la Dirección Provincial del Ministerio del Ambiente, Renato Tambaco Director de Gestión Ambiental del Municipio de Esmeraldas, y Carolina Cortés de CAF (Foto 1, Foto 2 y Foto 3), quienes agradecieron la asistencia de los participantes y proveyeron información sobre el marco general de la reunión. Se agradeció al Cuerpo de Bomberos de Esmeraldas por la gentileza de facilitar las instalaciones del centro de capacitación para que se realice el evento. Participaron en la reunión 30 personas, el registro de asistencia está en el Anexo 1.

Adaptación al cambio climático y medidas planteadas en el concepto

La presentación estuvo a cargo de Nicolás Zambrano del Ministerio del Ambiente (MAE) (Foto 4), quien resumió la situación de las zonas costeras de Ecuador con respecto al cambio climático global. Se indicó que se prevé un incremento en la temperatura y la precipitación en la ciudad de Esmeraldas, lo que incrementaría la vulnerabilidad de los sectores que ya tienen alto riesgo de inundaciones y deslizamientos. También se resumió las medidas de adaptación preliminares identificadas para la ciudad de Esmeraldas, algunas de las cuales se han incluido en el pre-concepto de proyecto. A continuación, Diego Guzmán (director de adaptación al cambio climático) resumió el marco político e institucional en el que se desarrollan las acciones de mitigación y adaptación al cambio climático. Indicó que hay líneas de acción al 2017 y 2025 con respecto a la adaptación al cambio climático. La presentación está en el Anexo 2.

Estrategia de adaptación al cambio climático de la ciudad de Esmeraldas

La presentación estuvo a cargo de Renato Tambaco (Foto 5), director de gestión ambiental del municipio de Esmeraldas. Se indicó que las principales amenazas son el incremento de precipitación extrema y de la temperatura ambiente. También se resumió la situación de vulnerabilidad de la ciudad, la misma que es afectada principalmente por inundaciones y deslizamientos de tierra ocasionadas por fuertes precipitaciones. Finalmente, se presentó cinco proyectos enfocados en adaptación al cambio climático, uno de estos es la regularización de los asentamientos en zonas de alto riesgo. La presentación está en el Anexo 3.

El Fondo de Adaptación

La presentación estuvo a cargo Carolina Cortés de CAF (Foto 6), quien explicó el alcance y forma de operación del Fondo de Adaptación. Se indicó que CAF, además de su rol como banco de desarrollo, es una Agencia Implementadora Regional y está articulando la preparación de la propuesta del presente proyecto. Se explicó que el proyecto se enmarca en la convocatoria del Fondo de Adaptación para proyecto regionales realizada en 2015, a la cual se presentó el pre-concepto que fue aceptado por el fondo. Finalmente, se indicó que hay la opción de presentar, a finales de julio de 2016, un concepto o una

propuesta completa. La propuesta completa es el documento de proyecto totalmente desarrollado con todas las exigencias del Fondo de Adaptación. De presentarse a nivel de concepto éste podría ser comentado y de ser necesario hacer ajustes hay la oportunidad de presentar la propuesta completa a finales de año. Sin embargo, si se presenta a nivel de propuesta completa, sólo hay opción de aceptación o rechazo, lo que limita las opciones para ajustes.

Se enfatizó que este es un proyecto regional que involucra a las ciudades de Esmeraldas, en Ecuador, y Antofagasta y Taltal, en Chile. También se indicó que el taller inicial de Chile se efectuó el 4 de mayo en la ciudad de Antofagasta. La presentación está en el Anexo 4.

Presentación del concepto regional de proyecto

La presentación estuvo a cargo de Segundo Coello, consultor de CAF para la preparación del documento de proyecto. Se recordó que el proyecto está a nivel de pre-concepto y que debe desarrollarse en las próximas semanas a nivel de propuesta completa. También se destacó que el tiempo disponible es muy corto, pues el proyecto debe estar listo al 15 de julio para poder revisarlo en los dos países y presentarlo el 29 de julio al Fondo de Adaptación.

Se destacó que el proyecto está a nivel de idea y que los recursos no reembolsables disponibles son limitados, por lo que es necesario priorizar estratégicamente la intervención a realizar.

Se resumió las similitudes y diferencias entre las tres ciudades en las que se trabajará, destacando que es un proyecto regional y que se espera que las lecciones y aprendizajes sirvan a otras ciudades costeras. Se revisó el objetivo y resultados esperados del proyecto, resaltando que en la lógica del proyecto los resultados son cambios en la situación y que los productos (e.g., número de personas capacitadas, obras de infraestructura) son elementos concretos que contribuyen a lograr los resultados. Se revisó el presupuesto y su distribución en los tres componentes y resultados esperados. También se revisó los comentarios del Secretariado del Fondo de Adaptación a la propuesta de proyecto. Se indicó que sólo está pendiente un comentario que tiene que ver con la participación de la Agencia Nacional de Implementación del Fondo de Adaptación (i.e., Agencia de Cooperación Internacional de Chile), asunto que se atenderá oportunamente. La presentación está en el Anexo 5.

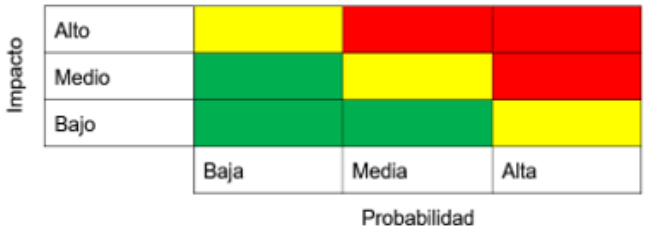
Mesas de trabajo. Análisis de situación en la ciudad de Esmeraldas

Los participantes conformaron dos grupos de trabajo que analizaron las prioridades de intervención en la ciudad. La tarea a desarrollar fue:

1. Formar dos grupos de trabajo. Designar relator.

2. Primero. Lluvia de ideas sobre riesgos derivados del probable escenario climático.

3. Segundo. Categorización de riesgos identificados en base a matriz de riesgos.



4. Tercero. Identificación de las áreas que serían más susceptibles a los principales impactos identificados [usar mapas] **40 minutos**

El grupo 1 estuvo integrado por Ericka Perdómo, Renato Tambaco, Byron Vargas, Mauricio Perea, Alfredo Quiñonez, José Maffares, Jaime Arellano, Cheo Reyes, Iván Sánches y Gissela Yunda (Foto 8).

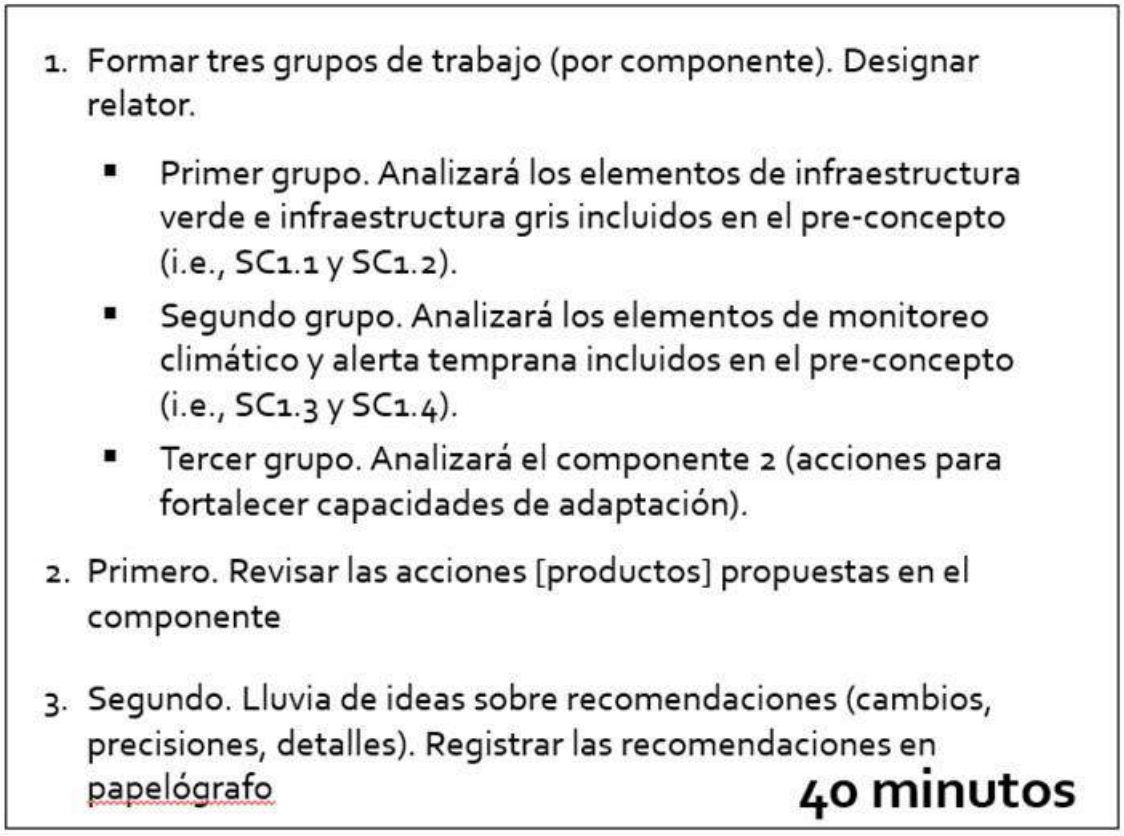
El grupo priorizó las inundaciones y los deslizamientos en las laderas como los riesgos con alta probabilidad y alto impacto (Figura 1). El incremento del nivel del mar no fue considerado un elemento a ser enfrentado en el presente proyecto.

El grupo priorizó los tres sectores más vulnerables en caso de inundación y los seis sectores más vulnerables a deslizamientos (Figura 2, Figura 3). Finalmente, el grupo priorizó que la intervención debería centrarse en el problema de inundación del sector de las islas y el problema de deslizamiento de tierra en el cerro Gatazo (barrio 20 de noviembre).

El grupo 2 también priorizó las inundaciones y deslizamiento como los riesgos de mayor probabilidad e impacto, e identificó los sectores más vulnerables de la ciudad (Foto 9, Figura 4, Figura 5). El grupo también identificó como riesgos los incendios forestales, que ocurren en la época seca y podrían agravarse con mayor temperatura, en las colinas de la ciudad y el incremento del nivel del mar. Aunque no existe suficiente conocimiento de la posible afectación por incremento del nivel del mar. El grupo priorizó siete sectores que son afectados recurrentemente por inundaciones; tres están a lo largo del trayecto del río Teaone (Figura 6). En el sector IV (donde está ubicada la planta de tratamiento de la ciudad) se destacó que, durante las crecidas de los ríos, el agua sale por las alcantarillas y los desagües de las casas (Figura 7).

Mesas de trabajo acciones para el proyecto

Los participaron conformaron tres grupos de trabajo para analizar los elementos planteados en el marco de resultados (Anexo 6). El grupo 1 se enfocó en los elementos de infraestructura verde e infraestructura gris (elementos SC 1.1 y SC 1.2), el grupo 2 se enfocó en los elementos de monitoreo climático y respuesta a emergencias (elementos SC 1.3 y SC 1.4), y el grupo 3 se enfocó en analizar el componente. La tarea a desarrollar fue:


1. Formar tres grupos de trabajo (por componente). Designar relator.
    - Primer grupo. Analizará los elementos de infraestructura verde e infraestructura gris incluidos en el pre-concepto (i.e., SC1.1 y SC1.2).
    - Segundo grupo. Analizará los elementos de monitoreo climático y alerta temprana incluidos en el pre-concepto (i.e., SC1.3 y SC1.4).
    - Tercer grupo. Analizará el componente 2 (acciones para fortalecer capacidades de adaptación).
2. Primero. Revisar las acciones [productos] propuestas en el componente
3. Segundo. Lluvia de ideas sobre recomendaciones (cambios, precisiones, detalles). Registrar las recomendaciones en papelógrafo

40 minutos

El grupo 1 estuvo integrado por Janino Carvache, Alfredo Quiñonez, Marianela Gamboa, Gissella Yunda, Nicolás Zambrano, Jaime Arellano y Raúl Chiriboga (Foto 10). El grupo planteó que las acciones de infraestructura verde podrían centrarse en reforestación de borde costero en el sector de las islas y revegetación de las laderas en zonas de deslizamiento (Figura 8). Con respecto a infraestructura gris, el grupo propuso que se centre en estabilización de las zonas de deslizamiento y muros de protección en las áreas de inundación el sector IV indicado en el mapa (Figura 7). El grupo propuso que la intervención en laderas sea integral, combinando infraestructura gris para estabilizar el terreno, infraestructura verde para proteger el terreno de las lluvias, y fortalecimiento de capacidades de los actores del sector para que actuar en caso de emergencia.

El grupo 2 estuvo integrado por Elvis Bastidas, Cheo Reyes, Patricio Caiza, José Morales, Erika Perdomo e Iván Sánchez (Foto 11). El grupo propuso colocar dos estaciones meteorológicas en la parte alta del río Teaone y en el sector de Mútile (sobre el río Esmeraldas) (Figura 9). Se discutió sobre la conveniencia de colocar estaciones convencionales o estaciones automáticas. También se propuso la opción de instalar un radar meteorológico. Se propuso

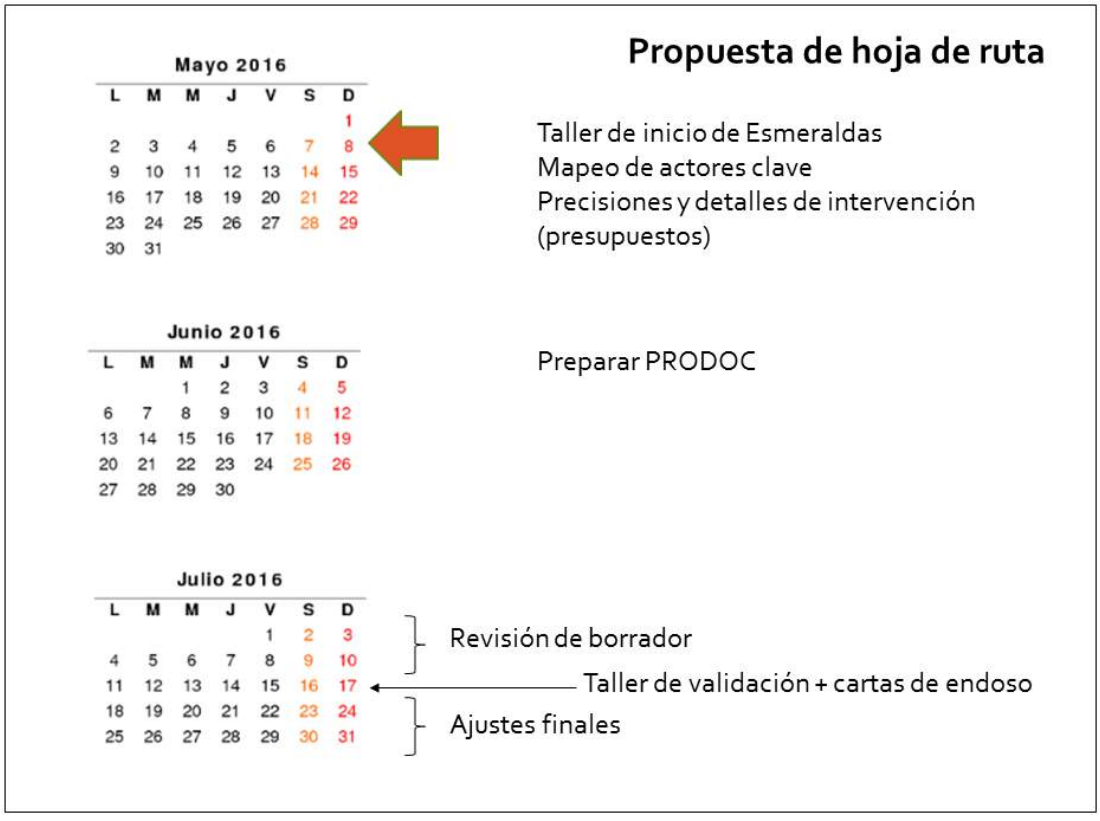
que las estaciones meteorológicas podrían estar a cargo del Consejo Provincial de Esmeraldas. Falta definir dónde se asentaría el radar meteorológico.

El grupo 2 también planteó que es necesario un sistema de radio que facilite la comunicación entre grupos de emergencia, robustecer la capacidad de reacción del cuerpo de bomberos, la señalización de las rutas de evacuación, y la adecuación de albergues.

El grupo 3 estuvo integrado por Paul Mite, Exon Bone, Milton Meza, José Maffares, Byron Vargas y Carolina Cortés (Foto 12). El grupo planteó que las acciones de formación se asienten en el sistema de educación formal por medio del Ministerio de Educación (Figura 10). No obstante, se discutió la necesidad de involucrar grupos culturales de la sociedad civil para albergar y sustentar iniciativas como los narradores y otras manifestaciones culturales como marimba y arrullos. También se planteó que el componente 2 incluya robustecer el marco político y normativo para actuar ante los asentamientos en zonas de riesgo y prevenir nuevos asentamientos.

Próximos pasos

Se propuso a los participantes la siguiente hoja de ruta:



Se explicó que en lo que resta del mes de mayo de 2016 el énfasis sería en:

(i) Mapear los actores clave de la ciudad, actividad que ya está en marcha y que enfocará en las áreas que se prioricen; y

(ii) Definir detalles como (a) áreas donde intervendrá el proyecto, (b) verificar existencia de diseños de obra, (c) definir ejecutores de los productos del proyecto, (d) mecanismo de flujo de fondos.

(iii) Establecer comunicación y colaboración entre los socios del proyecto en Chile y Ecuador.

En junio se prepararía el documento de proyecto. En la primera de julio se enviaría el documento para revisión y en la segunda semana del mes se realizaría el taller de validación, en Antofagasta y Esmeraldas, para recabar los comentarios a la propuesta de proyecto. En el taller de validación participarían los mismos actores que participaron en el taller de inicio, más otros actores o socios que se identifiquen durante la preparación del proyecto. Se mencionó que en la segunda semana de julio será necesario que se emitan las cartas de endoso de los gobiernos de Chile y Ecuador.

Finalmente, se acordó los actores clave con los que se desarrollará los elementos del proyecto:

1. Infraestructura gris y verde (SC 1.1 y SC 1.2). El punto focal será el municipio de Esmeraldas (dirección de gestión ambiental), con apoyo de la dirección provincial del Ministerio del Ambiente.
2. Monitoreo climático y respuesta a emergencias (SC 1.3 y SC 1.4). El punto focal será la prefectura de Esmeraldas, con apoyo del municipio de Esmeraldas. La prefectura deberá articular a los miembros del Comité de Operaciones de Emergencia (COE) del cantón.
3. Fortalecimiento de capacidades (componente 2). El punto focal será el municipio de Esmeraldas con apoyo del MAE y el Ministerio de Educación. El municipio deberá identificar y articular grupos de la sociedad civil.

Figuras

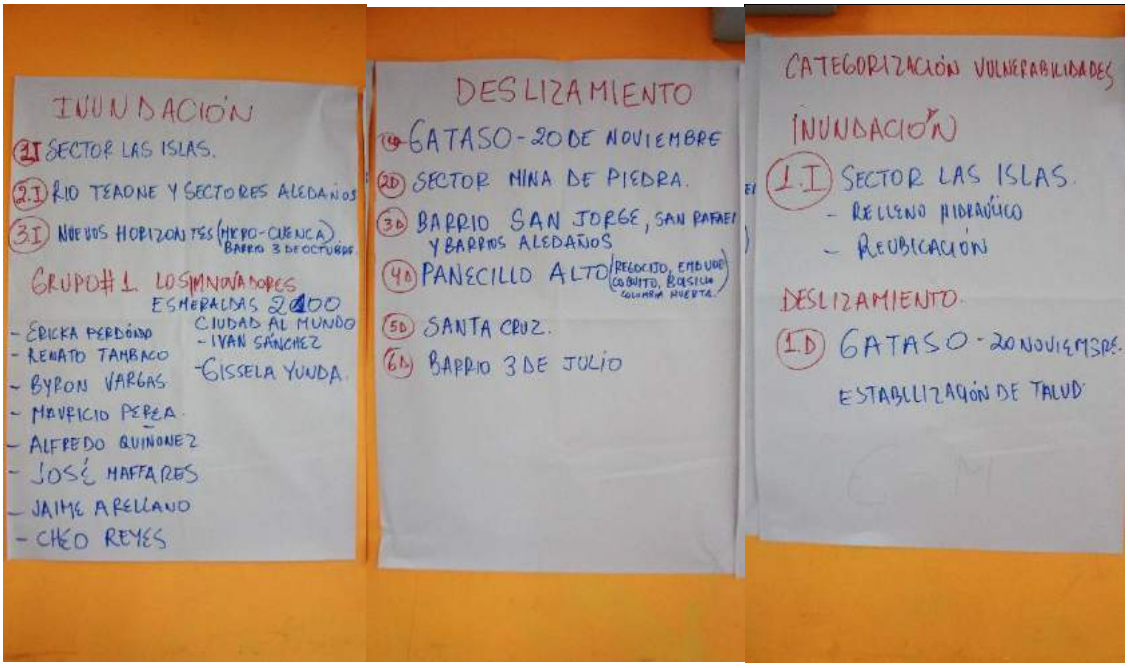


Figura 1. Resultados del trabajo del grupo 1 en la primera sesión de trabajo grupal.

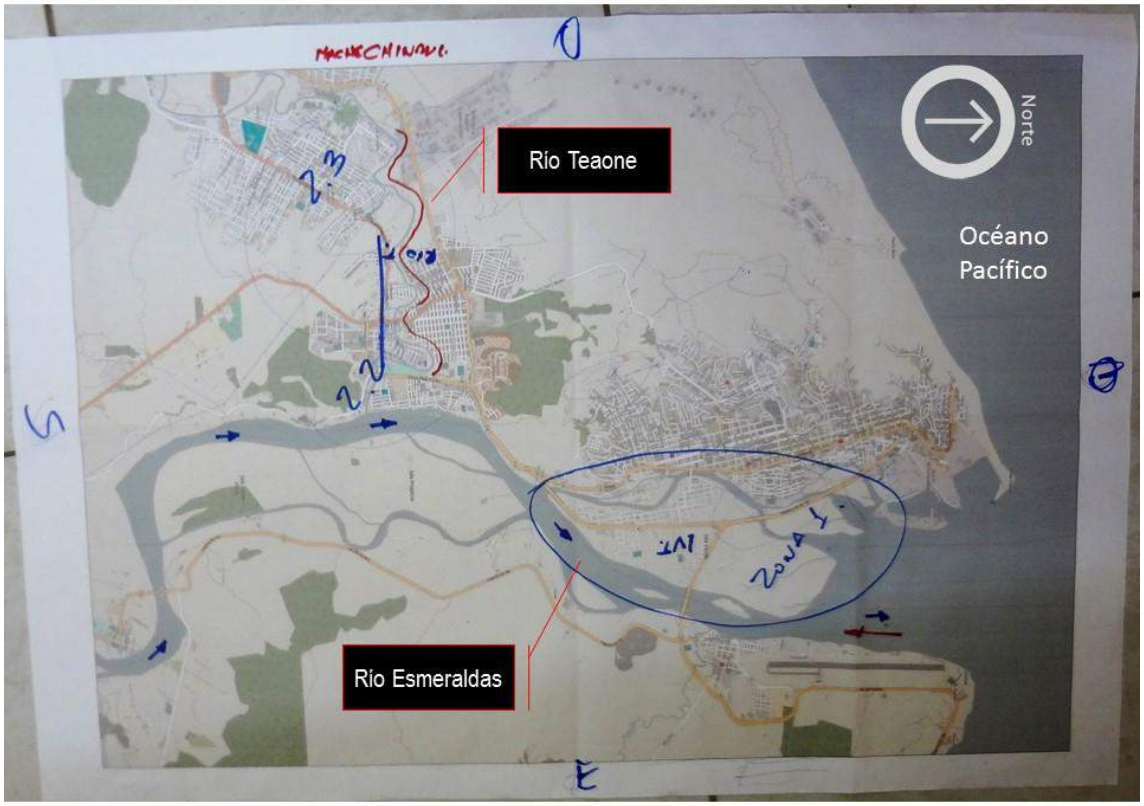


Figura 2. Zonas marcadas en el mapa de la ciudad por el grupo 1 en la primera sesión de trabajo grupal.

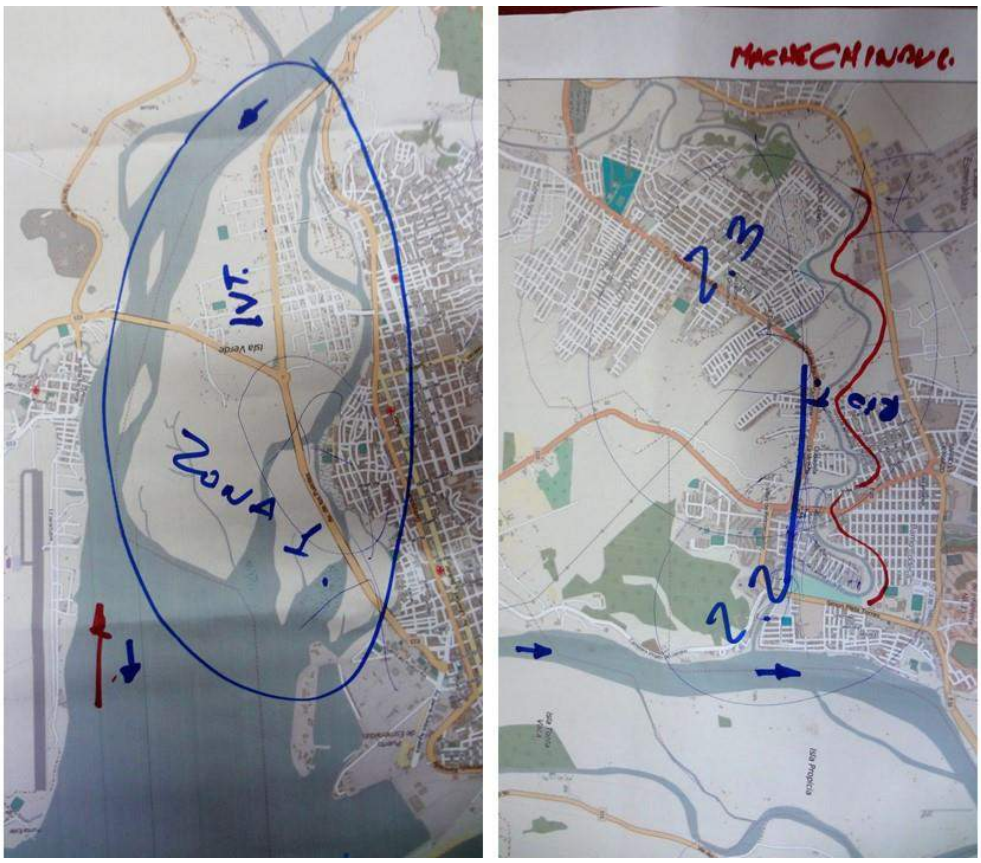
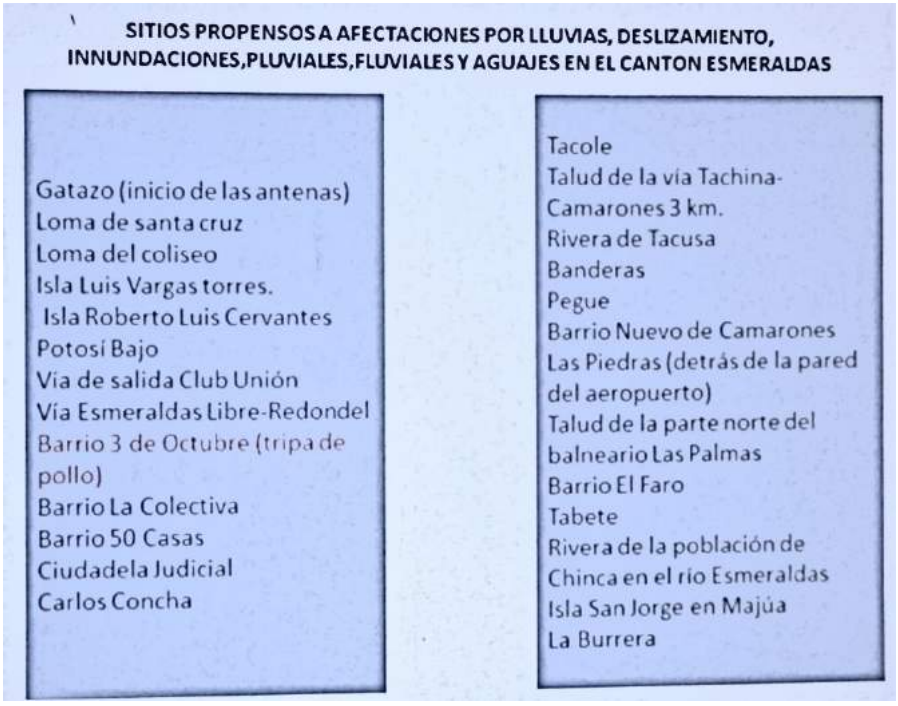


Figura 3. Detalle de las zonas marcadas en el mapa de la ciudad por el grupo 1 en la primera sesión de trabajo grupal.

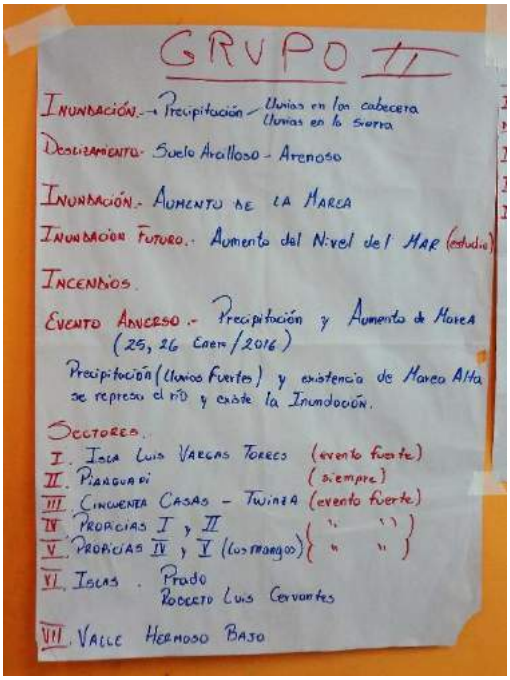


SITIOS PROPENSOS A AFECTACIONES POR LLUVIAS, DESLIZAMIENTO, INNUNDACIONES,PLUVIALES,FLUVIALES Y AGUAJES EN EL CANTON ESMERALDAS

Gatazo (inicio de las antenas)
Loma de santa cruz
Loma del coliseo
Isla Luis Vargas torres.
Isla Roberto Luis Cervantes
Potosí Bajo
Vía de salida Club Unión
Vía Esmeraldas Libre-Redondel
Barrio 3 de Octubre (tripa de pollo)
Barrio La Colectiva
Barrio 50 Casas
Ciudadela Judicial
Carlos Concha

Tacole
Talud de la vía Tachina-Camarones 3 km.
Rivera de Tacusa
Banderas
Pegue
Barrio Nuevo de Camarones
Las Piedras (detrás de la pared del aeropuerto)
Talud de la parte norte del balneario Las Palmas
Barrio El Faro
Tabete
Rivera de la población de Chinca en el río Esmeraldas
Isla San Jorge en Majúa
La Burrera

Figura 4. Sitios vulnerables listados por el grupo 2 en la primera sesión de trabajo grupal.



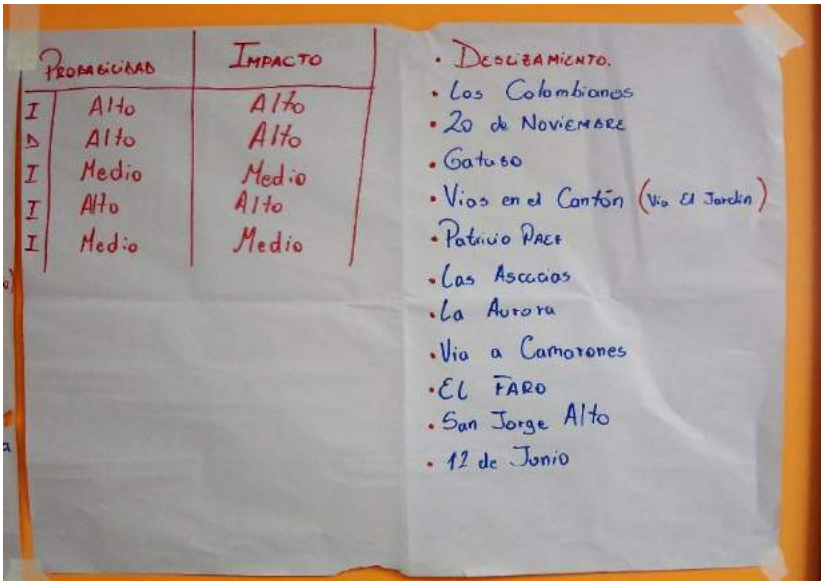


Figura 5. Resultados del trabajo del grupo 2 en la primera sesión de trabajo grupal.

Figura 6. Zonas marcadas en el mapa de la ciudad por el grupo 2 en la primera sesión de trabajo grupal.

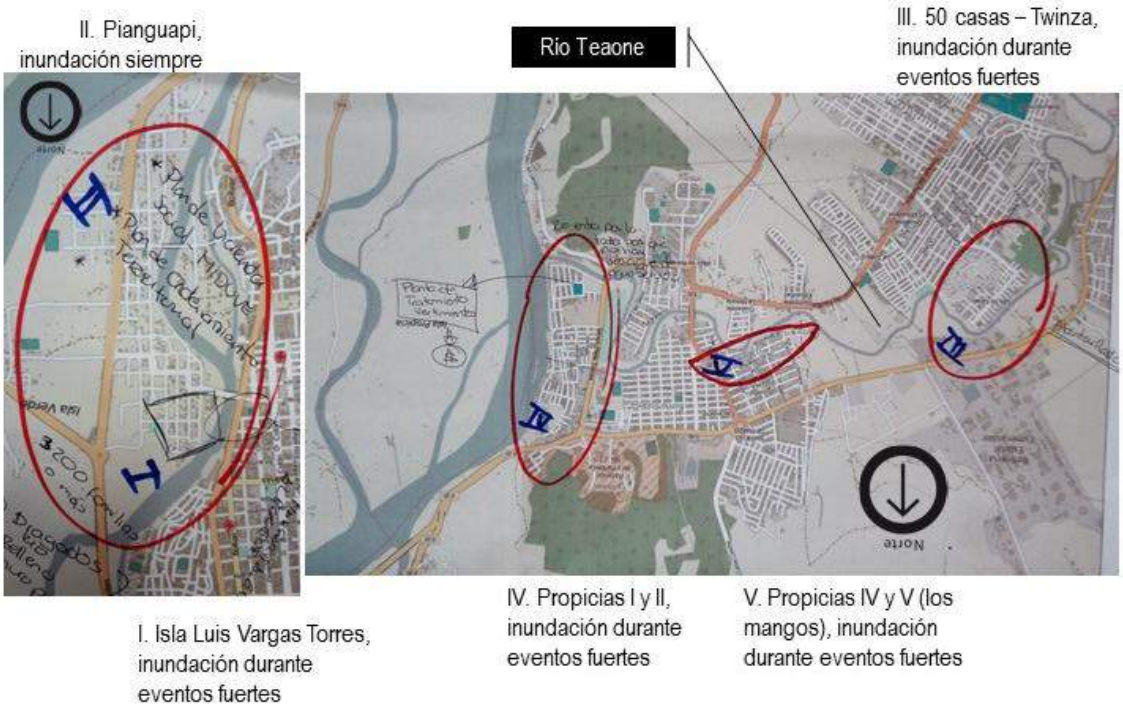


Figura 7. Detalle de las zonas de inundación marcadas en el mapa por el grupo 2 en la primera sesión de trabajo grupal.

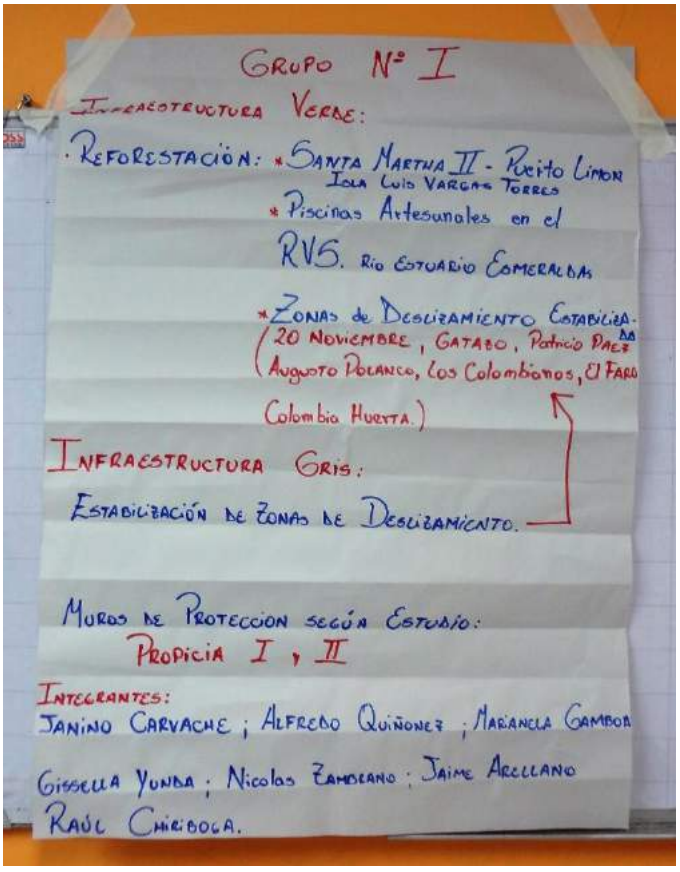


Figura 8. Resultados del grupo 1 (infraestructura verde e infraestructura gris) en la segunda sesión de trabajo grupal.

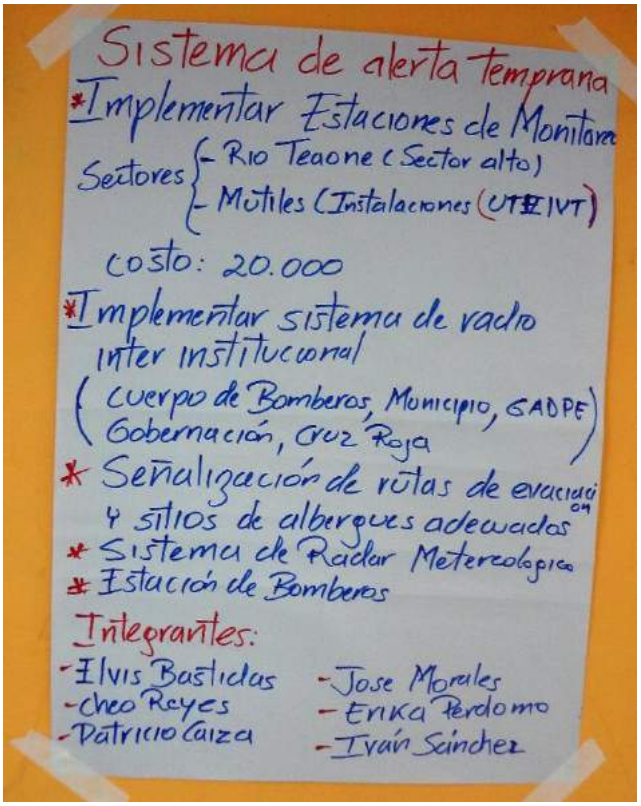


Figura 9. Resultados del grupo 2 (monitoreo climático y respuesta a emergencias) en la segunda sesión de trabajo grupal.

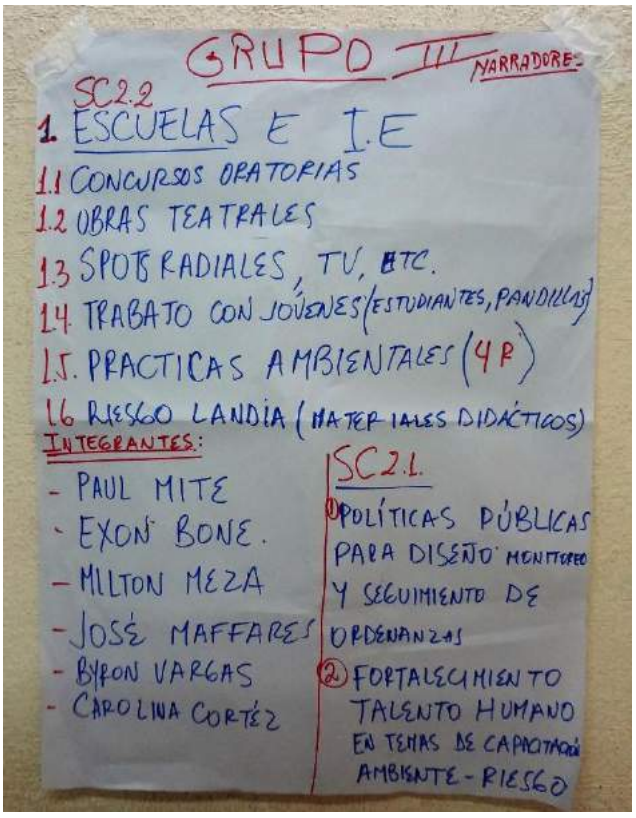


Figura 10. Resultados del grupo 3 (capacidades de los actores locales) en la segunda sesión de trabajo grupal.

Fotos

Foto 1. Bienvenida a cargo de Guillermo Oleas de la Dirección Provincial de Esmeraldas del Ministerio del Ambiente.

Foto 2. Bienvenida a cargo de Renato Tambaco, Director de Gestión Ambiental del Municipio de Esmeraldas.

Foto 3. Bienvenida a cargo de Carolina Cortés de CAF.

Foto 4. Presentación de Nicolás Zambrano (arriba) y Diego Guzmán (abajo) de la Dirección de Adaptación al Cambio Climático del MAE.

Foto 5. Presentación del Municipio de Esmeraldas a cargo de Renato Tambaco, director de gestión ambiental.

Foto 6. Presentación de Carolina Cortés de CAF.

Foto 7. Uriel Castillo (director provincial del MAE) y Diego Guzmán (director de adaptación al cambio climático del MAE).

Foto 8. Primera sesión de trabajo, grupo 1.

Foto 9. Primera sesión de trabajo, grupo 2.

Foto 10. Segunda sesión de trabajo, grupo 1 enfocado en infraestructura verde e infraestructura gris (componente 1) del proyecto.

Foto 11. Segunda sesión de trabajo, grupo 2 enfocado en monitoreo climático y respuesta a emergencia (componente 1) del proyecto.

Foto 12. Segunda sesión de trabajo, grupo 3 enfocado en el componente 2 del proyecto.

Anexo 1. Registro de participantes

Taller inicial

Formulación Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Ciudad de Esmeraldas, 16 de mayo de 2016

POR FAVOR ESCRIBIR EN LETRA DE IMPRENTA

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Cheo Reyes	C.B.E.	Subt. Bomberos	"	0967948852	Ismael2312@Gmail.com
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1

Ministerio del Ambiente

Taller inicial

Formulación Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Ciudad de Esmeraldas, 16 de mayo de 2016

BANCO DE DESARROLLO DE AMÉRICA LATINA

POR FAVOR ESCRIBIR EN LETRA DE IMPRENTA

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EXON BONE LASSO Exon Bone Lasso	Barrio 12 de Mayo	Presidente	ESMERALDAS	0994024172	Escuela Leonidas Ortiz @outlook.es
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Taller inicial

Formulación Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Ciudad de Esmeraldas, 16 de mayo de 2016

POR FAVOR ESCRIBIR EN LETRA DE IMPRENTA

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Potrerón Corozo Duarte	GADME	Responsable de Riesgo	Esmeraldas	0985429193 ~~280~~	Pegi2002@hotm...es

3

Ministerio del Ambiente

Taller inicial

Formulación Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Ciudad de Esmeraldas, 16 de mayo de 2016

CAF BANCO DE DESARROLLO DE AMÉRICA LATINA

POR FAVOR ESCRIBIR EN LETRA DE IMPRENTA

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José Mafares	Dirg. Barrial	Presidente	ESMERALDAS	0968585633	José.mafares@hotmail.com
Byron Real	CAF	Consultor	Quito	0985658252	byronvreal@gmail
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Ministerio del Ambiente

Taller inicial

Formulación Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Ciudad de Esmeraldas, 16 de mayo de 2016

CAF BANCO DE DESARROLLO DE AMÉRICA LATINA

POR FAVOR ESCRIBIR EN LETRA DE IMPRENTA

Nombre	Entidad	Cargo	Ciudad	Teléfono(s)	Correo electrónico
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Marianela Santana	29 de agosto Isla bogotá	Presidente	Esmeraldas	0990598934	

Ministerio del Ambiente

Adaptación al cambio climático y medidas planteadas

Anexo 2. Presentación sobre cambio climático y adaptación en Ecuador y las medidas de adaptación propuestas en el pre-concepto de proyecto

16 mayo 2016 – DNACC-SCC

Contenidos

1. Cambio climático y la adaptación
2. Principales riesgos/impactos zonas costeras y adaptación
3. Escenarios de cambio climático para Esmeraldas
4. Principales impactos esperados en ciudad de Esmeraldas
5. Medidas de adaptación identificadas en la propuesta para el Fondo de Adaptación
6. Marco Político e Institucional
7. Estrategia Nacional de Cambio Climático
8. Proyectos de adaptación
9. Preguntas y comentarios

Cambio climático y la adaptación

Cambio climático

Un cambio de clima atribuido directa a la actividad humana que altera la composición de la atmósfera mundial y que se suma a la variabilidad natural del clima observada durante periodos de tiempo comparables.

Variabilidad climática

La variabilidad es la repetición cíclica de anomalías climáticas que se dan cuando se presentan oscilaciones en las condiciones normales o patrones climáticos establecidos. Un ejemplo típico de variabilidad climática en el Ecuador son los fenómenos de El Niño y La Niña, los cuales presentan un incremento o disminución de la precipitación, respectivamente.

Cambio climático y la adaptación

Adaptación al cambio climático

"Proceso de ajuste al clima real o proyectado y sus efectos. En los sistemas humanos, la adaptación trata de moderar o evitar los daños o aprovechar las oportunidades beneficiosas. En algunos sistemas naturales, la intervención humana puede facilitar el ajuste al clima proyectado y a sus efectos" IPCC, 2014

Principales riesgos/impactos zonas costeras y adaptación

Incremento del nivel del mar (mayor riesgo de inundación)

Incremento de la temperatura del mar (pérdida de fauna y flora)

Cambios en precipitación y caudales en zonas costeras

Cambios en corrientes oceánicas (cambio en pesquerías)

Variación en duración e intensidad de tormentas, fenómeno de El Niño, La Niña, etc. (inundaciones o sequías)

Pérdida de perfil costero (desplazamiento de comunidades)

Escenarios de cambio climático para Esmeraldas

Precipitación.

- Estación Teaone.
- Escenario RCP 6.0 para el periodo 2011-2040 incremento del 7,33% en precipitación anual
- Escenario RCP 6.0 para el periodo 2041-2070 incremento del 12,05% en precipitación anual

Temperatura

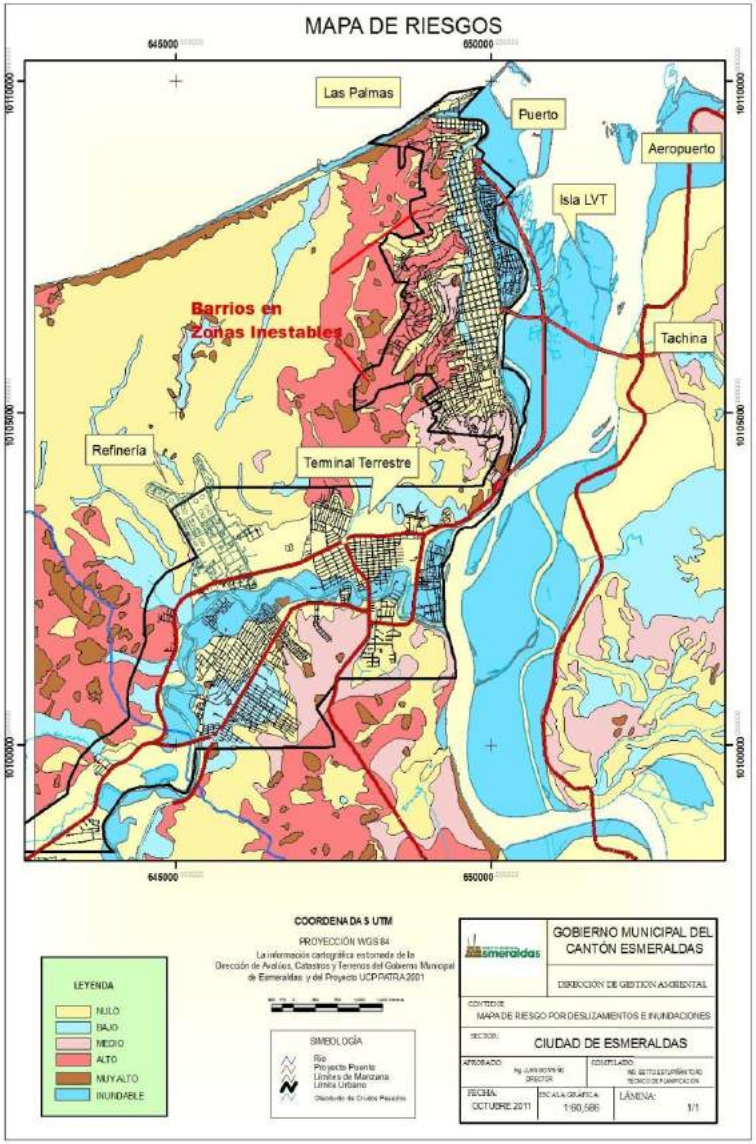
- Estación La Concordia

Escenario RCP 6.0 para el periodo 2011-2040 incremento del 0,76°C en temperatura promedio anual

Escenario RCP 6.0 para el periodo 2041-2070 incremento del 1,49°C en temperatura promedio anual

Fuente: TCN-MAE, 2016

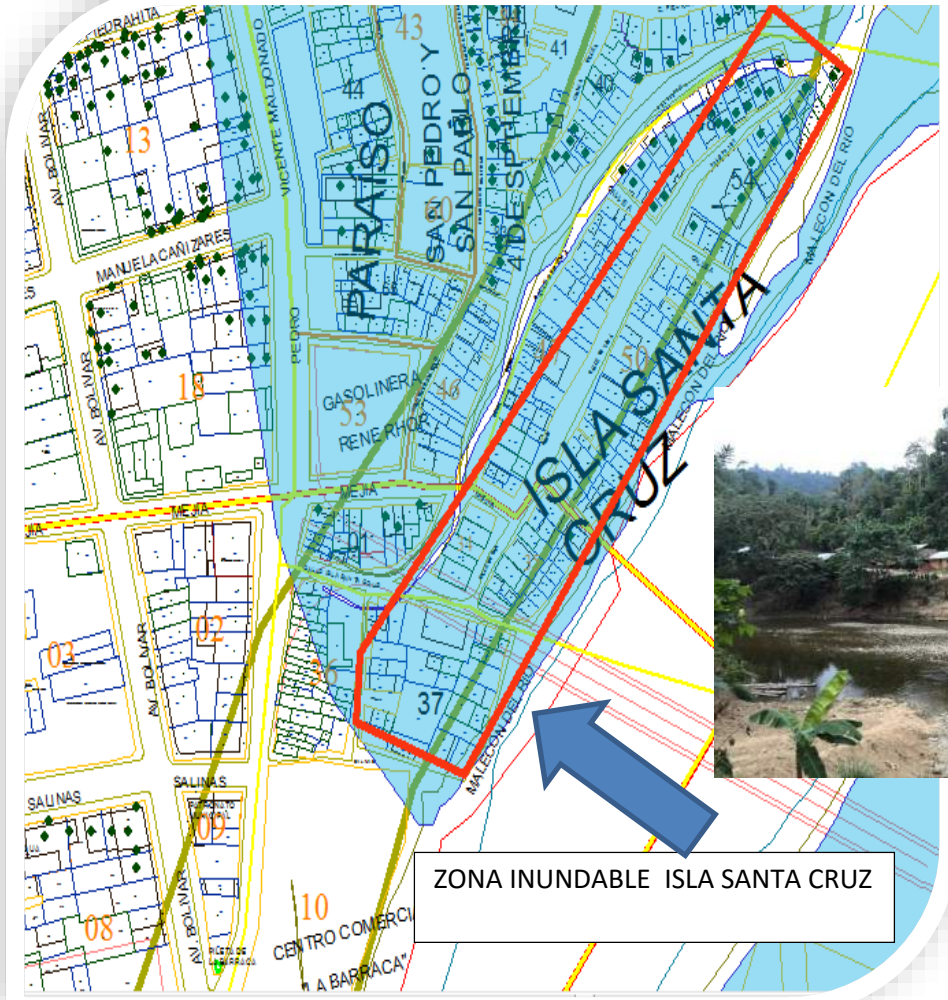
Principales impactos esperados en ciudad de Esmeraldas

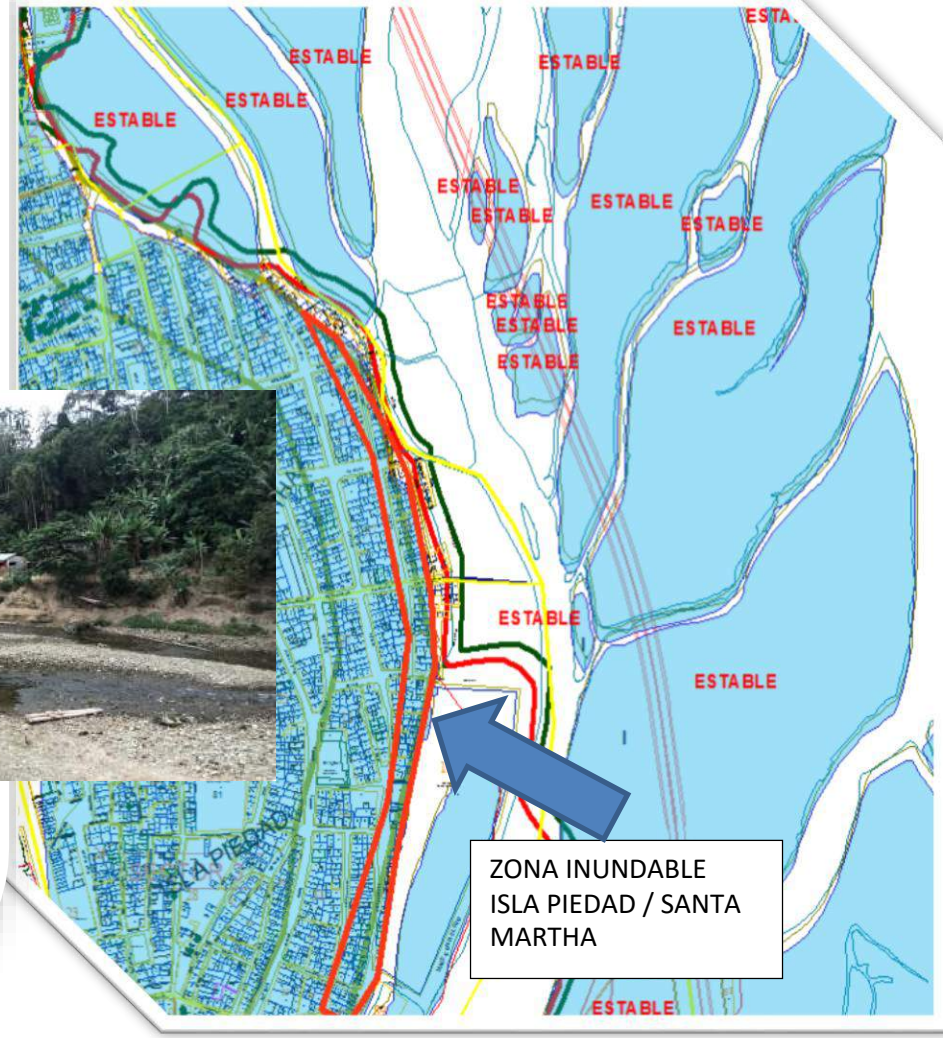


En la actualidad Esmeraldas tiene alto riesgo a fenómenos de inundaciones y deslizamientos

Mayor precipitación ocasionada por el CC puede incrementar las zonas de riesgo a estos fenómenos en la ciudad

Principales impactos esperados en ciudad de Esmeraldas





PUNTOS VULNERABLES DE INUNDACIONES Y DESLIZAMIENTO DEL CANTON ESMERALDAS

Medidas de adaptación identificadas en la propuesta del Fondo de Adaptación

Medidas de adaptación preliminares identificadas para la ciudad de Esmeraldas

1. Mejoramiento de red de monitoreo hidrometeorológico (caudales, precipitación y temperatura)
2. Protección de ecosistemas remanentes (bosques y manglares)
3. Desarrollo de infraestructura verde en la ciudad
4. Trabajos de mitigación en zonas de riesgo de deslizamientos
5. Construcción de infraestructura para control de escorrentía en microcuencas
6. Fortalecimiento de los comités de respuesta de emergencia
7. Mejora de la capacidad de adaptación del gobierno local y de la ciudadanía
8. Incrementar la preparación de la ciudadanía para responder a eventos extremos climáticos

Marco político e institucional

CONSTITUCIÓN 2008

Art. 414

PNBV 2013 - 2017

Política: 7.10

DECRETOS EJECUTIVOS

D.E. 1815
D.E.495

POLÍTICA AMBIENTAL NACIONAL

Política 3

ACUERDOS MINISTERIALES

Es la política integral que guía la lucha contra el de cambio climático con un horizonte al 2025. Una herramienta fundamental para trasversalizar la gestión desde las distintas instituciones del Estado (desde *el sector ecosistemas, agricultura, agua y energía)*

Espacios de articulación

Ministerio del Ambiente

Subsecretaría de Cambio Climático

Dirección Nacional de Adaptación

Dirección Nacional de Mitigación

Plan Nacional de Cambio Climático

Plan Nacional de Cambio Climático

4 SECTORES

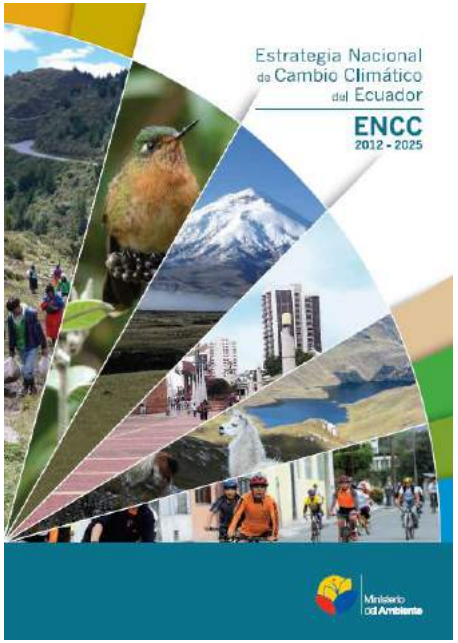
2 Ejes Transversales

- FORTALECIMIENTO DE CAPACIDADES
- FINANCIAMIENTO

Estrategia Nacional de Cambio Climático

Para el periodo 2012-2015. Objetivos de la ENCC. Adaptación

Objetivo general	Crear y fortalecer la capacidad de los sistemas social, económico y ambiental para afrontar los impactos del cambio climático.
Objetivos específicos	Implementar medidas que garanticen la soberanía alimentaria frente a los impactos del cambio climático.
	Iniciar acciones para que los niveles de rendimiento de los sectores productivos y estratégicos, así como la infraestructura del país no se vean afectados por los efectos del cambio climático.
	Implementar medidas de prevención para proteger la salud humana frente a los impactos del cambio climático.
	Manejar el patrimonio hídrico con un enfoque integral e integrado por Unidad Hidrográfica, para asegurar la disponibilidad, uso sostenible y calidad del recurso hídrico para los diversos usos humanos y naturales, frente a los impactos del cambio climático.
	Conservar y manejar sustentablemente el patrimonio natural y sus ecosistemas terrestres y marinos, para contribuir con su capacidad de respuesta frente a los impactos del cambio climático.
	Tomar medidas para garantizar el acceso de los grupos de atención prioritaria y de atención prioritaria a recursos que contribuyan a fortalecer su capacidad de respuesta ante los impactos del cambio climático.
	Incluir la gestión integral de riesgos frente a los eventos extremos atribuidos al cambio climático en los ámbitos y actividades a nivel público y privado.
	Implementar medidas para incrementar la capacidad de respuesta de los asentamientos humanos para enfrentar los impactos del cambio climático.



ADAPTACIÓN

Incorporación de criterios de adaptación para reducir la vulnerabilidad nacional frente al cambio climático

Espacios de articulación

COMITÉ INTERINSTITUCIONAL DE CAMBIO CLIMÁTICO

* Miembros adhoc: SENESCYT y Ministerio Coordinador de la Política Económica (MCPEC)

Comité liderado por el Ministerio del Ambiente

- Órgano de alto nivel para coordinación de políticas y medidas para el cambio climático
- Los miembros de este comité son Ministros y Secretarios de Estado
- La Subsecretaría de Cambio Climático actúa como secretaría técnica

Instrumentos para la transversalización

Subsecretaría de Cambio Climático

Lidera la gestión del cambio climático

Para cumplir con el mandato de transversalizar la gestión del cambio climático, el Ministerio del Ambiente cuenta con los siguientes instrumentos:

Gestión frente al cambio climático

Medidas de Adaptación

Acciones encaminadas a reducir la vulnerabilidad y aumentar la resiliencia de la población frente al cambio climático.

- Manejo de cuencas hidrográficas
- Seguridad/soberanía alimentaria
- Gestión de recursos hídricos
- Protección de ecosistemas

Cambio de Matriz Productiva y Matriz Energética Estrategia para la erradicación de Pobreza

Eje transversal: Fortalecimiento de capacidades y gestión de riesgos

Iniciativas de Mitigación

Acciones encaminadas a reducir la emisión de gases de efecto invernadero y aumentar las fuentes de captura de carbono (sumideros).

- Energía renovable
- Eficiencia energética
- Ahorro y uso racional de la energía
- Agricultura y ganadería sostenible
- Conservación y manejo de bosques

Guía técnica

Apoyo a gobiernos locales para su preparación frente al Cambio Climático

Apoyo para la incorporación de criterios de cambio climático en planes de desarrollo local

Guía Técnica para incluir Cambio Climático en GAD

Guía Explicativa que constituye un apoyo a los GADs para la aplicación de los Lineamientos Generales para Planes, Programas y Estrategias de Cambio Climático.

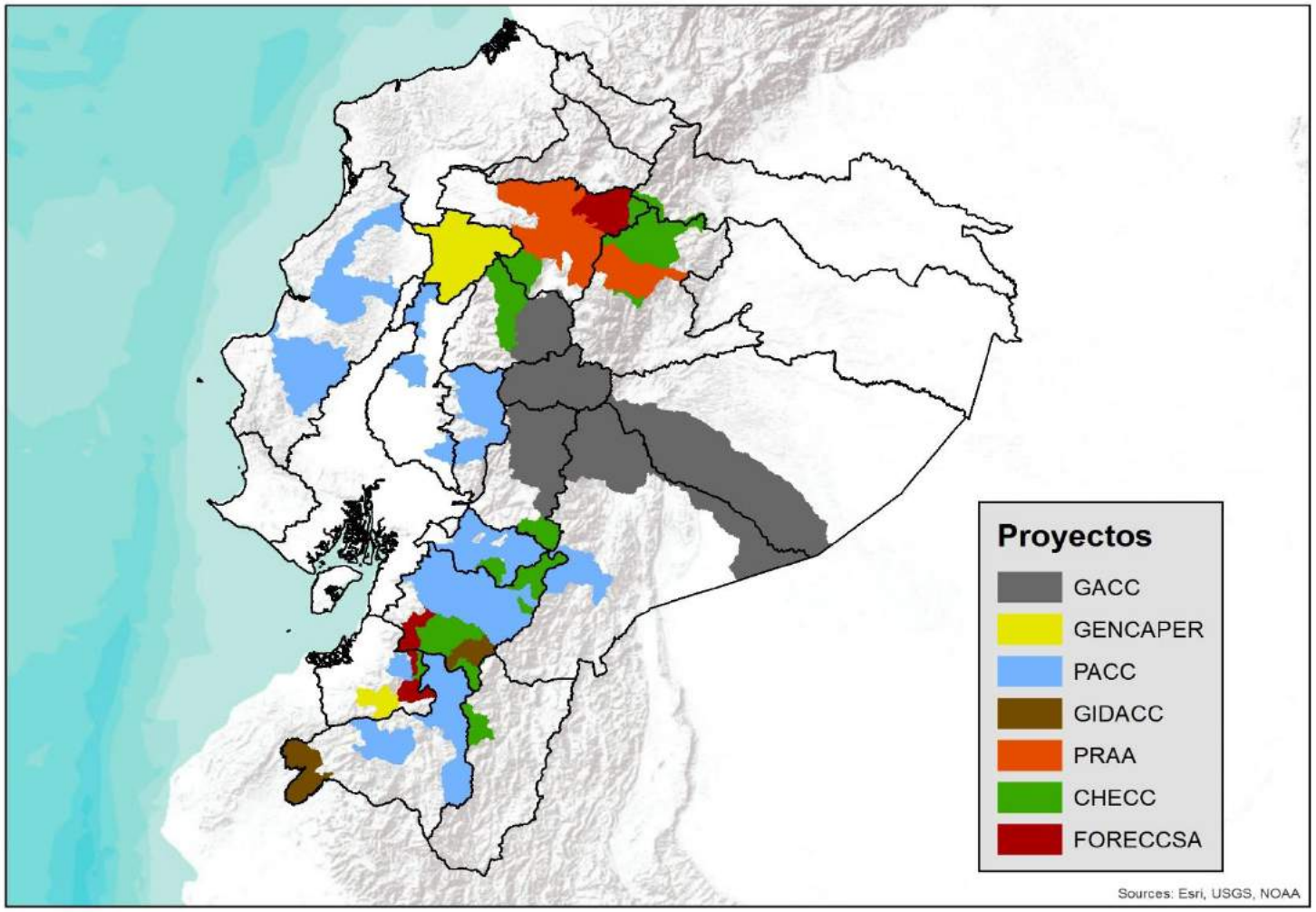
Acuerdos Ministeriales: 095. 137

- ✓ Apoyar a los GAD en el desarrollo de planes, programas y estrategias de cambio climático en sus respectivas jurisdicciones, tomando en cuenta sus competencias y capacidades.
- ✓ Construir a partir del trabajo ya efectuado por los GADs en la formulación y actualización de sus PDOT.

Resultado: 2 Estrategias aprobadas, 5 planes en fase de aprobación, 35 GAD capacitados en temas de inclusión de cambio climático en los PDOT (12 GAD cantonales, 4 GAD Provinciales y 18 parroquiales) y se capacitaron aproximadamente 300 técnicos.

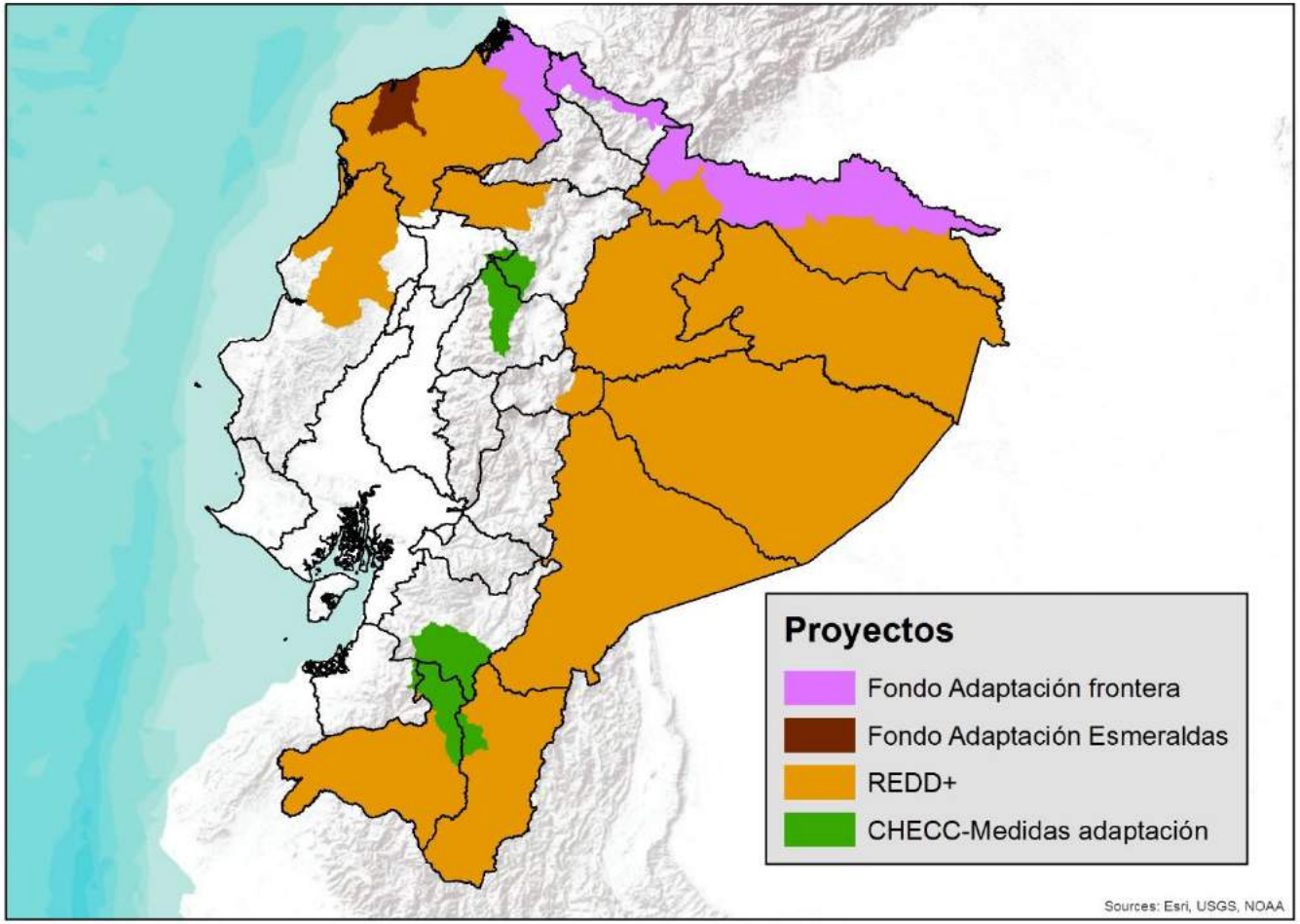
Proyectos de adaptación

Sitios de intervención de la Subsecretaría de Cambio Climático. MAE.



Proyectos por Ejecutar

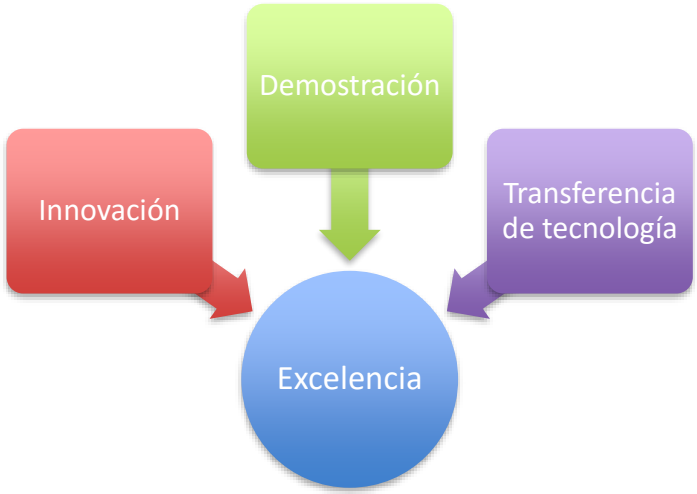
Sitios de intervención planificada Subsecretaría de Cambio Climático. MAE.



Una Visión


PACC
PRAA
GIDDACC
FORECCSA
Soluciones basadas en la Naturaleza
Soluciones Climáticas
Los Ciudadanos se adaptan al Cambio Climático
Proyectos
Adaptación al Cambio Climático
PROGRAMA DE INVERSIÓN CLIMÁTICA

Una Visión



TERRITORIO
Diversidad Flora y Fauna
Diversidad Climática
Diversidad Cultural

EXPERIENCIA
Proyectos territoriales
Soberanía Alimentaria
Género
Cuencas hidrológicas estratégicas
Gobernanza del Agua
Retroceso de Glaciares
Desertificación
Planificación Local

REFERENCIA
Laboratorio Territorial “Living Lab”
Centro de innovación – YACHAY
Financiamiento Climático
FVC – GEF – AF


GRACIAS
Ministerio
del Ambiente

ESTRATEGIAS DE REDUCCIÓN DE LA VULNERABILIDAD CLIMÁTICA Y RIESGO DE INUNDACIONES EN ÁREAS COSTERAS URBANAS Y SEMIURBANAS EN LA CIUDAD Y CANTÓN DE ESMERALDAS


Esmeraldas
Ciudad Al Mundo

ESMERALDAS - GADMCE

- Coordenadas:
  - 1°03'N 79°12'O - 1°03'N 79°12'O
- **Cabecera Cantonal:** Esmeraldas
- **Idioma Oficial:** Español
- **País:** Ecuador
- **Provincia:** Esmeraldas
- **Alcalde:** Dr. Lenin Lara
- **Superficie:** 135 1 Km2
- **Clima:** *de 20 a 35°C*
- **Población:** *189504 (2010)*

PARROQUIAS

Parroquias rurales

- Tabiazo
- Tachina
- Vuelta Larga
- Camarones
- Chinca
- Carlos Concha
- Majua
- San Mateo

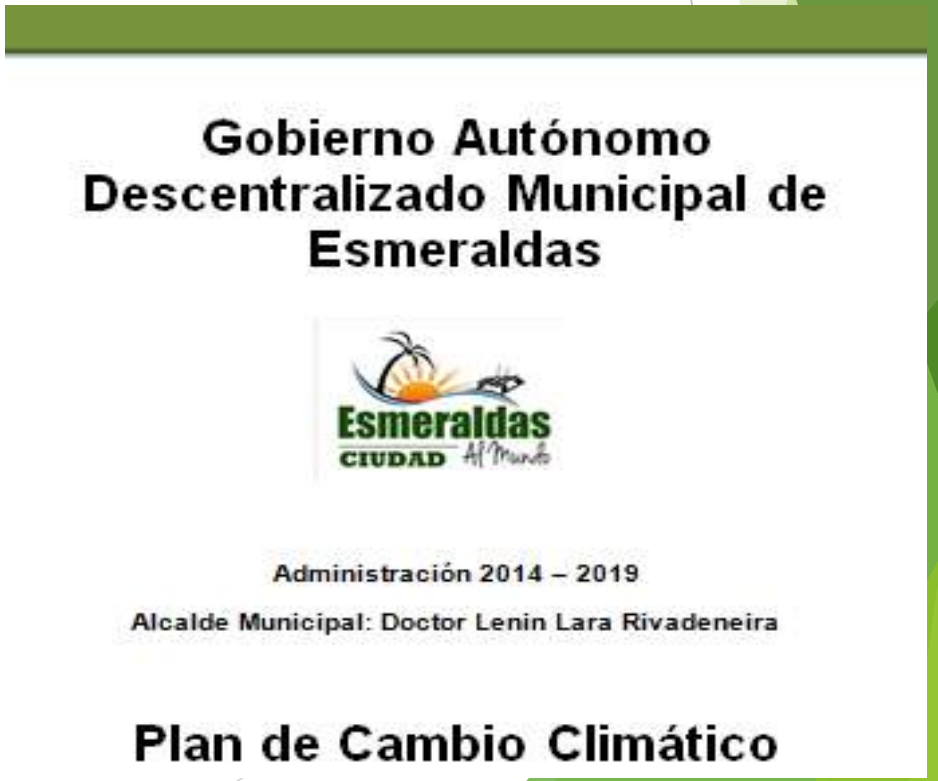
Parroquias urbanas

- 5 de Agosto
- Bartolomé Ruíz
- Esmeraldas
- Luis Tello
- Simón Plata

PROYECTOS EMBLEMÁTICOS

- ✓Agua potable
- ✓Malecón Rio Esmeraldas
- ✓Malecón playa las palmas
- ✓Asfaltado y hormigonado de vías
- ✓Proyecto de reforestación
- ✓Proyecto de reubicación
- ✓Proyectos de recuperación de Cuencas Hídricas
- ✓Proyectos de manejo de desechos sólidos

AMENAZAS IDENTIFICADAS EN EL PLAN DE CAMBIO CLIMÁTICO DEL GADME



AMENAZAS

Incremento de precipitación extrema

Incremento de Temperatura

Componente: Asentamientos Humanos		
Amenaza	Sector/Componente	Descripción
Incremento de precipitación extrema	Acceso a servicios básicos	Las lluvias extremas en la ciudad ocasionan el colapso de la red de alcantarillado
		Las captaciones de agua sufren contaminación por exceso de lluvia y colapsa la infraestructura de la misma
	Servicios de salud	El aumento de precipitación y el mal manejo de aguas en la ciudad generan la proliferación de vectores
	Transporte y movilización	Las vías son afectadas por deslizamientos por exceso de precipitación
	Acceso a educación	La infraestructura de las escuelas se ve afectada lo que perjudica a los alumnos

Componente: Biofísico		
Amenaza	**Sector/Componente**	**Descripción**
Incremento de Temperatura	Agua	Afecta a la cantidad y calidad del recurso diferenciando por tipo de uso
	Suelo	Cambio en los componentes físicos, químicos y biológicos del suelo
	Bosques protectores y áreas protegidas	Los sistemas frágiles se ven afectados. Aumento de riesgos de incendios forestales
	Biodiversidad	Desplazamiento de especies sensibles a aumento de temperatura hacia zonas más frías.

Proyecto	Medida
Fomentar la plantación de especies nativas alrededor de la ciudad de Esmeraldas para estabilización de taludes, regulación climática	Establecimiento de criterios técnicos y climáticamente inteligente para implementar el proyecto de plantaciòn de especies nativas.
	Generación de un sistema de monitoreo y seguimiento enfocado en aumentar la resiliencia de las especies nativas sembradas.
Manejo de zonas de amortiguamiento mediante re vegetación del área industrial de Esmeraldas (Refinería, Termo esmeraldas, CODESA y SUIMBA)	Establecimiento de criterios técnicos y climáticamente inteligente para implementar la reforestación con especies resistentes al aumento de temperatura e incremento de precipitaciones extraordinarias
	Generación de un sistema de monitoreo y seguimiento enfocado en reducir las **vulnerabilidades sociales y ambientales** de las poblaciones cercanas al área industrial, como estaciones automatizadas de monitoreo para el control de la calidad del aire
Fortalecimiento de la Gestión del Riesgo	Programa para fortalecer la institucionalidad de la gestión de riesgo en el Cantón de Esmeraldas con enfoque de cambio climático: – Generación de conocimiento sobre las amenazas y vulnerabilidades climáticas y no climáticas en el cantón. – Monitoreo de las amenazas climáticas y no climáticas identificadas – Desarrollo de **sistemas y herramientas** que permitan **pronosticar los fenómenos catastróficos y potencialmente destructores** de origen climático en el cantón – Socialización de procesos
Normas y regulaciones de los servicios turísticos de playa	Generación de normas y regulaciones del uso de suelo con criterios de cambio climático que permitan aumentar la capacidad de adaptación de los sistemas y servicios relacionados al sector turismo en zonas de playa.
Ordenanzas para la regularización de asentamientos humanos en las cuencas hidrográficas, playas y zonas de alto riesgo	Generación de ordenanzas para disminuir la vulnerabilidad de los asentamientos humanos en playas, cuencas hidrográficas zonas de alto riesgo a través de políticas públicas

Esmeraldas Ciudad Al Mundo

Adicionalmente, se evidenció una oportunidad para trabajar en regular los asentamientos humanos específicamente los ubicados en cuencas hidrográficas, playas y zonas de alto riesgo. Estas zonas son muy vulnerables a las inundaciones y al aumento de precipitación.

GRACIAS POR SU ATENCIÓN

BANCO DE DESARROLLO DE AMÉRICA LATINA

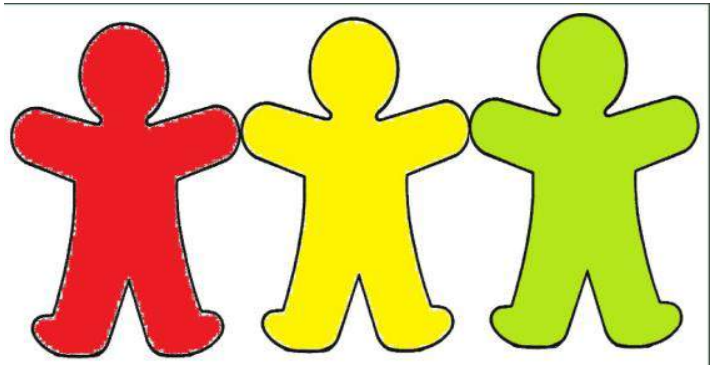
Programa de Adaptación al Cambio Climático

Dirección de Ambiente y Cambio Climático
Unidad de Cambio Climático

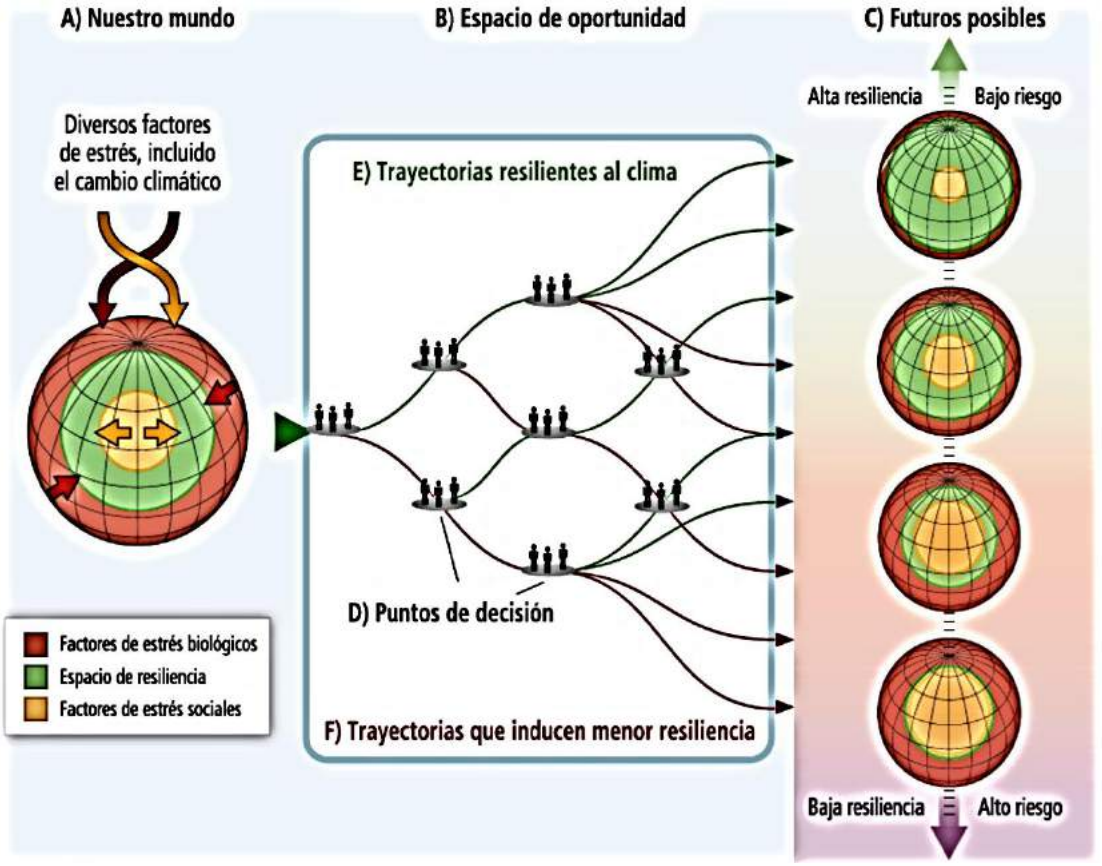
CAMBIO CLIMÁTICO

A nivel mundial la temperatura ha aumentado 0.13˚ C por cada década

En el periodo 1880 – 2012, el promedio de la temperatura a nivel global ha aumentado 0.85˚ C.



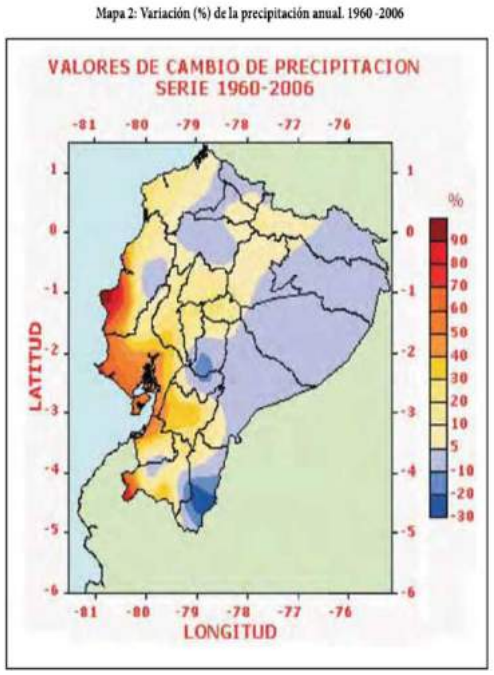
Para un ser humano:
1˚ C es tener fiebre = 37˚ C
2˚ C es estar enfermo = 38˚ C
3˚ C es una urgencia = 39˚ C



Circunstancias Nacionales Ecuador

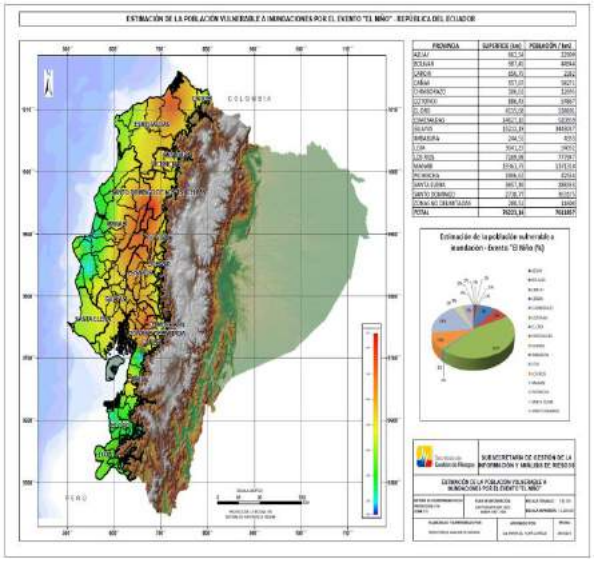
Según el inventario nacional de GEI para en año 2010 Ecuador emitió 71,8 millones tonelada CO2 eq.

Cambio en las Precipitaciones

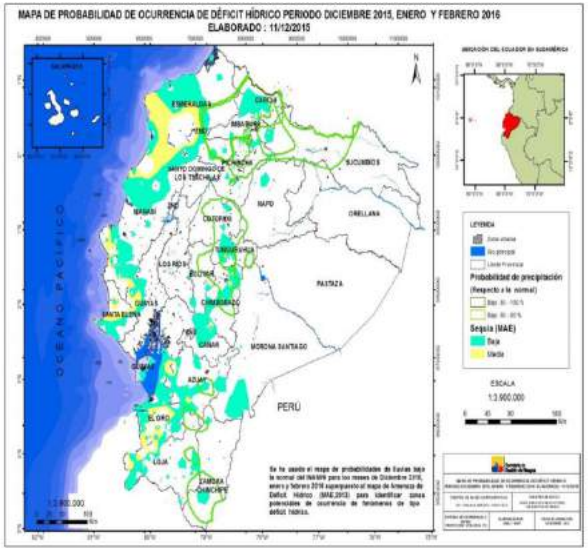


Fuente: INAMHI, 2007

Población Vulnerable a Inundaciones



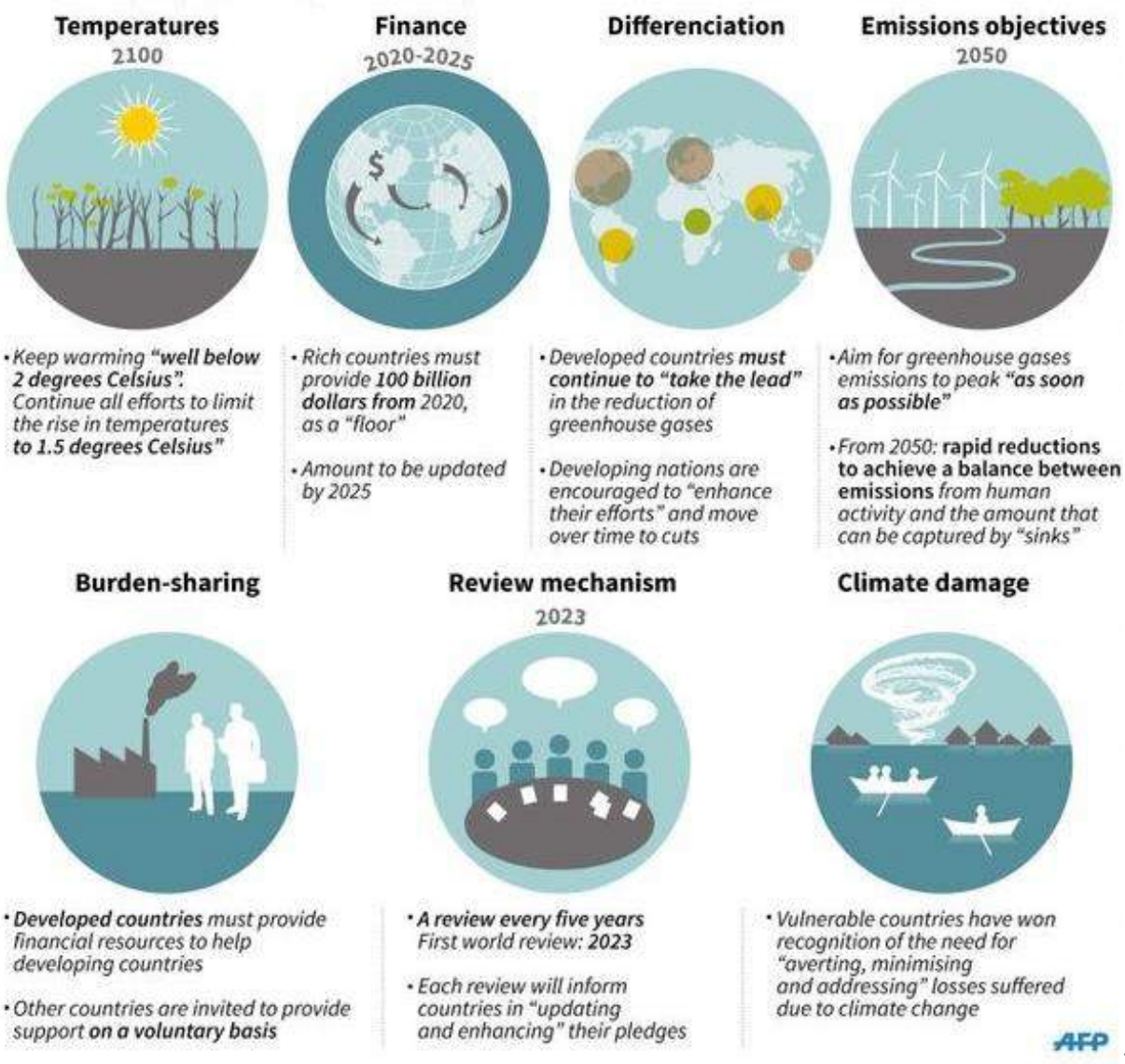
Áreas Afectación por Sequia



BANCO DE DESARROLLO DE AMÉRICA LATINA

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

Acuerdo de Paris



Tomado de: http://www.lowcarbonfuture.es/

Acuerdo histórico, aprobado por 195 países y firmado por 175 el pasado 22 de abril.

Entrará en vigor en 2020 y una vez sea ratificado por el 55% de los países.

Contribuciones Nacionales Determinadas

NDC - Nationally Determined Contributions *son los compromisos de reducción de emisiones y acciones de adaptación que cada país presentó previo a la COP21, de manera voluntaria y de acuerdo a sus realidades.*

Principales medidas

- Energías renovables y eficiencia energética
- Protección de los bosques
- Buenas prácticas agrícolas
- Transporte limpio
- Gestión de residuos
- Mejora de procesos industriales

Fuente: http://www.diversidadbioculturalyterritorios.org/pg.base.php?id=7&id_news=258&lang=es

DACC

Ambiente y Cambio Climático

Contribución Nacional Determinada - Mitigación

- Ecuador representa el 3.027% de las emisiones totales de gases de efecto invernadero GEI en la región América Latina y el Caribe.
- Según el inventario nacional de GEI para los sectores del IPCC en el año 2010 Ecuador emitió 71,8 millones t CO2 eq. De este valor, los sectores de mayor incidencia en las emisiones totales del país son Energía (50%) y AFOLU (Agricultura, Silvicultura y otros usos del suelo) (43%).
- Compromiso: Ecuador se comprometió a reducir en un 25% las emisiones de gases de efecto invernadero del sector energía.
- Dependiendo del apoyo financiero internacional, Ecuador se compromete de manera condicionada a reducir sus emisiones hasta en un 45%.

SI	Energía renovable
SI	Eficiencia Energética
SI	Agropecuario
SI	LULUCF
NO	Transporte
NO	Industria
NO	Construcción
NO	Residuos

DACC

Ambiente y Cambio Climático

Contribución Nacional Determinada - Adaptación

Compromiso: Plan Nacional de Cambio climático. Estrategia Nacional de Cambio Climático 2015 – 2025,

- *Establece las bases estratégicas e institucionales para la generación de planes nacionales de cambio climático en los sectores prioritarios definidos para la mitigación y la adaptación con visión de fortalecimiento de las capacidades.*
- *Priorización en agricultura, energía, gestión de riesgos, bosques y biodiversidad e infraestructura.*

Adaptación Integral

a) Basada en ecosistemas;
b) Basada en infraestructura
c) Basada en la comunidad
d) Basada en las tecnologías de la información
e) Basada en la gestión (políticas)

NO	Adaptación social
SI	Energía
NO	Transporte
NO	Salud (riesgo de contagio/amenaza)
SI	Agricultura y Seguridad alimentaria
NO	Sistemas de alerta temprana y gestión de riesgo
SI	Agua potable
NO	Reubicación asentamientos
SI	Bosques y biodiversidad
SI	Adaptación infraestructura
NO	No especificado

A través del Programa Latinoamericano de Cambio Climático, de la UCC, CAF contribuye a la Mitigación y Adaptación al cambio climático y promueve el desarrollo sustentable y bajo en carbono de Latinoamerica

- **Programa de Mitigation y Mercados de Carbono**
- **Programa de Adaptación al Cambio Climático**

Programa de Adaptación al Cambio Climático

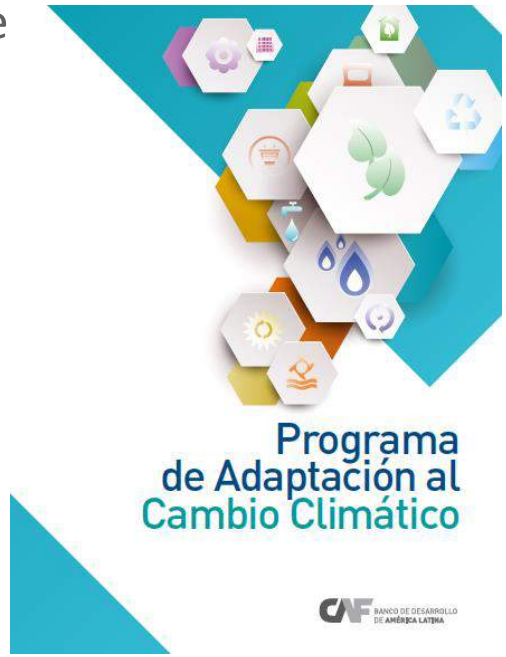
Objetivo: Promover y apoyar procesos planificados de adaptación a nivel de políticas, planes, programas y proyectos, para orientar la construcción del desarrollo sostenible de los países de América Latina y el Caribe.

Líneas de Acción:

1. Promover el acceso al flujo de los recursos financieros e materia de adaptación

2. Fortalecer la capacidad institucional de los sectores público y privado en materia de adaptación (Planes, programas y política)

3. Promover medidas de adaptación concretas sobre el terreno, como respuesta a las necesidades más inminentes (inversiones)



4. Apoyar la generación y la gestión del conocimiento

Antecedentes
Fondo de Adaptación

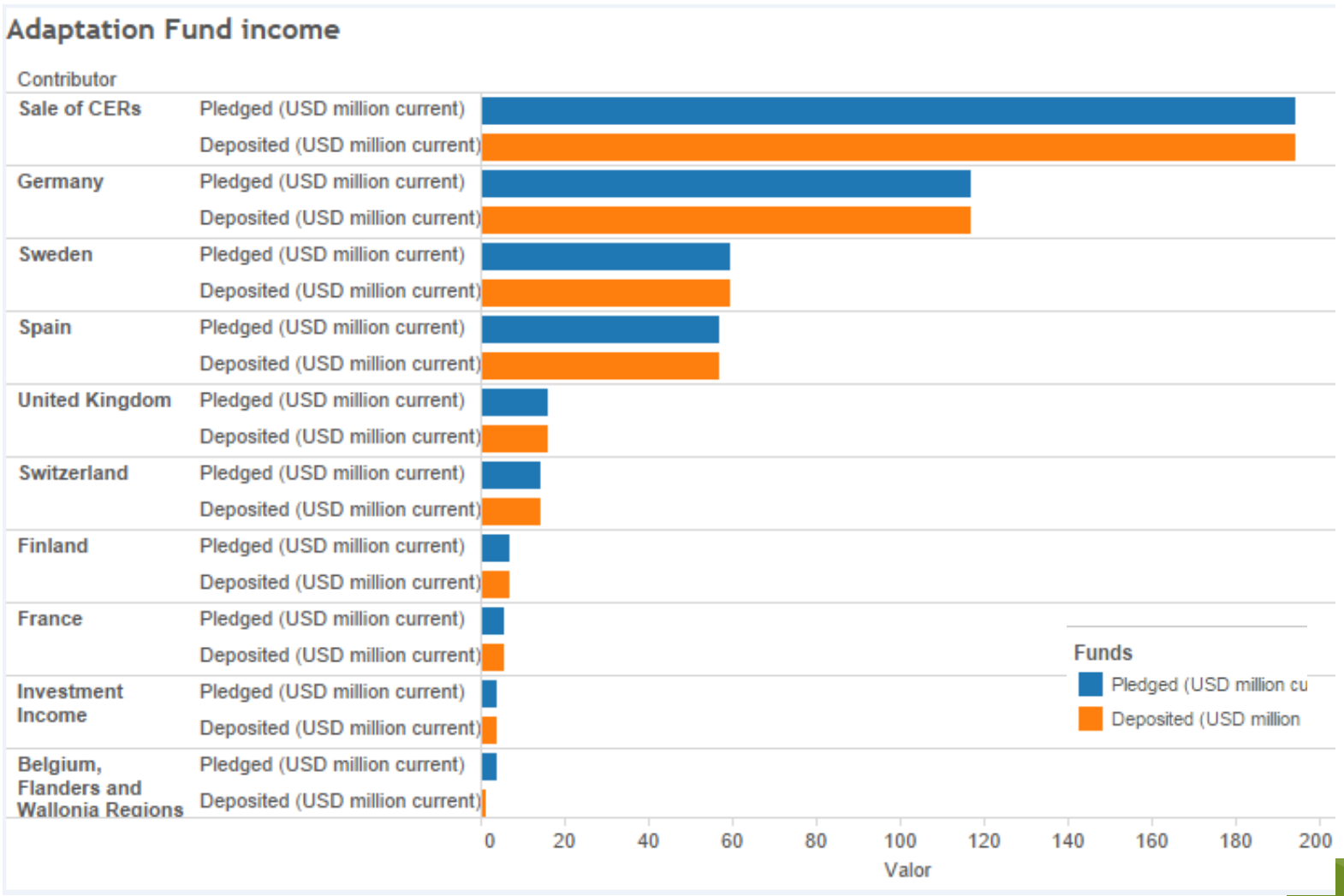
- El Fondo de Adaptación entró plenamente en vigor en abril de 2010
- La CAF fue acreditada por el Fondo de Adaptación de las Naciones Unidas en Marzo 2014
- El Fondo de Adaptación cuenta con las siguientes fuentes de recursos:
  - Un 2% de las reducciones certificadas de emisiones (RCE) de los proyectos de mitigación del cambio climático registrados en el Mecanismo para un Desarrollo Limpio (MDL)
  - Donaciones de países desarrollados, las cuales representan la principal fuente de recursos hoy en día
- El Fondo de Adaptación evolucionó a través de una serie de decisiones del principal órgano rector de los países que ratificaron el Protocolo de Kyoto.

Impacto del AF

Fuente. https://www.adaptation-fund.org/wp-content/uploads/2016/01/AF-infographic-Spanish-1.11.16.pdf

FONDO DE ADAPTACIÓN

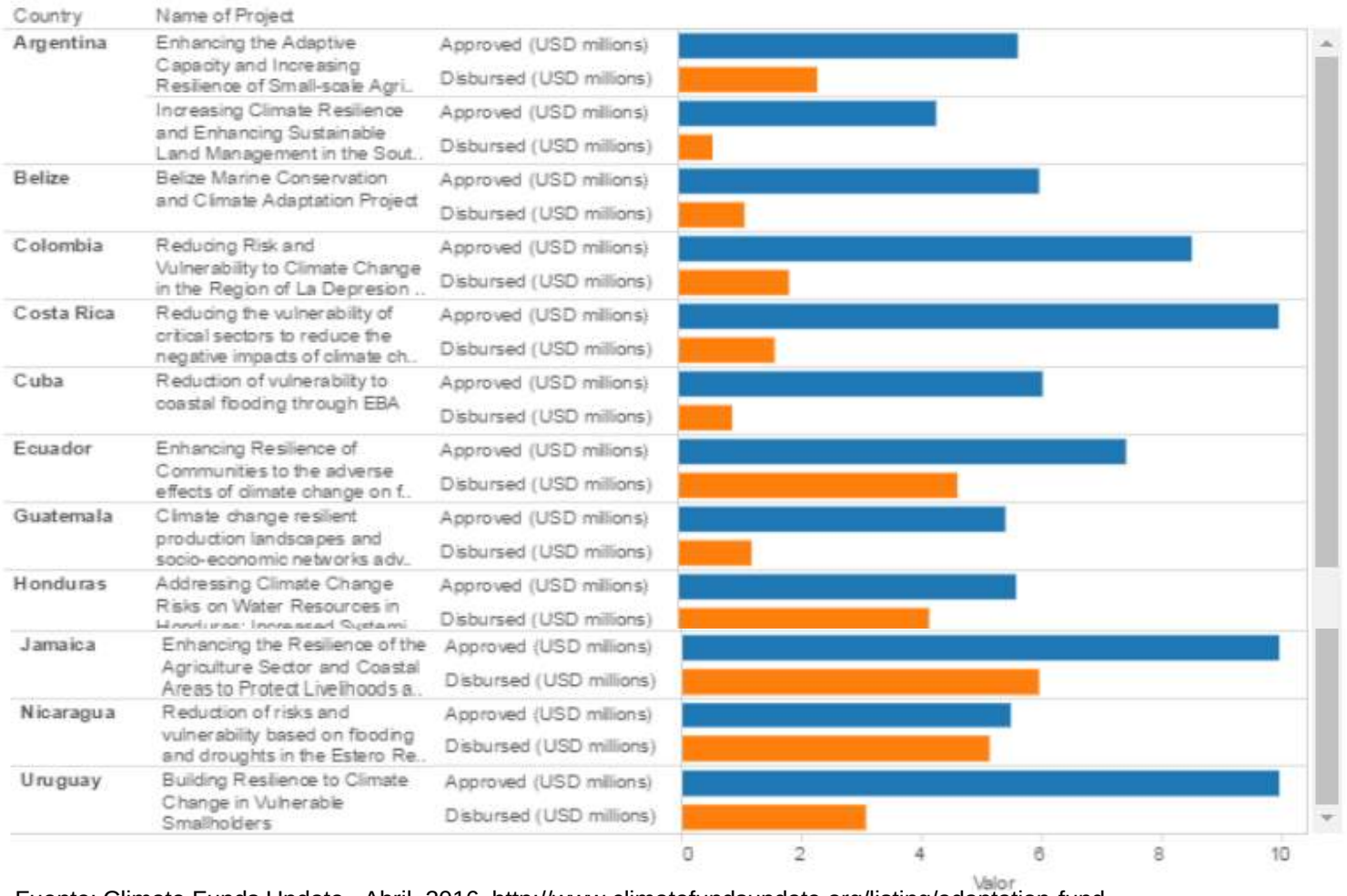
Fuente de Recursos – principales fuentes



Fuente: Climate Funds Update. Abril, 2016. http://www.climatefundsupdate.org/listing/adaptation-fund

Proyectos AF en Latinoamérica

Projects by country



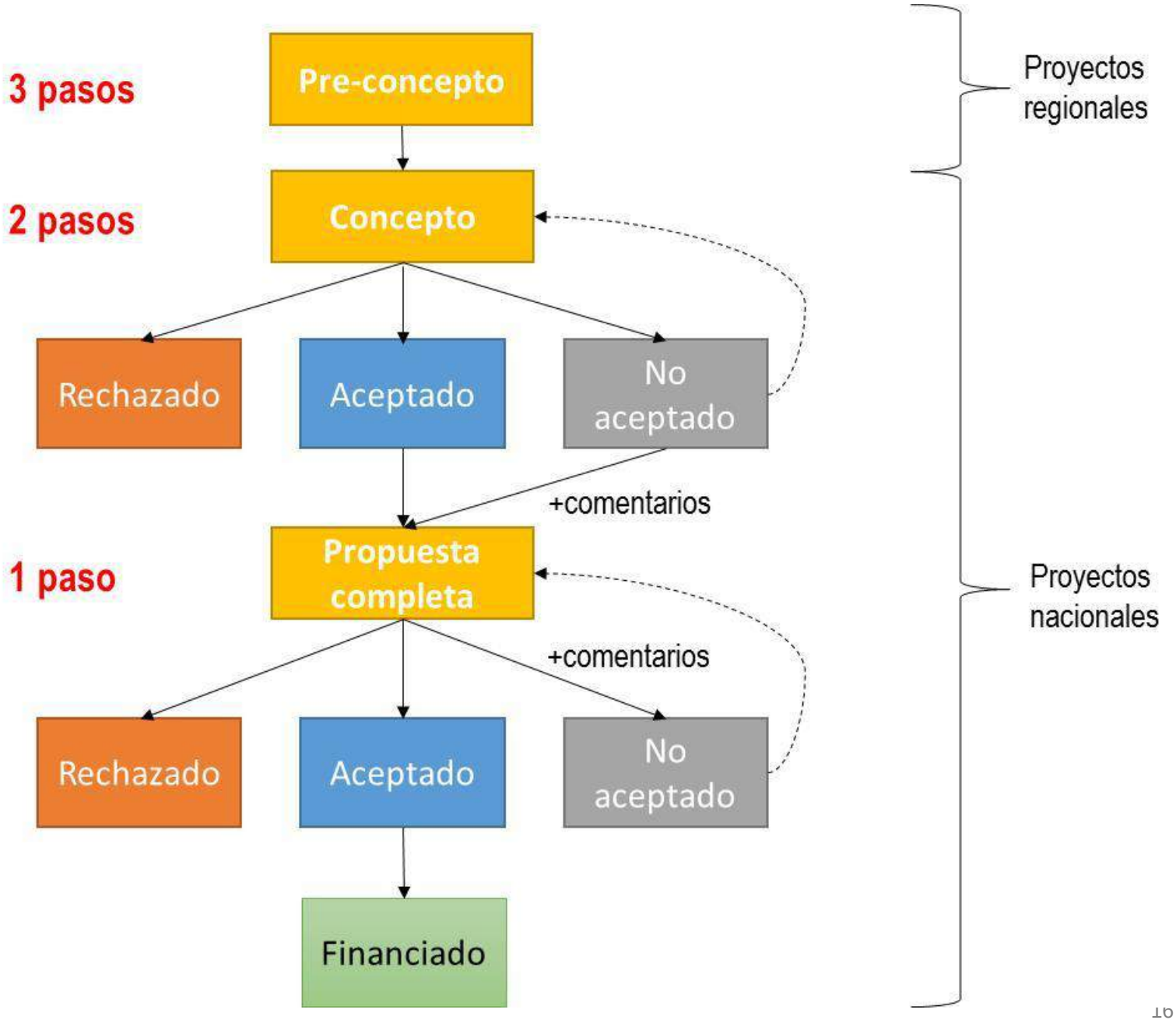
Fuente: Climate Funds Update. Abril, 2016. http://www.climatefundsupdate.org/listing/adaptation-fund

Programa para Actividades Regionales

1. Lanzado en Mayo 2015
2. Sigue los mismos tiempos definidos por el Fondo para todos los proyectos.
3. Primera fecha para entregas el 4 Agosto 2015.
4. Esta abierta para **RIEs** (Agencias Implementadoras Regionales) y **MIEs** (Agencias Implementadoras Multilaterales) que deben trabajar de forma conjunta con las Agencias de Implementación Nacionales (NIEs).
5. Hasta 4 proyectos / programas regionales
6. Un total de USD 30 millones
7. Cada proyecto / programa hasta USD 14 millones
8. Tres proyecto / programa hasta USD 5 millones
9. Hasta 10 proyecto / programa para su formulación con subsidio – grants de hasta USD 100,000 cada uno.
10. La financiación esta fuera de los limites de los países. / MIEs limites

Consideraciones para la Evaluación de Proyectos

- Consistente con las estrategias de sostenibilidad
- Beneficios económicos, sociales y ambientales
- Cumple con los estándares técnicos nacionales.
- Costo eficiente y sostenibilidad
- Consideración de asuntos de genero en el diseño de proyecto
- Análisis de actores claves e incorporación de la visión de la comunidad
- Evitar duplicidad con otro proyectos
- Arreglos para la gestión de los recursos, riesgos y posibles impactos


3 pasos
Pre-concepto
2 pasos
Concepto
Rechazado
Aceptado
No aceptado
+comentarios
1 paso
Propuesta completa
+comentarios
Rechazado
Aceptado
No aceptado
Financiado
Proyectos regionales
Proyectos nacionales

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DE AMÉRICA LATINA

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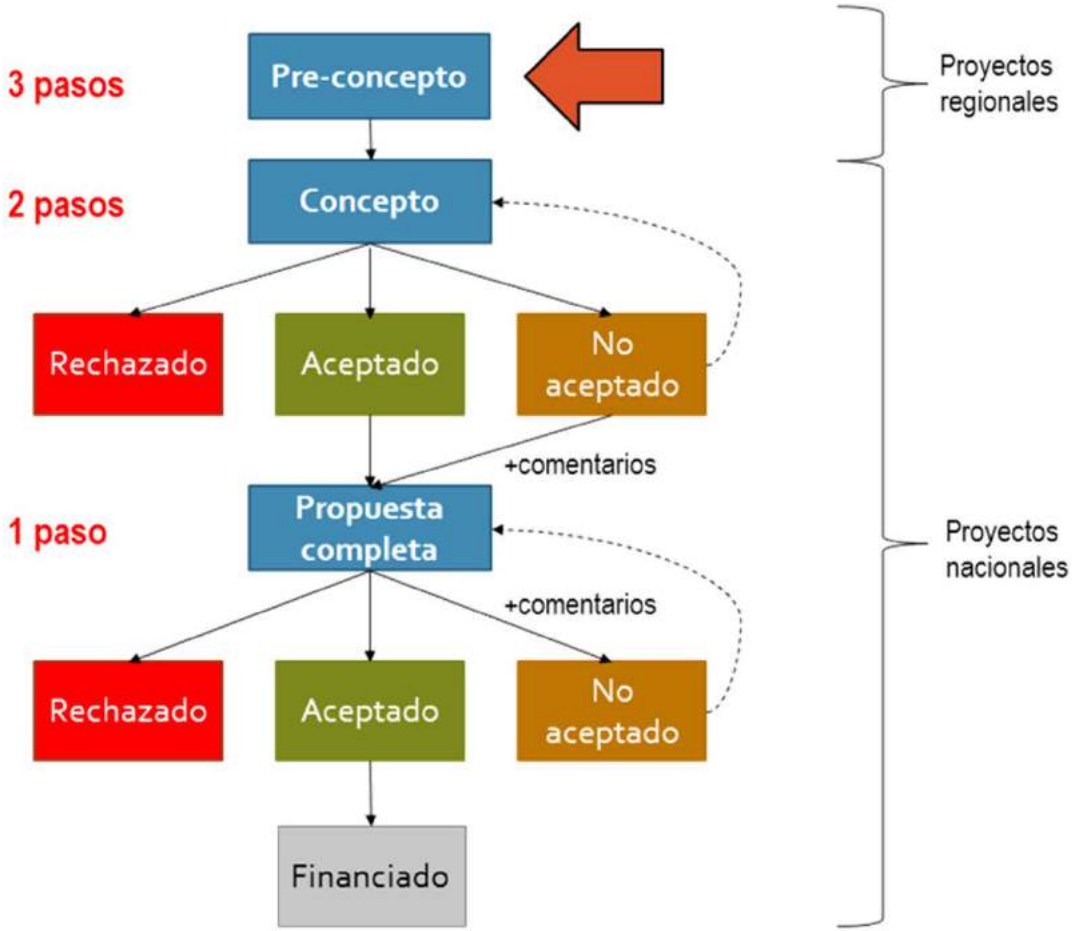
PRE-CONCEPTO DE PROYECTO REGIONAL

Taller inicial de formulación

Proyecto Regional Chile – Ecuador



1. El proyecto no está asegurado [**idea**]
2. Ejecución **no** es inmediata
3. No reembolsable, pero **limitado**
4. Ejecución de medidas **concretas** adaptación / resiliencia
5. **Impactos** visibles y tangibles

Proyecto regional

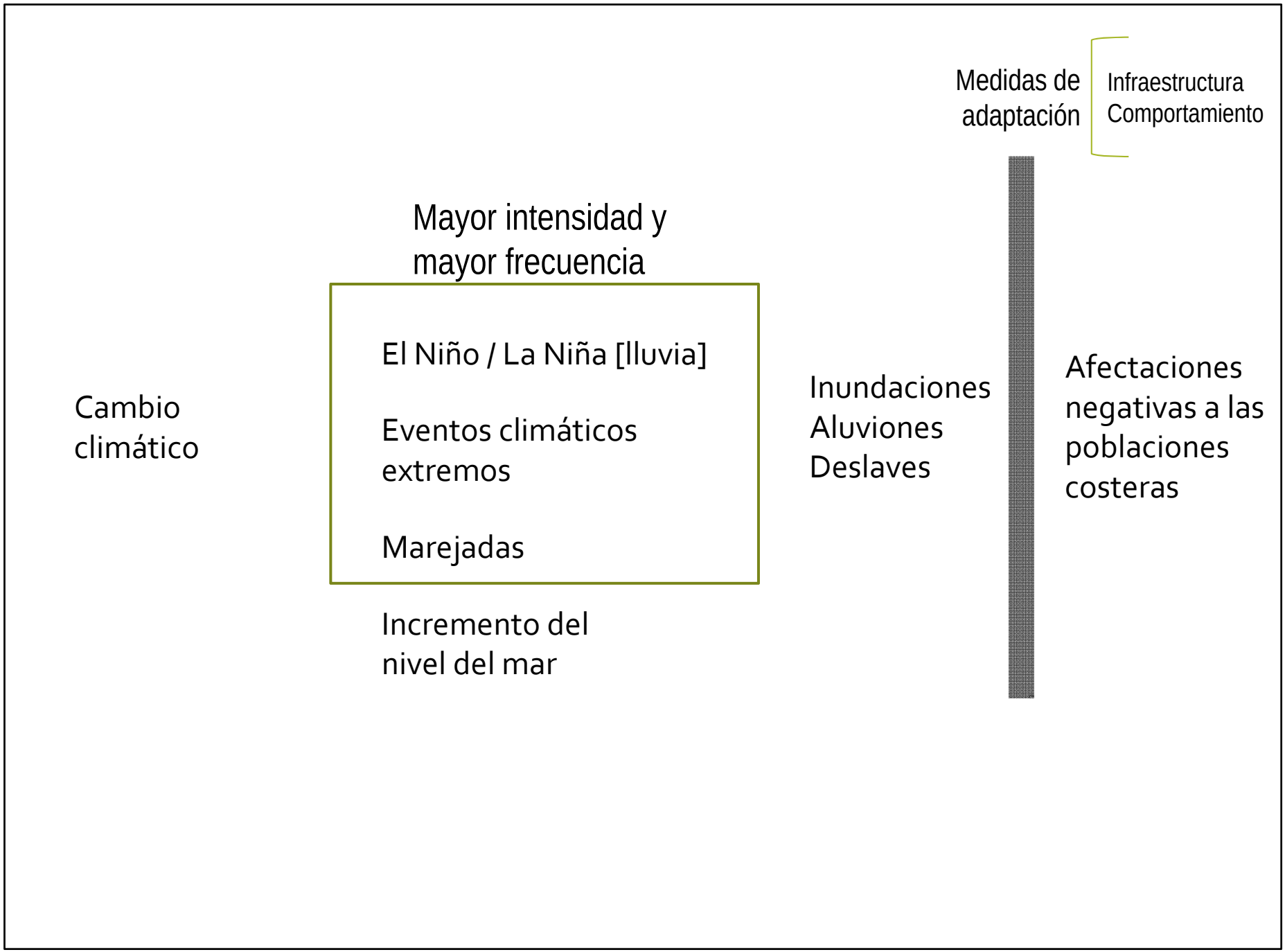
Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Similitudes

1. Ciudades costeras
2. Vulnerables a impacto de El Niño / La Niña = inundaciones, deslaves, aluviones
3. Vulnerables a tsunamis
4. Vulnerables a incremento en el nivel del mar

Diferencias

1. Índice de capacidad de adaptación. Antofagasta 9.40 / Esmeraldas 4.44 / Taltal no datos
2. Cultura y costumbres. Esmeraldas – clima tropical húmedo / afroecuatoriana. Antofagasta – clima árido templado
3. Tamaño y población: Antofagasta 390 mil / Esmeraldas 174 mil / Taltal 10 mil.
4. Economía. Antofagasta centrada en minería cobre. Esmeraldas mixta: pesca, turismo, portuaria petróleo.


Medidas de adaptación
Infraestructura
Comportamiento
Mayor intensidad y mayor frecuencia
El Niño / La Niña [lluvia]
Eventos climáticos extremos
Marejadas
Cambio climático
Incremento del nivel del mar
Inundaciones
Aluviones
Deslaves
Afectaciones negativas a las poblaciones costeras


Productos
Resultados
Objetivo

Objetivo

Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Resultados

1. Los planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras — Infraestructura verde
2. Se ha reducido la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras (ca., 574,000 personas protegidas) — Infraestructura gris
3. Se ha mejorado el monitoreo del clima y los medios para alertar a la población local — Monitoreo climático
4. Se han robustecido los medios para responder a inundaciones, deslaves y aluviones — Atención a emergencias

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Resultados

1. Gobiernos locales con capacidad mejorada para diseñar e implementar medidas de adaptación
2. Población local y personal gubernamental con mayor conciencia sobre riesgos relacionado al cambio climático (inundaciones, deslaves, aluviones)

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Resultados

1. Los aprendizajes / lecciones se han documentado y compartido
2. Se ha asegurado contacto directo y aprendizaje del proceso de implementación
3. Se ha asegurado el intercambio de experiencias y lecciones entre los ejecutores del proyecto

Presupuesto previsto USD 13.910.400

Componente 1. Acciones prioritarias para incrementar la resiliencia.	10,230,000 (73.5%)
Componente 2. Fortalecer capacidades para adaptación.	1,300,000 (9.3%)
Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.	1,000,000 (7.2%)
Costo directo ejecución proyecto	350,000 (2.5%)
Costo indirecto ejecución del proyecto	1,030,400 (7.4%)

Línea de acción	Resultado		Chile	Ecuador
SC 1.1. Medidas no estructurales	Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras		1,500,000	1,000,000
SC 1.2. Medidas de infraestructura	Se ha reducido la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras (ca., 574,000 personas protegidas)		3,938,000	2,292,000
SC 1.3. Sistemas de alerta temprana	Se ha mejorado el monitoreo del clima y los medios para alertar a la población local		600,000	400,000
SC 1.4. Respuesta a emergencias	Se han robustecido los medios para responder a inundaciones, deslaves y aluviones		350,000	150,000
SC 2.1. Fortalecer capacidad de gobiernos locales	Gobiernos locales con capacidad mejorada para diseñar e implementar medidas de adaptación		200,000	
SC 2.1. Fortalecer capacidad de residentes locales	Población local y personal gubernamental con mayor conciencia sobre riesgos relacionado al cambio climático (inundaciones, deslaves, aluviones)	Estrategias com. & educ. (3)	350,000	150,000
		Narradores	400,000	200,000
SC 3.1. TICs y alianzas entre ciudades costeras en Latinoamérica	Los aprendizajes / lecciones se han documentado y compartido		750,000	
SC 3.2. Visitas guiadas a sitios demostrativos	Se ha asegurado contacto directo y aprendizaje del proceso de implementación		150,000	
SC 3.3. Comité de integración	Se ha asegurado el intercambio de experiencias y lecciones entre los ejecutores del proyecto		100,000	

Comentarios del Secretariado del Fondo de Adaptación

1. Justificación suficiente para un programa **regional**

2. En componentes 1 y 2 clarificar cómo las actividades de los dos países conformaran un enfoque regional en lugar de dos o tres proyectos separados. Cómo el proyecto abordará los desafíos de la adaptación a nivel regional

3. Clarificar y de ser necesario robustecer la **innovación** del proyecto

4. Clarificar el papel de la Agencia de Cooperación Internacional de Chile (AGCI) [NIE]

Elementos pendientes

1. Proyecto debe estar listo al **15 de julio de 2016**. Decidir si presentar concepto o propuesta completa

2. Precisar sitios de intervención y presupuesto [detalles]

   - ¿Qué hacer?
   - ¿Dónde hacerlo?
   - ¿Cuánto cuesta?
   - ¿Quién lo hace y se hace cargo a futuro?

3. Arreglos de implementación [quién ejecuta qué, cómo se canalizan los fondos]

GRACIAS

Anexo 6. Marco de resultados

Proyecto regional. Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Objetivo. Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y networking, y desarrollar una cultura de adaptación.

Componentes	Resultados	Productos	Países	USD
Componente 1. Acciones prioritarias para incrementar la resiliencia.				**10,230,000**[1,2]
SC 1.1. Medidas no estructurales	Los planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	- Planes de infraestructura verde - Actualización del plan maestro de aguas lluvias incorporando las microcuencas de Antofagasta y Taltal - Expansión de áreas protegidas de manglar (Esmeraldas)	Chile Ecuador	1,500,000 1,000,000
SC 1.2. Medidas de infraestructura	Se ha reducido la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras (ca., 574,000 personas protegidas)	- Construcción de infraestructura (canales de aguas lluvias, obras de control) en micro-cuencas priorizadas - Adquisición de software para análisis, diseño y priorización (e.g., ArcGIS, Aquaveo WMS o Mike She y/o inundación. - Obras de mitigación para control de deslaves	Chile Ecuador	3,938,000 2,292,000
SC 1.3. Sistemas de alerta temprana	Se ha mejorado el monitoreo del clima y los medios para alertar a la población local	- Instalación de Sistema de alerta climática temprana (cuarto de emergencia) y medios para alertar a los residentes en caso de emergencia (e.g., sirenas, SMS, mensajes de radio). - Incrementar el número de estaciones de monitoreo y ampliar los parámetros de monitoreo - Sistema de radar meteorológico (Chile) - Red de monitoreo de altura del río (Esmeraldas) - Implementar plataforma en línea para datos meteorológicos	Chile Ecuador	600,000 400,000
SC 1.4. Respuesta a emergencias	Se han robustecido los medios para responder a inundaciones, deslaves y aluviones	- Comités de emergencia fortalecidos (Sistema de coordinación interagencial) - Señalización de rutas de evacuación - Mapas de evacuación por inundación	Chile Ecuador	350,000 150,000
Componente 2. Fortalecer capacidades para adaptación.			Chile, Ecuador	**1,300,000**
SC 2.1. Fortalecer capacidad de gobiernos locales	Gobiernos locales con capacidad mejorada para diseñar e implementar medidas de adaptación	- Cursos y materiales para adaptación basada en riesgos	Chile and Ecuador	200,000
SC 2.1. Fortalecer capacidad de residentes locales	Población local y personal gubernamental con mayor conciencia sobre riesgos relacionado al cambio climático (inundaciones, deslaves, aluviones)	- Tres estrategias de comunicación y educación diseñadas e implementadas	Chile Ecuador	350,000 150,000
		- Experiencia de narradores en tres ciudades.	Chile Ecuador	400,000 200,000

[1] El número y tipo de obras dependerá de los resultados de los estudios y costos asociados para construir las obras.
[2] Del total, se usará 10-15% para estudios, el resto para los proyectos de mitigación para control de inundaciones.

Componentes	Resultados	Productos	Países	USD
Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.			Chile, Ecuador	**1,000,000**
SC 3.1. TICs y alianzas entre ciudades costeras en Latinoamérica	Los aprendizajes / lecciones se han documentado y compartido	- Diseño / implementación de plataforma regional en línea - Documentación de estudios de caso de lecciones clave y buenas practicas - Entrenamiento / talleres por medio de herramientas de colaboración web - Eventos en sitio (eventos locales)	Chile, Ecuador	750,000
SC 3.2. Visitas guiadas a sitios demostrativos	Se ha asegurado contacto directo y aprendizaje del proceso de implementación	- Implementar una serie de visitas guiadas a cada sitio, incluyendo participación de otros países interesados	Chile Ecuador; visitantes: Latinoamérica	150,000
SC 3.3. Comité de integración	Se ha asegurado el intercambio de experiencias y lecciones entre los ejecutores del proyecto	- 1 reporte anual de evaluación, retro-alimentación y lecciones de cada proyecto	Chile, Ecuador	100,000
4. Costos de ejecución del Proyecto / programa				**350,000**
5. Costo total del Proyecto / programa				**12,880,000**
6. Costo de gestión del Proyecto de la agencia de implementación (8%)				**1,030,400**
Monto total				**13.910.400**

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Memoria

Taller inicial de formulación

Antofagasta

República de Chile

4 de mayo de 2016

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Introducción

El Ministerio de Medio Ambiente de Chile (MMA) y el Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - banco de desarrollo de América Latina - presentaron al Fondo de Adaptación la iniciativa del Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina. Esta iniciativa regional cual incluye tres ciudades costeras: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador. El Fondo de Adaptación fue establecido en 2001 para financiar proyectos y programas concretos de adaptación en los países en desarrollo. El fondo es un mecanismo financiero de la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Protocolo de Kioto.

La iniciativa en mención fue presentada a consideración del Fondo de Adaptación a nivel de pre-concepto, el cual fue aprobado por dicho fondo a finales del mes de marzo de 2016. A efectos de avanzar en la aprobación final, se requiere formular en detalle el proyecto en colaboración con los actores claves públicos y privados. Consecuentemente, se organizó el taller inicial en la ciudad de Antofagasta con el objetivo de presentar el pre-concepto a los socios clave, recibir retroalimentación e iniciar el proceso de desarrollo de la propuesta de completa para ser presentada hasta el 01 de agosto de 2016[1].

Agenda

La reunión tuvo los siguientes elementos:

10:30	Bienvenida
10:45	Presentación de participantes
11:00	Revisión de la agenda
11:45	Cambio climático y adaptación. Peter Muck (MMA)
12:15	El Fondo de Adaptación. Carolina Cortés (CAF)
12:35	Principales riesgos y medidas de adaptación planteadas en el concepto de proyecto. Gladys Santis (MMA)
13:00	Almuerzo
14:00	Gestión de ONEMI en el sector. María José Mejías (ONEMI).
14:10	Presentación del concepto regional de proyecto
15:00	Mesas de trabajo. Análisis de situación en Antofagasta y Taltal

[1] Fecha límite para ingresar propuestas a ser consideradas en 28 reunión de la junta directiva del Fondo de Adaptación que se realizará el 4 de octubre de 2016 en Bonn (Alemania).

16:00 Mesas de trabajo acciones para el proyecto

17:00 Próximos pasos

17:30 Cierre del evento

Bienvenida

La bienvenida estuvo a cargo de Roberto Villablanca de la Secretaría Regional Ministerial del Medio Ambiente (MMA) y Marco Giussani de CAF (Foto 1 y Foto 2), quienes agradecieron la asistencia de los participantes y proveyeron información sobre el marco general de la reunión. Participaron en la reunión 35 personas, el registro de asistencia está en el Anexo 1.

Cambio climático y adaptación

La presentación estuvo a cargo de Peter Muck del MMA (Foto 3), quien resumió la situación de Chile con respecto al cambio climático global y los avances con respecto a acciones de mitigación y adaptación. Se explicó que están en desarrollo los planes sectoriales de adaptación al cambio climático, uno de los cuales es el plan de ciudades que estaría listo en 2017 y que tiene directa relación con el presente proyecto regional. La presentación está en el Anexo 2.

El Fondo de Adaptación

La presentación estuvo a cargo Carolina Cortés de CAF (Foto 4), quien explicó el alcance y forma de operación del Fondo de Adaptación. Se indicó que CAF, además de su rol como banco de desarrollo, es una Agencia Implementadora Regional y está articulando la preparación de la propuesta del presente proyecto. Se explicó que el proyecto se enmarca en la convocatoria del Fondo de Adaptación para proyecto regionales realizada en 2015, a la cual se presentó el pre-concepto que fue aceptado por el fondo. Finalmente, se indicó que hay la opción de presentar, a finales de julio de 2016, un concepto o una propuesta completa. La propuesta completa es el documento de proyecto totalmente desarrollado con todas las exigencias del Fondo de Adaptación. De presentarse a nivel de concepto éste podría ser comentado y de ser necesario hacer ajustes hay la oportunidad de presentar la propuesta completa a finales de año. Sin embargo, si se presenta a nivel de propuesta completa, sólo hay opción de aceptación o rechazo, lo que limita las opciones para ajustes. La presentación está en el Anexo 3.

Principales riesgos y medidas de adaptación planteadas en el concepto de proyecto

La presentación estuvo a cargo de Gladys Santis del MMA (Foto 5), quien explicó los posibles impactos del cambio climático en la región de Antofagasta. Se destacó que se estima que los eventos climáticos extremos serían más

intensos y frecuentes, al igual de las marejadas. Igualmente, se pronostica un importante incremento del nivel del mar. La presentación está en el Anexo 4.

Gestión de ONEMI en el sector

La presentación estuvo a cargo de María José Mejías de la Oficina Nacional de Emergencia del Ministerio del Interior y Seguridad Pública (ONEMI) (Foto 6). Se resumió las acciones que está implementando ONEMI en Antofagasta y Taltal, incluyendo planos de evacuación por remoción de masas.

Presentación del concepto regional de proyecto

La presentación estuvo a cargo de Segundo Coello, consultor de CAF para la preparación del documento de proyecto. Se recordó que el proyecto está a nivel de pre-concepto y que debe desarrollarse en las próximas semanas a nivel de propuesta completa, de ser posible. Se resumió las similitudes y diferencias entre las tres ciudades en las que se trabajará, destacando que es un proyecto regional y que se espera que las lecciones y aprendizajes sirvan a otras ciudades costeras. Se revisó el objetivo y resultados esperados del proyecto, resaltando que en la lógica del proyecto los resultados son cambios en la situación y que los productos son elementos concretos que contribuyen a lograr los resultados (e.g., radar meteorológico, número de personas capacitadas). Se revisó el presupuesto y su distribución en los tres componentes y resultados esperados. También se revisó los comentarios del Secretariado del Fondo de Adaptación a la propuesta de proyecto. Se indicó que sólo está pendiente un comentario que tiene que ver con la participación de la Agencia Nacional de Implementación del Fondo de Adaptación (i.e., Agencia de Cooperación Internacional de Chile). La presentación está en el Anexo 5.

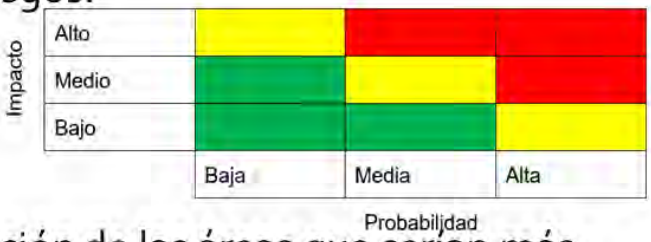
Mesas de trabajo. Análisis de situación en Antofagasta y Taltal

Los participaron conformaron dos mesas de trabajo (i.e., Antofagasta y Taltal) (Foto 7 y Foto 8). La tarea a desarrollar fue:

1. Formar dos grupos de trabajo (Antofagasta y Taltal). Designar relator.

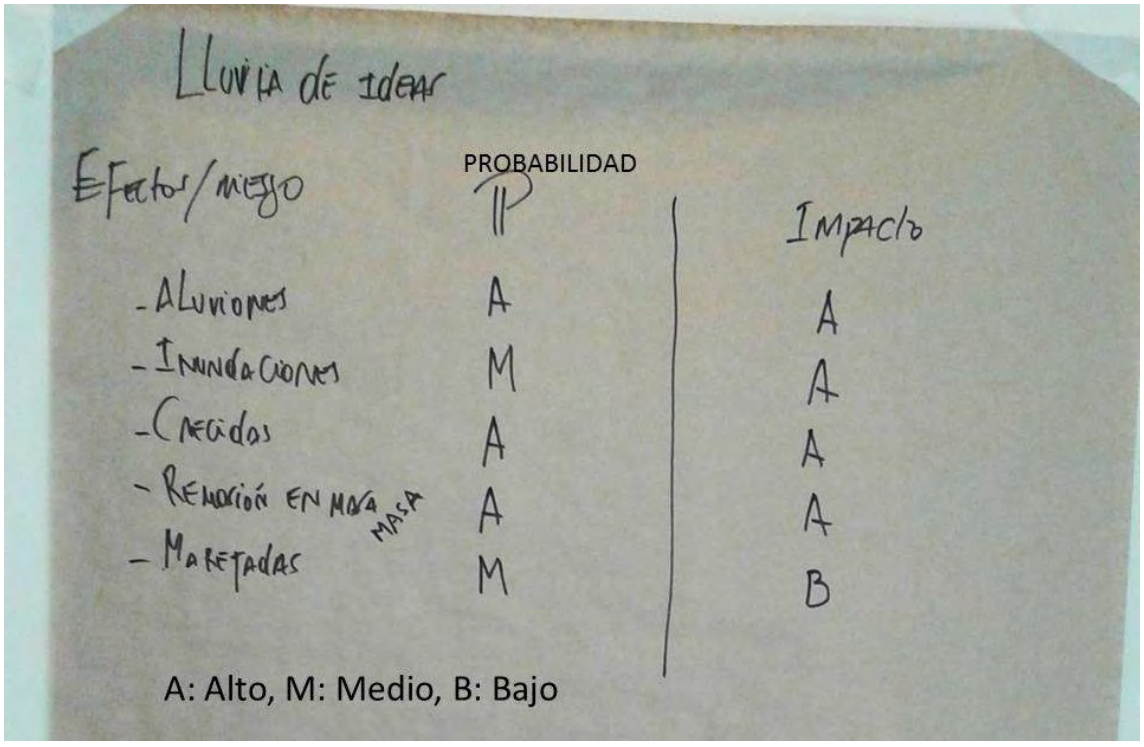
2. Primero. Lluvia de ideas sobre riesgos derivados del probable escenario climático

3. Segundo. Categorización de riesgos identificados en base a matriz de riesgos.



4. Tercero. Identificación de las áreas que serían más susceptibles a los principales impactos identificados [usar mapas] **40 minutos**

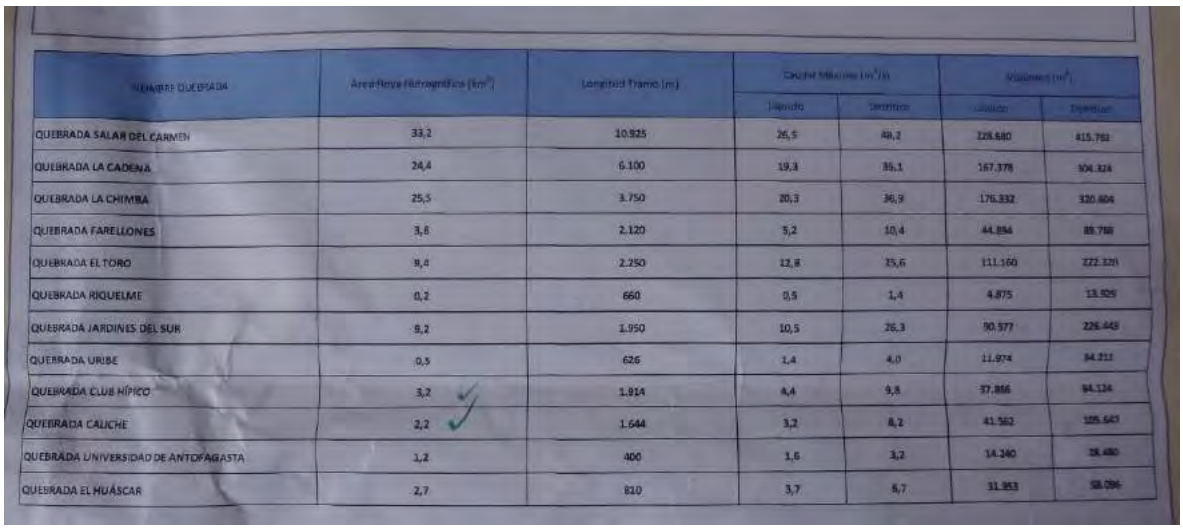
La mesa de Antofagasta estuvo integrada por Evelyne Medel, Juan Carlos Reyes, Daniza Vicencio, Edison Moraga, Eduardo Guevara, María José Mejías, Mirna Aguilar, y Gladys Santis. El grupo priorizó los aluviones, las crecidas y la remoción de masa como los riesgos con alta probabilidad y alto impacto.



En la plenaria se preguntó por qué no se había considerado el incremento del nivel del mar. Se indicó que los riesgos indicados son los que ya han impactado

a la población, en el caso del incremento del nivel del mar no hay suficiente información de su posible impacto. También se indicó que la topografía de Antofagasta tiene una pronunciada pendiente, por lo que las áreas de inundación permanente pudieren ser menores. Se recomendó hacer el ejercicio de sobreponer en un plano topográfico de la ciudad lo que correspondería a un incremento de un metro en el nivel del mar para visualizar el área que pudiese verse afectada.

En el siguiente cuadro se resume la información de las quebradas que atraviesan la ciudad de Antofagasta que constan en el mapa usado en el trabajo en grupo[2]:



NOMBRE QUEBRADA	Área Hoya Hidrográfica (km²)	Longitud Tramo (m)	Caudal Máximo (m³/s)		Volumen (m³)	
			Líquido	Sedimento	Líquido	Sedimento
QUEBRADA SALAR DEL CARMEN	33,2	10.925	26,5	49,2	228.680	615.782
QUEBRADA LA CADENA	24,4	6.100	19,3	35,1	167.378	504.324
QUEBRADA LA CHIMBA	25,5	3.750	20,3	36,9	176.332	520.604
QUEBRADA FARELLONES	3,8	2.120	5,2	10,4	44.894	88.788
QUEBRADA EL TORO	9,4	2.250	12,8	25,6	111.160	222.320
QUEBRADA RIQUELME	0,2	660	0,5	1,4	4.875	13.929
QUEBRADA JARDINES DEL SUR	9,2	1.950	10,5	26,3	90.577	226.443
QUEBRADA URIBE	0,5	626	1,4	4,0	11.974	34.211
QUEBRADA CLUB HÍPICO	3,2	1.914	4,4	9,8	37.866	84.124
QUEBRADA CALICHE	2,2	1.644	3,2	8,2	41.562	105.647
QUEBRADA UNIVERSIDAD DE ANTOFAGASTA	1,2	400	1,6	3,2	14.240	28.480
QUEBRADA EL HUÁSCAR	2,7	810	3,7	6,7	31.953	58.096

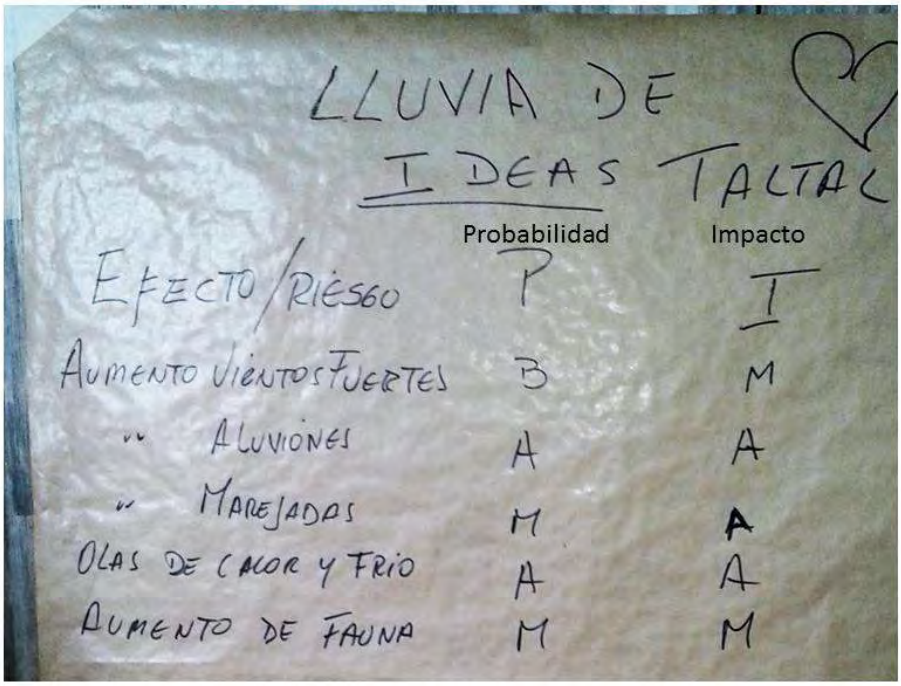
El grupo marcó en el mapa de la ciudad las quebradas que no tienen obras de control aluvional ni obras proyectadas:

Las tres quebradas que requerirían atención son (de norte a sur): Club Hípico, Bonilla y Caliche (Figura 1 y Figura 2). La quebrada Bonilla es la que tiene una mayor afectación en número de personas.

La mesa de Taltal estuvo integrada por: Emilio Rojas, Viviana Reyes, Hilda Sepulveda, Antonio Barrera, Ruth Bravo, Ximena Estay, Marcela Olivos, Peter

[2] Plano de Amenaza Aluvional. Fecha: 14 diciembre 2015. Código DP-UGT-MOP-OCT-II-A1-2015. Dirección de Planeamiento. Unidad de Gestión de Información Territorial. Ministerio de Obras Públicas.

Munck, Roberto Villablanca y Elsa Giovagnoli. El grupo priorizó los aluviones y las olas de calor y frío como los riesgos con alta probabilidad y alto impacto:



A: Alto, M: Medio, B: Bajo

El riesgo de aluviones abarca toda la ciudad de Taltal[3] (Figura 3), estos pueden generarse por precipitación en la cordillera y por precipitación costera. Taltal tiene obras de control aluvional que fueron ampliadas a finales de 2015[4] con una capacidad de retención de 338 mil m^3.

El programa “Quiero Mi Barrio”, que ejecutan conjuntamente el Ministerio de Vivienda y Urbanismo (MINVU) y la Municipalidad de Taltal, entregó una presentación que muestra los impactos del aluvión de marzo de 2015. La presentación está en el Anexo 6.

Mesas de trabajo acciones para el proyecto

Los participaron conformaron dos mesas de trabajo, una para analizar el componente 1 del pre-concepto y otra para analizar el componente 2 del marco de resultados (Anexo 7) (Foto 9 y Foto 10). La tarea a desarrollar fue:

[3] Propuesta de Plano de Evacuación ante peligros aluvionales. Localidad de Taltal. Fecha: 17 de diciembre de 2015. Código: DP-UAT-MOP-DIC-II-A1-2015. Dirección de Planeamiento. Unidad de Gestión de Información Territorial. Ministerio de Obras Públicas.

[4] Mont, C. 2015. Taltal: Gobierno finalizó obras de control aluvional. El Nortero. 27 de diciembre, 2015. En línea: http://www.elnortero.cl/noticia/sociedad/taltal-gobierno-finalizo-obras-de-control-aluvional

Anon. 2015. Finalizaron las obras de control aluvional en Taltal: aumentaron a 338 mil m3 la cantidad de retención. Soy Chile. 26 diciembre 2015. En línea: http://www.soychile.cl/Antofagasta/Sociedad/2015/12/26/366246/Finalizaron-las-obras-de-control-aluvional-en-Taltal-aumentaron-a-338-mil-m3-la-cantidad-de-retencion.aspx

1. Formar dos grupos de trabajo (por componente). Designar relator.
   - C1. Acciones prioritarias para incrementar la resiliencia.
   - C2. Fortalecer capacidades para adaptación.
2. Primero. Revisar las acciones [productos] propuestas en el componente
3. Segundo. Lluvia de ideas sobre recomendaciones (cambios, precisiones, detalles). Registrar las recomendaciones en papelógrafo / tarjetas

40 minutos

Los resultados del grupo que analizó el componente 1 están en la Figura 4 y la Figura 5. El grupo no alcanzó a analizar los subcomponentes SC1.3 y SC1.4 (Anexo 7). En la plenaria, sin embargo, se destacó que es importante la implementación del radar meteorológico que permitirá tener información en tiempo real sobre la precipitación en la zona. El equipo ya está identificado y tiene un costo de ca., €120,000. Se recomendó que el radar se instale en la ciudad de Antofagasta. El radar podría estar albergado en la Dirección General de Aguas del MOP.

Con respecto al subcomponente SC1.4 la representante de ONEMI indicó que ya se está preparando los mapas de evacuación y la señalización de rutas de evacuación y que ya están operativos los comités de operaciones de emergencia, por lo que no es necesario incluir estos elementos en el proyecto. Habrá que considerar cómo reasignar los USD350,000 que estaban asignados para estas acciones en Chile.

El análisis del componente 2 fue realizado por Emilio Rojas, Viviana Reyes, Hilda Sepulveda, Antonio Barrera, Ximena Estay, Marcela Olivo, Roberto Villablanca, María José Mejías y Elsa Giovagnoli. Los resultados del grupo están en la Figura 6. Se destacó que es necesario que haya trabajo coordinado con los actores locales y que se fortalezca los equipos municipales. El SC2.1 debería incluir un diagnóstico de reacción ante la emergencia. Finalmente, con respecto a la experiencia de los narradores, se sugirió que esta incluya diversos materiales audiovisuales.

Próximos pasos

Se propuso a los participantes la siguiente hoja de ruta:

Se explicó que en lo que resta del mes de mayo de 2016 el énfasis sería en:

(i) Mapear los actores clave de cada ciudad, con énfasis en las áreas que se prioricen; y

(ii) Definir detalles como (a) quebradas donde intervendrá el proyecto, (b) verificar existencia de diseños de obra y actualización de costos, (c) definir ejecutores de los productos del proyecto, (d) mecanismo de flujo de fondos.

En junio se prepararía el documento de proyecto. En la primera de julio se enviaría el documento para revisión y en la segunda semana del mes se realizaría el taller de validación para recabar los comentarios a la propuesta de proyecto. En el taller de validación participarían los mismos actores que participaron en el taller de inicio, más otros actores o socios que se identifiquen durante la preparación del proyecto. Se mencionó que en la segunda semana de julio será necesario que se emitan las cartas de endoso de los gobiernos de Chile y Ecuador.

Figuras

Figura 1. Quebradas Club Hípico y Bonilla en la ciudad Antofagasta.

Figura 2. Quebrada Caliche en la ciudad de Antofagasta.

Figura 3. Área afectación por riesgos asociados con el cambio climático en la ciudad de Taltal.

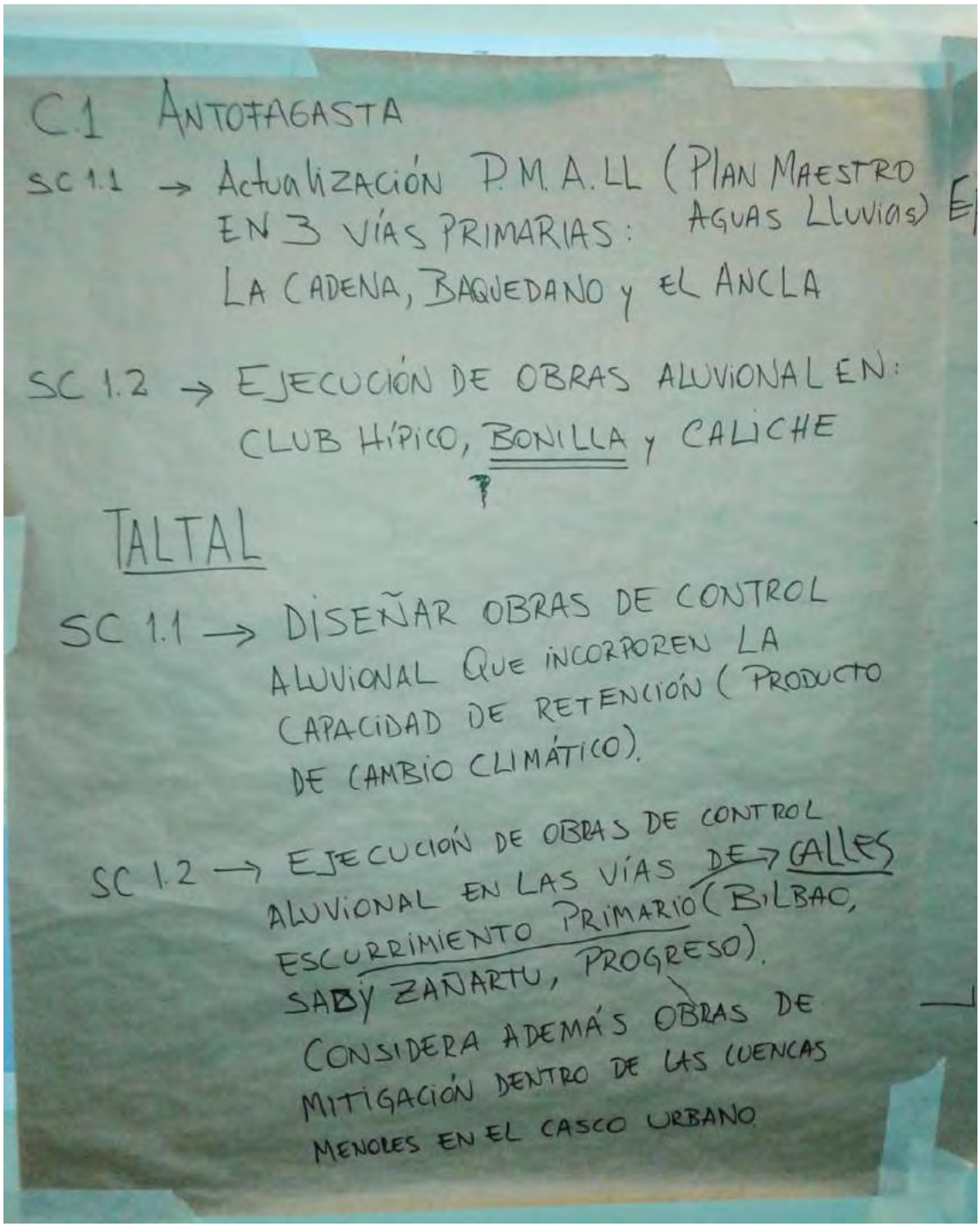


Figura 4. Resultados del grupo que analizó el componente 1, respecto a acciones en las ciudades de Antofagasta y Taltal.

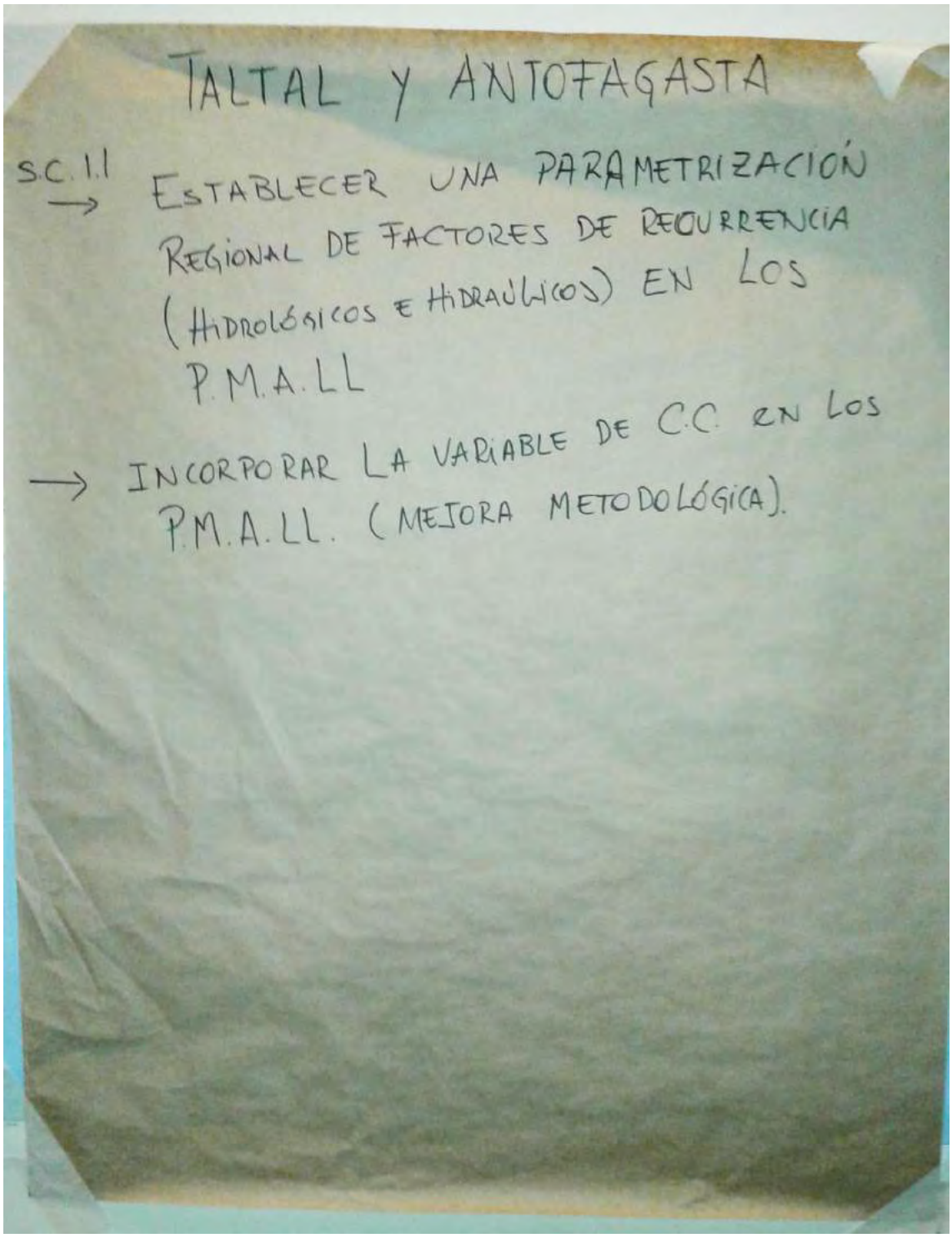


Figura 5. Resultados del grupo que analizó el componente 1, respecto a acciones comunes a las ciudades de Antofagasta y Taltal.

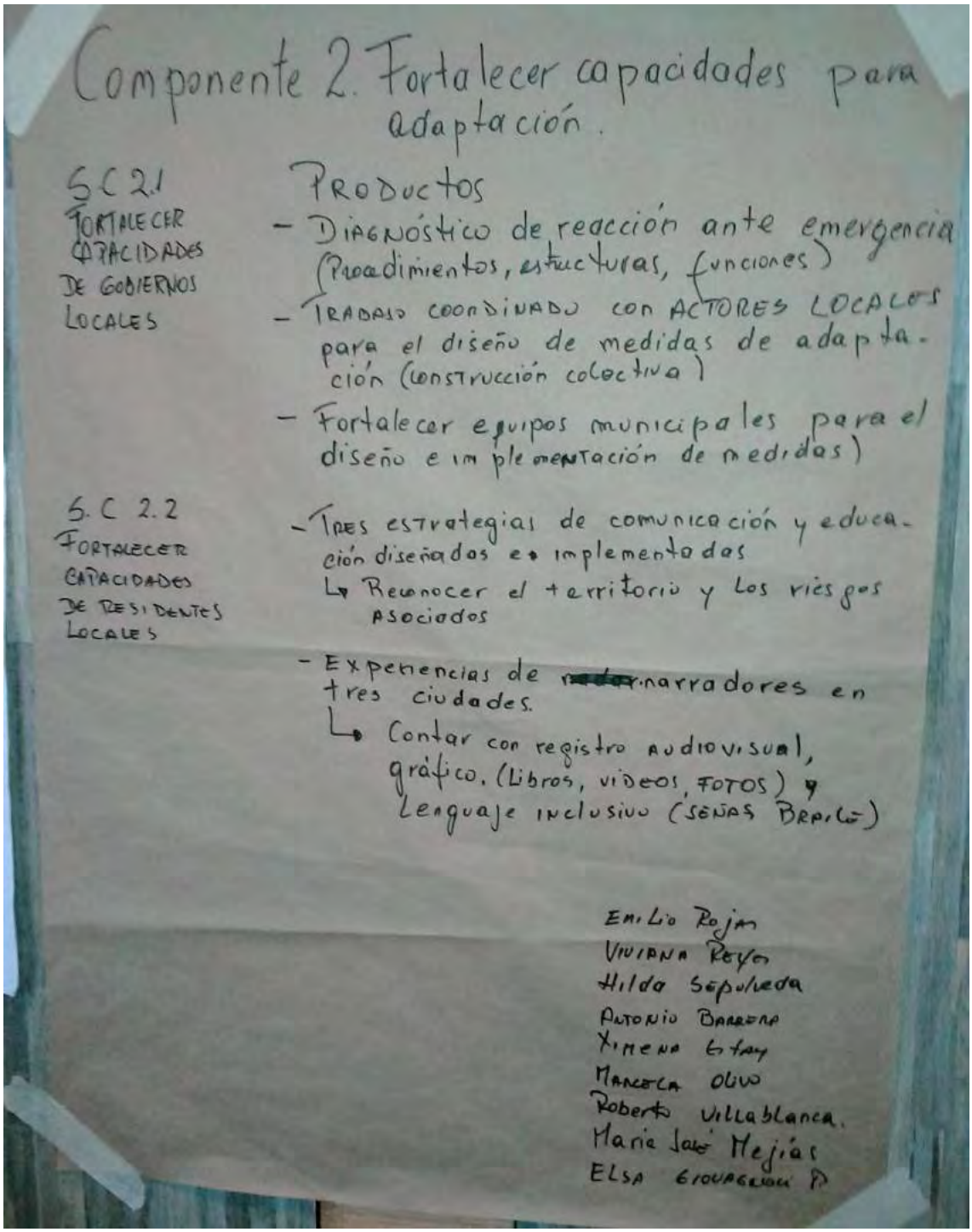


Figura 6. Resultados del grupo que analizó el componente 2.

Fotos

Foto 1. Bienvenida a cargo de Roberto Villablanca del MMA.

Foto 2. Bienvenida a cargo de Marco Giussani de CAF

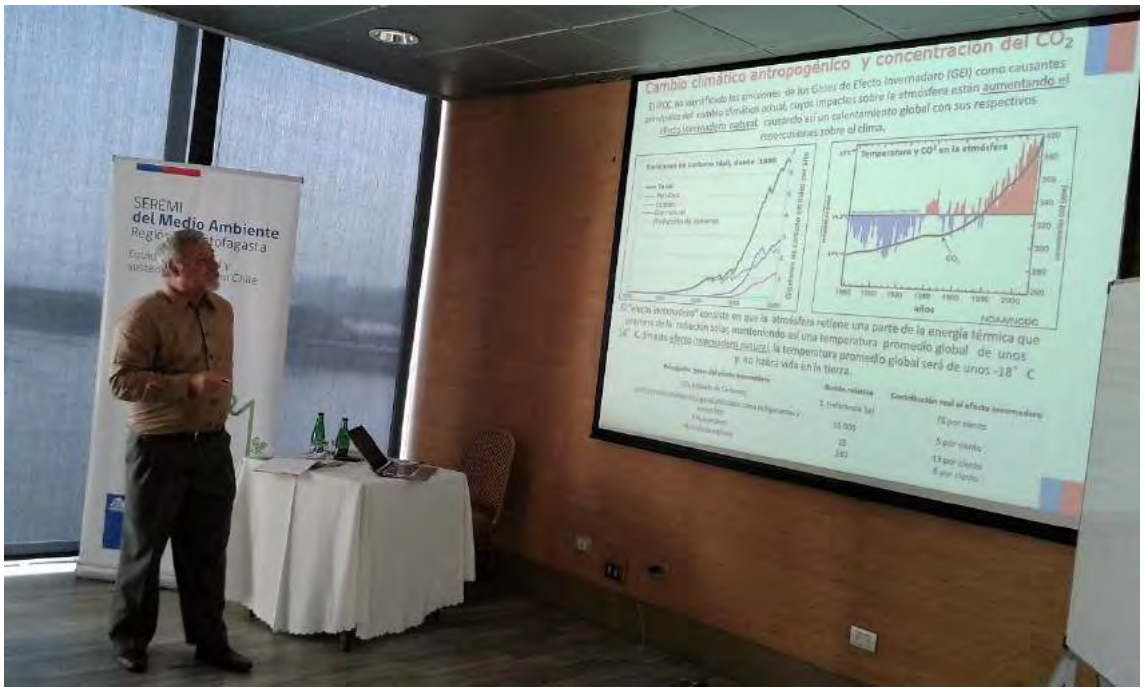


Foto 3. Presentación de Peter Muck del MMA.

Foto 4. Presentación de Carolina Cortés de CAF.

Foto 5. Presentación de Gladys Santis del MMA.

Foto 6. Presentación de María José Mejías de ONEMI.

Foto 7. Sesión de trabajo del grupo de Taltal.

Foto 8. Sesión de trabajo del grupo de Antofagasta.

Foto 9. Sesión de trabajo del grupo que analizó el componente 1.

Foto 10. Sesión de trabajo del grupo que analizó el componente 2.

Anexo 1. Registro de participantes.

Ministerio del Medio Ambiente

Gobierno de Chile

Taller inicial

Formulación Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Antofagasta, 4 de mayo de 2016

CAF BANCO DE DESARROLLO DE AMÉRICA LATINA

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Edison Moraga	DGA	Jefe Hidrología	ANF	968786358	edison.moraga@mop.gov.cl
Hilda Sepúlveda	taltal	Socios	taltal	997192514	
Antonio Barrera	taltal	Socias	taltal	997192514	
Peter Muck	Ministerio del Medio Ambiente	Asesor	Santiago		pmuck@mma.gob.cl
Viviana Bugos	manuel Rodriguez 1299 tal tal		tal tal	75641013	

Ministerio del Medio Ambiente
Gobierno de Chile

Taller inicial

Formulación Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Antofagasta, 4 de mayo de 2016

CAF BANCO DE DESARROLLO DE AMÉRICA LATINA

Nombre	Entidad	Cargo	Ciudad	Teléfono(s)	Correo electrónico
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Ministerio del Medio Ambiente
Gobierno de Chile

Taller inicial

Formulación Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Antofagasta, 4 de mayo de 2016

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Ministerio del Medio Ambiente

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Ministerio del Medio Ambiente
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Taller inicial

Formulación Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

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Anexo 2. Presentación sobre cambio climático y adaptación en Chile

Taller inicial: Proyecto regional de reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina;
Antofagasta, 4.5.2016

Desafíos en la política climática para las ciudades chilenas

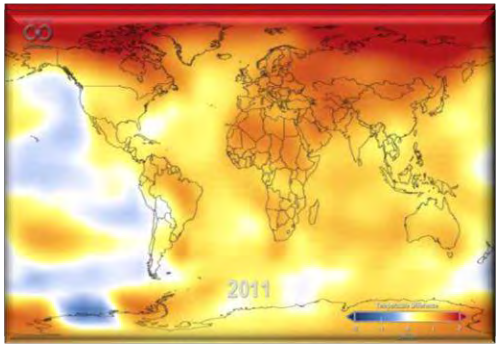
Dr. Peter Muck
Departamento de Cambio Climático del Ministerio del Medio Ambiente

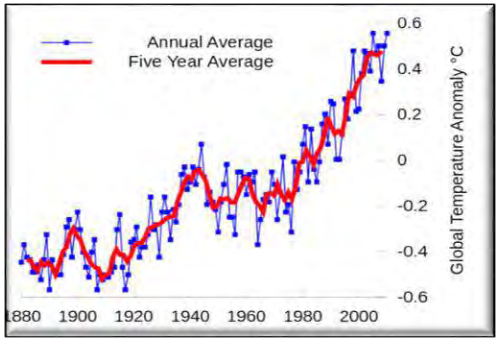
EL CAMBIO CLIMATICO

El último reporte del
***Panel Intergubernamental sobre Cambio Climático (2013/14,AR5,* IPCC,)**
confirma con muy alto grado de certeza:

Que el Cambio Climático de los últimos 100 años es un hecho inequívoco y que este fenómeno del calentamiento global es
causado principalmente por las actividades de contaminación atmosférica del hombre:

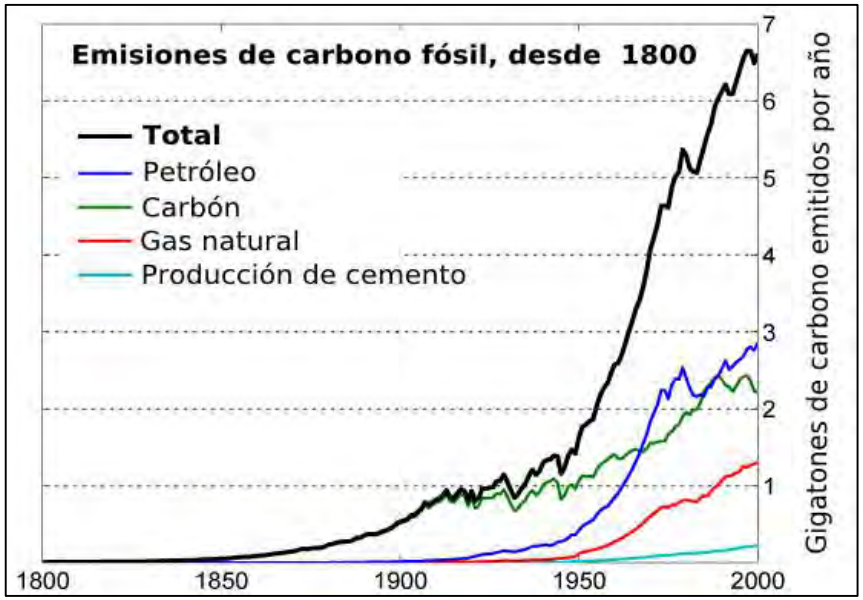
Cambio climático antropogénico

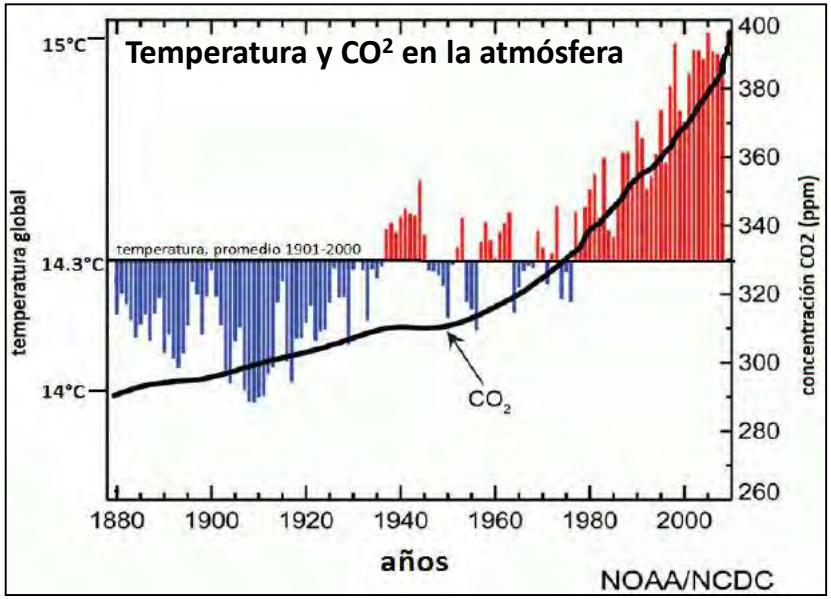




Cambio climático antropogénico y concentración del CO_2

El IPCC ha identificado las emisiones de los Gases de Efecto Invernadero (GEI) como causantes principales del cambio climático actual, cuyos impactos sobre la atmósfera están aumentando el efecto Invernadero natural, causando así un calentamiento global con sus respectivos repercusiones sobre el clima.





El "efecto invernadero" consiste en que la atmósfera retiene una parte de la energía térmica que proviene de la radiación solar, manteniendo así una temperatura promedio global de unos 14° C. Sin este efecto invernadero natural, la temperatura promedio global será de unos -18° C y no habrá vida en la tierra.

Principales gases del efecto invernadero	Acción relativa	Contribución real al efecto invernadero
CO_2 (dióxido de Carbono)	1 (referencia 1g)	76 por ciento
(CFCs (cloroflurocarbonos), gases utilizados como refrigerantes y aerosoles)	15.000	5 por ciento
CH_4 (metano)	25	13 por ciento
N_2O (óxido nitroso)	230	6 por ciento

Manifestaciones del Cambio Climático

El Cambio Climático se manifiesta tanto en forma de **tendencias:**

- Temperatura del aire
- Temperatura del mar
- Precipitaciones
- Acidificación de los mares
- Nivel del mar, etc.

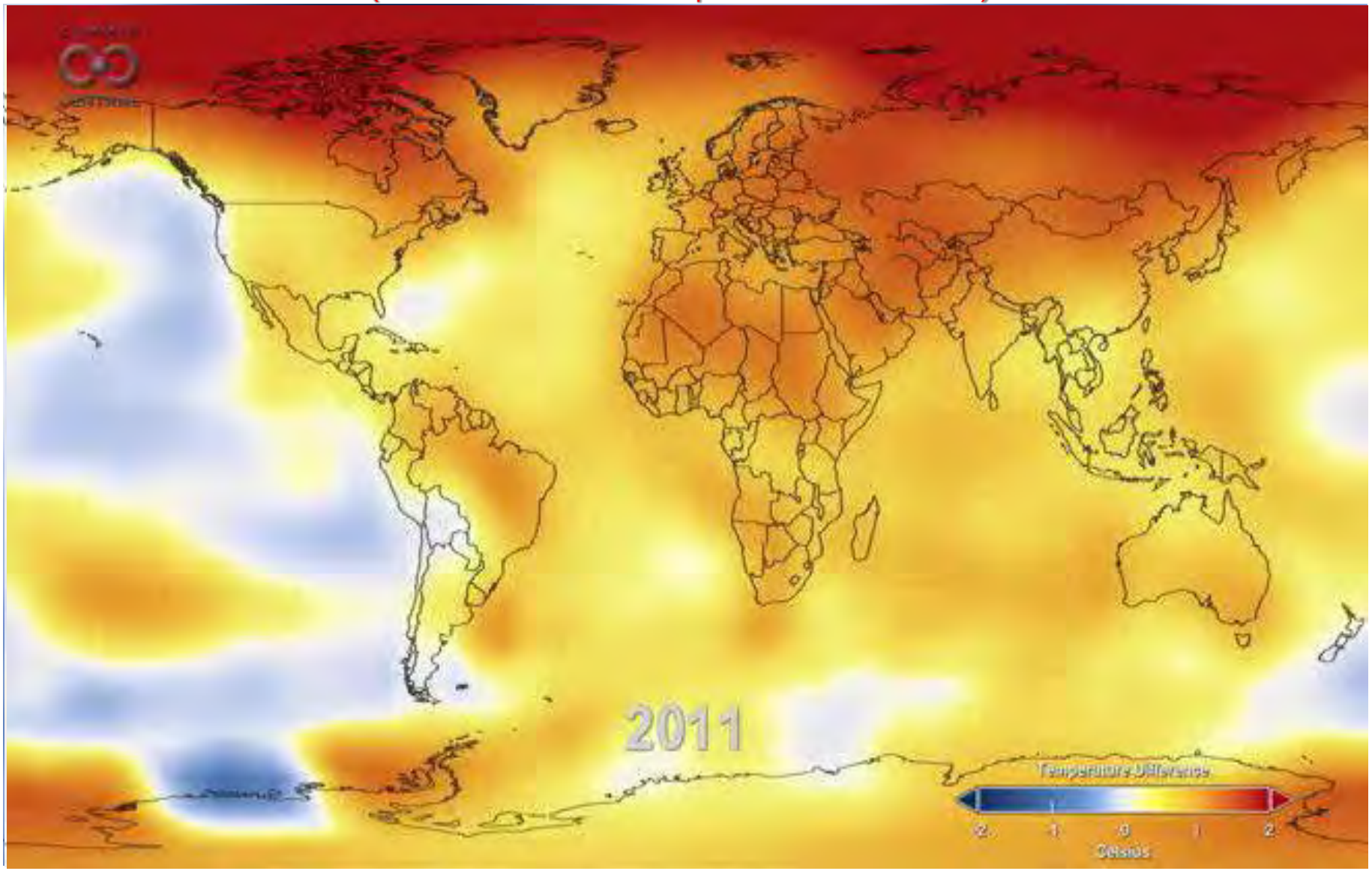
Como en forma de **eventos extremos**:

- Sequías
- Inundaciones
- Incendios
- Huracanes
- Olas de calor o de frío

Como también en **cambios en la estacionalidad** de los eventos

Manifestaciones del Cambio Climático:

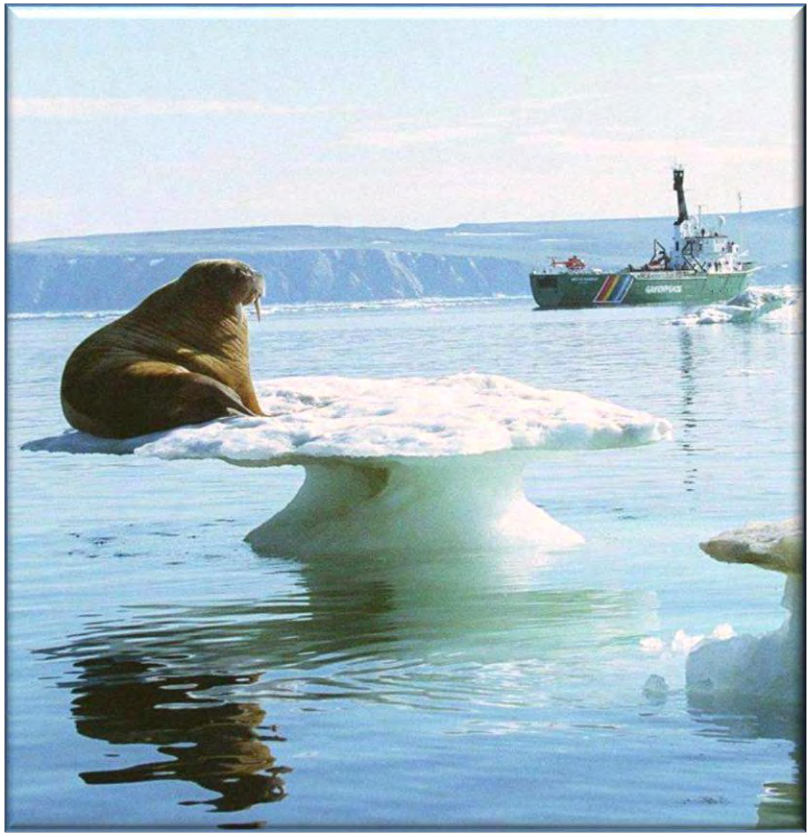
Tendencias; Cambios en la temperatura superficial entre 1891 y 2011 (anomalías referente al promedio 1951-1980)

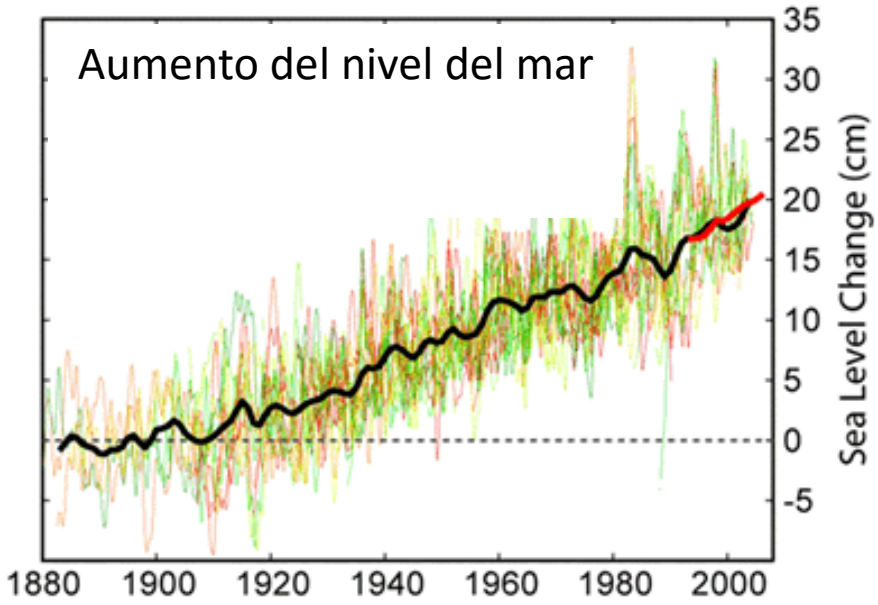


Mapas elaborados por el "*Goddard Institute for Space Studies*" de la NASA en New York. Los colores demuestran zonas donde la temperatura era mayor (=rojo) o menor(azul) que el promedio (=linea base) del período 1951-1980

Manifestaciones del Cambio Climático:
Tendencias; aumento del nivel del mar: 1880-2000

Datos del satélite europeo CryoSat-2 confirman en 2014 una perdida de hielo en Groenlandia y la Antártica de 80 km cúbicos por año, y que esta tasa se ha duplicado desde el 2009.





- Expansión térmica del agua
- Descongelamiento de hielo

Un tercio de la población mundial habita a 50 km de las costas. Tan sólo un aumento leve del nivel del mar podría inundar a las regiones costeras, causando la necesidad de tener que re-ubicar a comunidades así como su infraestructura.

Guía para la identificación de principales impactos por eventos climáticos

eventos climáticos

>tendencias y eventos extremos<

(Cambio Climático)

precipitación

Lluvias torrenciales,
Aumento de promedios,
Baja de promedios,
Cambio en la estacionalidad,
Sequias prolongadas,

temperatura

Olas de calor,
Aumento de promedios,
Baja de promedios,
Olas de frio,
Cambio en la estacionalidad,
Derretimiento de glaciares

movimiento de aire

Tormenta, Vendaval,
Temporal

mares

Aumento del nivel del mar
Marejadas, alto oleaje
Acidificación del agua

*Ejemplos principales. Son interdependientes.

componentes expuestos

Agua (Ríos, Lagos, Acuíferos, Glaciares, etc.)

Suelo

Aire

Ecosistemas

Sectores Productivos
- Silvoagropecuario
- Pesca y Acuicultura
- Minas y canteras

Infraestructura
- Comunicaciones
- Edificación
- Espacios públicos
- Transporte
- Energía
- Agua, Alcantarillado
- Sanitaria
- Portuaria
- Comercial
- Industrial

Población
- Salud, seguridad
- Empleo, migración
- Tejido social

ejemplos de impactos negativos*

Escasez de agua para consumo humano, riego, uso industrial , hidroeléctricas y ecosistemas

Contaminación y salinización de agua (superficial y acuíferos), suelos y contaminación de aire

Inundaciones, desborde de ríos, aludes, aluviones, nivel del mar

Erosión de suelos, desertificación, Incendios forestales

Degradación de ecosistemas , migración y extinción de especies, alteración de los servicios ecosistémicos

Disminución de producción agrícola, pesquera , acuícola y minera

Infraestructura dañada y servicios relacionados afectados

Vidas y salud en peligro, estrés bioclimático, enfermedades transmitidas por vectores
Seguridad alimentaria afectada,
Migraciones y desplazamientos

Conflictos sociales

Chile es un país vulnerable al Cambio Climático: Impactos climáticos en la prensa nacional

Vivimos la década más calurosa

Informe de la NASA afirma que la temperatura media ha subido 0,6° desde el siglo XX.

LA REPRESENTACIÓN DE ESTE TIPO DE TECNOLOGÍA EN EL SIC PASÓ DEL 40% AL 18% EN UNA DÉCADA:

Aporte de la generación hidroeléctrica de embalse cae a la mitad en 10 años

La sequía que afecta a la zona centro-sur y la nula inversión en nuevas represas explican la drástica caída de la participación del agua de embalse en la matriz nacional. Por su parte, el carbón triplicó su presencia.

40% del total de la energía inyectada en el SIC representaban las represas en 2003. Hoy apenas alcanzan el 18%.

30% representa el carbón. La generación a base de este combustible se triplicó en una década.

Ola de calor se extiende a zona sur y alertan por incendios

- Regiones IX al sur registran sobre 30°C. La Onemi llamó a tomar medidas preventivas.
- Altas temperaturas han provocado deshielos y aumento en caudal de los ríos de la zona central.

GUÍA PARA ENFRENTAR LOS DÍAS CÁLIDOS

Niños y adultos deben tomar medidas para adaptarse a las jornadas de mayor calor.

Horario nocturno

Horario más caluroso: Escoger horarios más frescos y evitar salir entre 11-16 h.

Santiago registró ayer la temperatura más alta de agosto en los últimos 41 años

- A las 16.30, el termómetro marcó 31°, cifra que no se registraba en este mes desde 1973.
- El fenómeno se repitió ...

Estimación bajó a 11 millones de cajas:

Envíos de cerezas podrían caer un 20% por problemas climáticos

Las distintas lluvias en época de cosecha han provocado mermas en la producción.

Cada foco registrado desde julio pasado ha arrasado en promedio con 29 hectáreas:

Incendios forestales esta temporada son los más destructivos en 25 años

Para este fin de semana se esperan máximas de hasta 38 °C en la zona central; este entre Biobío y La Araucanía complicará más el combate al fuego.

Parque Kaukarí en Copiapó.

Copiapó tuvo el día más caluroso desde hace 64 años

La temperatura en Copiapó ayer alcanzó los 35,6° según informó la Dirección Meteorológica de Chile, cuyo experto, Luis Salazar agregó que en Atacama no se sentía tal calor en este fecha desde 1951. Según los registros de Meteorología, hace 64 años hubo una máxima de 37,3°. En Bodega, a 6 km de Copiapó, la temperatura llegó a los 36,6°.

Petorca y La Ligua, las comunas con mayor riesgo de sufrir desastres por el cambio climático

- Estudio de la U. Católica creó un **índice de riesgo climático** en el que la zona del valle de la Región de Valparaíso aparece con el índice más alto.
- Inundaciones, sequías, aludes, remociones en masa e incendios forestales son las **principales amenazas**, que aumentan por el cambio climático.

Chile: Lo extremo se convierte en lo normal

Marzo 2015: Catástrofe en el Norte del país: Lluvias provocan el desborde del río Copiapó.

Agosto 2015: Las regiones de Tarapacá, Antofagasta, Atacama y Coquimbo son afectadas por fuertes marejadas; 6 muertos, 1 desaparecido y mil damnificados.

Agosto 2015: Santiago se inunda por fuertes lluvias

Estrategias a nivel mundial para enfrentar el Cambio Climático

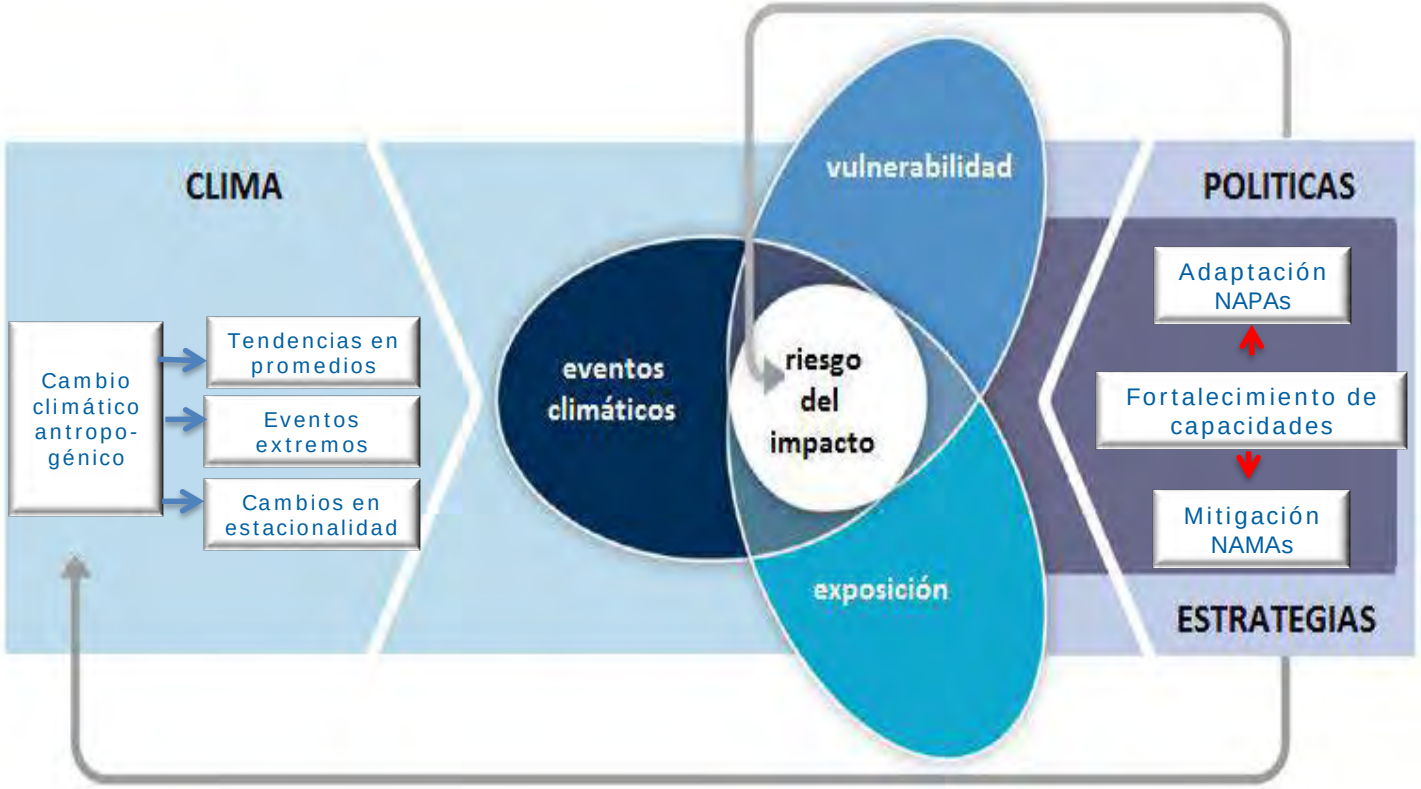
Las estrategias a nivel internacional para enfrentarse a los desafíos del Cambio Climático han sido elaboradas por la *Convención Marco de los Naciones Unidas sobre Cambio Climático* (CMNUCC) que trata este tema en sus reuniones (COP) anuales.

Los tres ejes estratégicos son:

- **Mitigación**
  Reducir las emisiones de los gases del efecto invernadero (GEI) y aumentar la capacidad de su almacenamiento
- **Adaptación**
  Evitar o minimizar los impactos negativos del cambio climático y obtener beneficios de los impactos positivos
- **Capacitación**
  Para poder identificar e implementar medidas apropiadas de mitigación y adaptación

Estrategias para enfrentar el Cambio Climático

Medidas de Adaptación
(NAPAs (*National Adaptation Programmes of Action*))



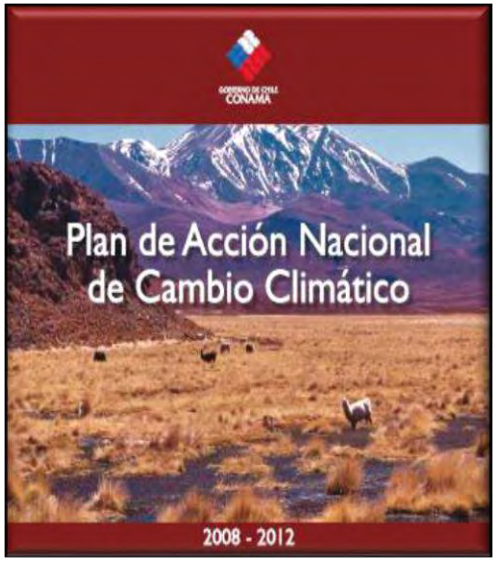
Medidas de Mitigación (NAMAs (*Nationally Appropiate Mitigation Actions*))

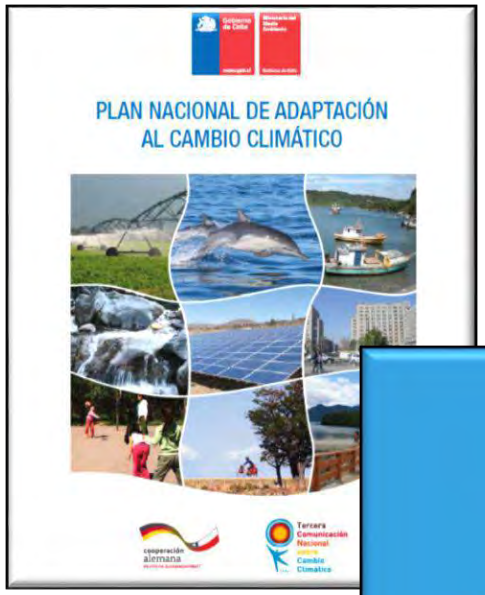
IPCC (AR 5,2013/14) "Un proceso de ajustes al clima y sus efectos actuales o esperados. En sistemas humanos adaptación busca moderar o evitar impactos negativos o aprovechar los efectos beneficiosos."

Adaptación preventiva, Adaptación reactiva, Adaptación planificada, Adaptación autónoma, "mala adaptación",…

La política chilena para enfrentar los desafíos de adaptación al cambio climático

Plan de Acción Nacional de Cambio Climático del 2008 (PANCC I), es el instrumento articulador de la política chilena en materia de cambio climático. Su actualización (PANCC II) estaré disponible en 2016



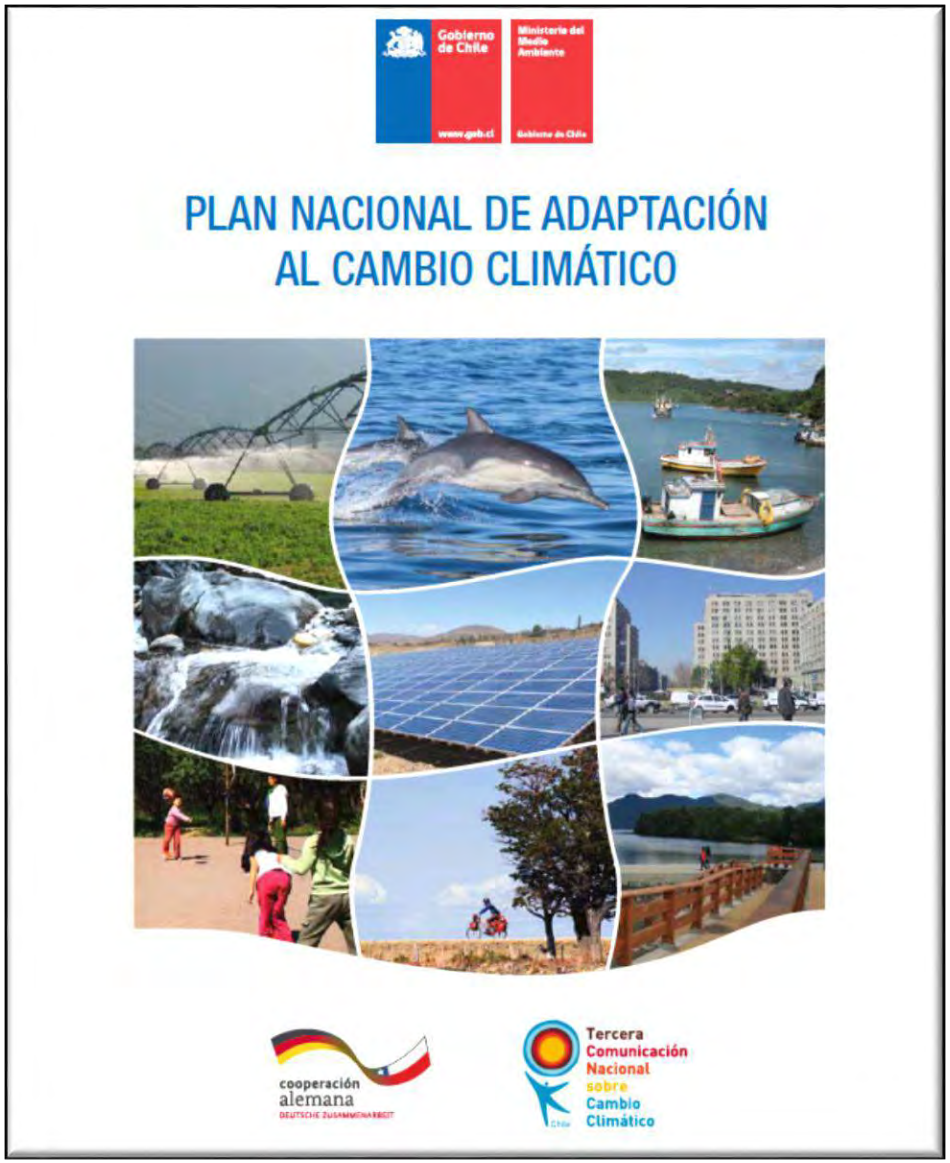


Plan Nacional de Adaptación al Cambio Climático del 2014, proporciona el marco conceptual para 9 Planes Sectoriales de Adaptación al Cambio Climático y una estructura operativa para su elaboración e implementación

Contribución Nacional Tentativa de Chile (INDC, 2015) entregada a la COP 21: el Gobierno se compromete con cinco pilares estratégicos:

- Mitigación de las emisiones de los GEI
- Adaptación al Cambio Climático
- Construcción y fortalecimiento de capacidades
- Desarrollo y transparencia de tecnologías climáticas
- Financiamiento

Adaptación en Chile:
El Plan Nacional de Adaptación al Cambio Climático



http://portal.mma.gob.cl

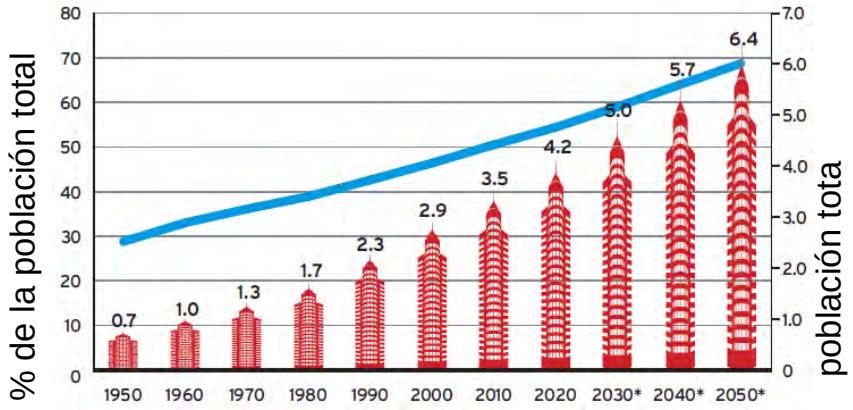
En diciembre del 2014 el Consejo de Ministros para Sustentabilidad y Cambio Climático aprobó el Plan Nacional de Adaptación al Cambio Climático.

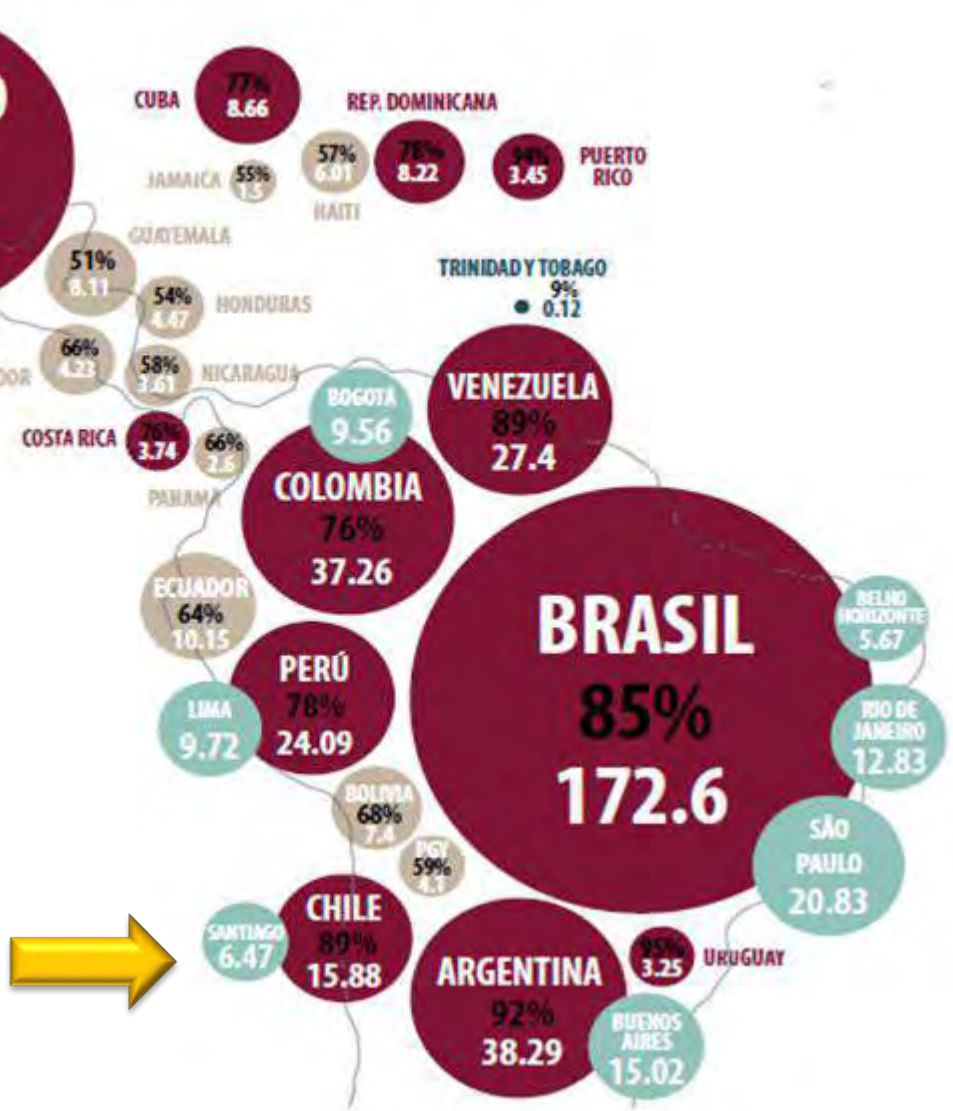
El Plan entrega los lineamientos para la adaptación en Chile y proporciona, entre otros, la estructura operativa para la elaboración e implementación de 9 Planes Sectoriales:

- Silvoagropecuario (2013)
- Biodiversidad (2014)
- Pesca y Acuicultura (2015
- Salud (2016)
- Infraestructura (2017)
- Ciudades (2017)
- Recursos Hídricos (2018)
- Energía (2018)
- Turismo (201()

Ciudades: situación actual y tendencia mundial

Un mundo urbanizado





Junto con Venezuela y Argentina, Chile es el país más urbanizado de América Latina y del Caribe

Fuentes: Banco Mundial; UN-Department of Economic and Social Affairs

Ciudades y Cambio Climático

Con 80% de las emisiones GEI, las ciudades son los principales causantes del cambio climático

pero también son las más vulnerables a sus efectos adversos :

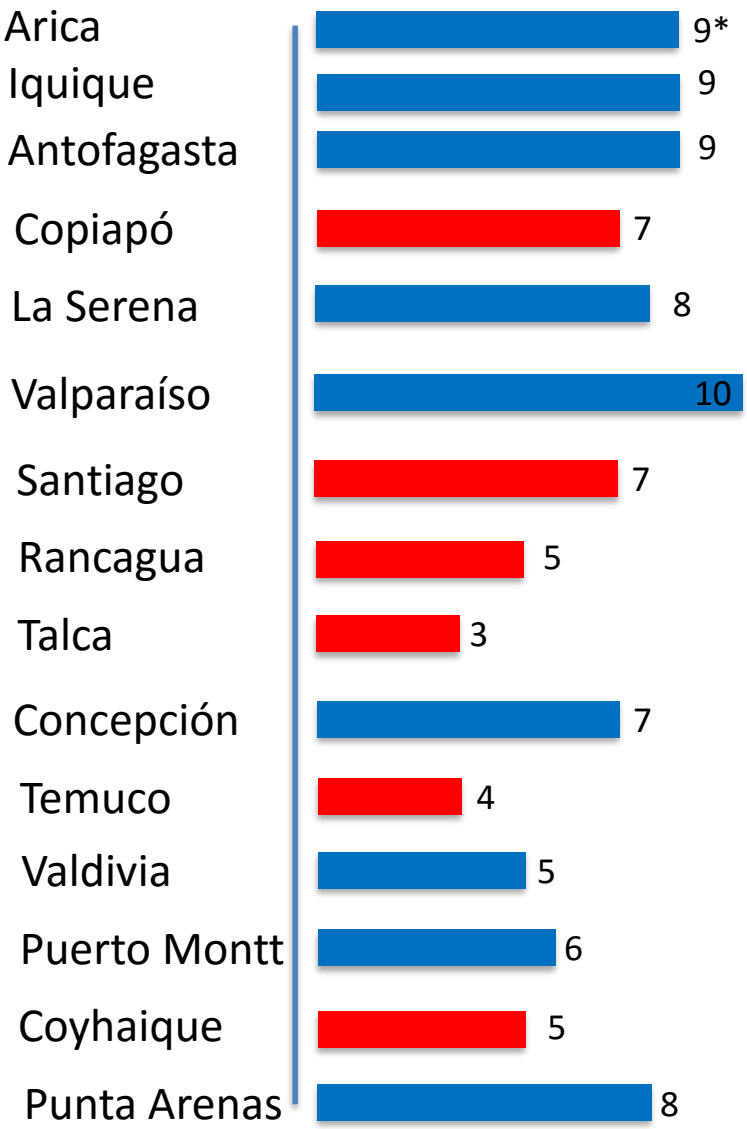
- por la alta densidad poblacional y el rápido crecimiento urbano , poco planificado
- por la alta concentración de infraestructura
- por la alta demanda/dependencioa de recursos y servicios
- cuando están situadas en zonas costeras

Principales amenazas del Cambio Climático a nivel mundial y su relevancia para las ciudades chilenas

ONU-HABITAT: "Las ciudades y el cambio climático: Orientaciones para políticas", 2011

Eventos climático	probabilidad	Posibles impactos (positivos y negativos)	
Días y noches menos fríos	Casi seguro	Disminución de la demanda de energía para la calefacción.	X
Días y noches calurosos	Casi seguro	Aumento de la demanda de refrigeración	X
Temperaturas más cálidas	Casi seguro	Disminución de la interrupción del transporte debido a la nieve y efectos del hielo. Impacto negativo sobre el turismo de invierno.	X
Periodos cálidos/olas de calor	Muy probable	Reducción de la calidad de vida de la gente en áreas cálidas sin aire acondicionado. Impacto en la gente de avanzada edad , jóvenes y pobres. Pérdida de vidas humanas. Aumento del consumo de energía para el aire acondicionado.	X
Fuertes precipitaciones	Muy probable	Problemas de asentamientos, comercio, transporte, y sociedades por inundación. Importante pérdida de vidas humanas, daños y pérdidas a la propiedad y a las infraestructuras. Deslizamientos Aumento del uso del agua de lluvia en producción de energía hidroeléctrica.	X
Aumento de las zonas afectadas por la sequía	Probable	Escasez de agua para viviendas, industrias y servicios. Disminución de los potenciales para la producción de energía hidroeléctrica.	X
Aumento de la actividad de ciclones tropicales intensos	Probable	Problemas de asentamiento por inundaciones y fuertes vientos. Problemas con el suministro del agua. Retirada de las coberturas de riesgos en áreas vulnerables por las aseguradoras	
Aumento de la incidencia del crecimiento extremo del nivel del mar	Muy Probable	Aumento de los costes de la protección costera y de los costes de la reubicación del aprovechamiento del suelo. Menor disponibilidad de agua dulce por intrusión salina. Importantes pérdidas humanas, daños y pérdidas a la propiedad. Movimientos de población. (éxodo).	X

Principales amenazas del clima para las 15 capitales regionales de Chile



Ranking de los 12 principales amenazas climáticas en Chile(según registros históricos):

- Aumento de la temperatura
- Inundaciones
- Alud/Aluviones
- Disminución de precipitaciones
- Aumento del nivel del mar
- Remoción en masa o deslizamiento
- Sequias
- Mareas altas y oleajes fuertes
- Aumento de la temperatura del mar
- Aumento de precipitaciones
- Días y noches mas frías
- Vendavales o fuertes vientos

*= numero de amenazas identificadas por ciudad, según tabla a la derecha; Fuente: " Adaptación Urbana al Cambio Climático, Propuesta para la adaptación urbana al cambio climático en capitales regionales de Chile"; (Estudio MMA, Informe final: diciembre 2014; AdaptChile, CEDEUS, Cambio Global)

El Plan de Adaptación al Cambio Climático para Ciudades

(según mandato del Plan Nacional de Adaptación al Cambio Climático del 2014 y del Plan de Acción Nacional de Cambio Climático: 2017-2022)

El Plan de Adaptación al Cambio Climático para Ciudades, actualmente en elaboración, requiere un enfoque intersectorial, tomando en cuenta los diferentes niveles de gobernanza, la participación ciudadana y buscando sinergias entre los enfoques de adaptación y mitigación.

El Plan de Adaptación al Cambio Climático para Ciudades

Para la identificación de las medidas de adaptación, el Plan se orienta a seis líneas estratégicas :

1. *Planificación y gestión urbana para la incorporación de las amenazas del Cambio Climático al desarrollo urbano*
2. *Monitoreo de variables climáticas y mapeo de vulnerabilidades para identificar zonas de riesgo*
3. *Planes de contingencia y capacidad de respuesta de los servicios de la ciudad frente a emergencias por eventos extremos*
4. *Líneas de acción específica para los recursos hídricos, la energía y la salud y seguridad*
5. *Información, sensibilización y educación de la población e instituciones en temas de Cambio Climático y el uso eficiente de los recursos hídricos y energéticos.*
6. *Coordinación intersectorial e interinstitucional para fomentar una estructura de coordinación y facilitar un enfoque participativo en la elaboración e implementación de las actividades de adaptación al Cambio Climático.*

Ejemplos de medidas previstas en el Plan de Adaptación al Cambio Climático para Ciudades

(versión preliminar, 33 medidas en 6 líneas estratégicas)

I. Planificación y gestión urbana (8 medidas)	
4 (32). Considerar los posibles impactos climáticos en la planificación urbana.	Planificación urbana
5. (33). Re-localización de viviendas ubicados en zonas de riesgo climático	viviendas
6. Fusión 37+38: Protección y restauración de ecosistemas urbanos y promover el desarrollo de corredores de la biodiversidad. (corresponde a las medidas.39,40 del Plan en Biodiversidad)	Ecosistemas/biodiversidad
7. Consideración de áreas de alto valor en biodiversidad en la planificación urbana en el contexto de la adaptación al cambio climático. (Propone Daniel Sanchez (MMA) ; corresponde a las medidas 22y 23 del Plan en Biodiversidad)	biodiversidad
8. Incorporar las variables de Cambio climático en los instrumentos de planificación territorial.(Propone Daniel Sanchez (MMA))	Normas e instrumentos

II. Monitoreo y riesgo climático (2 medidas)	
9. (3) Mapas del riesgo climático	Riesgo climático
10. (1) Sistemas de monitoreo para el cambio climático y alerta temprana (corresponde a la medida 1 del CAS y medida 1 del Plan en Biodiversidad)	Monitoreo y alerta temprana
III. Planes de contingencia y capacidad de respuesta (3 medidas)*	
11. (4) .Planes de contingencia para mejorar la capacidad de respuesta de la ciudad frente a eventos extremos climáticos	Planes de contingencia
12. (7). Implementación de lugares seguros/frescos que sean accesibles durante emergencias climáticas	Seguridad ciudadana
13. (8). Identificar y coordinar una estrategia para los impactos del aumento del nivel del mar para ciudades costeras	Zona costera

*Un plan de contingencia es un tipo de plan preventivo, predictivo y reactivo. Presenta una estructura estratégica y operativa que ayudará a controlar una situación de emergencia y a minimizar sus consecuencias negativas.

CHILE: Estudio: Evaluación económica del Plan de Acción Nacional de Cambio Climático, Diciembre 2015: “Aumento del nivel del mar: Distintos escenarios climáticos revelan un rango de incremento entre 0.8m y 1.8m para Valparaíso en 2100”.

ECUADOR: Documento (Pre-Concept) de la CAF: Amenaza principal del Cambio Climático para Esmeraldas: Aumento del nivel del mar: en 2100 el 3%-6% de la ciudad será inundada en forma permanente.

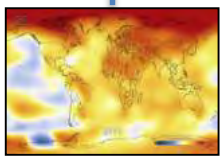
El Plan de Adaptación al Cambio Climático para Ciudades

> estado de elaboración <

II. Aprobación del Plan; 2017
(Consejo de Ministros para Sustentabilidad ; primer semestre 2017)

I. Elaboración del Plan (2016-2017)

III. Implementación del Plan→2017



Conformación de un equipo técnico interministerial para la elaboración del Plan

Identificación de los eventos climáticos relevantes

Análisis de la vulnerabilidad del Sector

Realizados durante 2014-primer trimestre 2016

Identificación de las medidas de adaptación (hasta junio 2016)

Elaboración del Anteproyecto del Plan (hasta septiembre 2016)

Consulta Pública del Anteproyecto (octubre-diciembre 2016)

Versión final del Plan (abril 2017)

>>del Plan a la acción<<

(primer paso: Proyectos piloto/modelo (por ejemplo: proyecto Antofagasta - Taltal(CAF))

Monitoreo y evaluación

Actualización cada cinco años


Los modelos no indican con absoluta certeza que viene un tsunami, así que mejor esperemos

Ministerio del Medio Ambiente

Gobierno de Chile

Taller inicial: Proyecto regional de reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina;
Antofagasta, 4.5.2016

Muchas gracias por su atención

Dr. Peter Muck
Departamento de Cambio Climático del Ministerio del Medio Ambiente

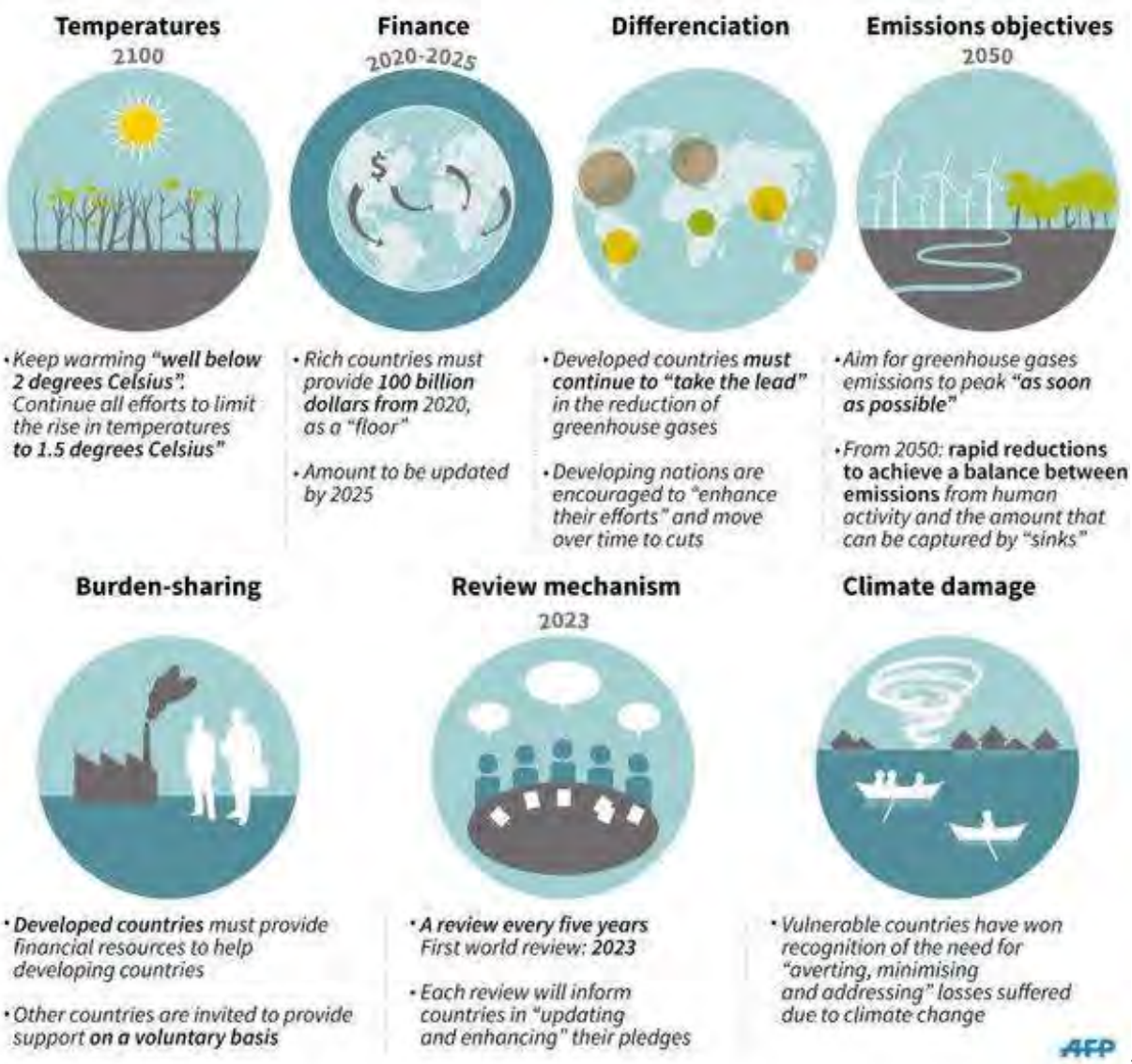
BANCO DE DESARROLLO DE AMÉRICA LATINA

Programa de Adaptación al Cambio Climático

Dirección de Ambiente y Cambio Climático
Unidad de Cambio Climático

BANCO DE DESARROLLO DE AMÉRICA LATINA

Acuerdo de Paris



Tomado de: http://www.lowcarbonfuture.es/

Acuerdo histórico, aprobado por 195 países y firmado por 175 el pasado 22 de abril.

Entrará en efecto en 2020 y una vez sea ratificado por el 55% de los países.

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Contribuciones Nacionales Determinadas

NDC (Nationally Determined Contributions) son los compromisos de reducción de emisiones y acciones de adaptación que cada país presentó previo a la COP21, de manera voluntaria y de acuerdo a sus realidades.

Principales medidas

- Energías renovables y eficiencia energética
- Protección de los bosques
- Buenas prácticas agrícolas
- Transporte limpio
- Gestión de residuos
- Mejora de procesos industriales

Fuente: http://www.diversidadbioculturalyterritorios.org/pg.base.php?id=7&id_news=258&lang=es

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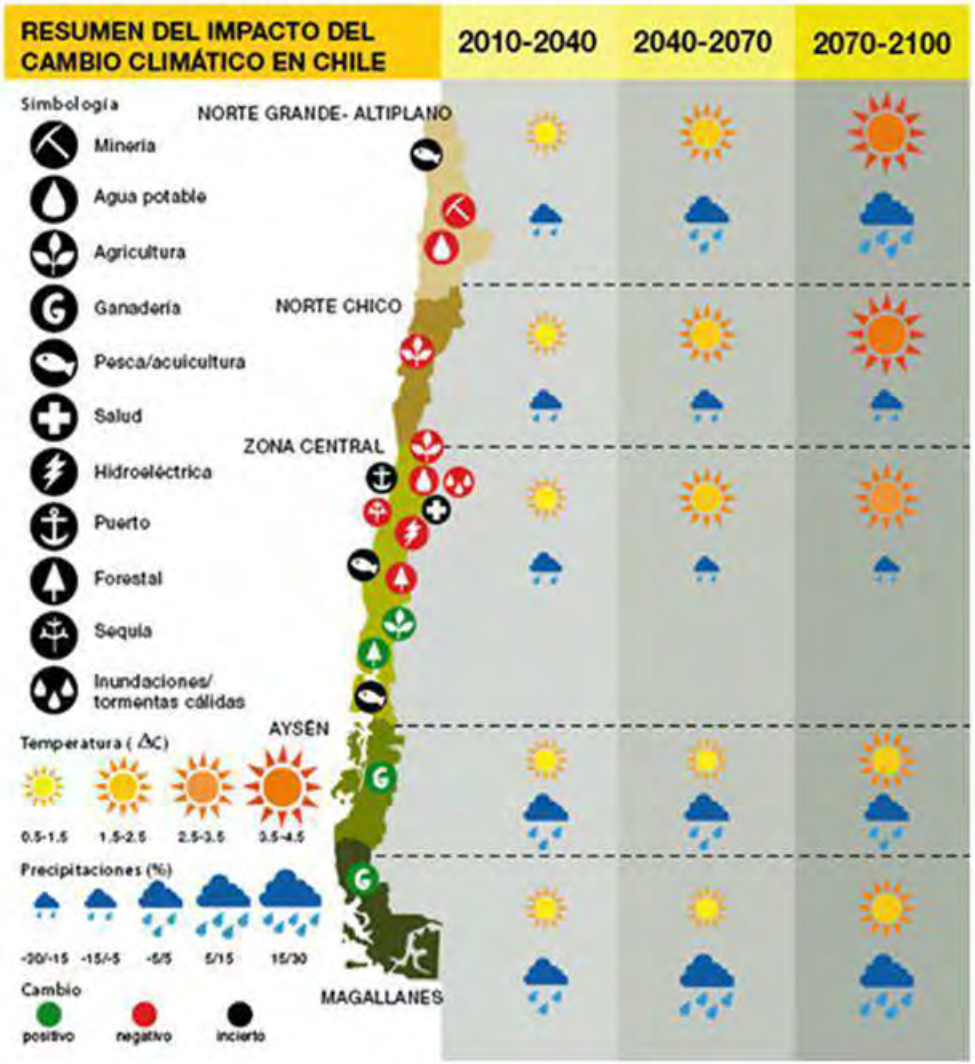
Contribuciones Chile de Adaptación

- Implementación de acciones concretas para incrementar la resiliencia en el país, en el marco del Plan Nacional de Adaptación al Cambio Climático y de los planes sectoriales, con una perspectiva descentralizada y buscando la integración de los esfuerzos entre los distintos niveles de decisión (nacional, regional, municipal).
- Identificación de fuentes de financiamiento para implementar dichos planes, en el marco de lo señalado en el pilar definanciamiento de esta contribución.
- Creación de sinergias con las iniciativas que se contemplen en materia de mitigación, y maximizar los beneficios provenientes de los pilares de desarrollo y construcción de capacidades y de creación y transferencias de tecnologías incluidos en esta contribución.
- Fortalecimiento del marco institucional de la adaptación en Chile.
- Preparación de métricas y mecanismos de medición de los planes sectoriales

A partir de 2021

- Iniciar un segundo ciclo de planes sectoriales de adaptación al Cambio Climático, sobre la base de la experiencia obtenida a la fecha.
- Contar con un Plan Nacional de Adaptación actualizado.
- Desarrollar un ejercicio de evaluación nacional al 2026, a través de indicadores de vulnerabilidad y metodologías para determinar el aumento de la capacidad adaptativa de las personas, las comunidades y los sistemas que serán impactados por el Cambio Climático.



CHILE

- Biodiversidad
- Recursos Hídricos
- Salud
- Infraestructura
- Energía
- Silvoagropecuario
- Pesca - Acuicultura
- Turismo
- Ciudades

***Figura**: Impactos del cambio climático en Chile (Fuente: CEPAL, 2012)*

Plan de Acción Nacional de Cambio Climático (2017-2022)

Impactos del cambio climático: CIUDADES

El aumento de temperatura y reducción de precipitaciones preocupa especialmente en las ciudades, que son las zonas donde se concentra la mayor parte de la población chilena y donde la demanda por el recurso hídrico aumentará. Las olas de calor pueden verse acentuadas por las características de la urbanización.

Se proyecta una presión adicional sobre el suministro de agua potable (con inversión mayor para alcanzar la calidad normada), el alcantarillado, los sistemas de energía y los servicios de transporte; también, se espera una mayor presión sobre los servicios de salud, especialmente entre la población de estratos socioeconómicos más bajos (Proyecto CAS, 201220).

A través del Programa Latinoamericano de Cambio Climático, de la UCC, CAF contribuye a la Mitigación y Adaptación al cambio climático y promueve el desarrollo sustentable y bajo en carbono de Latinoamerica

- **Programa de Mitigation y Mercados de Carbono**
- **Programa de Adaptación al Cambio Climático**

Programa de Adaptación al Cambio Climático

Objetivo: Promover y apoyar procesos planificados de adaptación a nivel de políticas, planes, programas y proyectos, para orientar la construcción del desarrollo sostenible de los países de América Latina y el Caribe.

Líneas de Acción:

1. Promover el acceso al flujo de los recursos financieros en materia de adaptación

2. Fortalecer la capacidad institucional de los sectores público y privado en materia de adaptación (Planes, programas y política)

3. Promover medidas de adaptación concretas sobre el terreno, como respuesta a las necesidades más inminentes (inversiones)

4. Apoyar la generación y la gestión del conocimiento

Antecedentes
Fondo de Adaptación

- El Fondo de Adaptación entró plenamente en vigor en abril de 2010

- La CAF fue acreditada por el Fondo de Adaptación de las Naciones Unidas en Marzo 2014

- El Fondo de Adaptación cuenta con las siguientes fuentes de recursos:

  - Un 2% de las reducciones certificadas de emisiones (RCE) de los proyectos de mitigación del cambio climático registrados en el Mecanismo para un Desarrollo Limpio (MDL)
  - Donaciones de países desarrollados, las cuales representan la principal fuente de recursos hoy en día

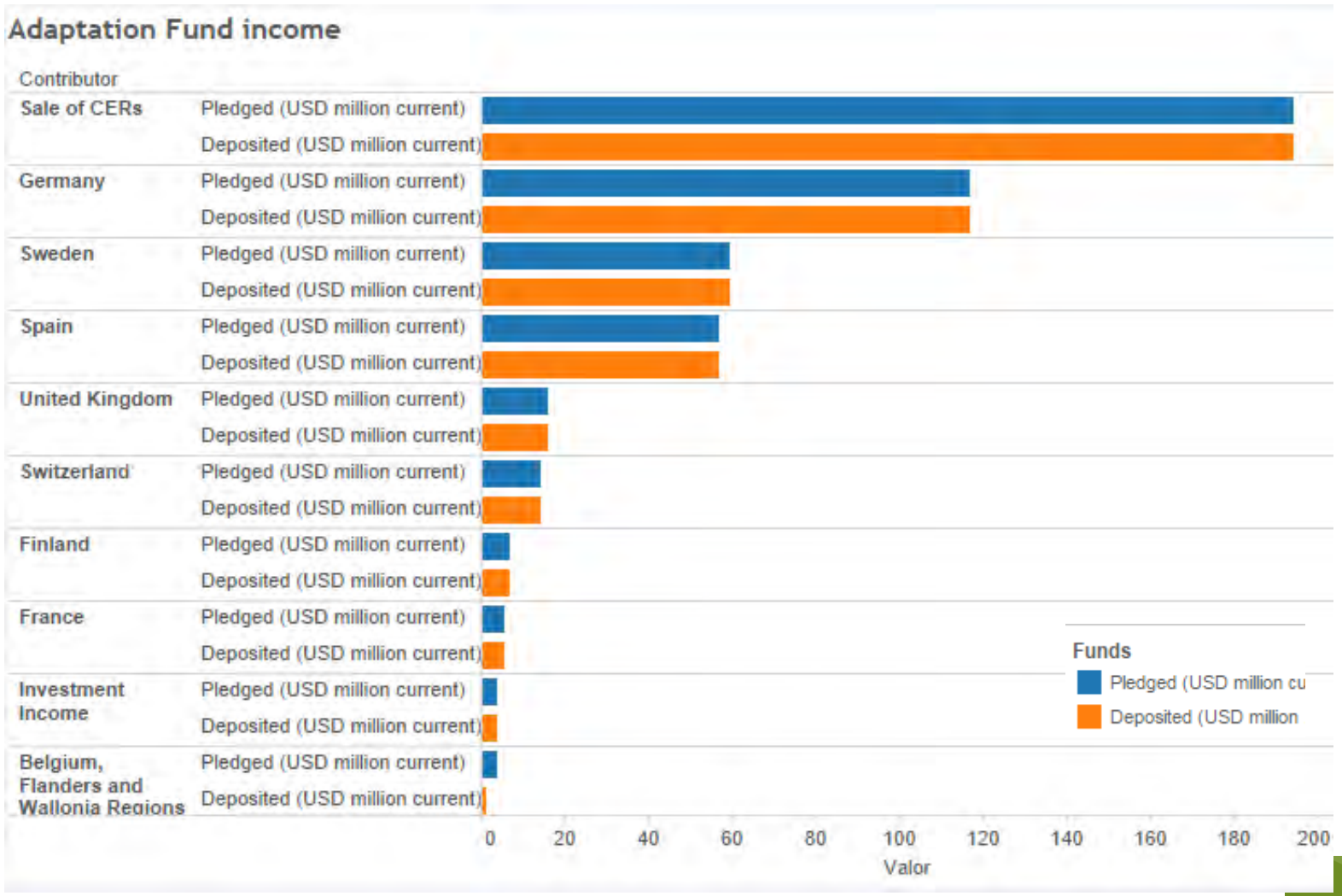
- El Fondo de Adaptación evolucionó a través de una serie de decisiones del principal órgano rector de los países que ratificaron el Protocolo de Kyoto: la Conferencia de las Partes (países) en calidad de Reunión de las Partes en el Protocolo (CP/RP).

Impacto del AF

Fuente. https://www.adaptation-fund.org/wp-content/uploads/2016/01/AF-infographic-Spanish-1.11.16.pdf

FONDO DE ADAPTACIÓN

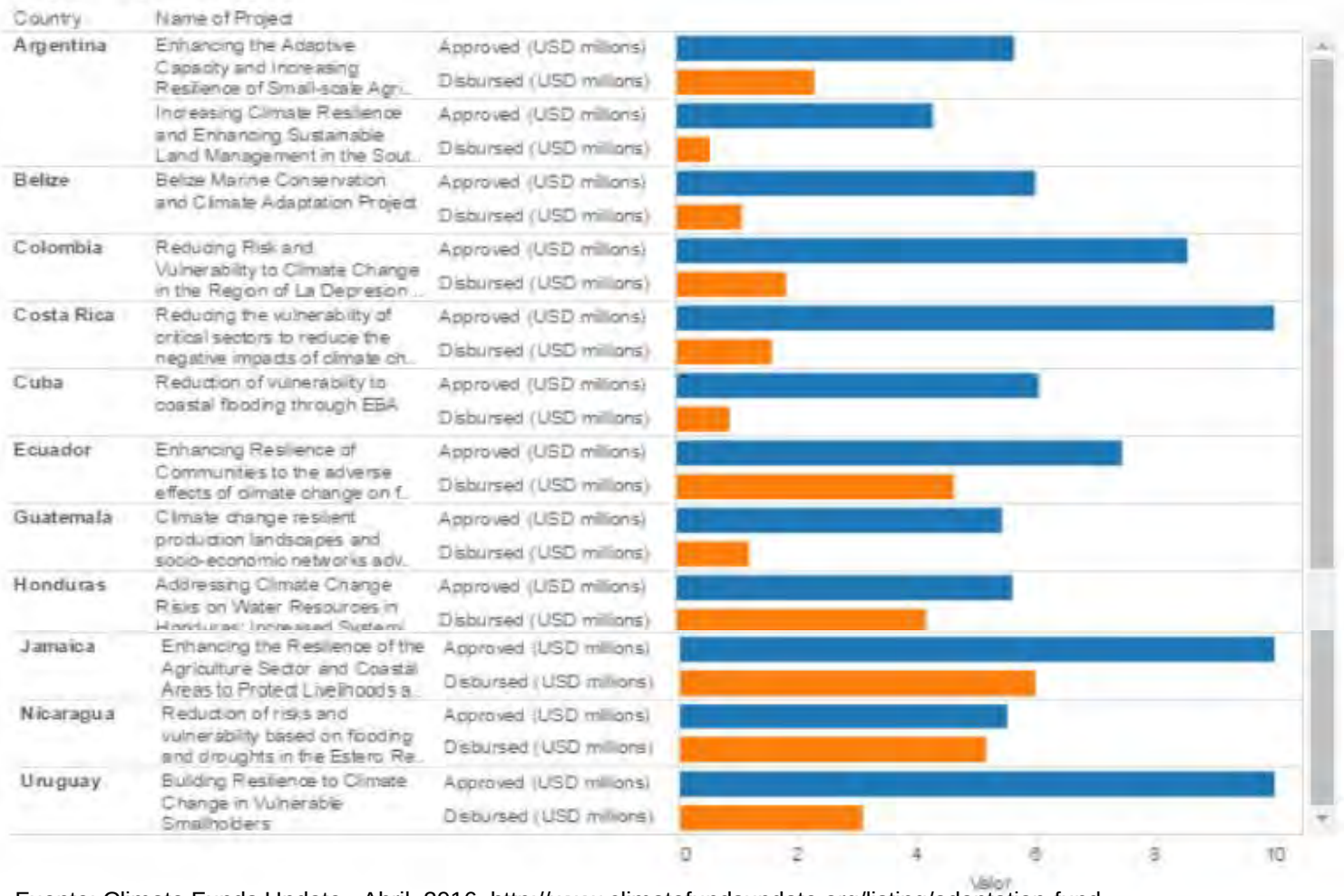
Fuente de Recursos – principales fuentes



Fuente: Climate Funds Update. Abril, 2016. http://www.climatefundsupdate.org/listing/adaptation-fund

Proyectos AF en Latinoamérica

Projects by country



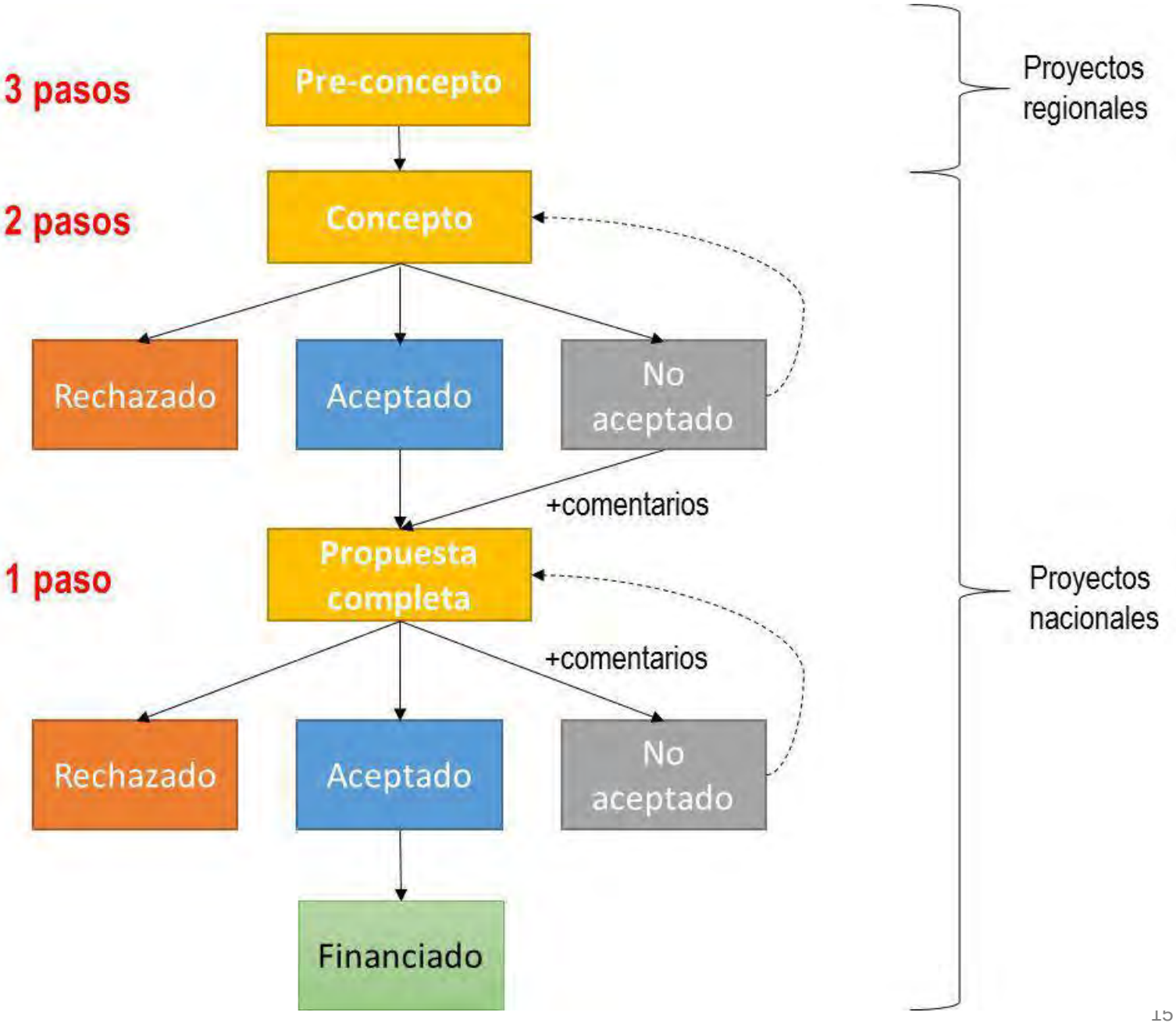
Fuente: Climate Funds Update. Abril, 2016. http://www.climatefundsupdate.org/listing/adaptation-fund

Programa para Actividades Regionales

- Lanzado en Mayo 2015
- Sigue los tiempos definidos por el Fondo para todos los proyectos
- Primera fecha para entregas el 4 August 2015.
- Esta abierta para **RIEs** (Agencias Implementadoras Regionales) y **MIEs** (Entidades implementadoras multilaterales) que deben trabajar de forma conjunta con las Agencias de Implementación Nacionales (NIEs).
- Hasta 4 proyectos / programas regionales
- Un total de USC 30 millones
- Cada proyecto / programa hasta USD 14 millones
- Tres proyecto / programa hasta USD 5 millones
- Hasta 10 proyecto / programa para su formulación con subsidio – grants de hasta USD 100,000 cada uno.
- La financiación esta fuera de los limites de los países. / MIEs limites

Consideraciones para la Evaluación de Proyectos

- Consistente con las estrategias de sostenibilidad
- Beneficios económicos, sociales y ambientales
- Cumple con los estándares técnicos nacionales.
- Costo eficiente y sostenibilidad
- Consideración de asuntos de genero en el diseño de proyecto
- Análisis de actores claves e incorporación de la visión de la comunidad
- Evitar duplicidad con otro proyectos
- Arreglos para la gestión de los recursos, riesgos y posibles impactos


3 pasos
Pre-concepto
2 pasos
Concepto
Rechazado
Aceptado
No aceptado
+comentarios
1 paso
Propuesta completa
+comentarios
Rechazado
Aceptado
No aceptado
Financiado
Proyectos regionales
Proyectos nacionales

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Anexo 4. Presentación sobre principales efectos del cambio climático en la Región de Antofagasta y medidas propuestas en el proyecto

Principales efectos del cambio climático en la Región de Antofagasta y medidas propuestas en el Proyecto.

Gladys Santis

División de Calidad del Aire y Cambio Climático

Ministerio del Medio Ambiente

Impactos Proyectados del cambio climático para la Región de Antofagasta

Ministerio del Medio Ambiente

EFECTOS EN LA PLUVIOMETRÍA

DISMINUCION PROMEDIO ANUAL DE PRECIPITACIONES POR PERIODO

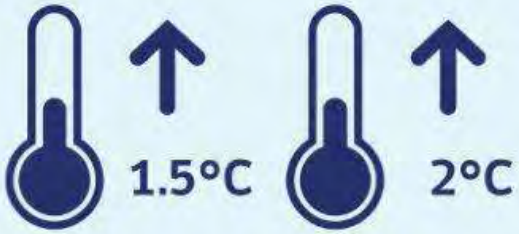
(2040 a 2070) (2070 a 2100)

Para el período 2040-2070, la ciudad de Antofagasta sufriría una disminución en alrededor de un 10% y para el período 2070-2100 no variaría respecto al valor actual.

Durante el período específico de otoño se incrementarían las precipitaciones. Además, en primavera y verano habría un aumento en las precipitaciones [illegible] en el altiplano

EFECTOS EN LA TEMPERATURA

MEDIA ANUAL



PERIODO CERCANO (2011 a 2030) PERIODO INTERMEDIO (2031 a 2050)

en un escenario de muy altas emisiones de Gases de Efecto Invernadero (GEI). El aumento llegaría a 3°C.

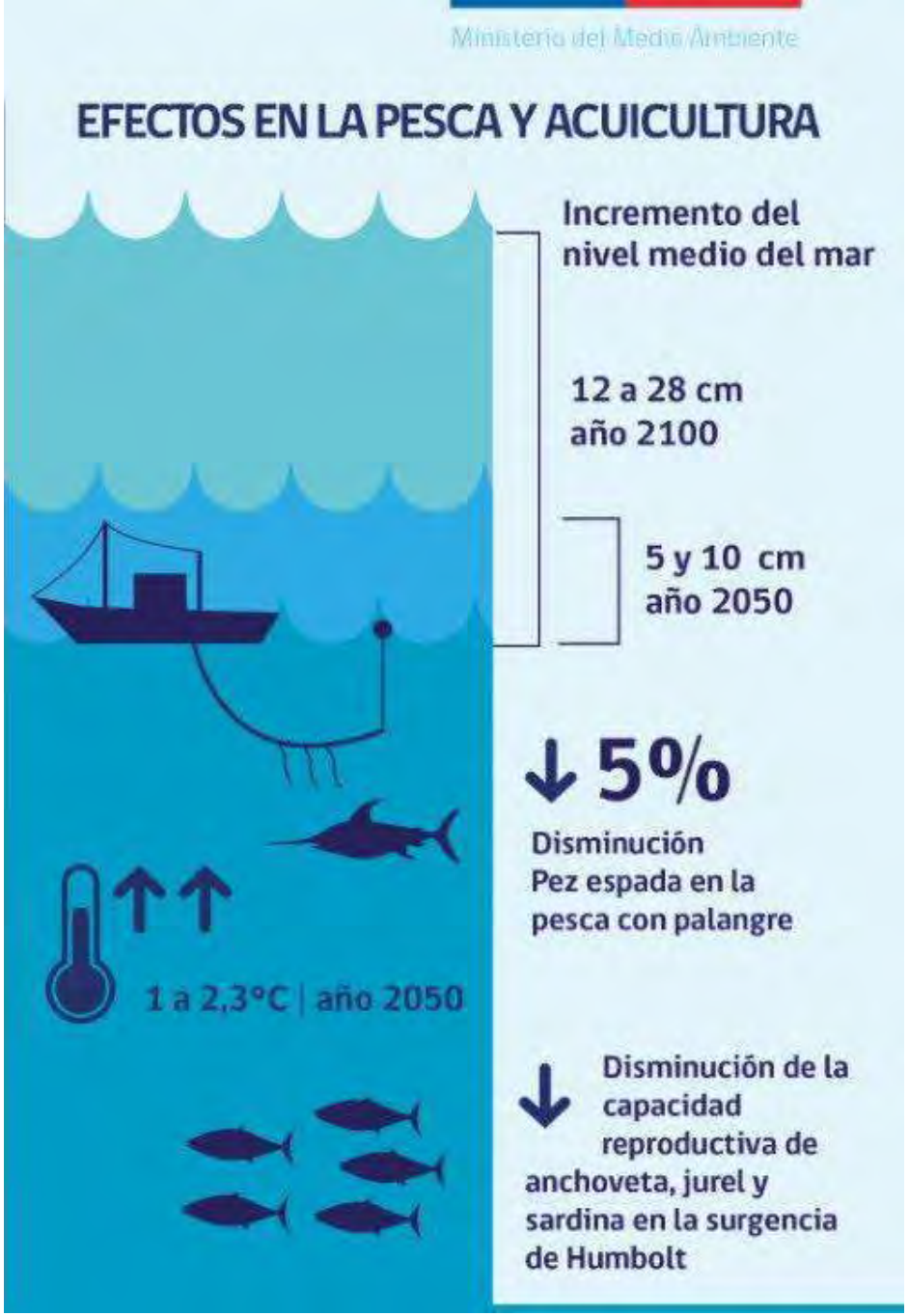
Se espera un aumento de 3°C entre el año 2065 y 2075 cerca de la costa y en el año 2060 sobre la cordillera. Además, se proyecta un aumento de 3°C en el altiplano para el año 2065.

Efectos del Cambio Climático en la Región de Antofagasta

Impactos esperados:

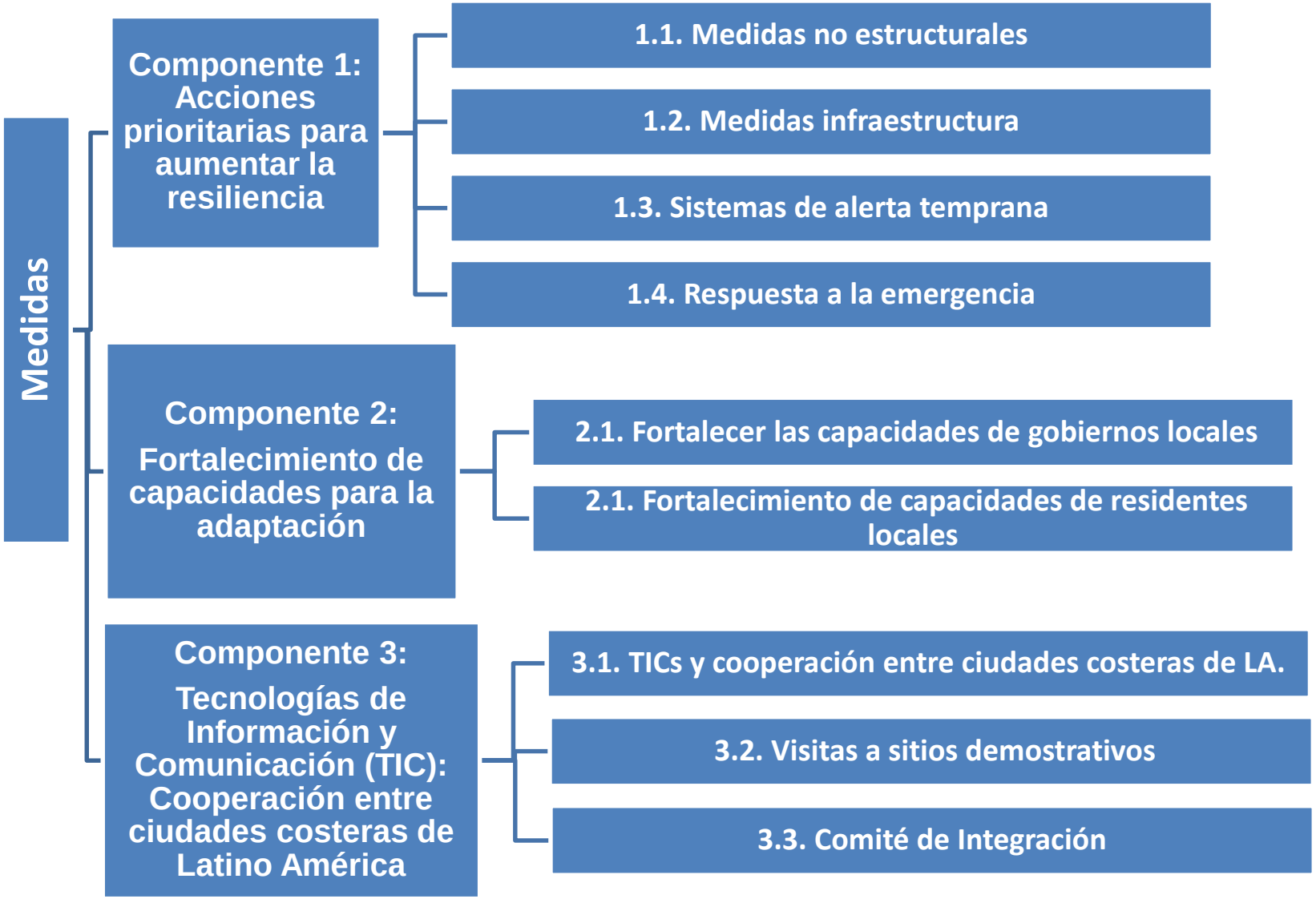
-Eventos de precipitación extrema con mayor frecuencia e intensidad.

-Especial importancia cobrarán los eventos de tormentas cálidas en la zona precordillerana y altiplano: fuertes precipitaciones en días con altas temperaturas, pudiendo generar eventos de inundación, aluviones, aludes, remoción en masa.



Además de los posibles efectos relacionados al aumento del nivel del mar, cobran importancia los eventos meteorológicos de "marejadas", las cuales aumentarían en intensidad y frecuencia en las próximas décadas, afectando la infraestructura costera, los sectores productivos y poblaciones que habitan en el borde costero y la biodiversidad.

Medidas propuestas en el Proyecto



Medidas propuestas en el Proyecto

Componentes del Proyecto	Resultados esperados	Productos esperados	País	(US$)
Componente 1. Acciones prioritarias para aumentar la resiliencia.				**10,230,000**
SC 1.1. Medidas no estructurales	Mejorar planes de infraestructura verde para reducir vulnerabilidad ante inundaciones, deslizamientos de tierras y aluviones.	- Planes infraestructura verde - Actualizar plan maestro de lluvias incorporando microcuencas en Antofagasta y Taltal. Pilotos reforestacion en riberas. - Protección y expansión de áreas de manglares (Esmeraldas)	Chile Ecuador	**1,500,000** 1,000,000
SC 1.2. Medidas infraestructura	Reducir la vulnerabilidad ante inundaciones deslizamientos de tierras y aluviones en tres ciudades costeras (ca., 574.000 personas protegidas)	- Obras (obras de control, canales de agua lluvia) en micro cuencas priorizadas. - Adquisición de software para análisis, diseño y priorización (ejemplo ArcGIS, Aquaveo WMS or Mike She and/or flood). - Obras de control para deslizamientos.	Chile Ecuador	**3,938,000** 2,292,000
SC 1.3. Sistemas de alerta temprana	Mejorar el monitoreo y los medios de alerta a la población	- Instalación de Sistemas de Alerta Temprana del Clima (emergency Room) y medios para alertas a los residentes durante las emergencias (e.g., sirens, SMS, radio broadcast). - Aumentar el número de estaciones de monitoreo con mejores parámetros. - Sistema Radar meteorológico (Chile) - River level monitoring network (Ec.) - Implementación de plataforma online para datos meteorológicos.	Chile Ecuador	**600,000** 400,000
SC 1.4. Respuesta a la emergencia	Mejorar los medios de respuesta a las inundaciones, deslizamientos de tierras y aluviones	- Fortalecimiento de los Comités de Emergencia - Señalética de evacuación - Mapas de evacuación para inundaciones	Chile Ecuador	**350,000** 150,000

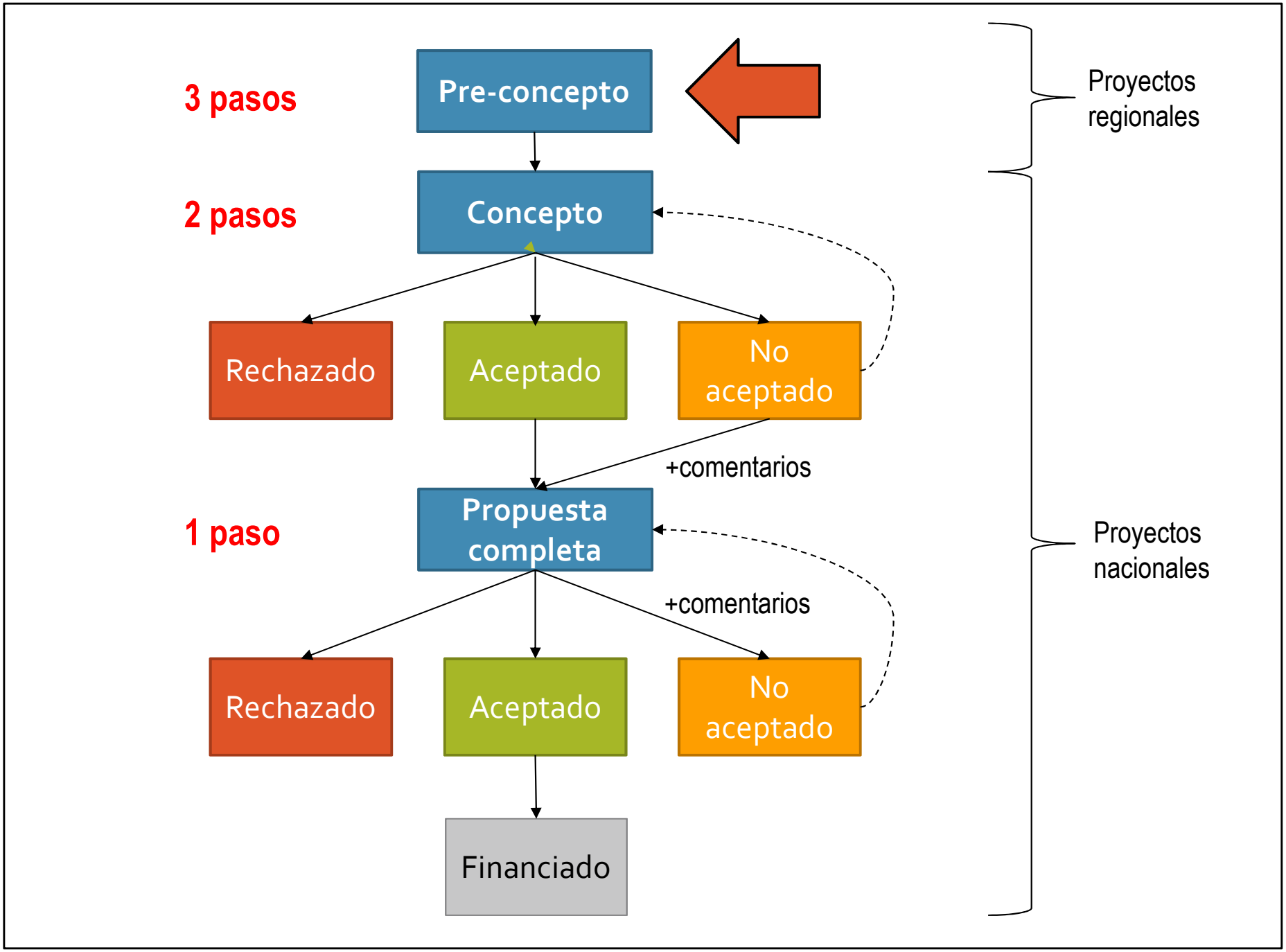
Componente 2. Fortalecimiento de capacidades para la adaptación.			Chile, Ecuador	**1,300,000**
SC 2.1. Fortalecer las capacidades de gobiernos locales	Gobiernos locales con capacidades mejoradas para diseñar e implementar medidas de adaptación.	- Cursos y materiales sobre adaptación basado en riesgos	Chile and Ecuador	**200,000**
SC 2.1. Fortalecimiento de capacidades de residentes locales	Poblacion local y personal de gobiernos con aumento de la conciencia de riesgos relacionados al clima (inundaciones deslizamientos de tierras y aluviones)	- Tres estrategias de educación y comunicación públicas diseñadas e implementadas	Chile Ecuador	**350,000** 150,000
		- Experiencia sobre narradores en tres ciudades (método Japón).	Chile Ecuador	**400,000** 200,000
Componente 3. Tecnologías de Información y Comunicación (TIC): Cooperación entre ciudades costeras de Latino América			Chile, Ecuador	**1,000,000**
SC 3.1. ICTs y cooperación entre ciudades costeras de LA.	Documentos de aprendizaje y lecciones compartidas	- Diseñar /implementar una plataforma online regional - Documentos de estudios de caso de aprendizajes claves y buenas prácticas - Entrenamiento/talleres a través de herramientas web - Eventos in situ.	Chile, Ecuador	750,000
SC 3.2. Visitas a sitios demostrativos	Garantizar el contacto directo y aprendizaje de los procesos de implementación	Inplementar una serie de visitas de estudio a cada lugar incluyendo la participación de otros países interesados.	Chile Ecuador; Visitors: LA	150,000
SC 3.3. Comité de Integración	Garantizar el intercambio de experiencias y lecciones aprendidas entre los ejecutores del proyecto.	1 Informe annual de evaluación, Annual report of evaluation, Retroalimentación y lecciones aprendidas para cada proyecto.	Chile, Ecuador	100,000
4. Project/ Programme Execution Cost				**350,000**
5. Total Project/ Programme Cost				**12,880,000**
6. Project/ Programme Cycle Management Fee charged by the Implementing Entity (8%)				**1,030,400**
Amount of Financing Requested				**13.910.400**


Gracias por su atención

PRE-CONCEPTO DE PROYECTO REGIONAL

Taller inicial de formulación

Proyecto Regional Chile – Ecuador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Pre-concepto
2 pasos
Concepto
Rechazado
Aceptado
No aceptado
+comentarios
1 paso
Propuesta completa
+comentarios
Rechazado
Aceptado
No aceptado
Financiado
Proyectos regionales
Proyectos nacionales

Proyecto regional

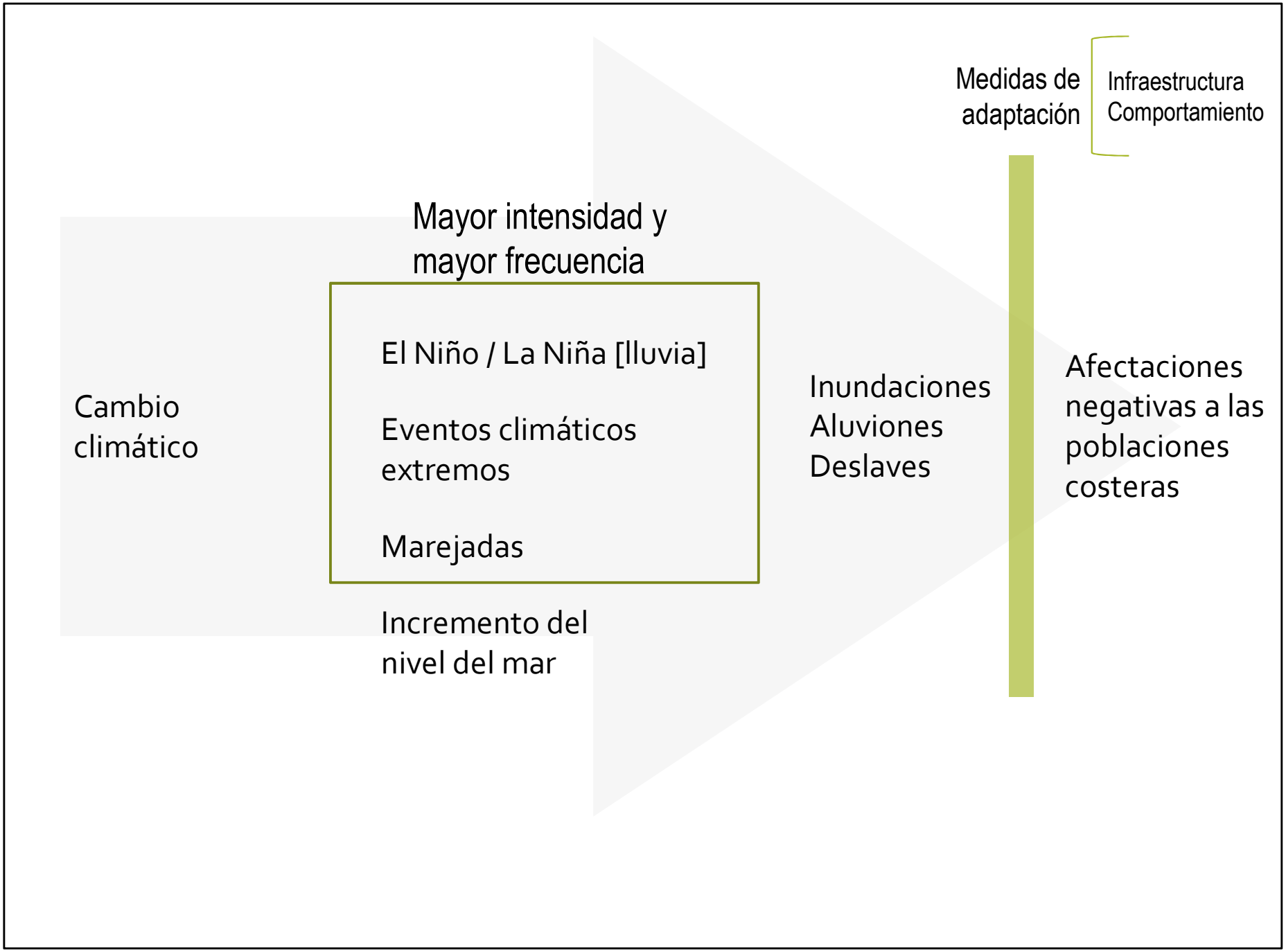
Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

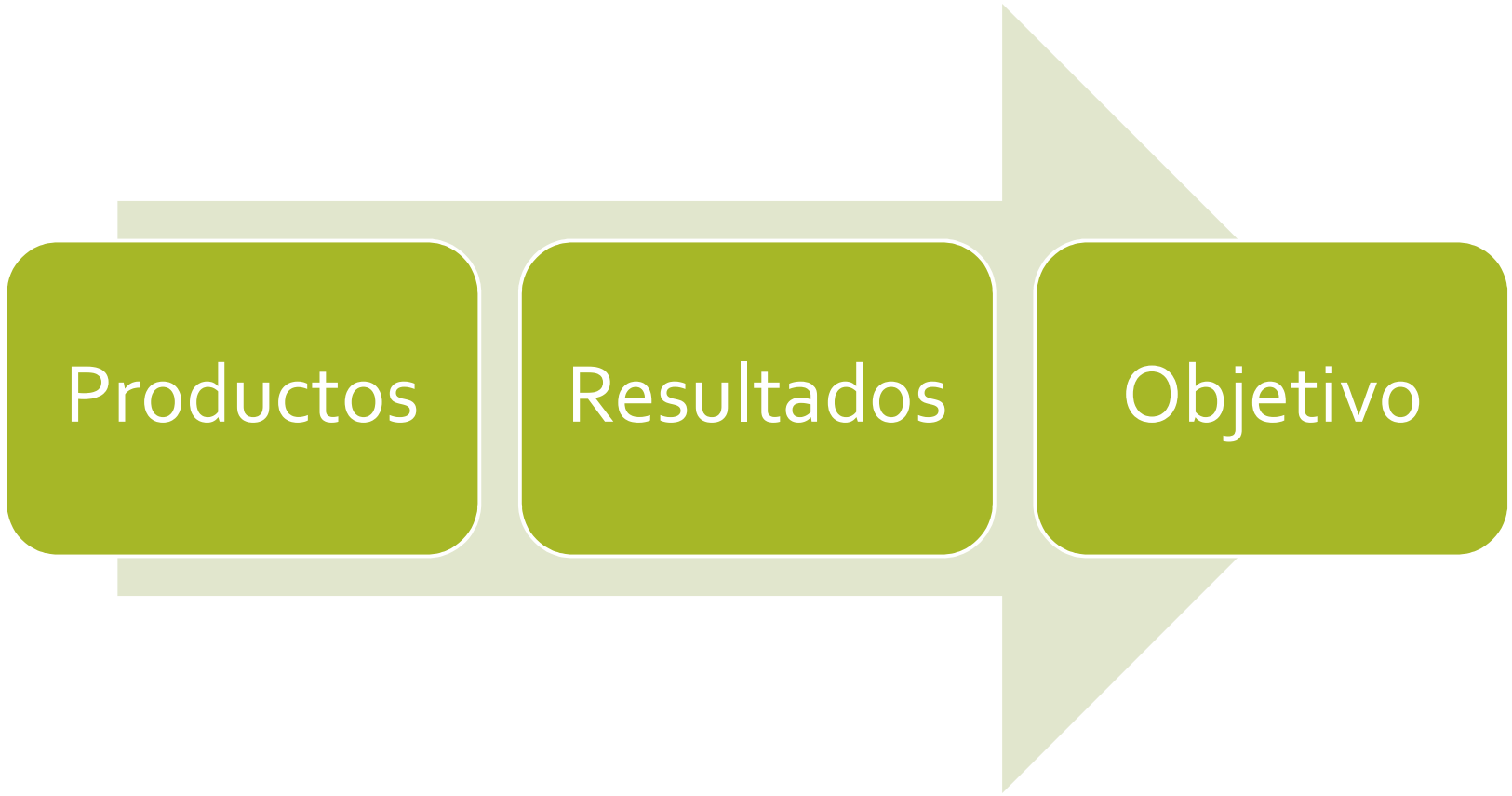
Similitudes

1. Ciudades costeras
2. Vulnerables a impacto de El Niño / La Niña = inundaciones, deslaves, aluviones
3. Vulnerables a tsunamis
4. Vulnerables a incremento en el nivel del mar

Diferencias

1. Índice de capacidad de adaptación. Antofagasta 9.40 / Esmeraldas 4.44 / Taltal no datos
2. Cultura y costumbres. Esmeraldas – clima tropical húmedo / afroecuatoriana. Antofagasta – clima árido templado
3. Tamaño y población: Antofagasta 390 mil / Esmeraldas 174 mil / Taltal 10 mil.
4. Economía. Antofagasta centrada en minería cobre. Esmeraldas mixta: pesca, turismo, portuaria petróleo.


Medidas de adaptación
Infraestructura
Comportamiento
Mayor intensidad y mayor frecuencia
El Niño / La Niña [lluvia]
Eventos climáticos extremos
Marejadas
Incremento del nivel del mar
Cambio climático
Inundaciones
Aluviones
Deslaves
Afectaciones negativas a las poblaciones costeras


Productos
Resultados
Objetivo

Objetivo

Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Resultados

1. Los planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras
2. Se ha reducido la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras (ca., 574,000 personas protegidas)
3. Se ha mejorado el monitoreo del clima y los medios para alertar a la población local
4. Se han robustecido los medios para responder a inundaciones, deslaves y aluviones

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Resultados

1. Gobiernos locales con capacidad mejorada para diseñar e implementar medidas de adaptación
2. Población local y personal gubernamental con mayor conciencia sobre riesgos relacionado al cambio climático (inundaciones, deslaves, aluviones)

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Resultados

1. Los aprendizajes / lecciones se han documentado y compartido
2. Se ha asegurado contacto directo y aprendizaje del proceso de implementación
3. Se ha asegurado el intercambio de experiencias y lecciones entre los ejecutores del proyecto

Presupuesto previsto USD 13.910.400	
Componente 1. Acciones prioritarias para incrementar la resiliencia.	10,230,000 (73.5%)
Componente 2. Fortalecer capacidades para adaptación.	1,300,000 (9.3%)
Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.	1,000,000 (7.2%)
Costo directo ejecución proyecto	350,000 (2.5%)
Costo indirecto ejecución del proyecto	1,030,400 (7.4%)

Línea de acción	Resultado		Chile	Ecuador
SC 1.1. Medidas no estructurales	Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras		1,500,000	1,000,000
SC 1.2. Medidas de infraestructura	Se ha reducido la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras (ca., 574,000 personas protegidas)		3,938,000	2,292,000
SC 1.3. Sistemas de alerta temprana	Se ha mejorado el monitoreo del clima y los medios para alertar a la población local		600,000	400,000
SC 1.4. Respuesta a emergencias	Se han robustecido los medios para responder a inundaciones, deslaves y aluviones		350,000	150,000
SC 2.1. Fortalecer capacidad de gobiernos locales	Gobiernos locales con capacidad mejorada para diseñar e implementar medidas de adaptación		200,000	
SC 2.1. Fortalecer capacidad de residentes locales	Población local y personal gubernamental con mayor conciencia sobre riesgos relacionado al cambio climático (inundaciones, deslaves, aluviones)	Estrategias com. & educ. (3)	350,000	150,000
		Narradores	400,000	200,000
SC 3.1. TICs y alianzas entre ciudades costeras en Latinoamérica	Los aprendizajes / lecciones se han documentado y compartido		750,000	
SC 3.2. Visitas guiadas a sitios demostrativos	Se ha asegurado contacto directo y aprendizaje del proceso de implementación		150,000	
SC 3.3. Comité de integración	Se ha asegurado el intercambio de experiencias y lecciones entre los ejecutores del proyecto		100,000	

Comentarios del Secretariado del Fondo de Adaptación

1. Justificación suficiente para un programa regional

2. En componentes 1 y 2 clarificar cómo las actividades de los dos países conformaran un enfoque regional en lugar de dos o tres proyectos separados. Cómo el proyecto abordará los desafíos de la adaptación a nivel regional

3. Clarificar y de ser necesario robustecer la innovación del proyecto

4. Clarificar el papel de la Agencia de Cooperación Internacional de Chile (AGCI) [NIE]

Elementos pendientes

1. Proyecto debe estar listo al 15 de julio de 2016. Decidir si presentar concepto o propuesta completa

2. Precisar sitios de intervención y presupuesto [detalles]

3. Arreglos de implementación [quién ejecuta qué, cómo se canalizan los fondos]

GRACIAS

Anexo 6. Programa Quiero mi Barrio, riesgo aluvional en Taltal.

Camanchaca

Cordillera Costa

Quebrada Taltal

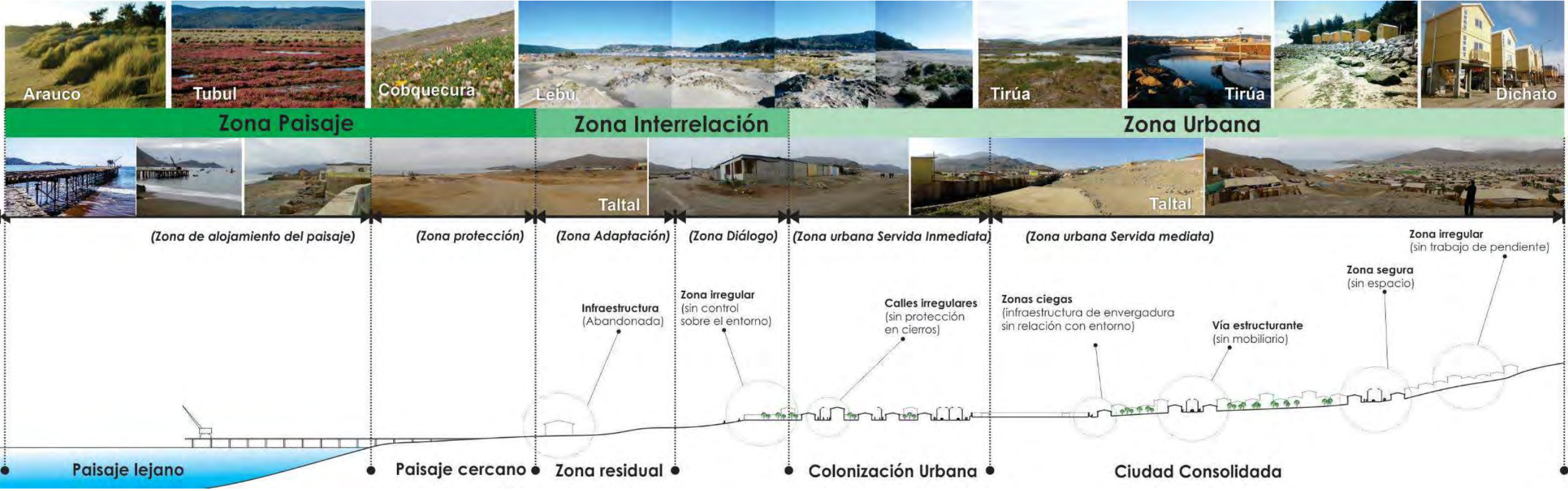
Taltal Urbano

Cinturón seguridad

Aluvión

Equipamiento

Tsunami



1a línea de estabilización
2a línea de protección
3a línea de regularización
4a línea de consolidación
5a línea de contención

PISCINAS ALUVIONALES

Lluvias 25 de marzo de 2015. 20:47 hrs. O´Higgins con Prat.

Aluvión de barro y agua. 26 de marzo de 2015. 08:53 hrs. Calle Progreso con Avenida Matta.

Aluvión de barro y agua. 26 de marzo de 2015. 18:56 hrs. Calle Bilbao con O´Higgins.

Aluvión de barro y agua. 27 de marzo de 2015. 14:07 hrs. Calle Progreso.

Aluvión. Calle Eusebio Lillo 27 de marzo de 2015. 17:35 hrs.

Aluvión. Calle Eusebio Lillo 27 de marzo de 2015. 17:37 hrs.

Aluvión. Calle Eusebio Lillo con Manuel Rodríguez. 27 de marzo de 2015. 17:44 hrs.

Anexo 7. Marco de resultados

Proyecto regional. Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Objetivo. Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y networking, y desarrollar una cultura de adaptación.

Componentes	Resultados	Productos	Países	USD
Componente 1. Acciones prioritarias para incrementar la resiliencia.				10,230,000[1,2]
SC 1.1. Medidas no estructurales	Los planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	- Planes de infraestructura verde - Actualización del plan maestro de aguas lluvias incorporando las microcuencas de Antofagasta y Taltal - Expansión de áreas protegidas de manglar (Esmeraldas)	Chile Ecuador	1,500,000 1,000,000
SC 1.2. Medidas de infraestructura	Se ha reducido la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras (ca., 574,000 personas protegidas)	- Construcción de infraestructura (canales de aguas lluvias, obras de control) en micro-cuencas priorizadas - Adquisición de software para análisis, diseño y priorización (e.g., ArcGIS, Aquaveo WMS o Mike She y/o inundación. - Obras de mitigación para control de deslaves	Chile Ecuador	3,938,000 2,292,000
SC 1.3. Sistemas de alerta temprana	Se ha mejorado el monitoreo del clima y los medios para alertar a la población local	- Instalación de Sistema de alerta climática temprana (cuarto de emergencia) y medios para alertar a los residentes en caso de emergencia (e.g., sirenas, SMS, mensajes de radio). - Incrementar el número de estaciones de monitoreo y ampliar los parámetros de monitoreo - Sistema de radar meteorológico (Chile) - Red de monitoreo de altura del río (Esmeraldas) - Implementar plataforma en línea para datos meteorológicos	Chile Ecuador	600,000 400,000
SC 1.4. Respuesta a emergencias	Se han robustecido los medios para responder a inundaciones, deslaves y aluviones	- Comités de emergencia fortalecidos (Sistema de coordinación interagencial) - Señalización de rutas de evacuación - Mapas de evacuación por inundación	Chile Ecuador	350,000 150,000
Componente 2. Fortalecer capacidades para adaptación.			Chile, Ecuador	1,300,000
SC 2.1. Fortalecer capacidad de gobiernos locales	Gobiernos locales con capacidad mejorada para diseñar e implementar medidas de adaptación	- Cursos y materiales para adaptación basada en riesgos	Chile and Ecuador	200,000
SC 2.1. Fortalecer capacidad de residentes locales	Población local y personal gubernamental con mayor conciencia sobre riesgos relacionado al cambio climático (inundaciones, deslaves, aluviones)	- Tres estrategias de comunicación y educación diseñadas e implementadas	Chile Ecuador	350,000 150,000
		- Experiencia de narradores en tres ciudades.	Chile Ecuador	400,000 200,000

[1] El número y tipo de obras dependerá de los resultados de los estudios y costos asociados para construir las obras.
[2] Del total, se usará 10-15% para estudios, el resto para los proyectos de mitigación para control de inundaciones.

Componentes	Resultados	Productos	Países	USD
Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.			Chile, Ecuador	1,000,000
SC 3.1. TICs y alianzas entre ciudades costeras en Latinoamérica	Los aprendizajes / lecciones se han documentado y compartido	- Diseño / implementación de plataforma regional en línea - Documentación de estudios de caso de lecciones clave y buenas practicas - Entrenamiento / talleres por medio de herramientas de colaboración web - Eventos en sitio (eventos locales)	Chile, Ecuador	750,000
SC 3.2. Visitas guiadas a sitios demostrativos	Se ha asegurado contacto directo y aprendizaje del proceso de implementación	- Implementar una serie de visitas guiadas a cada sitio, incluyendo participación de otros países interesados	Chile Ecuador; visitantes: Latinoamérica	150,000
SC 3.3. Comité de integración	Se ha asegurado el intercambio de experiencias y lecciones entre los ejecutores del proyecto	- 1 reporte anual de evaluación, retro-alimentación y lecciones de cada proyecto	Chile, Ecuador	100,000
4. Costos de ejecución del Proyecto / programa				350,000
5. Costo total del Proyecto / programa				12,880,000
6. Costo de gestión del Proyecto de la agencia de implementación (8%)				1,030,400
Monto total				13.910.400

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Memoria

Taller de validación

Antofagasta

República de Chile

19 de julio de 2016

Tabla de contenido

Anexos

Introducción

El Ministerio de Medio Ambiente de Chile (MMA) y el Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - banco de desarrollo de América Latina - presentaron al Fondo de Adaptación la iniciativa del Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina. Esta iniciativa regional incluye tres ciudades costeras: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador. El Fondo de Adaptación fue establecido en 2001 para financiar proyectos y programas concretos de adaptación en los países en desarrollo. El fondo es un mecanismo financiero de la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Protocolo de Kioto.

La iniciativa en mención fue presentada a consideración del Fondo de Adaptación a nivel de pre-concepto, el cual fue aprobado por dicho fondo a finales del mes de marzo de 2016. A efectos de avanzar en la aprobación final, se requiere formular en detalle el proyecto en colaboración con los actores claves públicos y privados. El 4 de mayo de 2016 se realizó el taller de inicio en la ciudad de Antofagasta con el objetivo de presentar el pre-concepto a los socios clave, recibir retroalimentación e iniciar el proceso de desarrollo de la propuesta de completa para ser presentada hasta el 01 de agosto de 2016[1]. Un taller de inicio similar se realizó en la ciudad de Esmeraldas el 16 de mayo de 2016. Las memorias de los talleres de inicio Antofagasta y Esmeraldas fueron enviadas a los participantes en ambos países.

Agenda

La reunión tuvo los siguientes elementos:

10:00	Registro de participantes
10:30	Bienvenida
10:45	Presentación de participantes
11:00	Revisión de la agenda
11:15	Presentación del borrador de proyecto
12:30	Resultados del mapeo de actores
13:00	Almuerzo
14:00	Mesas de trabajo acciones para el proyecto
16:00	Elementos pendientes para el cierre del PRODOC
17:30	Cierre del evento

[1] Fecha límite para ingresar propuestas a ser consideradas en 28 reunión de la junta directiva del Fondo de Adaptación que se realizará el 4 de octubre de 2016 en Bonn (Alemania).

Bienvenida

La bienvenida estuvo a cargo de Felipe Lerzundi, Secretario Regional Ministerial de Ambiente y Carolina Cortés de CAF (Foto 1 y Foto 2), quienes agradecieron la asistencia de los participantes y proveyeron información sobre el marco general de la reunión. Participaron en la reunión 24 personas, el registro de asistencia está en el Anexo 1.

Presentación del borrador del proyecto regional

La presentación estuvo a cargo de Segundo Coello, consultor de CAF para la preparación del documento de proyecto. La presentación está en el Anexo 2 y los materiales de apoyo en el Anexo 4.

Se recordó que el proyecto fue presentado y aprobado por el Fondo de Adaptación como pre-concepto y que se acordó en el taller anterior desarrollarlo a nivel de propuesta completa. No obstante, en esta instancia se decidiría si presentarlo como concepto (si todavía faltara desarrollar elementos importantes del proyecto) o directamente como propuesta completa.

Se explicó que se trató de mantener el objetivo y resultados propuestos en el pre-concepto, sólo se incorporaron pequeños ajustes en la redacción de estos para reflejar el alcance del proyecto.

Posteriormente se explicó cada uno de los resultados y productos previstos, así como la asignación presupuestaria correspondiente. Se mencionó que los recursos para la obra de control aluvional en la quebrada Bonilla serían insuficientes teniendo en cuenta los diseños existentes y que es necesario definir el alcance de la intervención del proyecto (e.g., intervenir sólo en uno de los dos ramales de la quebrada).

Con respecto al radar y estaciones meteorológicas, se mencionó que está pendiente definir el tipo de radar a usar y el número de estaciones meteorológicas. La Dirección General de Aguas (DGA) del Ministerio de Obras Públicas (MOP), todavía no ha decidido si usar un radar Furuno o un radar doppler. Se mencionó que el Instituto Nacional de Meteorología e Hidrología de Ecuador (INAMHI) decidió usar un radar doppler pues considera provee mejor información. Igualmente, se indicó que en el lunes 18 de julio de 2016 se realizó una reunión en el MMA en Santiago[2] y en esta Peter Muck (asesor de GIZ) indicó que en una reunión internacional reciente se ha recomendado el uso de radares doppler para monitoreo meteorológico. Un punto adicional es que, en la reunión de Santiago, Fernando Díaz de ONEMI destacó la necesidad de asegurar un adecuado flujo de información del radar y estaciones meteorológicas a la Dirección Meteorológica de Chile (DMC) pues ellos hacen el pronóstico y luego envían la información a ONEMHI.

Con respecto al curso regional para oficiales de gobiernos locales, se mencionó que se ha considerado que la Academia de Protección Civil (APC) lidere el desarrollo de esta iniciativa, teniendo en cuenta su experiencia con cursos

[2] En esta reunión participaron Gladys Santis de MMA, Fernando Díaz de ONEMI, Peter Muck de MMA, Andrea Osses de MOP, Carolina Cortés de CAF y Segundo Coello consultor de CAF.

presenciales y en línea. No obstante, se está a la espera de que la APC indique si está interesada participar en este elemento del proyecto.

Se indicó que en el marco de resultados hay varios valores de las metas que requieren completarse a partir de la experiencia de los actores locales.

Se explicó la estructura organizacional del proyecto. Se ha incluido un Comité Asesor integrado por la Agencia Chilena de Cooperación Internacional para el Desarrollo (AGCID) y la Secretaría Técnica de Cooperación Internacional (SETECI) de Ecuador. También se informó que el lunes 18 de julio se mantuvo una reunión con AGCID en Santiago, en la cual se recibió la anuencia de ellos para participar en el comité asesor del proyecto.

Se indicó las entidades ejecutoras de los productos del proyecto, y se destacó que se propone que el equipo de proyecto en Chile (tres personas) opere desde las municipalidades de Antofagasta (dos personas) y Taltal (una persona). Esto requiere de la anuencia de los municipios.

Se resumió los elementos que están pendientes para que sean analizados en los grupos de trabajo:

1. Especificar lo que se puede construir en quebrada Bonilla con los recursos disponibles [¿una de las dos quebradas?]
2. Incluir los diseños existentes y que serán actualizados para quebrada Bonilla [incluirlos como un anexo del documento de proyecto]
3. Tipo y probable ubicación de radar meteorológico [¿doppler?]
4. Número y probable ubicación de estaciones meteorológicas [¿automáticas?]
5. Mecanismos para asegurar flujo de información de MOP a Dirección Meteorológica de Chile (DMC)
6. Ratificar que MOP cubrirá infraestructura complementaria, operación y mantenimiento de equipos
7. Número de sirenas y ubicación [validar con presupuesto disponible]
8. Número de personas que pueden ser capacitadas por curso regional
9. Número de personas a las que se puede llegar con las estrategias de comunicación y sensibilización
10. Validar ubicación de personal dentro de MdA y MdT

Presentación de resultados del mapeo de actores

María José Godoy presentó los resultados del mapeo de actores de Antofagasta y Taltal que sirvió de base para el diseño del proyecto. La presentación está en el Anexo 3.

Mesas de trabajo. Acciones para el proyecto

Los participaron conformaron dos mesas de trabajo (i.e., Componente 1 y Componente 2), ambos grupos analizaron el componente 3. La tarea a desarrollar fue:

1. Formar dos grupos de trabajo (por componente). Designar relator.
   - C1. Acciones prioritarias para incrementar la resiliencia + C3.
   - C2. Fortalecer capacidades para adaptación + C3.
2. Primero. Revisar las acciones [productos] propuestas en el componente. Analizar los pendientes. Anotar dudas.
3. Segundo. Lluvia de ideas sobre recomendaciones. Registrar las recomendaciones en papelógrafo.

40 minutos

Grupo 1. Componentes 1 y 3.

El grupo 1 estuvo integrado por Hilda Sepulveda, Lorena Herrera, Daniza Vicencio, Carolina Ampuero, Nolvia Severino, Juan Carlos Reyes, Carlos Iriarte y Elsa Giovanoli (Foto 5). Los resultados del grupo están en la Figura 1.

Se fijó fechas para tener ciertas definiciones para el proyecto. También se estableció que se harán las obras de control aluvional en la quebrada Bonilla, pero interviniendo ambos ramales. Se iniciará la construcción de infraestructura partiendo de aguas abajo y subiendo hasta donde alcance el financiamiento. Se espera que esto servirá para conseguir financiamiento complementario.

Se recomendó que las estrategias de comunicación ciudadana y la iniciativa de narradores incluyan trabajo con los colegios y escuelas (educación formal) y los grupos con capacidades diferentes. Este último grupo igualmente debe ser considerado en los procesos de evacuación en caso de emergencia.

Se recomendó que los documentos que se generen (producto 7.2) deben asegurar acceso inclusivo y universal. Por tanto, debe usarse lenguaje sencillo e incluyente.

Se consideró necesario que el Municipio de Taltal indique formalmente su disponibilidad para acoger un miembro del equipo del proyecto durante los cinco años que dure el mismo.

Grupo 2. Componentes 2 y 3.

El grupo 2 estuvo integrado por Aida Espejo, Jimena Estay, Sergio Albornoz, Diane Trigo, Carola Aparicio, Miguel Baroza, Rosemarie Rosas y María José Godoy (Foto 6). El grupo precisó los actores locales que deben tomar el curso

regional sobre adaptación al cambio climático. Se enfatizó en que el curso debe ser evaluado y debe medirse el impacto de la capacitación.

Elementos pendientes para el cierre del PRODOC

Se revisó la lista de pendientes y se acordó tener todo listo hasta inicios de la semana siguiente teniendo en cuenta que el documento deberá ser enviado el viernes 29 de julio. Se destacó la necesidad de que las municipalidades indiquen su disponibilidad de alojar en su interior al equipo de proyecto.

Cierre del evento

La clausura estuvo a cargo de Roberto Villablanca del MMA (Foto 7). Se agradeció la participación y contribuciones de las personas e instituciones.

Figuras

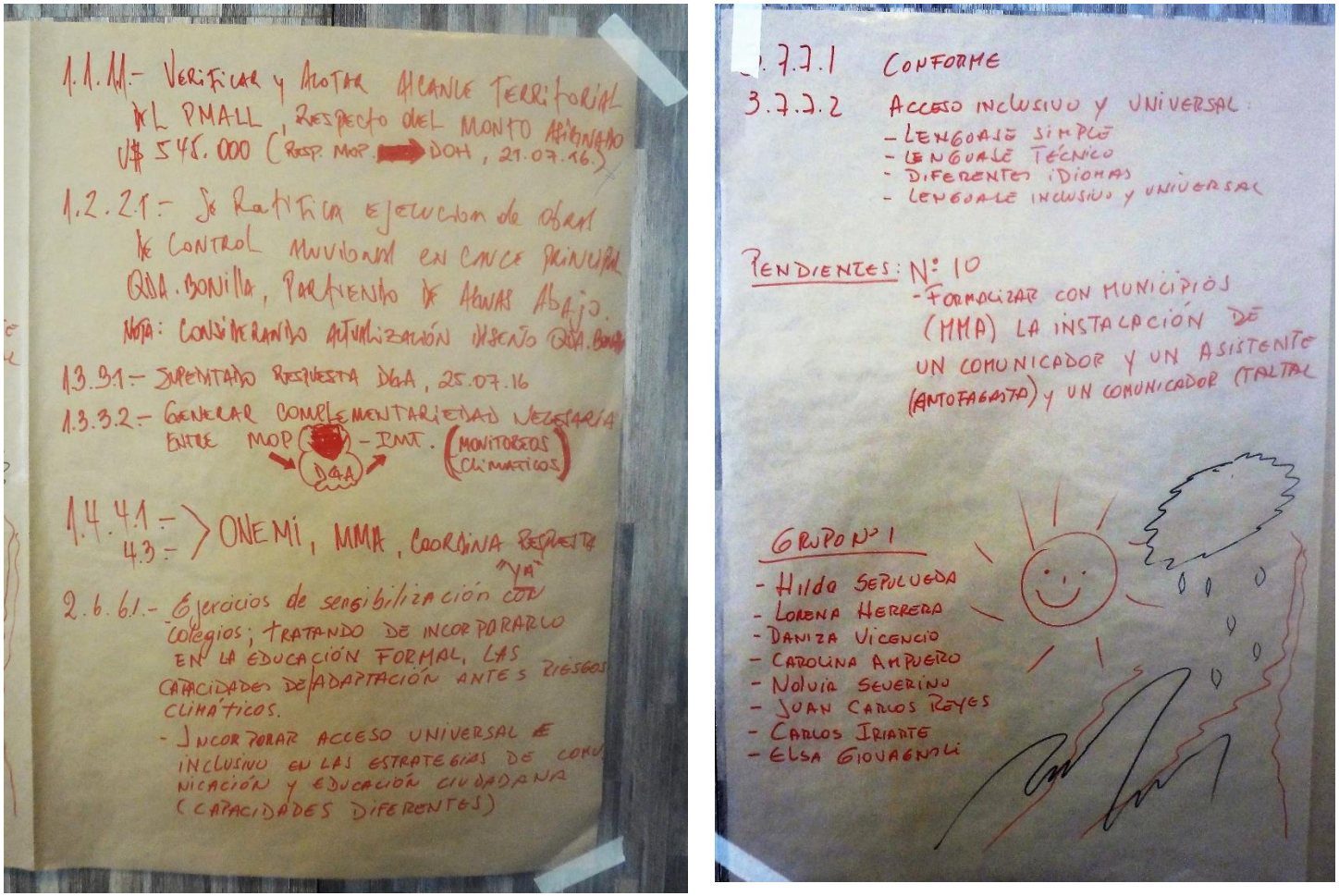
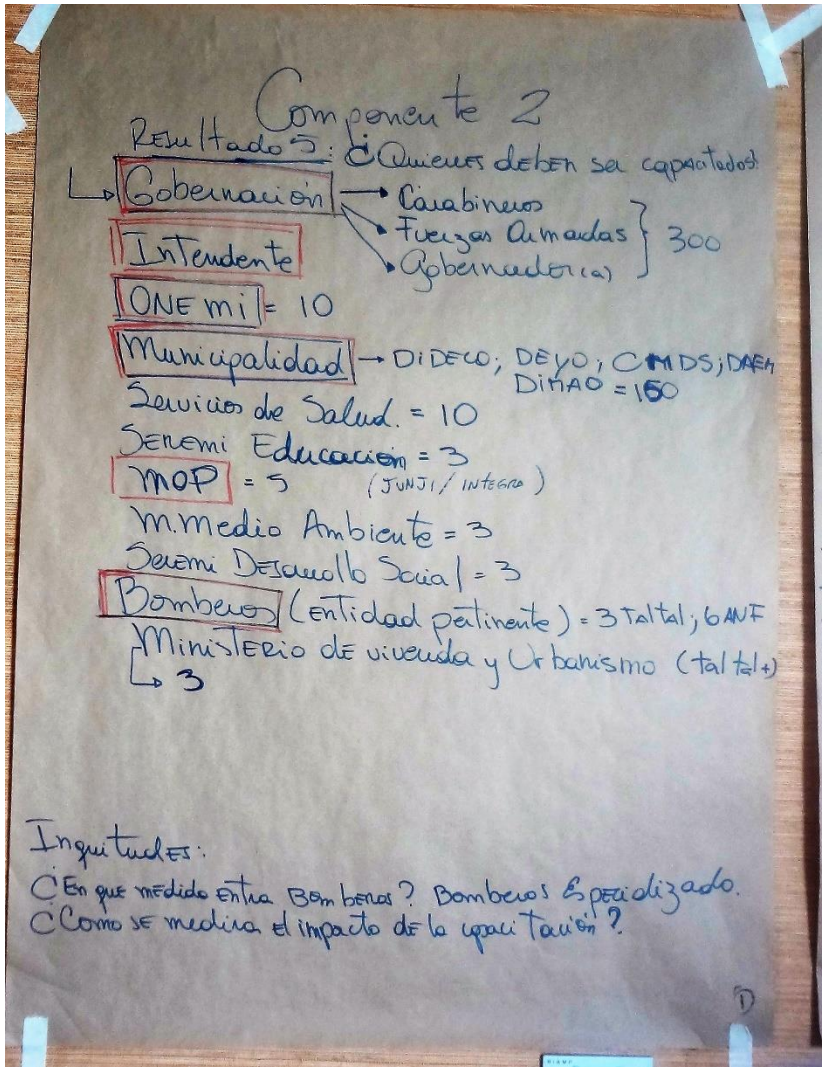


Figura 1. Resultados del grupo 1.



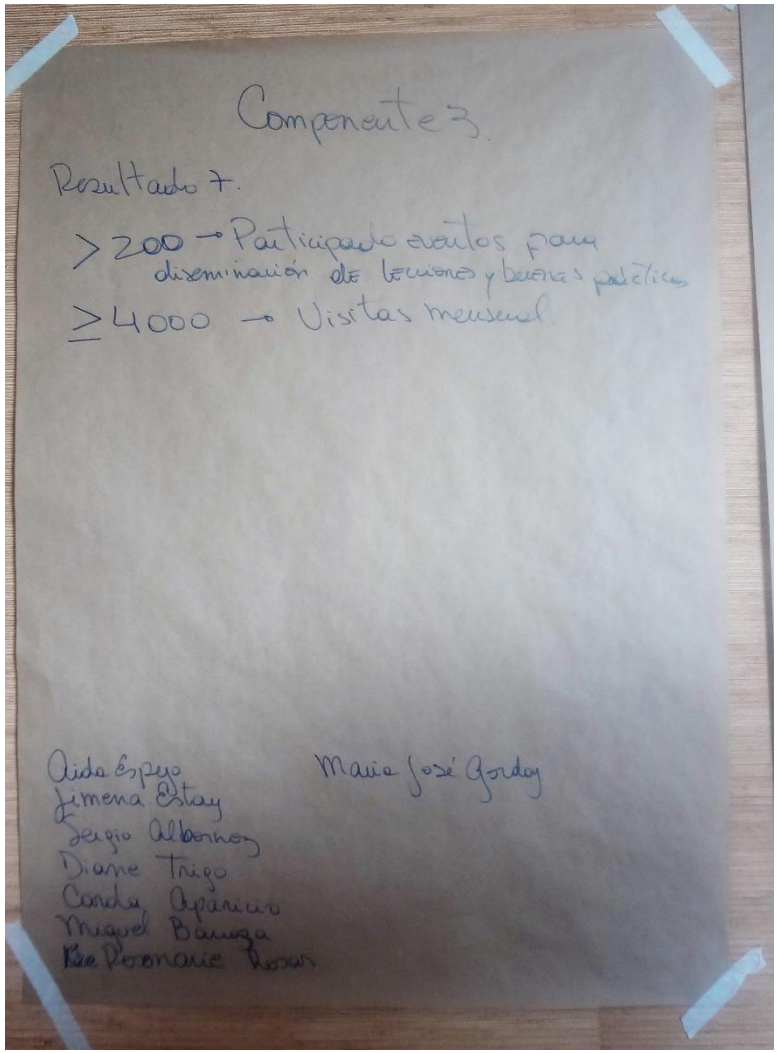


Figura 2. Resultados del grupo 2.

Fotos

Foto 1. Bienvenida a cargo de Felipe Lerzundi del MMA.

Foto 2. Bienvenida a cargo de Carolina Cortés de CAF.

Foto 3. Presentación de resultados del mapeo de actores por María José Godoy.

Foto 4. Participantes de la reunión.

Foto 5. Sesión de trabajo del grupo 1.

Foto 6. Sesión de trabajo del grupo 2.

Foto 7. Clausura a cargo de Roberto Villablanca del MMA.

SEREMI Región de Antofagasta — Ministerio del Medio Ambiente | ONEMI Ministerio del Interior y Seguridad Pública — Gobierno de Chile | Ministerio de Obras Públicas — Gobierno de Chile | CAF BANCO DE DESARROLLO DE AMÉRICA LATINA

Segundo Taller:
"Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina"
Lugar: Hotel Terrado, Balmaceda 2575, Salón Lascar.
Fecha: Martes 19 de julio 2015 de 10:00 a 17.30 hrs.

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SEREMI Región de Antofagasta
Ministerio del Medio Ambiente

ONEMI Ministerio del Interior y Seguridad Pública
Gobierno de Chile

Ministerio de Obras Públicas
Gobierno de Chile

CAF
BANCO DE DESARROLLO DE AMÉRICA LATINA

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Nombre y Apellido	Organización/ Institución	E-mail	Teléfono	Firma
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Carlos Ramírez M	I.M. PM PM	[illegible] @ PMM.cl	[illegible]	[firma]
Carola Aparicio Rozas	CEA	caparicio@mma.gob.cl caparicio@cea.cl	76950066.	[firma]
Felipe Lerzundi [illegible]	MMA	flerzundi@mma.gob.cl	55 2277 477	[firma]
Carolina Cortés	CAF	acortes@caf.com	+593987883698	[firma]
Diane Trigo	MMA	dtrigo@mma.gob.cl	942231500	[firma]
Rose Marie Rosas	Pobl. Oro blanco	Rosemarierosascielo@gmail.com	979879223	[firma] *

SEREMI Región de Antofagasta – Ministerio del Medio Ambiente | ONEMI Ministerio del Interior y Seguridad Pública – Gobierno de Chile | Ministerio de Obras Públicas – Gobierno de Chile | CAF BANCO DE DESARROLLO DE AMÉRICA LATINA

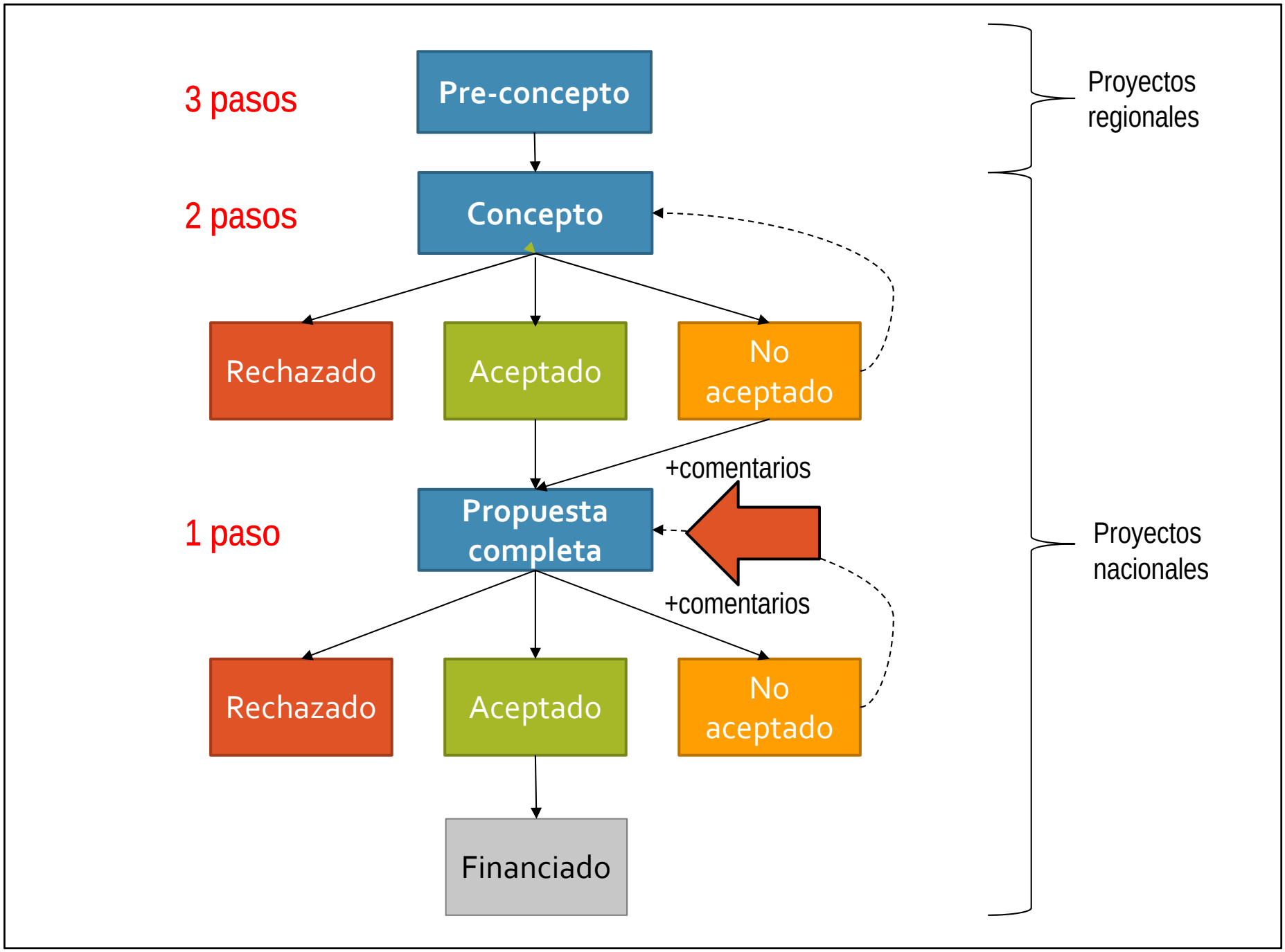
Segundo Taller:
"Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina"
Lugar: Hotel Terrado, Balmaceda 2575, Salón Lascar.
Fecha: Martes 19 de julio 2015 de 10:00 a 17.30 hrs.

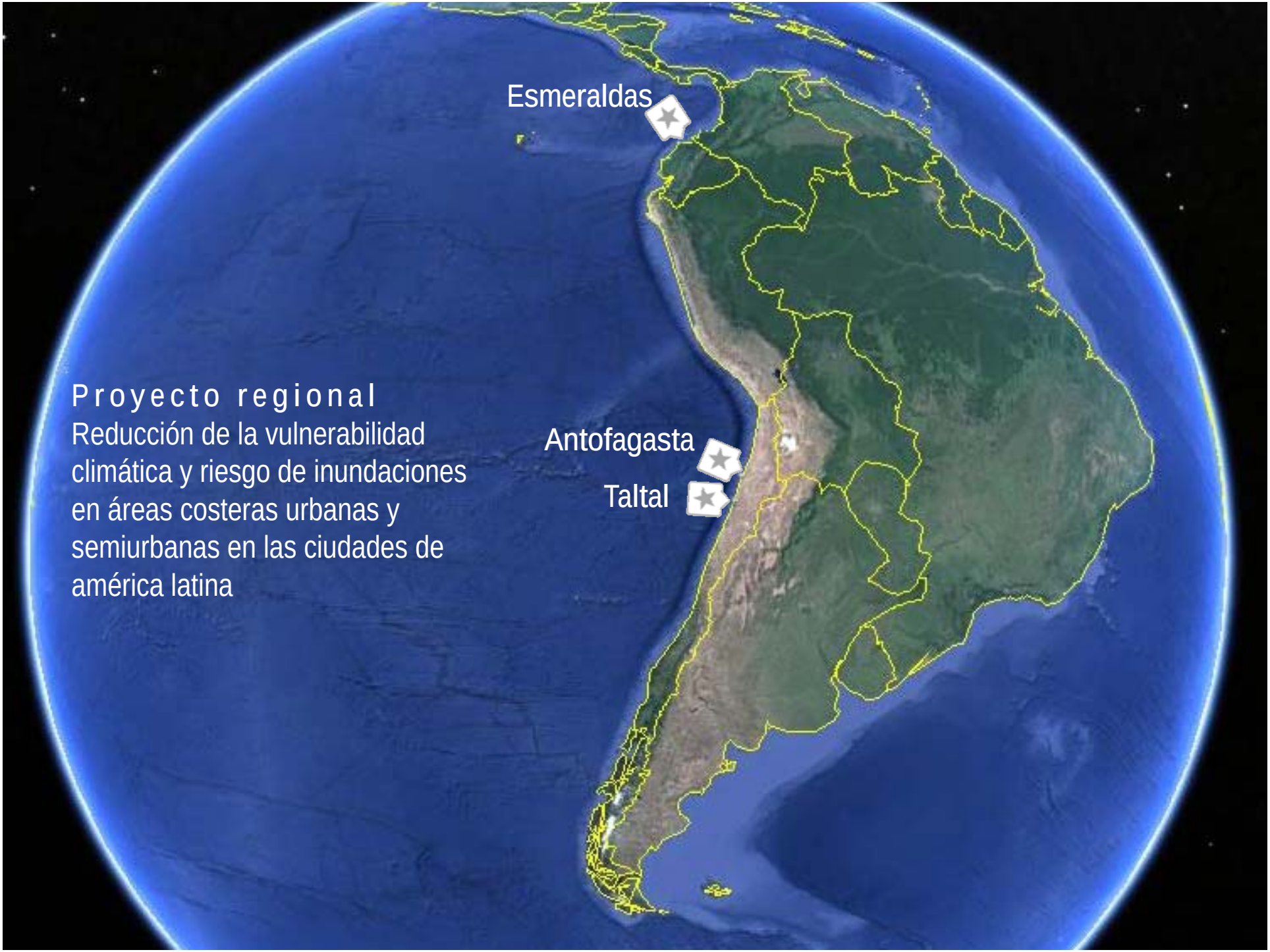
Nombre y Apellido	Organización/ Institución	E-mail	Teléfono	Firma
Marcela Olivos	Programa Quiero mi barrio Taltal	quieromibarrio taltal@ gmail.com	97866 8728	[firma]
Hilda [illegible]	Taltal		97192514	[firma]
Antonio Barrera	Taltal		97192514	[firma]
Ximena Estay S.	Programa Quiero mi Barrio taltal.	quieromibarriotaltal@ gmail.com	958615269	[firma]
Aída Espejo A.	Junta Vecinos V. Valdivieso #4		81416322	Aída Espejo A.
María José Mejías	ONEMI	mmejias@onemi.gov.cl	2463003	M. José Mejías

PRESENTACIÓN DEL BORRADOR DE PROYECTO REGIONAL

Taller de validación

Proyecto Regional Chile – Ecuador


3 pasos
Pre-concepto
2 pasos
Concepto
Rechazado
Aceptado
No aceptado
+comentarios
1 paso
Propuesta completa
+comentarios
Rechazado
Aceptado
No aceptado
Financiado
Proyectos regionales
Proyectos nacionales



Proyecto regional

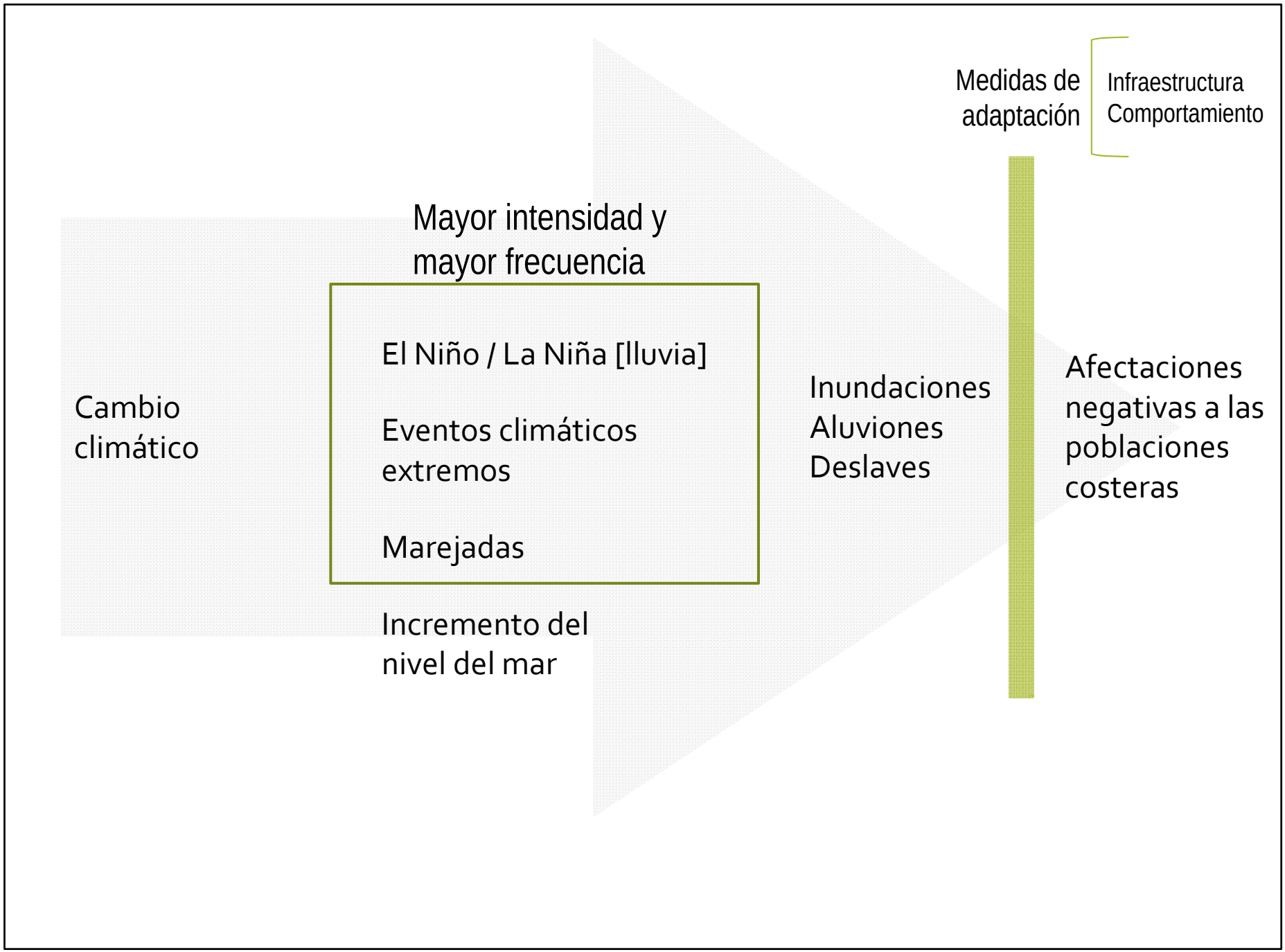
Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Similitudes

1. Ciudades costeras
2. Vulnerables a impacto de El Niño / La Niña = inundaciones, deslaves, aluviones
3. Vulnerables a tsunamis
4. Vulnerables a incremento en el nivel del mar

Diferencias

1. Índice de capacidad de adaptación. Antofagasta 9.40 / Esmeraldas 4.44 / Taltal no datos
2. Cultura y costumbres. Esmeraldas – clima tropical húmedo / afroecuatoriana. Antofagasta – clima árido templado
3. Tamaño y población: Antofagasta 390 mil / Esmeraldas 174 mil / Taltal 10 mil.
4. Economía. Antofagasta centrada en minería cobre. Esmeraldas mixta: pesca, turismo, portuaria petróleo.


Medidas de adaptación
Infraestructura
Comportamiento
Mayor intensidad y mayor frecuencia
El Niño / La Niña [lluvia]
Eventos climáticos extremos
Marejadas
Incremento del nivel del mar
Cambio climático
Inundaciones
Aluviones
Deslaves
Afectaciones negativas a las poblaciones costeras

Objetivo

Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.

5 años
USD 13,910,400
USD 7.138.000 Antofagasta y Taltal
USD 4.192.000 Esmeraldas
USD 1.200.000 Regional

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Componente	Resultados esperados	Productos esperados	Países	Presupuesto (USD)
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 545,000]	Chile	10,237,800 (81.71%)
		1.2. Plan de infraestructura verde de Esmeraldas [USD 425,000]	Ecuador	
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,917,200]	Chile	
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,820,000]	Ecuador	
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 910,000]	Chile and Ecuador	
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 140,000]	Chile and Ecuador	
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,000]	Chile	
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,600]	Ecuador	
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 110.000]	Chile and Ecuador	

Componente	Resultados esperados	Productos esperados	Países	Presupuesto (USD)
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 213,000]	Chile and Ecuador	1,305,200 (10.42%)
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 474,200]	Chile and Ecuador	
		6.2. Iniciativa de Narradores iniciada [USD 618,000]	Chile and Ecuador	

Componente	Resultados esperados	Productos esperados	Países	Presupuesto (USD)
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 424,000]	Chile and Ecuador	987,000 (7.88%)
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 563,000]	Chile and Ecuador	
6. Costos de ejecución del Proyecto / Programa				350,000
7. Costo total del Proyecto/Programa				12,880,000
8. Cuota de manejo de ciclo de Proyecto/Programa de la Agencia de Implementación (si aplica)				1,030,400
Monto de financiamiento solicitado				13,910,400

Calendario propuesto

Hitos	Fechas esperadas
Inicio de implementación del proyecto	Enero 2017
Revisión de medio-término	Junio 2019
Cierre del Proyecto	Diciembre 2021
Evaluación final	Septiembre 2021

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Objetivo del proyecto: Reducir la vulnerabilidad a inundaciones relacionadas con el cambio climático en tres ciudades costeras por medio de incorporar un enfoque de adaptación basada en riesgos, construir colaboración y desarrollar una cultura de adaptación	Número de personas (hombres y mujeres) protegidas por medidas mejoradas de reducción del riesgo en Antofagasta, Taltal and Esmeraldas.	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto Antofagasta = 380,000 Taltal = 10,000 Esmeraldas = 161,000	▪ Informe de desempeño del proyecto	▪ Apoyo político de autoridades locales y nacionales ▪ Las entidades responsables de construir la infraestructura pertinente y de los sistemas de alerta temprana están dispuestas a incorporar medidas de adaptación en sus planes y acciones ▪ La población local y actores clave se interesan y colaboran

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Componente 1. Acciones prioritarias para incrementar resiliencia					
Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	Número de planes que incorporan previsiones para adaptación al cambio climático	Planes de manejo de aguas lluvias Antofagasta = 0 Plan de infraestructura verde plan Esmeraldas = 0	Medio término: 1 Fin de proyecto: 2	▪ Plan de manejo de aguas lluvias ▪ Plan de infraestructura verde ▪ Instrumentos legales adoptando los planes	▪ Interés y apoyo de las autoridades locales ▪ Autoridades locales y nacionales comprometidas en financiar e implementar los planes.
Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	Número de infraestructuras construidas para soportar condiciones resultantes de la variabilidad y cambio climático	Antofagasta = 0 Esmeraldas = 0	Medio término: 1 Fin de proyecto: 2	▪ Diseños e informe de construcción de infraestructura de control aluvional en la quebrada Bonilla (Antofagasta) ▪ Diseños e informe de construcción de infraestructura de control de deslaves en Cerro Gataso (Esmeraldas)	▪ Autoridades locales y nacionales garantizan control de calidad de los diseños y proceso constructivo ▪ Las autoridades locales y nacionales pertinentes incorporar en sus planes financieros los recursos para mantenimiento futuro de la nueva infraestructura
	Número de personas (hombres y mujeres) protegidas por infraestructura mejorada para soportar presiones de variabilidad y cambio climático.	Antofagasta = 0 Esmeraldas = 0	Fin de proyecto: 12,840 Antofagasta = (ca., 50% mujeres) Esmeraldas = 500 (ca., 50% mujeres	▪ Encuesta de personas que viven en áreas protegidas por la infraestructura mejorada (quebrada Bonilla y cerro Gataso) ▪ Porcentaje de mujeres en Antofagasta y Esmeraldas de las estadísticas nacionales	

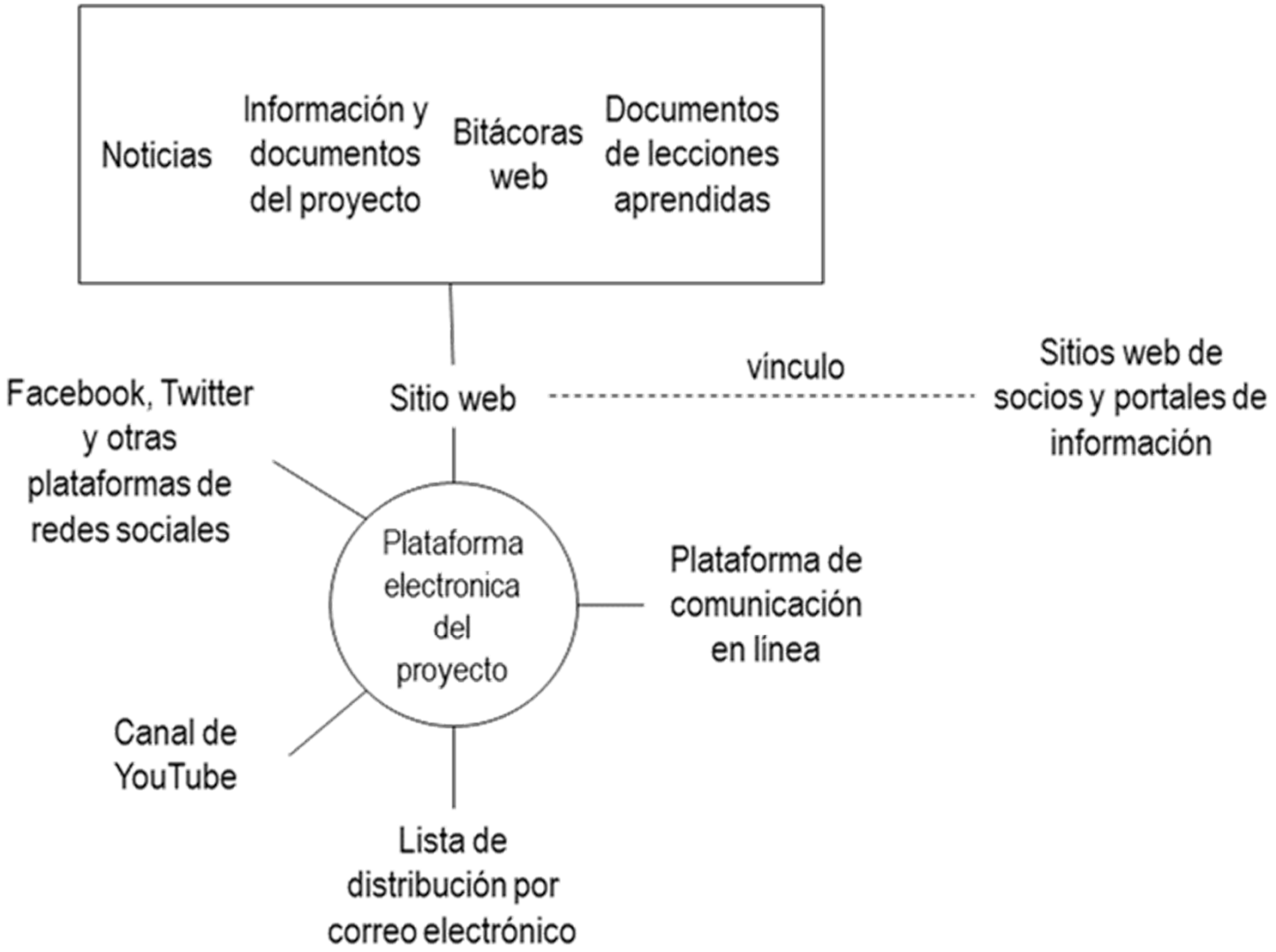
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	Número de radares meteorológicos para monitorear precipitación, vinculados con los sistemas de alerta temprana	Antofagasta = 0 Esmeraldas = 0	Medio término Antofagasta = 1 Esmeraldas = 1	▪ Reportes de análisis de ubicación de radares ▪ Reportes de instalación de radares ▪ Reportes trimestrales de operación de radares ▪ Acuerdo para asegurar el flujo de información a los sistemas de alerta temprana ▪ Acuerdo de largo plazo para operación y mantenimiento.	▪ Las entidades responsables ejecutan puntualmente los trabajos complementarios para albergar y operar los equipos (e.g., torre de radar, link de comunicación). ▪ Las entidades pertinentes incorporar en sus planes financieros los recursos para la operación y mantenimiento del Nuevo equipo meteorológico ▪ Las autoridades de gestión de riesgos incorporan la nueva información en sus sistemas de alerta temprana para alertar a la población local.
	Número de estaciones meteorológicas para monitorear precipitación que afecta a las ciudades, vinculadas a los sistemas de alerta temprana	Antofagasta = XX Taltal = XX Esmeraldas = XX	Medio término Antofagasta = XX Taltal = XX Esmeraldas = XX	Reportes de instalación Reportes trimestrales de operación Acuerdo para asegurar el flujo de información a los sistemas de alerta temprana Acuerdo de largo plazo para operación y mantenimiento.	

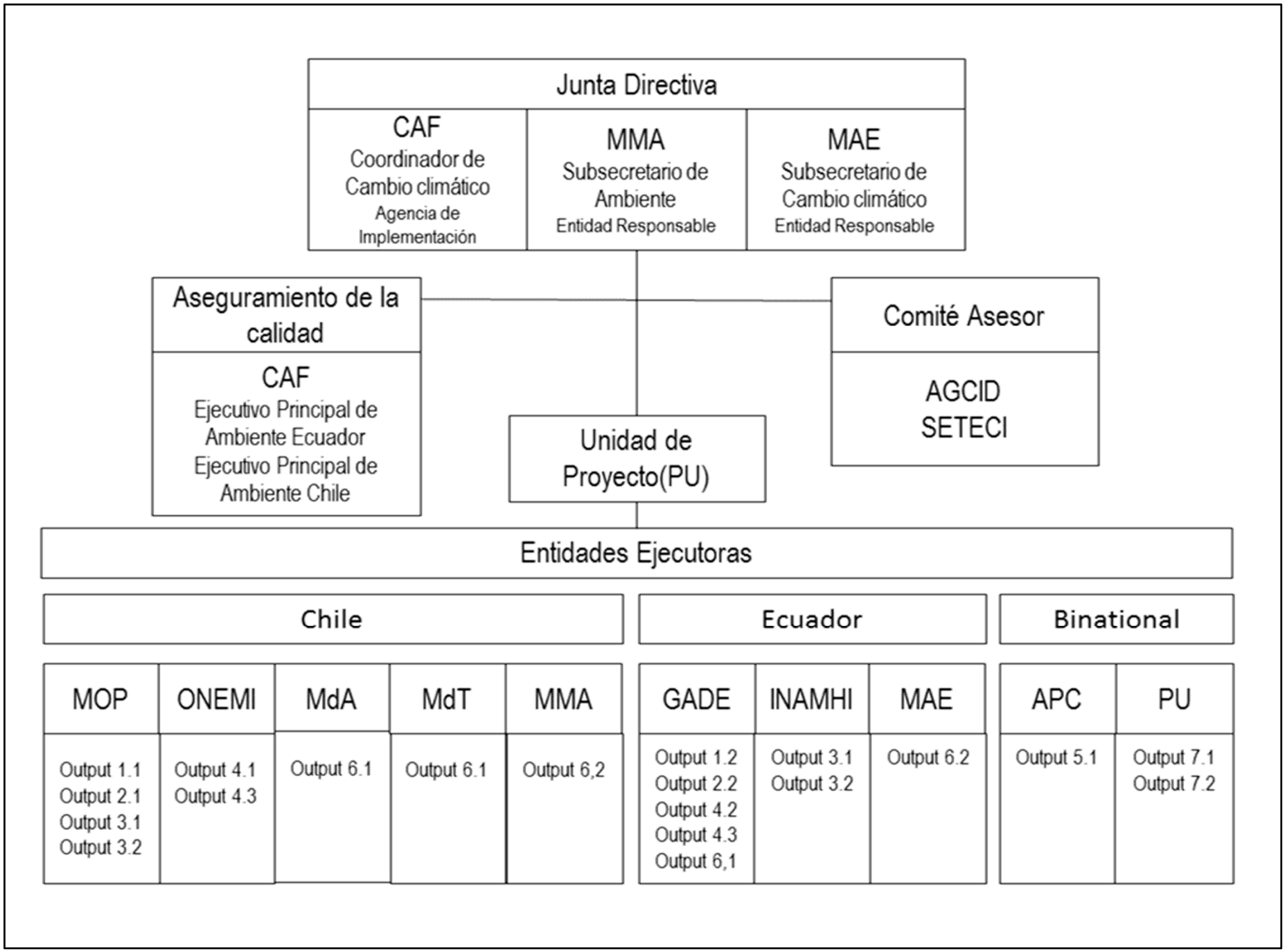
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	Número de personas (hombres y mujeres) cubiertos por señalización de rutas de evacuación en respuesta a inundaciones (Esmeraldas), deslaves (Esmeraldas) y aluviones (Antofagasta y Taltal)	Antofagasta = 0 Taltal = 0 Esmeraldas (inundación) = 0 Esmeraldas (deslaves) = 0	Fin de proyecto: Antofagasta = 380,000 Taltal = 10,000 Esmeraldas (inundación) = 161,000 Esmeraldas (deslaves) = 161,000	▪ Reporte de instalación de sirenas y señalización de rutas de evacuación ▪ Mapas de evacuación fácilmente accesibles ▪ Señalización de rutas evacuación instalada ▪ Procedimientos y guías de evacuación fácilmente accesibles.	▪ Las autoridades de gestión de riesgos integran las nuevas herramientas en sus sistemas de alerta temprana para alertar a la población ▪ Las entidades pertinentes incorporan en sus planes financieros los recursos para la futuro operación y mantenimiento de sirenas y señales de evacuación

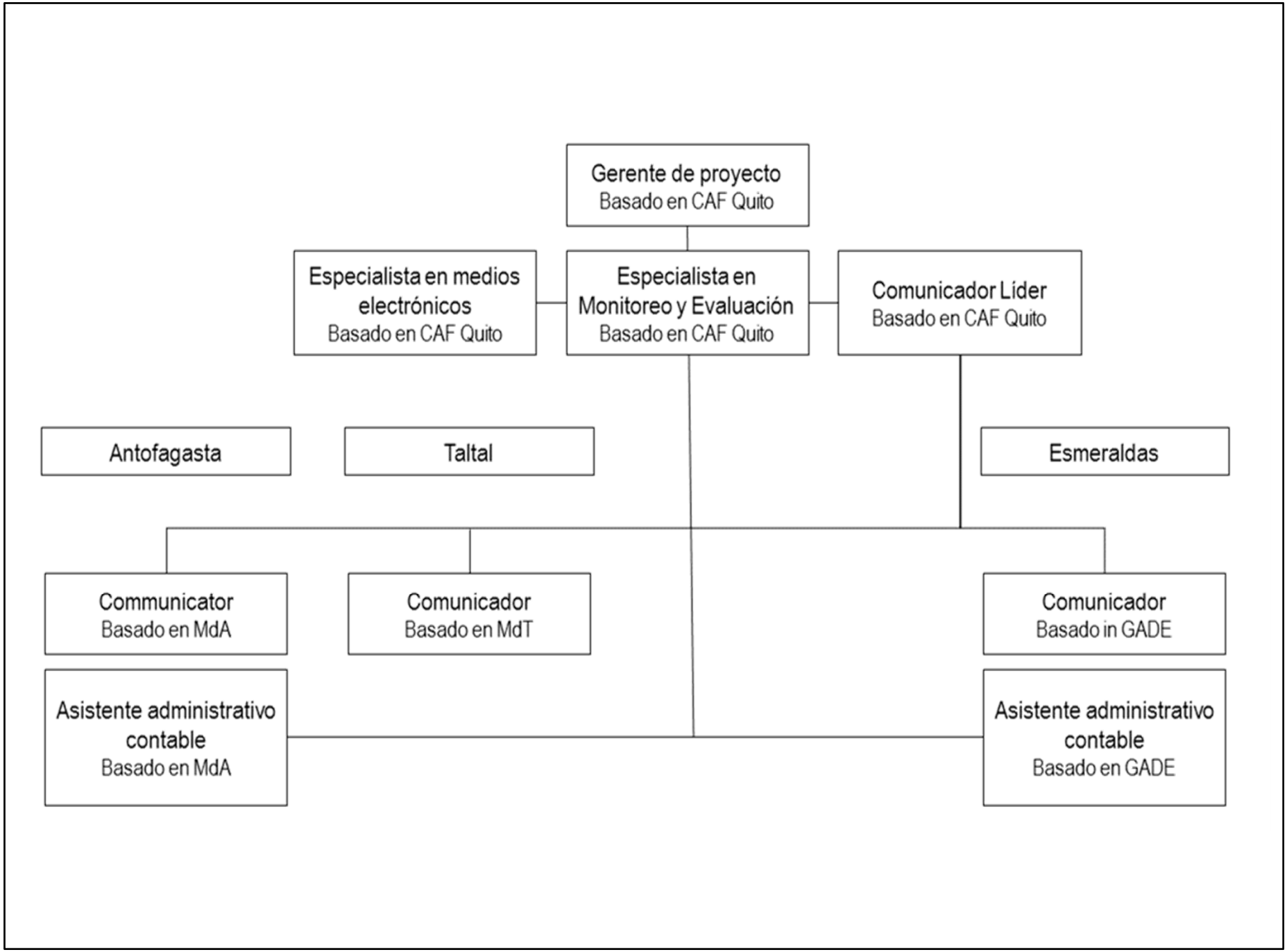
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Componente 2. Fortalecer capacidades de adaptación					
Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	Número de personal (hombres y mujeres) de gobiernos locales y entidades pertinentes entrenados en adaptación basada en riesgos en ciudades costeras	Antofagasta = 0 Taltal = 0 Esmeraldas = 0 Otras ciudades costeras Chile = 0 Otras ciudades costeras Ecuador = 0	Fin de proyecto: Antofagasta = XX Taltal = XX Esmeraldas = XX Otras ciudades costeras Chile = XX Otras ciudades costeras Ecuador = XX	▪ Plan de curso y materiales de capacitación en adaptación basada en riesgos en ciudades costeras ▪ Reporte de la capacitación de capacitadores ▪ Reportes de cada evento de entrenamiento (incluyendo lista de participantes)	▪ El personal de los gobiernos locales y entidades pertinentes está dispuesto a participar en la capacitación e incorporar la adaptación basada en riesgos en su trabajo

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	Número de personas (hombres y mujeres) que han participado en actividades y eventos de sensibilización	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto: Antofagasta = XX Taltal = XX Esmeraldas = XX	▪ Estrategias de comunicación y educación pública para Antofagasta, Taltal y Esmeraldas. ▪ Reporte de cada actividad y evento de sensibilización (incluyendo lista de participantes) ▪ Reportes trimestrales de implementación de cada estrategia de comunicación y educación.	▪ La población local es sensible a los mensajes sobre riesgos climáticos y adaptación al cambio climático ▪ Las entidades pertinentes están dispuestas a mantener a largo plazo estrategia de sensibilización ciudadana y la iniciativa de los narradores.
	Número de narradores (hombres y mujeres) capacitados para mantener la memoria cultural de riesgos y desastres vinculados con el clima	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto: Antofagasta = 10 Taltal = 5 Esmeraldas = 10	▪ Materiales de capacitación ▪ Acuerdos de largo plazo para mantener la iniciativa de los narradores en las tres ciudades ▪ Reportes trimestrales de avance en la implementación de la iniciativa de los narradores	

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Componente 3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina					
Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	Número de personas (hombres y mujeres, por nacionalidad) que han participado en eventos para la diseminación de lecciones y buenas prácticas (e.g., talleres, visitas guiada, seminarios)	0	Medio término >100 personas ≥ 50% mujeres Fin de proyecto: >200 personas ≥ 50% mujeres	▪ Memorias / reportes de eventos virtuales y presenciales (incluyendo lista de participantes)	▪ La información es atractiva, útil y accesible a actores clave y grupos de interés
	Número de visitantes por mes (media anual) registrada en la red de canales electrónicos de la plataforma regional en línea que se usa para diseminar los aprendizajes y buenas prácticas del Proyecto	Visitas 0 Visitas únicas 0	Medio término Visitas ≥2000 Visitas únicas ≥1600 Fin de proyecto: Visitas ≥4000 Visitas únicas ≥3200	▪ Reporte mensual del administrador de la plataforma	▪ Las comunidades costeras tienen adecuado acceso a internet


Noticias
Información y documentos del proyecto
Bitácoras web
Documentos de lecciones aprendidas
Sitio web
vínculo
Sitios web de socios y portales de información
Facebook, Twitter y otras plataformas de redes sociales
Plataforma electronica del proyecto
Plataforma de comunicación en línea
Canal de YouTube
Lista de distribución por correo electrónico


Junta Directiva
CAF
Coordinador de Cambio climático
Agencia de Implementación
MMA
Subsecretario de Ambiente
Entidad Responsable
MAE
Subsecretario de Cambio climático
Entidad Responsable
Aseguramiento de la calidad
CAF
Ejecutivo Principal de Ambiente Ecuador
Ejecutivo Principal de Ambiente Chile
Unidad de Proyecto(PU)
Comité Asesor
AGCID
SETECI
Entidades Ejecutoras
Chile
Ecuador
Binational
MOP
Output 1.1
Output 2.1
Output 3.1
Output 3.2
ONEMI
Output 4.1
Output 4.3
MdA
Output 6.1
MdT
Output 6.1
MMA
Output 6,2
GADE
Output 1.2
Output 2.2
Output 4.2
Output 4.3
Output 6,1
INAMHI
Output 3.1
Output 3.2
MAE
Output 6.2
APC
Output 5.1
PU
Output 7.1
Output 7.2


Gerente de proyecto
Basado en CAF Quito
Especialista en medios electrónicos
Basado en CAF Quito
Especialista en Monitoreo y Evaluación
Basado en CAF Quito
Comunicador Líder
Basado en CAF Quito
Antofagasta
Taltal
Esmeraldas
Communicator
Basado en MdA
Comunicador
Basado en MdT
Comunicador
Basado in GADE
Asistente administrativo contable
Basado en MdA
Asistente administrativo contable
Basado en GADE

PENDIENTES

1. Especificar lo que se puede construir en quebrada Bonilla con los recursos disponibles [¿una de las dos quebradas?]
2. Incluir los diseños existentes y que serán actualizados para quebrada Bonilla
3. Tipo y probable ubicación de radar meteorológico [¿doppler?]
4. Número y probable ubicación de estaciones meteorológicas [¿automáticas?]
5. Mecanismos para asegurar flujo de información de MOP a Dirección Meteorológica de Chile (DMC)
6. Ratificar que MOP cubrirá infraestructura complementaria, operación y mantenimiento de equipos
7. Número de sirenas y ubicación [validar con presupuesto disponible]
8. Número de personas que pueden ser capacitadas por curso regional
9. Número de personas a las que se puede llegar con las estrategias de comunicación y sensibilización
10. Validar ubicación de personal dentro de MdA y MdT

Comentarios del Secretariado del Fondo de Adaptación

1. Justificación suficiente para un programa regional

2. En componentes 1 y 2 clarificar cómo las actividades de los dos países conformaran un enfoque regional en lugar de dos o tres proyectos separados. Cómo el proyecto abordará los desafíos de la adaptación a nivel regional

3. Clarificar y de ser necesario robustecer la innovación del proyecto

4. Clarificar el papel de la Agencia de Cooperación Internacional de Chile (AGCI) [NIE]

Elementos pendientes del taller anterior

1. Proyecto debe estar listo al 15 de julio de 2016. Decidir si presentar concepto o propuesta completa — LISTO
2. Precisar sitios de intervención y presupuesto [detalles] — LISTO
3. Arreglos de implementación [quién ejecuta qué, cómo se canalizan los fondos] — LISTO

GRACIAS

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Mapa de Actores

Antofagasta y Taltal, Chile

María José Godoy

Mapeo de actores

- Metodología que tiene por objetivo identificar a los actores claves relacionados con las áreas, sectores y comunidades vulnerables al cambio climático, poniendo énfasis en la disposición de los actores claves para involucrarse en la implementación de las medidas del preconcepto del proyecto. Además identificar a grupos de mujeres, etarios e indígenas que puedan manifestar barreras de orden cultural, social u otro que limite su participación.

¿Quiénes son los actores?

- Los actores a identificar se consideran como personas o instituciones con algún grado de influencia respecto de alcance y ámbito en que se desenvuelve el proyecto (medidas de pre-concepto) que se pretende desarrollar e implementar. De igual manera, se consideran actores aquellas personas o grupo de personas que se verán significativamente influenciadas por esas actividades.

Clasificación de los actores

- Tipo de organización: gubernamental / no gubernamental.
- Nivel de acción o incidencia: Territorial/Local; Comunal; Regional; Nacional
- Nivel de involucramiento e interés: primario/ secundario /de apoyo

Identificación de roles y funciones

- Relaciones predominantes: a favor/ indeciso o indiferente / en contra.
- Niveles de poder: Alto/ medio/ bajo

Actores Gubernamentales primarios

Nombre Institución	Categoría	Nivel de incidencia	Poder	Posición	Interés
Gobierno Regional	Primario/Gub.	Regional	Alto	A favor	Alto
Intendente	Primario/Gub.	Regional	Alto	A favor	Alto
Consejo Regional	Primario/Gub.	Regional	Medio	A favor	Alto
Ministerio de Obras Públicas	Primario/Gub.	Regional/Nacional	Alto	A favor	Alto
Ministerio de Medio Ambiente	Primario/Gub.	Regional/Nacional	Medio/Alto	A favor	Alto
ONEMI	Primario/Gub.	Nacional/Regional/Comunal	Alto	A favor	Alto
SHOA	Primario/Gub.	Nacional	Medio	A favor	Alto
Ilustre Municipalidad de Antofagasta	Primario/Gub.	Comunal	Alto (a nivel comunal)	A favor	Alto
Dirección de Emergencia y Operaciones (I.M.A.)	Primario/Gub.	Comunal	Medio	A favor	Alto
Ministerio de Vivienda y Urbanismo	Primario/Gub.	Regional/Nacional	Medio/Alto	A favor	Alto

Actores Gubernamentales de Apoyo

Nombre Institución	Categoría	Nivel de incidencia	Poder	Posición	Interés
ASEMUCH	De apoyo/No Gubernamental	Regional	Medio/bajo	A favor	Indiferente
Dirección de Medio Ambiente, Aseo y Ornato (I.M.A.)	De apoyo/Gubernamental	Comunal	Medio	A favor	Alto/indiferente
Programa Antofagasta Verde. DIDECO. I.M.A.	De apoyo/Gubernamental	Comunal	Bajo	A favor	Alto/indiferente
Carabineros de Chile	De apoyo/ Gubernamental	Comunal/Regional/ Nacional	Bajo	A favor	Alto/indiferente
Fuerzas Armadas de Chile	De apoyo/Gubernamental	Nacional	Bajo	A favor	Alto/indiferente
Programa superación de campamentos GORE	De apoyo/Gubernamental	Comunal	Bajo	A Favor	Alto
Encargada de campamentos. I.M.A.	De apoyo/Gubernamental	Comunal	Bajo	A favor	Alto/indiferente

Actores no Gubernamentales de apoyo.

Nombre Institución	Categoría	Nivel de incidencia	Poder	Posición	Interés
Fundación para la superación de la pobreza	De apoyo/no Gubernamental	Nacional/Regional/Comunal	Bajo	A favor	Alto/indiferente
Hogar de Cristo	De apoyo/no Gubernamental	Nacional/Regional/Comunal	Bajo	A favor	Indiferente
Techo para Chile	De apoyo/no Gubernamental	Nacional/Regional/Comunal	Bajo	A favor	indiferente
FRACTAL	De apoyo/no Gubernamental	Territorial/local	Bajo	A favor	Alto/indiferente
CULTAM	De apoyo/no Gubernamental	Territorial/local	Bajo	A favor	Alto/indiferente
CREO Antofagasta	De apoyo/no Gubernamental	Comunal	alto	A favor	Alto
Fundación mi Parque	De apoyo/no Gubernamental	Nacional/Regional/Comunal	Bajo	A favor	Indiferente
Corporación de Desarrollo Productivo	De apoyo/no Gubernamental	Regional	Bajo	A favor	Indiferente
CEITSAZA U.C.N.	De apoyo/no Gubernamental	Regional	Bajo	A favor	Indiferente

Actores no Gubernamentales primarios.

Nombre Institución	Categoría	Nivel de incidencia	Poder	Posición	Interés
Campamento Mujeres Unidas	Primario/no gubernamental	Territorial/local	Bajo	A favor	Alto
JJ.VV. Carol Urzúa	Primario/no Gubernamental	Territorial/local	Bajo	A favor	Alto
JJ.VV. Esperanza Nuestra	Primario/no Gubernamental	Territorial/local	Bajo	A favor	Alto
JJ.VV. Villa Valdivieso	Primero/no Gubernamental	Territorial/local	Bajo	A favor	Alto

Actores del primarios Antofagasta.

- JJ.VV. Cardenal Zamoré
- JJ.VV. Villa México
- JJ.VV. Villa Alemania
- JJ.VV. Bonilla Alto
- JJ.VV. Bonilla Bajo
- JJ.VV. Jorge Alessandri
- JJ.VV. Rubén Infanta
- Casa del adulto mayor (municipalidad)
- Campamento Victor Jara
- Campamento Villa Esperanza

Actores Taltal

Nombre Institución	Categoría	Nivel de incidencia	Poder	Posición	Interés
Bomberos	De apoyo/no Gubernamental	Comunal/Regional/Nacional	Bajo	A favor	Alto/indiferente
Ilustre Municipalidad de Taltal	Primario/Gubernamental	Comunal	Alto (a nivel comunal)	A favor	Alto
JJ.VV. Gabriela Mistral	Primario/no Gubernamental	Territorial/local	Bajo	A favor	Alto
Campamento Vista Hermosa	Primario/no Gubernamental	Territorial/local	Bajo	A favor	Alto
JJ.VV. Juan Cortés	Primario/ no Gubernamental	Territorial/local	Bajo	A favor	Alto
Hogar de Ancianos Taltal	Primario/no Gubernamental	Territorial/local	Bajo	A favor	Alto

Actores primarios de Taltal

- Toma circunvalación
- Campamento Tiro al Blanco
- Campamento Andrés Sabella
- Campamento Manco moreno
- Campamento Eusebio Lillo
- Campamento Salvador Allende
- JJ.VV. El Salitre
- JJ.VV. La Caleta
- JJ.VV. San Lorenzo
- Club deportivo La Caleta

Instituciones que actúan en caso de catástrofe.

Entre las principales instituciones que son identificadas como aquellas que reaccionan ante el resguardo y protección de la población más vulnerable, en caso de catástrofe, destacan la Municipalidad y Bomberos, le sigue Fuerzas Armada, Carabineros, luego ONEMI, Gobierno Regional, Juntas de Vecinos y por último SERVIU, MOP y servicio de salud.

En el caso de Taltal se reconoce la institución de Bomberos y Municipio como las primeras que reaccionan ante el resguardo de la población mas vulnerable.

Procesos de educación

- Las organizaciones identificadas para el proceso de educación, sensibilización y resiliencia, son principalmente el Municipio, le sigue Onemi, Gobierno Regional y MOP. También se considera el rol de las ONG´s en cuanto a la vinculación con el territorio y la comunidad en procesos de educación.
- Las organizaciones primarias/ no gubernamentales reconocen al municipio como actor clave en los procesos de educación, pero existe la percepción de que carecen de las competencias para llevarlas a cabo.

Grupos Focales

- Mujeres en el territorio.
- Grupos etarios en el territorio.
- Campamentos: asentamientos en terrenos no autorizados.
- Pueblos originarios no se identifican en los territorios.

Percepción respecto de las medidas del preconcepto. Caso Taltal

- Las medidas del preconcepto fueron aceptadas en su máxima valoración ponderada como “muy importante”, por todos los actores entrevistados.

Percepción respecto de las medidas del preconcepto. Caso Antofagasta

- Las medidas del preconcepto del proyecto fueron evaluadas con una alta y máxima ponderación de importancia.
- Componentes no estructurales
- Componentes estructurales
- Componentes de respuesta a la emergencia.
- Componentes de fortalecimiento a gobiernos locales y residentes.
- Componentes sistema de alerta temprana

Recomendaciones

- Programa de educación medioambiental mediante la puesta en valor de los riesgos, catástrofe y vulnerabilidad climática como elemento valorativo del imaginario cultural y territorial".
- Fenómeno de migrantes asociado a la proliferación de campamentos expone la carencia de una memoria colectiva por parte de los inmigrantes que desconocen las particularidades del territorio. Una de las entrevistadas manifiesta que "no se moverán del lugar, ya que no solo han construido sus casas, sino también lazos y redes de apoyo".

Recomendaciones

- La poca habitualidad y frecuencia de estos eventos en los últimos 20 años ha llevado a invisibilidad y a descartar estas variables climáticas como parte de la toma de decisiones al momento de radicarse en el territorio (campamentos).
- En su mayoría las organizaciones del territorio identifican su cercanía con los municipiosasí como el actor medular en el desarrollo e implementación de medidas de resguardo y protección cuando de problemas o catástrofes climáticas .

Recomendaciones

- Percepción de desarticulación y desvinculación de los órganos pertinentes tanto de gobierno regional como comunal, en caso de catástrofe provocadas por eventos naturales.
- Es por esto que se asume como riesgos la percepción acerca de la escasa asociatividad, cooperativismo y articulación de redes entre las instituciones gubernamentales (aparato del estado) y el gobierno local.
- Se recomienda una vinculación de carácter informativo acerca de las funciones de cada organismo.

Recomendaciones

- Discontinuidad de los programas y políticas gubernamentales, además de su carácter centralista, lo cual debilita la mirada y caracterización particular de las necesidades de las regiones.

- El riesgo anterior se compensa con el trabajo con el municipio, ya que cuenta con instrumentos de planificación, organigrama y ordenanzas que lo facultan para promover directrices de desarrollo en el área de prevención y sensibilización.

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Componentes y financiamiento

Componente	Resultados esperados	Productos esperados	Países	Presupuesto (USD)
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 545,000]	Chile	10,237,800 (81.71%)
		1.2. Plan de infraestructura verde de Esmeraldas [USD 425,000]	Ecuador	
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,917,200]	Chile	
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,820,000]	Ecuador	
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 910,000]	Chile and Ecuador	
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 140,000]	Chile and Ecuador	
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,000]	Chile	
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,600]	Ecuador	
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas	Chile and Ecuador	

		[USD 110.000]		
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 213,000]	Chile and Ecuador	1,305,200 (10.42%)
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 474,200]	Chile and Ecuador	
		6.2. Iniciativa de Narradores iniciada [USD 618,000]	Chile and Ecuador	
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 424,000]	Chile and Ecuador	987,000 (7.88%)
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 563,000]	Chile and Ecuador	
6. Costos de ejecución del Proyecto / Programa				350,000
7. Costo total del Proyecto/Programa				12,880,000
8. Cuota de manejo de ciclo de Proyecto/Programa de la Agencia de Implementación (si aplica)				1,030,400
Monto de financiamiento solicitado				13,910,400

Calendario propuesto

Hitos	Fechas esperadas
Inicio de implementación del proyecto	Enero 2017
Revisión de medio-término	Junio 2019
Cierre del Proyecto	Diciembre 2021
Evaluación final	Septiembre 2021

Marco de resultados

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Objetivo del proyecto: Reducir la vulnerabilidad a inundaciones relacionadas con el cambio climático en tres ciudades costeras por medio de incorporar un enfoque de adaptación basada en riesgos, construir colaboración y desarrollar una cultura de adaptación	Número de personas (hombres y mujeres) protegidas por medidas mejoradas de reducción del riesgo en Antofagasta, Taltal and Esmeraldas.	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto Antofagasta = 380,000 Taltal = 10,000 Esmeraldas = 161,000	▪ Informe de desempeño del proyecto	▪ Apoyo político de autoridades locales y nacionales ▪ Las entidades responsables de construir la infraestructura pertinente y de los sistemas de alerta temprana están dispuestas a incorporar medidas de adaptación en sus planes y acciones ▪ La población local y actores clave se interesan y colaboran
Componente 1. Acciones prioritarias para incrementar resiliencia					
Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	Número de planes que incorporan previsiones para adaptación al cambio climático	Planes de manejo de aguas lluvias[1] Antofagasta = 0 Plan de infraestructura verde plan[2] Esmeraldas = 0	Medio término: 1 Fin de proyecto: 2	▪ Plan de manejo de aguas lluvias ▪ Plan de infraestructura verde ▪ Instrumentos legales adoptando los planes	▪ Interés y apoyo de las autoridades locales ▪ Autoridades locales y nacionales comprometidas en financiar e implementar los planes.
Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y	Número de infraestructuras construidas para soportar condiciones resultantes de la variabilidad y cambio climático	Antofagasta = 0 Esmeraldas = 0	Medio término: 1 Fin de proyecto: 2	▪ Diseños e informe de construcción de infraestructura de control aluvional en la quebrada Bonilla (Antofagasta)	▪ Autoridades locales y nacionales garantizan control de calidad de los diseños y proceso constructivo

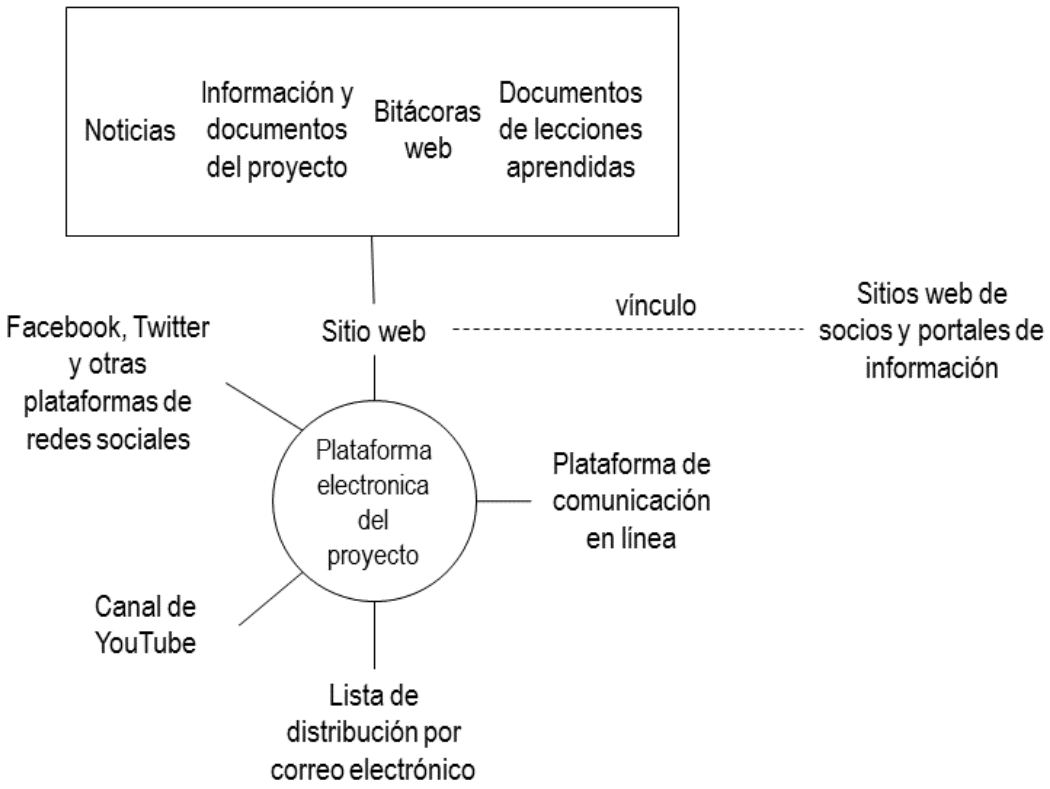
[1] Antofagasta tiene un plan de manejo de aguas lluvias que fue preparado en 2004 y que no incorpora el factor climático. Taltal también tiene un plan de gestión de aguas lluvias, pero los aluviones del 26 de marzo de 2015 causados por una precipitación inusual mostraron que la planificación e infraestructura no son suficientes para resistir los futuros impactos del cambio climático.

[2] La estrategia de adaptación y mitigación (ONU-HABITAT, 2011) y la estrategia de gestión de riesgos y desastres (GAD Esmeraldas, 2012) incluyen elementos para siembra de manglares y reforestación de laderas. Sin embargo, no hay un esquema para operativizar una red de espacios verdes que contribuyan a proteger a la población de inundaciones y deslaves y generar beneficios adicionales (i.e., plan de infraestructura verde).

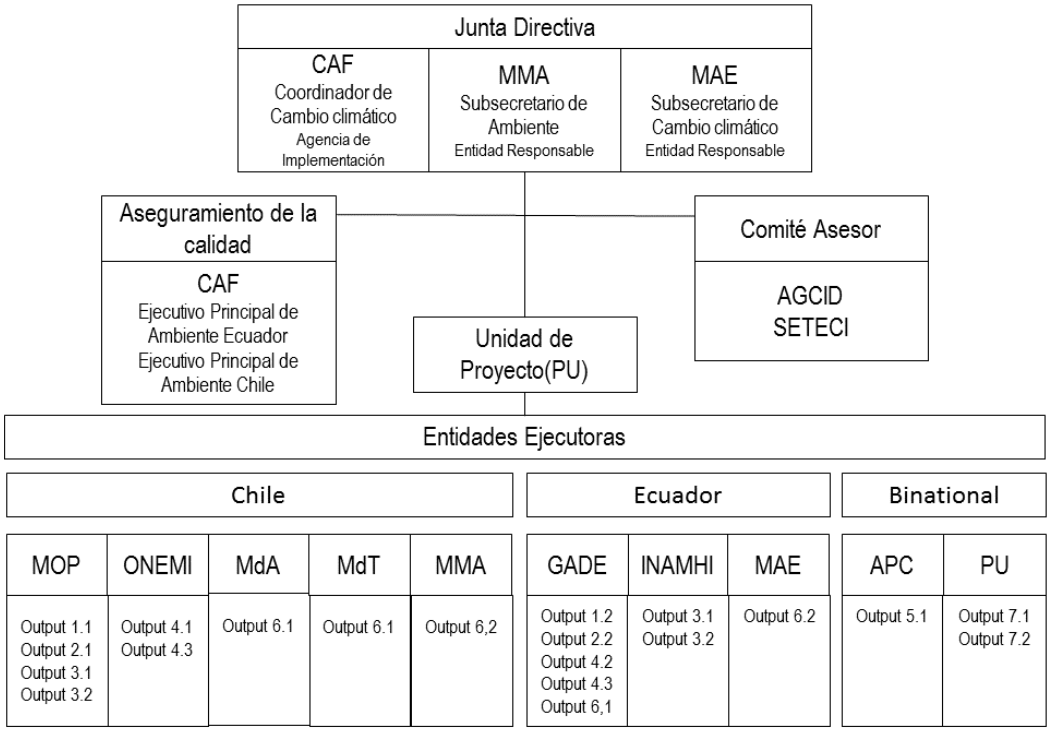
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
aluviones en dos ciudades costeras				▪ Diseños e informe de construcción de infraestructura de control de deslaves en Cerro Gataso (Esmeraldas)	▪ Las autoridades locales y nacionales pertinentes incorporar en sus planes financieros los recursos para mantenimiento futuro de la nueva infraestructura
	Número de personas (hombres y mujeres) protegidas por infraestructura mejorada para soportar presiones de variabilidad y cambio climático.	Antofagasta = 0 Esmeraldas = 0	Fin de proyecto: 12,840 Antofagasta = (ca., 50% mujeres) Esmeraldas = 500 (ca., 50% mujeres	▪ Encuesta de personas que viven en áreas protegidas por la infraestructura mejorada (quebrada Bonilla y cerro Gataso) ▪ Porcentaje de mujeres en Antofagasta y Esmeraldas de las estadísticas nacionales	
Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	Número de radares meteorológicos para monitorear precipitación, vinculados con los sistemas de alerta temprana	Antofagasta = 0 Esmeraldas = 0	Medio término Antofagasta = 1 Esmeraldas = 1	▪ Reportes de análisis de ubicación de radares ▪ Reportes de instalación de radares ▪ Reportes trimestrales de operación de radares ▪ Acuerdo para asegurar el flujo de información a los sistemas de alerta temprana ▪ Acuerdo de largo plazo para operación y mantenimiento.	▪ Las entidades responsables ejecutan puntualmente los trabajos complementarios para albergar y operar los equipos (e.g., torre de radar, link de comunicación). ▪ Las entidades pertinentes incorporar en sus planes financieros los recursos para la operación y mantenimiento del Nuevo equipo meteorológico ▪ Las autoridades de gestión de riesgos incorporan la nueva información en sus sistemas de alerta temprana para alertar a la población local.
	Número de estaciones meteorológicas para monitorear precipitación que afecta a las ciudades, vinculadas a los sistemas de alerta temprana	Antofagasta = XX Taltal = XX Esmeraldas = XX	Medio término Antofagasta = XX Taltal = XX Esmeraldas = XX	Reportes de instalación Reportes trimestrales de operación Acuerdo para asegurar el flujo de información a los sistemas de alerta temprana Acuerdo de largo plazo para operación y mantenimiento.	
Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	Número de personas (hombres y mujeres) cubiertos por señalización de rutas de evacuación en respuesta a inundaciones (Esmeraldas), deslaves (Esmeraldas) y aluviones (Antofagasta y Taltal)	Antofagasta = 0 Taltal = 0 Esmeraldas (inundación) = 0	Fin de proyecto: Antofagasta = 380,000 Taltal = 10,000	▪ Reporte de instalación de sirenas y señalización de rutas de evacuación ▪ Mapas de evacuación fácilmente accesibles	▪ Las autoridades de gestión de riesgos integran las nuevas herramientas en sus sistemas de alerta temprana para alertar a la población

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
		Esmeraldas (deslaves) = 0	Esmeraldas (inundación) = 161,000 Esmeraldas (deslaves) = 161,000	▪ Señalización de rutas evacuación instalada ▪ Procedimientos y guías de evacuación fácilmente accesibles.	▪ Las entidades pertinentes incorporan en sus planes financieros los recursos para la futuro operación y mantenimiento de sirenas y señales de evacuación
Componente 2. Fortalecer capacidades de adaptación					
Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	Número de personal (hombres y mujeres) de gobiernos locales y entidades pertinentes entrenados en adaptación basada en riesgos en ciudades costeras	Antofagasta = 0 Taltal = 0 Esmeraldas = 0 Otras ciudades costeras Chile = 0 Otras ciudades costeras Ecuador = 0	Fin de proyecto: Antofagasta = XX Taltal = XX Esmeraldas = XX Otras ciudades costeras Chile = XX Otras ciudades costeras Ecuador = XX	▪ Plan de curso y materiales de capacitación en adaptación basada en riesgos en ciudades costeras ▪ Reporte de la capacitación de capacitadores ▪ Reportes de cada evento de entrenamiento (incluyendo lista de participantes)	▪ El personal de los gobiernos locales y entidades pertinentes está dispuesto a participar en la capacitación e incorporar la adaptación basada en riesgos en su trabajo
Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	Número de personas (hombres y mujeres) que han participado en actividades y eventos de sensibilización	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto: Antofagasta = XX Taltal = XX Esmeraldas = XX	▪ Estrategias de comunicación y educación pública para Antofagasta, Taltal y Esmeraldas. ▪ Reporte de cada actividad y evento de sensibilización (incluyendo lista de participantes) ▪ Reportes trimestrales de implementación de cada estrategia de comunicación y educación.	▪ La población local es sensible a los mensajes sobre riesgos climáticos y adaptación al cambio climático ▪ Las entidades pertinentes están dispuestas a mantener a largo plazo estrategia de sensibilización ciudadana y la iniciativa de los narradores.
	Número de narradores (hombres y mujeres) capacitados para mantener la memoria cultural de riesgos y desastres vinculados con el clima	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto: Antofagasta = 10 Taltal = 5 Esmeraldas = 10	▪ Materiales de capacitación ▪ Acuerdos de largo plazo para mantener la iniciativa de los narradores en las tres ciudades	

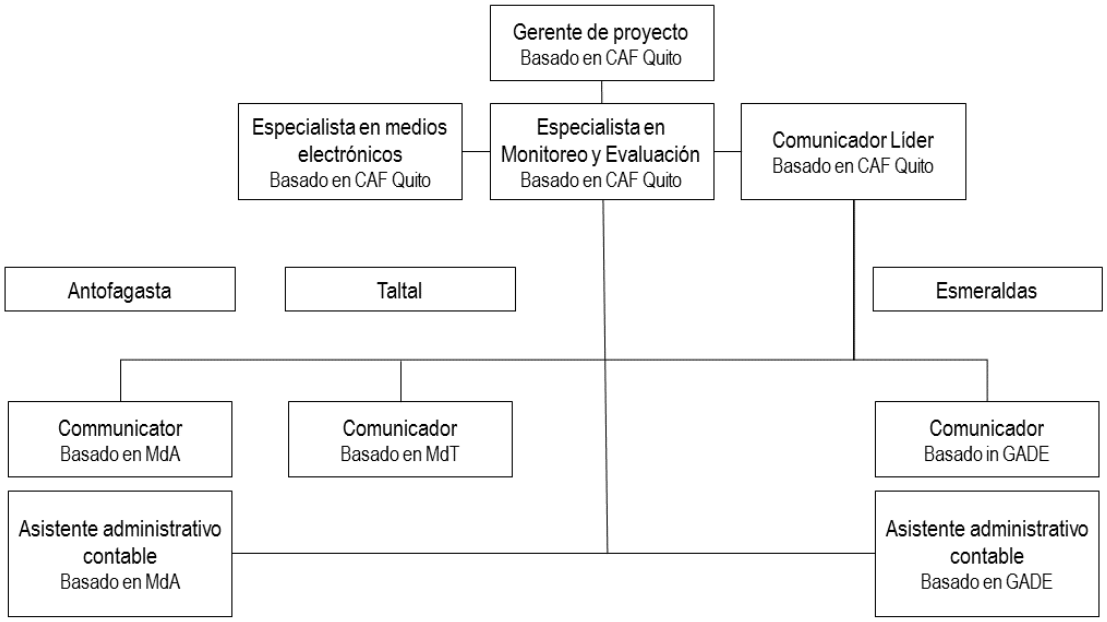
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
				▪ Reportes trimestrales de avance en la implementación de la iniciativa de los narradores	
Componente 3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina					
Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	Número de personas (hombres y mujeres, por nacionalidad) que han participado en eventos para la diseminación de lecciones y buenas prácticas (e.g., talleres, visitas guiada, seminarios)	0	Medio término >100 personas ≥ 50% mujeres Fin de proyecto: >200 personas ≥ 50% mujeres	▪ Memorias / reportes de eventos virtuales y presenciales (incluyendo lista de participantes)	▪ La información es atractiva, útil y accesible a actores clave y grupos de interés
	Número de visitantes por mes (media anual) registrada en la red de canales electrónicos de la plataforma regional en línea que se usa para diseminar los aprendizajes y buenas prácticas del Proyecto	Visitas 0 Visitas únicas 0	Medio término Visitas ≥2000 Visitas únicas ≥1600 Fin de proyecto: Visitas ≥4000 Visitas únicas ≥3200	▪ Reporte mensual del administrador de la plataforma	▪ Las comunidades costeras tienen adecuado acceso a internet



Plataforma electrónica del proyecto

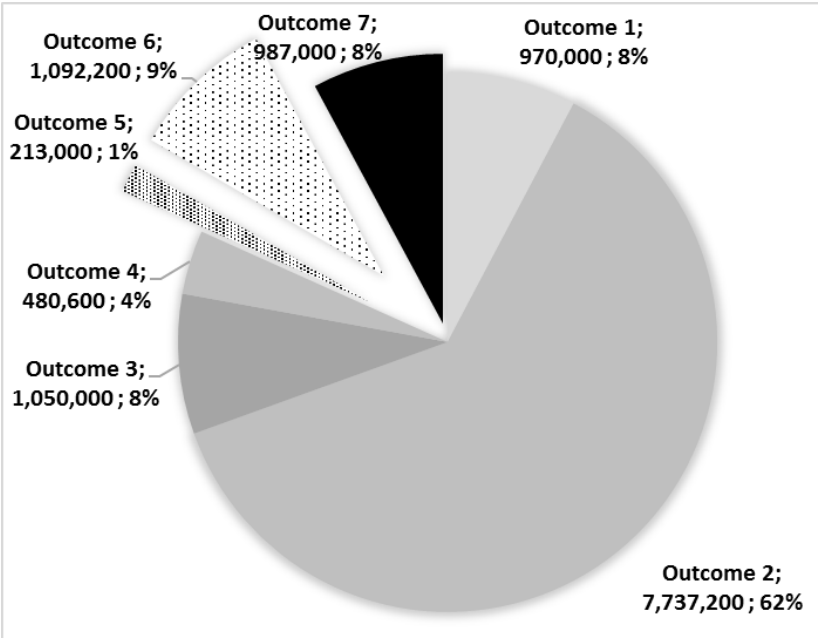


Estructura organizativa del proyecto



Conformación del equipo de proyecto

Costo del proyecto: USD 13,910,400



- Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras
- Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras
- Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local
- Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones
- Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación
- Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)
- Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región

Presupuesto por resultados

Presupuesto en pre-concepto y documento completo

Outcome	Output	Chile	Ecuador	Binational	Total	Outcome total	Chile	Ecuador		Total	Outcome total	Difference
Outcome 1. Enhanced plans and green infrastructure reduces vulnerability to floods, landslides and mudflows in three coastal cities	1.1. Stormwater management plans for Antofagasta and Taltal	1,500,000			1,500,000	2,500,000	545,000			545,000	970,000	-1,530,000
	1.2. Green infrastructure plan for Esmeraldas		1,000,000		1,000,000			425,000		425,000		
Outcome 2. Reduced vulnerability to floods, landslides and mudflows in two coastal cities (ca., 574.000 people protected)	2.1. Mudflow control infrastructure in Antofagasta	3,938,000			3,938,000	6,230,000	4,917,200			4,917,200	7,737,200	1,507,200
	2.2. Landslide mitigation works in Esmeraldas		2,292,000		2,292,000			2,820,000		2,820,000		
Outcome 3. Improved climate monitoring and means to alert the local population	3.1. Weather radars in Antofagasta and Esmeraldas	600,000	400,000		1,000,000	1,000,000	530,000	380,000		910,000	1,050,000	50,000
	3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas						70,000	70,000		140,000		
Outcome 4. Improved means to respond to floods, landslides and mudflows	4.1. Enhanced public warning system in Antofagasta and Taltal	350,000	150,000		500,000	500,000	250,000			250,000	480,600	-19,400
	4.2. Pilot flood warning system in Esmeraldas							120,600		120,600		
	4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas						77,000	33,000		110,000		
Outcome 5. Local governments with improved capacity to design and implement adaptation measures	5.1. Course on risk-based adaptation in coastal cities			200,000	200,000	200,000			213,000	213,000	213,000	13,000
Outcome 6. Local population and government personnel with increased awareness of climate-related risks (floods, landslides, mudflows)	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	350,000	150,000		500,000	500,000	330,800	143,400		474,200	1,092,200	
	6.2. Narrators´ initiative initiated	400,000	200,000		600,000	600,000	418,000	200,000		618,000		
Outcome 7. Lessons and best practice on reducing vulnerability to climate related flooding, landslides and mudflows in coastal cities have been shared in the region.	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice			1,000,000	1,000,000	1,000,000			424,000	424,000	987,000	
	7.2. Lessons and best practice documented and disseminated								563,000	563,000		
TOTAL		7,138,000	4,192,000	1,200,000	12,530,000	12,530,000	7,138,000	4,192,000	1,200,000	12,530,000	12,530,000	

Presupuesto

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
1.1. Stormwater management plan for Antofagasta	MOP	CHI	Contractual services company	500.000					500.000	1
	MOP	CHI	Travel	10.000	2.000				12.000	2
	MOP	CHI	Contractual services individual		10.000				10.000	3
	MOP	CHI	Meetings		20.000				20.000	4
	MOP	CHI	Audiovisual & print production costs		3.000				3.000	5
			Subtotal	510.000	35.000	-	-	-	545.000	
1.2. Green infrastructure plan for Esmeraldas	GADE	ECU	Contractual services company	20.000					20.000	6
	GADE	ECU	Contractual services company	90.000					90.000	7
	GADE	ECU	Contractual services company		80.000				80.000	8
	GADE	ECU	Meetings		20.000				20.000	9
	GADE	ECU	Audiovisual & print production costs		5.000				5.000	10
	GADE	ECU	Contractual services company		100.000	70.000	40.000		210.000	11
			Subtotal	110.000	205.000	70.000	40.000	-	425.000	
2.1. Mudflow control infrastructure in Antofagasta	MOP	CHI	Contractual services company		200.000				200.000	12
	MOP	CHI	Contractual services company			4.633.200			4.633.200	13

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	MOP	CHI	Contractual services company		30.000				30.000	14
	MOP	CHI	Miscellaneous expenses		10.000	30.000			40.000	15
	MOP	CHI	Equipment and furniture	14.000					14.000	16
			Subtotal	14.000	240.000	4.693.200	-	-	4.917.200	
2.2. Landslide mitigation works in Esmeraldas	GADE	ECU	Contractual services company		50.000	150.000			200.000	17
	GADE	ECU	Contractual services company			2.600.000			2.600.000	18
	GADE	ECU	Miscellaneous expenses			20.000			20.000	19
			Subtotal	-	50.000	2.770.000	-	-	2.820.000	
3.1. Weather radars in Antofagasta and Esmeraldas	MOP	CHI	Contractual services company	30.000					30.000	20
	MOP	CHI	Equipment and furniture		500.000				500.000	21
	INAMHI	ECU	Contractual services company	30.000					30.000	22
	INAMHI	ECU	Equipment and furniture		350.000				350.000	23
			Subtotal	60.000	850.000	-	-	-	910.000	
3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas	MOP	CHI	Equipment and furniture	70.000					70.000	24
	INAMHI	ECU	Equipment and furniture	70.000					70.000	25
			Subtotal	140.000	-	-	-	-	140.000	
	ONEMI	CHI	Equipment and furniture		250.000				250.000	26

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
4.1. Enhanced public warning system in Antofagasta and Taltal			Subtotal	-	250.000	-	-	-	250.000	
4.2. Pilot flood warning system in Esmeraldas	GADE	ECU	Contractual services company	10.000					10.000	27
	GADE	ECU	Equipment and furniture	10.000	70.000				80.000	28
	GADE	ECU	Meetings	2.000	6.600	2.000			10.600	29
	GADE	ECU	Miscellaneous expenses		5.000	5.000	5.000	5.000	20.000	30
			Subtotal	22.000	81.600	7.000	5.000	5.000	120.600	
4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	ONEMI	CHI	Contractual services company	10.000					10.000	31
	ONEMI	CHI	Audiovisual & print production costs		3.000				3.000	32
	ONEMI	CHI	Audiovisual & print production costs		40.000				40.000	33
	ONEMI	CHI	Miscellaneous expenses		6.000	6.000	6.000	6.000	24.000	34
	GADE	ECU	Contractual services company	10.000					10.000	35
	GADE	ECU	Audiovisual & print production costs		3.000				3.000	36
	GADE	ECU	Audiovisual & print production costs		20.000				20.000	37
			Subtotal	20.000	72.000	6.000	6.000	6.000	110.000	
5.1. Course on risk-based adaptation in coastal cities	APC	Regional	Local consultants	25.000	50.000	25.000			100.000	38
	APC	Regional	Meetings	8.000					8.000	39
	APC	Regional	Grant		40.000				40.000	40
	APC	Regional	Meetings		20.000				20.000	41

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	APC	Regional	Grant			15.000	15.000	15.000	45.000	42
			Subtotal	33.000	110.000	40.000	15.000	15.000	213.000	
6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	MdA	CHI	Contractual services company	15.000					15.000	43
	MdA	CHI	Local consultants	12.000	12.000	12.000	12.000	12.000	60.000	44
	MdA	CHI	Miscellaneous expenses		50.000	40.000	30.000		120.000	45
	MdA	CHI	Equipment and furniture		3.400				3.400	46
	MdT	CHI	Contractual services company	15.000					15.000	47
	MdT	CHI	Local consultants	10.800	10.800	10.800	10.800	10.800	54.000	48
	MdT	CHI	Miscellaneous expenses		25.000	20.000	15.000		60.000	49
	MdT	CHI	Equipment and furniture		3.400				3.400	50
	GADE	ECU	Contractual services company	15.000					15.000	51
	GADE	ECU	Local consultants	12.000	12.000	12.000	12.000	12.000	60.000	52
	GADE	ECU	Miscellaneous expenses		30.000	20.000	15.000		65.000	53
	GADE	ECU	Equipment and furniture		3.400				3.400	54
			Subtotal	79.800	150.000	114.800	94.800	34.800	474.200	
6.2. Narrators´ initiative initiated	MMA	CHI	Local consultants	12.000	12.000	12.000	12.000	12.000	60.000	55
	MMA	CHI	Local consultants	10.800	10.800	10.800	10.800	10.800	54.000	56
	MMA	CHI	Meetings	8.000					8.000	57
	MMA	CHI	Contractual services company		30.000	20.000	10.000		60.000	58

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	MMA	CHI	Grant		50.000	70.000	60.000	50.000	230.000	59
	MMA	CHI	Local consultants			6.000			6.000	60
	MAE	ECU	Local consultants	10.800	21.600	21.600	21.600	10.800	86.400	61
	MAE	ECU	Contractual services company		10.000	10.000	5.000		25.000	62
	MAE	ECU	Grant		20.000	30.000	19.000	15.000	84.000	63
	MAE	ECU	Local consultants			4.600			4.600	64
			Subtotal	41.600	154.400	185.000	138.400	98.600	618.000	
7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice	CAF	Regional	Equipment and furniture	28.000					28.000	65
	CAF	Regional	Contractual services company	8.600	8.600	8.600	8.600	8.600	43.000	66
	CAF	Regional	Local consultants	22.800	22.800	22.800	22.800	22.800	114.000	67
	CAF	Regional	Local consultants	24.000	24.000	24.000	24.000	24.000	120.000	68
	CAF	Regional	Supplies	1.800	1.800	1.800	1.800	1.800	9.000	69
	CAF	Regional	Audiovisual & print production costs	12.000	12.000	12.000	12.000	12.000	60.000	70
	CAF	Regional	Travel	10.000	10.000	10.000	10.000	10.000	50.000	71
			Subtotal	107.200	79.200	79.200	79.200	79.200	424.000	
7.2. Lessons and best practice documented and disseminated	CAF	Regional	Local consultants	24.000	24.000	24.000	24.000	24.000	120.000	72
	CAF	Regional	Miscellaneous expenses	13.000	15.000	15.000	15.000	15.000	73.000	73
	CAF	Regional	Meetings	20.000					20.000	74
	CAF	Regional	Meetings	5.000					5.000	75
	CAF	Regional	Meetings	5.000					5.000	76
	CAF	Regional	Travel		20.000	20.000	20.000	20.000	80.000	77
	CAF	Regional	Travel			10.000	10.000	10.000	30.000	78
	CAF	Regional	International consultants			30.000		40.000	70.000	79

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	CAF	Regional	Audiovisual & print production costs					30.000	30.000	80
	CAF	Regional	Audiovisual & print production costs					50.000	50.000	81
	CAF	Regional	Meetings					20.000	20.000	82
	CAF	Regional	Meetings					25.000	25.000	83
	CAF	Regional	Meetings					10.000	10.000	84
	CAF	Regional	Meetings					25.000	25.000	85
			Subtotal	67.000	59.000	99.000	69.000	269.000	563.000	
Project execution cost	CAF	Regional	Local consultants	36.000	36.000	36.000	36.000	36.000	180.000	86
	CAF	Regional	Local consultants	14.400	14.400	14.400	14.400	14.400	72.000	87
	CAF	Regional	Local consultants	14.400	14.400	14.400	14.400	14.400	72.000	88
	CAF	Regional	Travel	3.000	3.000	3.000	3.000	3.000	15.000	89
	CAF	Regional	Equipment and furniture	4.500					4.500	90
	CAF	Regional	Miscellaneous expenses	1.300	1.300	1.300	1.300	1.300	6.500	91
			Subtotal	73.600	69.100	69.100	69.100	69.100	350.000	

Total project cost	**1.278.200**	**2.405.300**	**8.103.300**	**516.500**	**576.700**	**12.880.000**

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Memoria

Taller de validación

Esmeraldas

República de Ecuador

22 de julio de 2016

Tabla de contenido

Introducción

El Ministerio de Medio Ambiente de Chile (MMA) y el Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - banco de desarrollo de América Latina - presentaron al Fondo de Adaptación la iniciativa del Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina. Esta iniciativa regional incluye tres ciudades costeras: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador. El Fondo de Adaptación fue establecido en 2001 para financiar proyectos y programas concretos de adaptación en los países en desarrollo. El fondo es un mecanismo financiero de la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Protocolo de Kioto.

La iniciativa en mención fue presentada a consideración del Fondo de Adaptación a nivel de pre-concepto, el cual fue aprobado por dicho fondo a finales del mes de marzo de 2016. A efectos de avanzar en la aprobación final, se requiere formular en detalle el proyecto en colaboración con los actores claves públicos y privados. El 16 de mayo de 2016 se realizó el taller de inicio en la ciudad de Esmeraldas con el objetivo de presentar el pre-concepto a los socios clave, recibir retroalimentación e iniciar el proceso de desarrollo de la propuesta de completa para ser presentada hasta el 01 de agosto de 2016[1]. Un taller de inicio similar se realizó en la ciudad de Antofagasta el 4 de mayo de 2016. Las memorias de los talleres de inicio Antofagasta y Esmeraldas fueron enviadas a los participantes en ambos países.

El taller de validación fue convocado el 23 de junio de 2016 y se enviaron varios mensajes recordando del evento. El martes 19 de julio sorpresivamente el Director de Gestión Ambiental del Municipio de Esmeraldas por mensaje de WhatsApp comunicó que durante la mañana del mismo día del taller habría un simulacro en la ciudad. Teniendo esto en cuenta se modificó la agenda y logística para realizar la revisión del documento durante la tarde del viernes 22 de julio de 2016, y se notificó a todos los convocados.

Agenda

La reunión tuvo los siguientes elementos:

13:00	Registro de participantes (almuerzo)
14:00	Bienvenida
14:10	Presentación de participantes
14:30	Revisión de la agenda
14:45	Presentación del borrador de proyecto
15:30	Mesas de trabajo acciones para el proyecto
17:00	Elementos pendientes para el cierre del PRODOC
17:30	Cierre del evento

[1] Fecha límite para ingresar propuestas a ser consideradas en 28 reunión de la junta directiva del Fondo de Adaptación que se realizará el 4 de octubre de 2016 en Bonn (Alemania).

Bienvenida

La bienvenida estuvo a cargo de Diego Guzmán, Director de Adaptación del Ministerio del Ambiente (MAE) y Carolina Cortés de CAF (Foto 1 y Foto 2), quienes agradecieron la asistencia de los participantes y proveyeron información sobre el marco general de la reunión. Participaron en la reunión 10 personas, el registro de asistencia está en el Anexo 1.

Presentación del borrador del proyecto regional

La presentación estuvo a cargo de Segundo Coello, consultor de CAF para la preparación del documento de proyecto. La presentación está en el Anexo 2 y los materiales de apoyo en el Anexo 3.

Se recordó que el proyecto fue presentado y aprobado por el Fondo de Adaptación como pre-concepto y que se acordó en el taller anterior desarrollarlo a nivel de propuesta completa. No obstante, en esta instancia se decidiría si presentarlo como concepto (si todavía faltara desarrollar elementos importantes del proyecto) o directamente como propuesta completa.

Se explicó que se trató de mantener el objetivo y resultados propuestos en el pre-concepto, sólo se incorporaron pequeños ajustes en la redacción de estos para reflejar el alcance del proyecto.

Posteriormente se explicó cada uno de los resultados y productos previstos, así como la asignación presupuestaria correspondiente.

Se mencionó que es necesario validar el número y posible ubicación de las estaciones meteorológicas, teniendo en cuenta los recursos disponibles en el proyecto (producto 3.2). Igualmente, se destacó que es necesario expandir el presupuesto del radar para incluir las instalaciones complementarias del equipo (e.g., torre, cerramiento).

Se destacó también que es necesario ratificar que INAMHI se encargará de administrar el radar y las estaciones meteorológicas y que la información fluirá a los sistemas de alerta temprana del cantón y la provincia.

Se indicó que es necesario identificar el sitio donde se realizará el piloto de sistema de alerta temprana con base comunitaria en la ciudad. Hay tres sitios identificados: (i) Isla Luis Vargas Torres, (ii) orillas del río Teaone, y (iii) punto de confluencia del río Teaone con el río Esmeraldas.

Con respecto al curso regional para oficiales de gobiernos locales, se mencionó que se ha considerado que la Academia de Protección Civil (APC) de Chile lidere el desarrollo de esta iniciativa, teniendo en cuenta su experiencia con cursos presenciales y en línea. No obstante, se está a la espera de que la APC indique si está interesada participar en este elemento del proyecto.

Se indicó que en el marco de resultados hay varios valores de las metas que requieren completarse a partir de la experiencia de los actores locales.

Se explicó la estructura organizacional del proyecto. Se ha incluido un Comité Asesor integrado por la Agencia Chilena de Cooperación Internacional para el Desarrollo (AGCID) y la Secretaría Técnica de Cooperación Internacional (SETECI) de Ecuador. También se informó que el lunes 18 de julio se mantuvo

una reunión con AGCID en Santiago, en la cual se recibió la anuencia de ellos para participar en el comité asesor del proyecto. Es necesario que el MAE valide con SETECI su participación en este comité.

Se indicó las entidades ejecutoras de los productos del proyecto, y se destacó que se propone que parte del equipo de proyecto opere desde la municipalidad de Esmeraldas. Esto requiere de la anuencia del municipio.

Se resumió los elementos que están pendientes para que sean analizados en los grupos de trabajo:

1. Número y probable ubicación de estaciones meteorológicas [¿automáticas?] Validar con recursos disponibles.
2. Revisar asignación de recursos para incluir instalaciones complementarias para el radar meteorológico.
3. Ratificar que INAMHI se encargará de operación y mantenimiento de equipos (radar y estaciones meteorológicas). Asegurar flujo de información a sistemas de alerta temprana locales.
4. Identificar posibles sitios para piloto de sistema de alerta de inundaciones.
5. Número de personas que pueden ser capacitadas por curso regional
6. Número de personas a las que se puede llegar con las estrategias de comunicación y sensibilización
7. Validar que se puede ubicar personal dentro de municipio de Esmeraldas

Mesa de trabajo. Acciones para el proyecto

Los participantes conformaron una mesa de trabajo para analizar los pendientes y detallar comentarios al documento de proyecto (Foto 5). El Ingeniero Edison Cruz de INAMHI detalló los elementos técnicos de los equipos de monitoreo climático a incluir en el proyecto (Foto 3).

El grupo discutió a profundidad la forma de operación del equipo de monitoreo climático. El Ingeniero Iván Sánchez expresó el interés de la Prefectura de Esmeraldas (GADPE) de administrar los equipos de monitoreo climático, para lo cual cuentan con los recursos presupuestarios necesarios. También indicó que hay un borrador de convenio entre el GADPE e INAMHI que está en revisión y que podría servir de base para esto.

Se recordó que se requiere asegurar inversión en la infraestructura complementaria para el radar y las estaciones meteorológicas (e.g., torre de radar, cerramientos, servidores), y luego su adecuada operación y mantenimiento a largo plazo. Los representantes de INAMHI destacaron que es necesario que los equipos funcionen bajo sus estándares de operación y mantenimiento (incluyendo calibración) para asegurar la calidad de los datos y homologación con el resto de la red nacional. Igualmente, se destacó que es necesario tener personal técnico calificado para operar y mantener los equipos, y buenos canales redundantes de comunicación para se transmitan los datos aún en situaciones de emergencia.

Se acordó que INAMHI (i) establecerá los parámetros requeridos para la operación de los equipos, (ii) proveerá entrenamiento y capacitación, (iii) supervisará la operación de monitoreo climático, y (iv) recibirá los datos y procesará la información. Por su parte el GADPE, se encargará a largo plazo del mantenimiento y operación efectiva de los equipos. Esto incluye, entre otras cosas, personal técnico y logística de operación y mantenimiento. Se recordó que el proyecto sólo cubre el costo de los equipos, su instalación y un stock de repuestos. El GADPE deberá financiar los costos complementarios. Se quedó en que todos estos puntos deben concretarse mediante un convenio entre ambas entidades.

Se detalló los costos de obras complementarias para el radar (ca., USD 82,000) y la asignación para repuestos de los equipos. Se recomendó que el GADPE cuente con un ingeniero electrónico que pueda asegurar la operación adecuada de los equipos.

Finalmente, se estableció que el piloto de alerta temprana de inundaciones se realizará en la Isla Luis Vargas Torres. Se trabajará con seis comités barriales que están legalmente constituidos y que incluyen unas 10,000 personas. Estos comités son:

1. 12 de mayo
2. Cordero Crespo
3. 20 de noviembre
4. Pianguapi
5. 29 de agosto
6. Habana

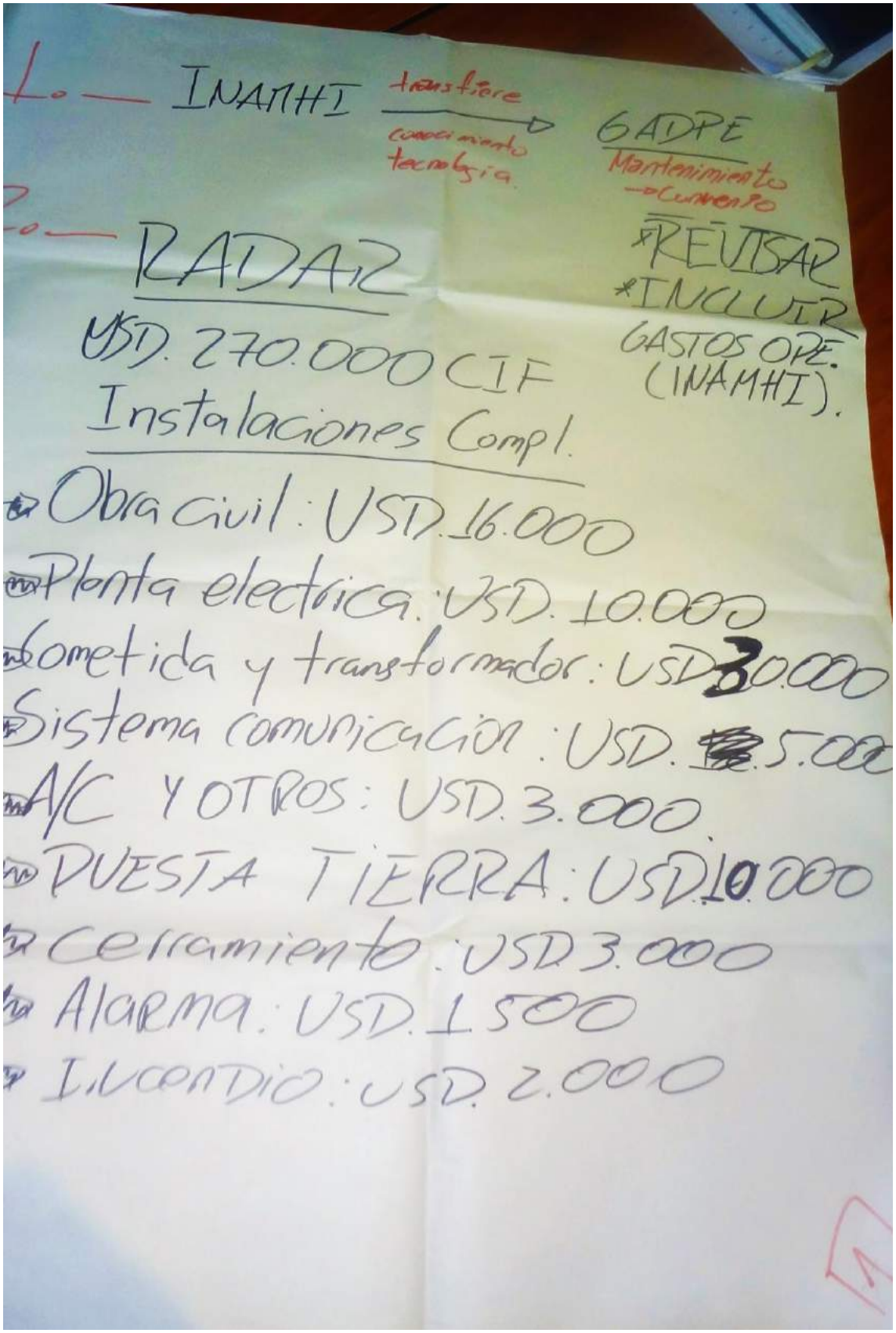
Elementos pendientes para el cierre del PRODOC

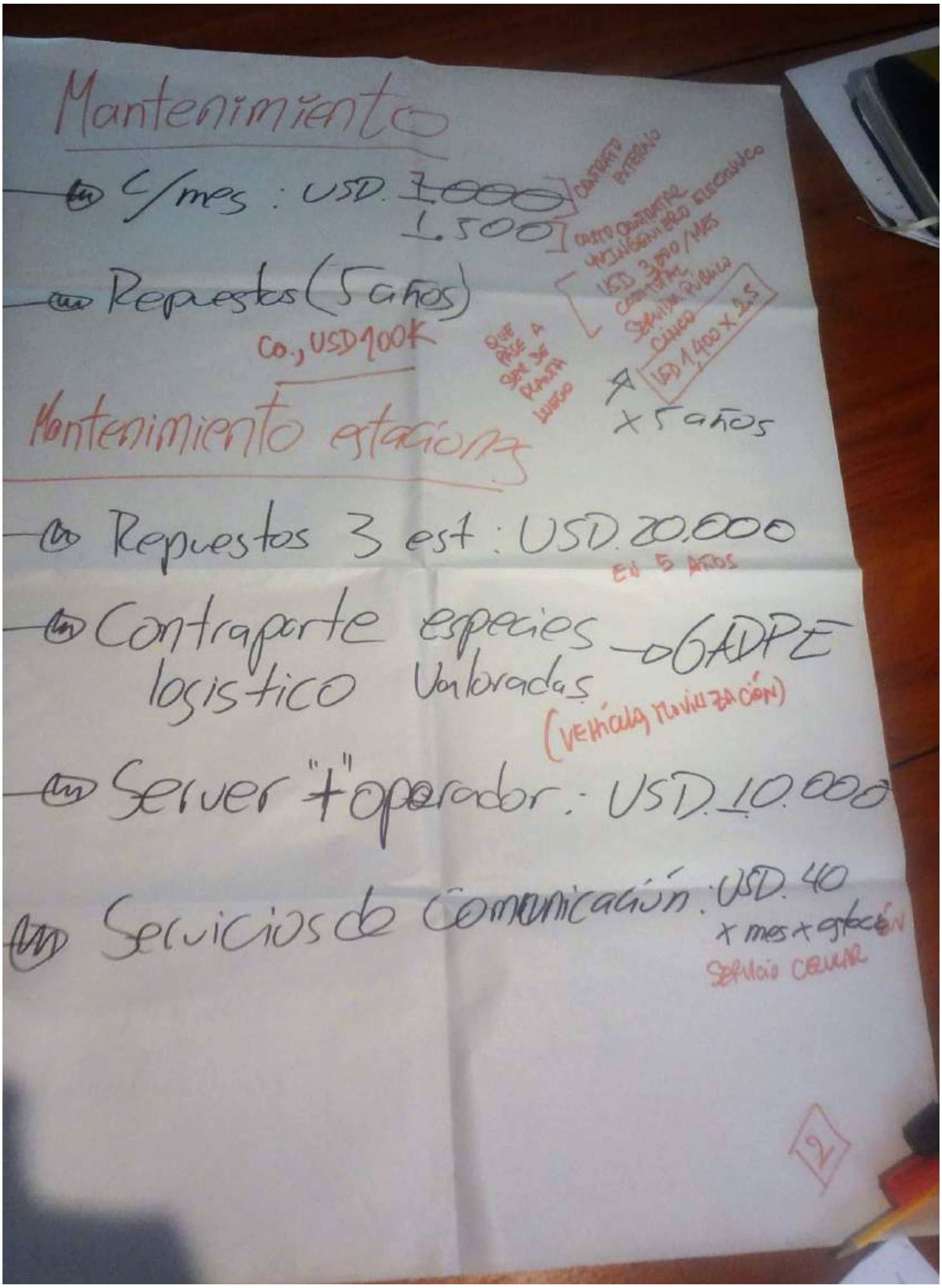
Se revisó la lista de pendientes y se acordó tener todo listo hasta inicios de la semana siguiente teniendo en cuenta que el documento deberá ser enviado el viernes 29 de julio. Se destacó la necesidad de que la municipalidad indiquen su disponibilidad de alojar en su interior al equipo de proyecto, caso contrario el equipo se alojaría en la oficina del MAE en Esmeraldas.

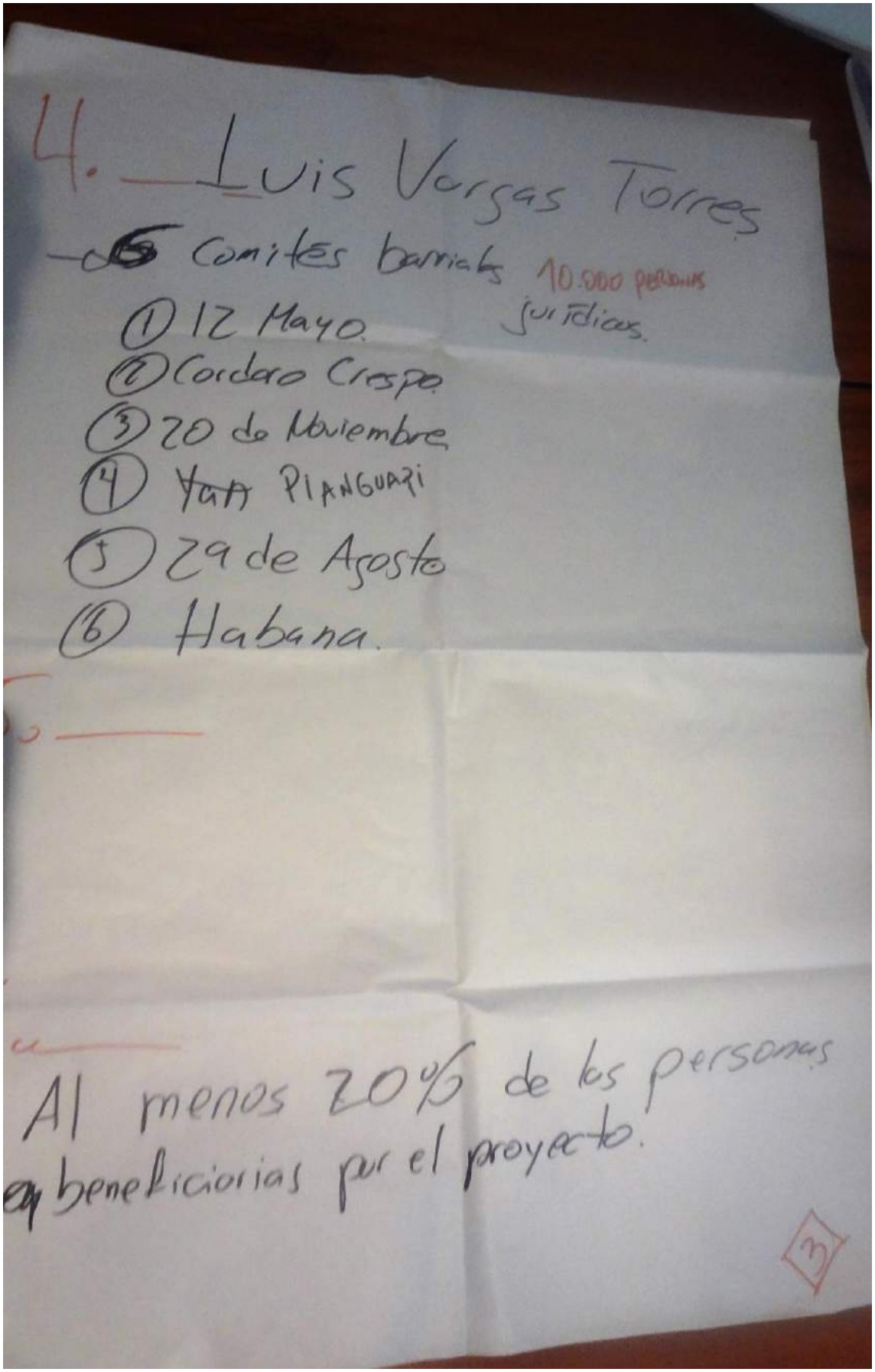
Cierre del evento

La clausura estuvo a cargo de Diego Guzmán del MAE (**¡Error! No se encuentra el origen de la referencia.**), quien agradeció la participación y contribuciones de las personas e instituciones presentes.

Figuras


INAMHI
transfiere
conocimiento
tecnología
GADPE
Mantenimiento
-Cuidado
RADAR
*REVISAR
*INCLUIR
GASTOS OPE.
(INAMHI).
USD. 270.000 CIF
Instalaciones Compl.
Obra civil: USD. 16.000
Planta electrica: USD. 10.000
Sometida y transformador: USD 30.000
Sistema comunicación: USD. 5.000
A/C Y OTROS: USD. 3.000
PUESTA TIERRA: USD. 10.000
cerramiento: USD 3.000
Alarma: USD. 1500
Incendio: USD. 2.000


Mantenimiento
C/mes : USD. 1.000
1.500
CONTRATO EXTERNO
Repuestos (5 años)
Co., USD 100K
x 5 años
Mantenimiento estaciones
Repuestos 3 est : USD. 20.000
EN 5 AÑOS
Contraparte especies → GADPE
logistico Valoradas
(VEHÍCULO MOVILIZACIÓN)
Server "+" operador : USD 10.000
Servicios de Comunicación : USD. 40
x mes x estación
SERVICIO CELULAR
2


4. Luis Vargas Torres
6 Comites barriales 10.000 personas jurídicas.
① 12 Mayo.
② Cordero Crespo
③ 20 de Noviembre
④ PIANGUARI
⑤ 29 de Agosto
⑥ Habana.
Al menos 20% de las personas beneficiarias por el proyecto.
3

Fotos

Foto 1. Bienvenida a cargo de Diego Guzmán del MAE.

Foto 2. Bienvenida a cargo de Carolina Cortés de CAF.

Foto 3. Explicación sobre monitoreo climático por parte del Ingeniero Edison Cruz de INAMHI.

Foto 4. Participantes de la reunión.

Foto 5. Sesión de trabajo en grupo.

Anexo 1. Registro de participantes.

Ministerio del Ambiente

TALLER DE VALIDACIÓN

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

CAF BANCO DE DESARROLLO DE AMÉRICA LATINA

Ciudad de Esmeraldas, 22 de julio de 2016

POR FAVOR ESCRIBIR EN LETRA DE IMPRENTA

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EDISON CRUZ	INAMHI	QUITO	(02) 3971100 ext. 2121	ecruz@inamhi.gob.ec
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Nelson López Aguayo	MAE	Esmeraldas	0993161025	nelson.lopez@ambiente.gob.ec.
HILTON HEZA VERA	PUCESE	ESMERALDAS	0994214877	HILTON.HEZA@PUCESE.EDU.EC. HILTON_HEZA@HOTMAIL.COM
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Carolina Cortés	CAF	Ecuador	0987883698	acortes@caf.com

Ministerio del Ambiente

TALLER DE VALIDACIÓN

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

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Ciudad de Esmeraldas, 22 de julio de 2016

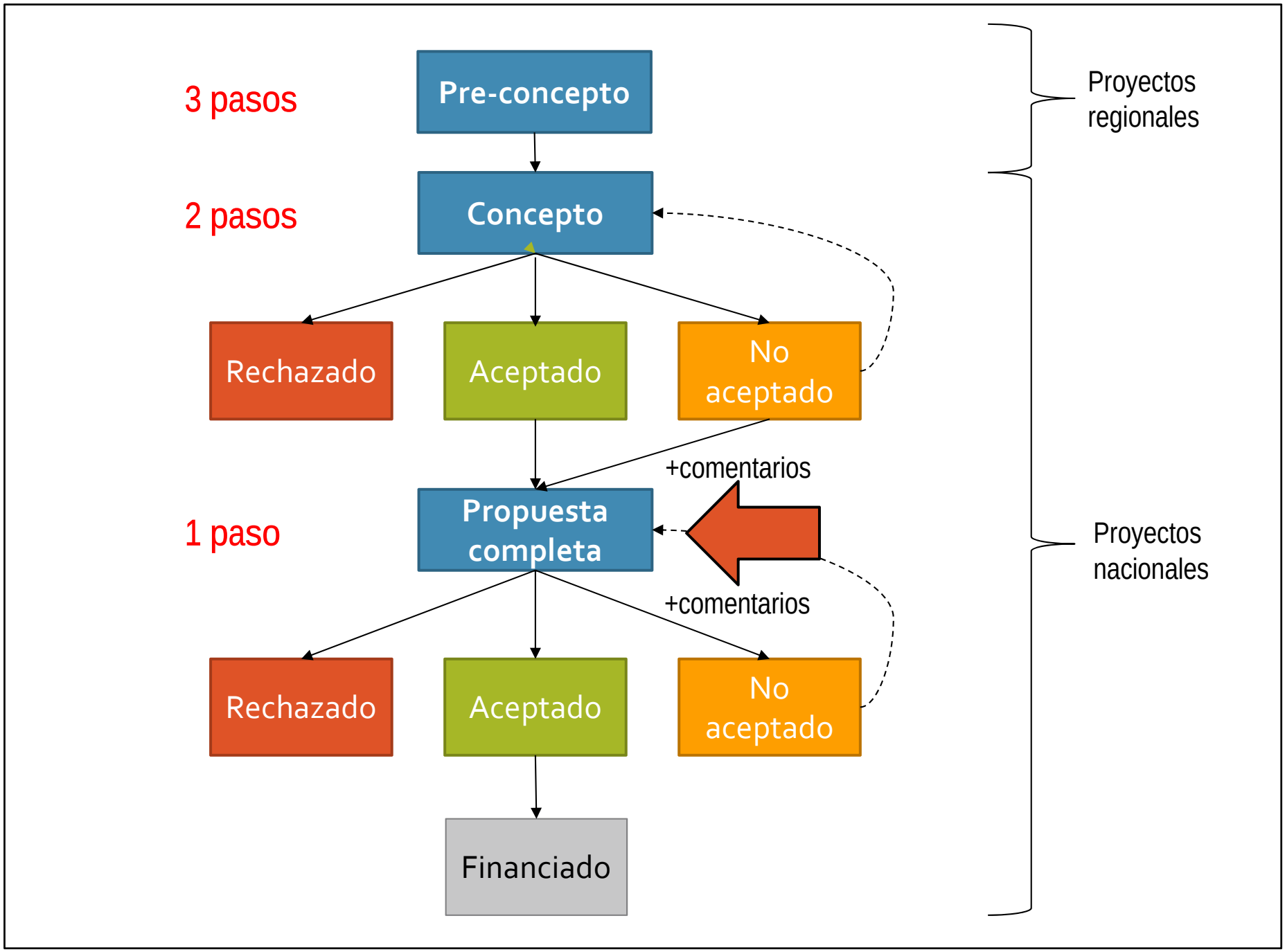
POR FAVOR ESCRIBIR EN LETRA DE IMPRENTA

Nombre	Entidad	Ciudad	Teléfono(s)	Correo electrónico
José Maffares	Banco Isla Luis Vargas	Esmeraldas	0982520986	josemaffares@gmail.com
SEGUNDO COELLO	CONSULTOR CAF	Quito	0999756169	SEGUNDO.COELLO@ECOBIOTEC.ORG

PRESENTACIÓN DEL BORRADOR DE PROYECTO REGIONAL

Taller de validación

Proyecto Regional Chile – Ecuador


3 pasos
Pre-concepto
2 pasos
Concepto
Rechazado
Aceptado
No aceptado
+comentarios
1 paso
Propuesta completa
+comentarios
Rechazado
Aceptado
No aceptado
Financiado
Proyectos regionales
Proyectos nacionales

Proyecto regional

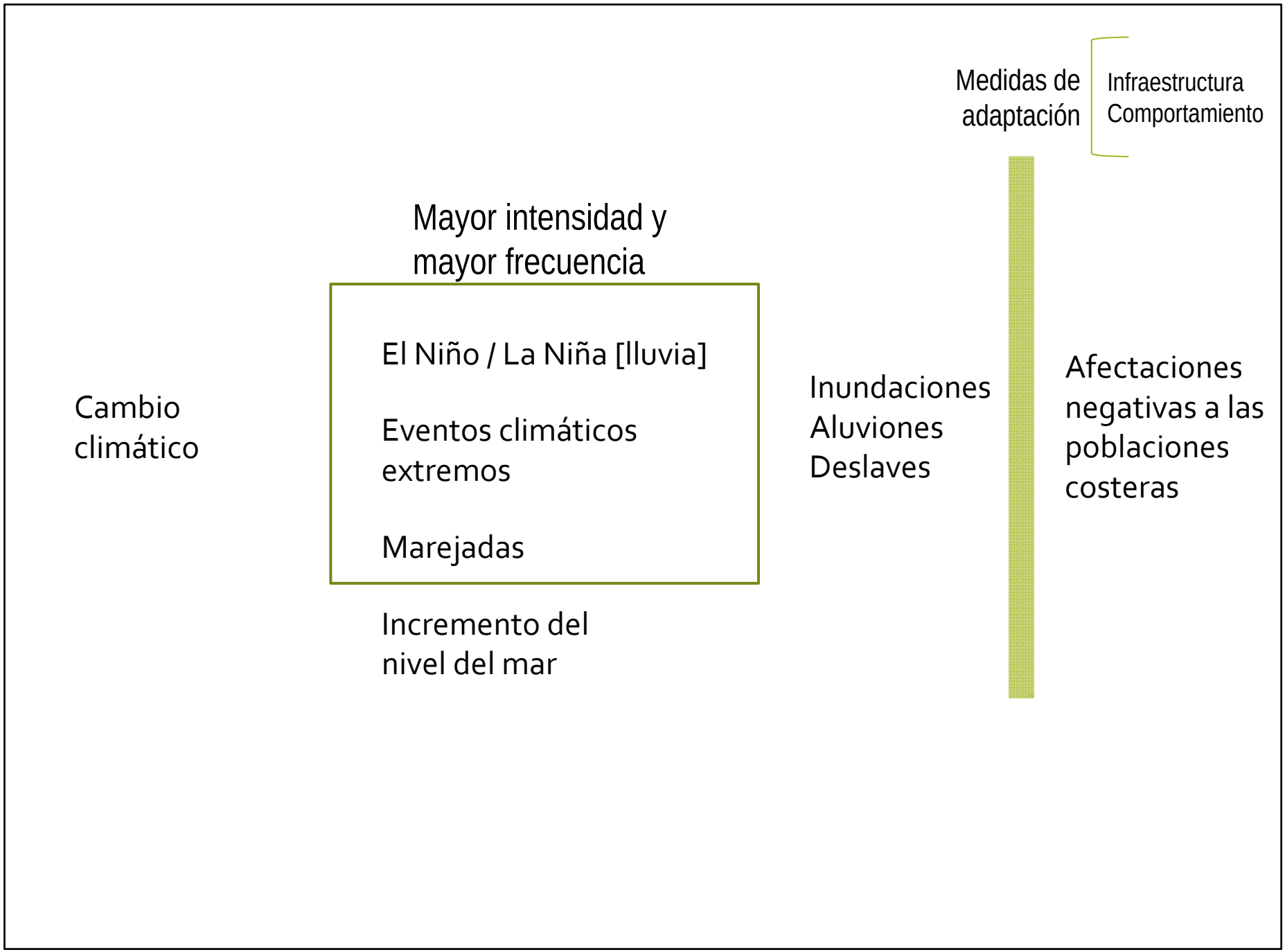
Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Similitudes

1. Ciudades costeras
2. Vulnerables a impacto de El Niño / La Niña = inundaciones, deslaves, aluviones
3. Vulnerables a tsunamis
4. Vulnerables a incremento en el nivel del mar

Diferencias

1. Índice de capacidad de adaptación. Antofagasta 9.40 / Esmeraldas 4.44 / Taltal no datos
2. Cultura y costumbres. Esmeraldas – clima tropical húmedo / afroecuatoriana. Antofagasta – clima árido templado
3. Tamaño y población: Antofagasta 390 mil / Esmeraldas 174 mil / Taltal 10 mil.
4. Economía. Antofagasta centrada en minería cobre. Esmeraldas mixta: pesca, turismo, portuaria petróleo.


Medidas de adaptación
Infraestructura
Comportamiento
Mayor intensidad y mayor frecuencia
El Niño / La Niña [lluvia]
Eventos climáticos extremos
Marejadas
Incremento del nivel del mar
Cambio climático
Inundaciones
Aluviones
Deslaves
Afectaciones negativas a las poblaciones costeras

Objetivo

Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.

5 años
USD 13,910,400
USD 7.138.000 Antofagasta y Taltal
USD 4.192.000 Esmeraldas
USD 1.200.000 Regional

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Componente	Resultados esperados	Productos esperados	Países	Presupuesto (USD)
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 545,000]	Chile	10,237,800 (81.71%)
		1.2. Plan de infraestructura verde de Esmeraldas [USD 425,000]	Ecuador	
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,917,200]	Chile	
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,820,000]	Ecuador	
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 910,000]	Chile and Ecuador	
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 140,000]	Chile and Ecuador	
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,000]	Chile	
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,600]	Ecuador	
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 110.000]	Chile and Ecuador	

Componente	Resultados esperados	Productos esperados	Países	Presupuesto (USD)
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 213,000]	Chile and Ecuador	1,305,200 (10.42%)
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 474,200]	Chile and Ecuador	
		6.2. Iniciativa de Narradores iniciada [USD 618,000]	Chile and Ecuador	

Componente	Resultados esperados	Productos esperados	Países	Presupuesto (USD)
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 424,000]	Chile and Ecuador	987,000 (7.88%)
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 563,000]	Chile and Ecuador	
6. Costos de ejecución del Proyecto / Programa				350,000
7. Costo total del Proyecto/Programa				12,880,000
8. Cuota de manejo de ciclo de Proyecto/Programa de la Agencia de Implementación (si aplica)				1,030,400
Monto de financiamiento solicitado				13,910,400

Calendario propuesto

Hitos	Fechas esperadas
Inicio de implementación del proyecto	Enero 2017
Revisión de medio-término	Junio 2019
Cierre del Proyecto	Diciembre 2021
Evaluación final	Septiembre 2021

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Objetivo del proyecto: Reducir la vulnerabilidad a inundaciones relacionadas con el cambio climático en tres ciudades costeras por medio de incorporar un enfoque de adaptación basada en riesgos, construir colaboración y desarrollar una cultura de adaptación	Número de personas (hombres y mujeres) protegidas por medidas mejoradas de reducción del riesgo en Antofagasta, Taltal and Esmeraldas.	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto Antofagasta = 380,000 Taltal = 10,000 Esmeraldas = 161,000	▪ Informe de desempeño del proyecto	▪ Apoyo político de autoridades locales y nacionales ▪ Las entidades responsables de construir la infraestructura pertinente y de los sistemas de alerta temprana están dispuestas a incorporar medidas de adaptación en sus planes y acciones ▪ La población local y actores clave se interesan y colaboran

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Componente 1. Acciones prioritarias para incrementar resiliencia					
Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	Número de planes que incorporan previsiones para adaptación al cambio climático	Planes de manejo de aguas lluvias Antofagasta = 0 Plan de infraestructura verde plan Esmeraldas = 0	Medio término: 1 Fin de proyecto: 2	▪ Plan de manejo de aguas lluvias ▪ Plan de infraestructura verde ▪ Instrumentos legales adoptando los planes	▪ Interés y apoyo de las autoridades locales ▪ Autoridades locales y nacionales comprometidas en financiar e implementar los planes.
Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	Número de infraestructuras construidas para soportar condiciones resultantes de la variabilidad y cambio climático	Antofagasta = 0 Esmeraldas = 0	Medio término: 1 Fin de proyecto: 2	▪ Diseños e informe de construcción de infraestructura de control aluvional en la quebrada Bonilla (Antofagasta) ▪ Diseños e informe de construcción de infraestructura de control de deslaves en Cerro Gataso (Esmeraldas)	▪ Autoridades locales y nacionales garantizan control de calidad de los diseños y proceso constructivo ▪ Las autoridades locales y nacionales pertinentes incorporar en sus planes financieros los recursos para mantenimiento futuro de la nueva infraestructura
	Número de personas (hombres y mujeres) protegidas por infraestructura mejorada para soportar presiones de variabilidad y cambio climático.	Antofagasta = 0 Esmeraldas = 0	Fin de proyecto: 12,840 Antofagasta = (ca., 50% mujeres) Esmeraldas = 500 (ca., 50% mujeres	▪ Encuesta de personas que viven en áreas protegidas por la infraestructura mejorada (quebrada Bonilla y cerro Gataso) ▪ Porcentaje de mujeres en Antofagasta y Esmeraldas de las estadísticas nacionales	

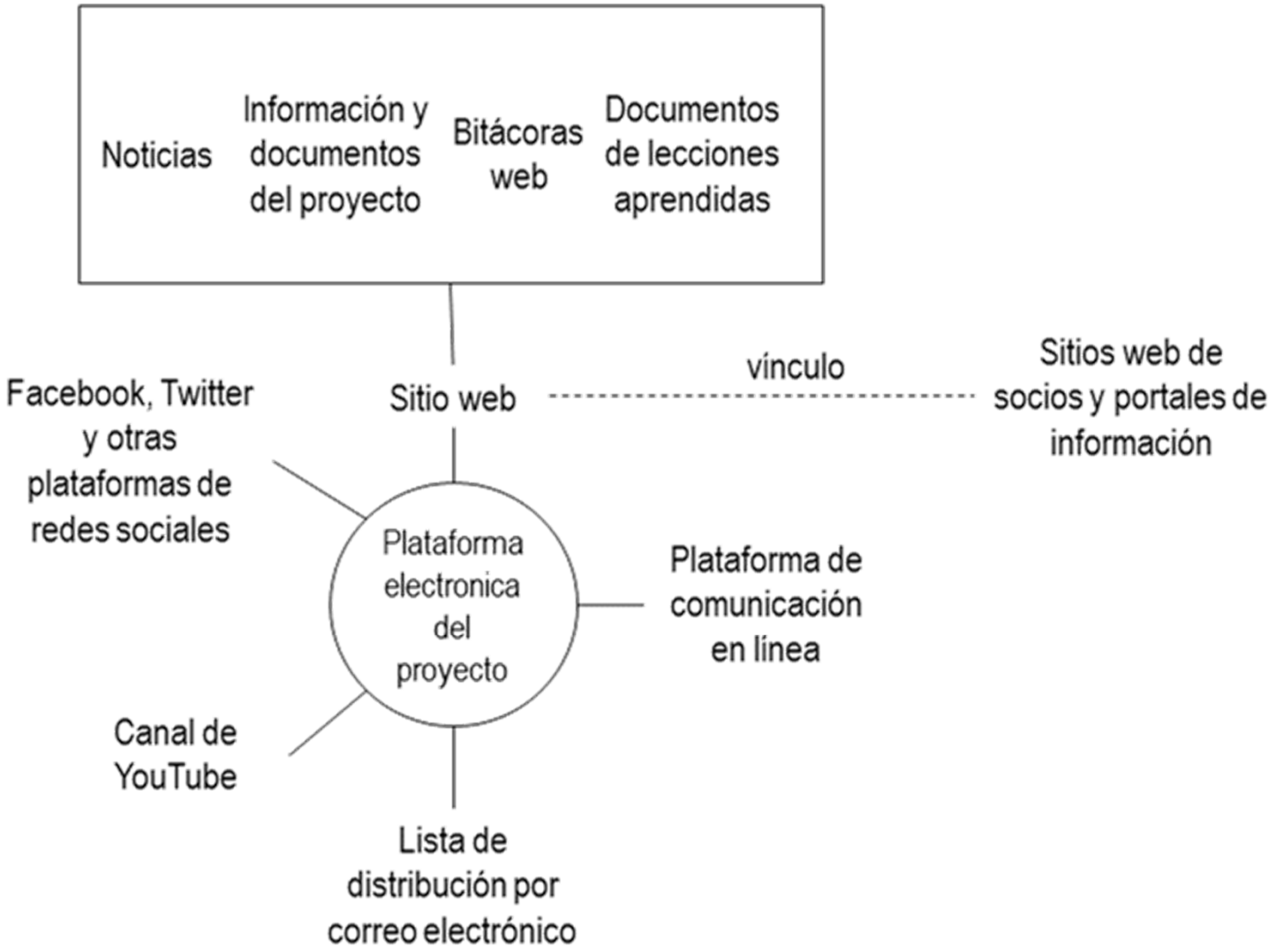
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	Número de radares meteorológicos para monitorear precipitación, vinculados con los sistemas de alerta temprana	Antofagasta = 0 Esmeraldas = 0	Medio término Antofagasta = 1 Esmeraldas = 1	▪ Reportes de análisis de ubicación de radares ▪ Reportes de instalación de radares ▪ Reportes trimestrales de operación de radares ▪ Acuerdo para asegurar el flujo de información a los sistemas de alerta temprana ▪ Acuerdo de largo plazo para operación y mantenimiento.	▪ Las entidades responsables ejecutan puntualmente los trabajos complementarios para albergar y operar los equipos (e.g., torre de radar, link de comunicación). ▪ Las entidades pertinentes incorporar en sus planes financieros los recursos para la operación y mantenimiento del Nuevo equipo meteorológico ▪ Las autoridades de gestión de riesgos incorporan la nueva información en sus sistemas de alerta temprana para alertar a la población local.
	Número de estaciones meteorológicas para monitorear precipitación que afecta a las ciudades, vinculadas a los sistemas de alerta temprana	Antofagasta = XX Taltal = XX Esmeraldas = XX	Medio término Antofagasta = XX Taltal = XX Esmeraldas = XX	Reportes de instalación Reportes trimestrales de operación Acuerdo para asegurar el flujo de información a los sistemas de alerta temprana Acuerdo de largo plazo para operación y mantenimiento.	

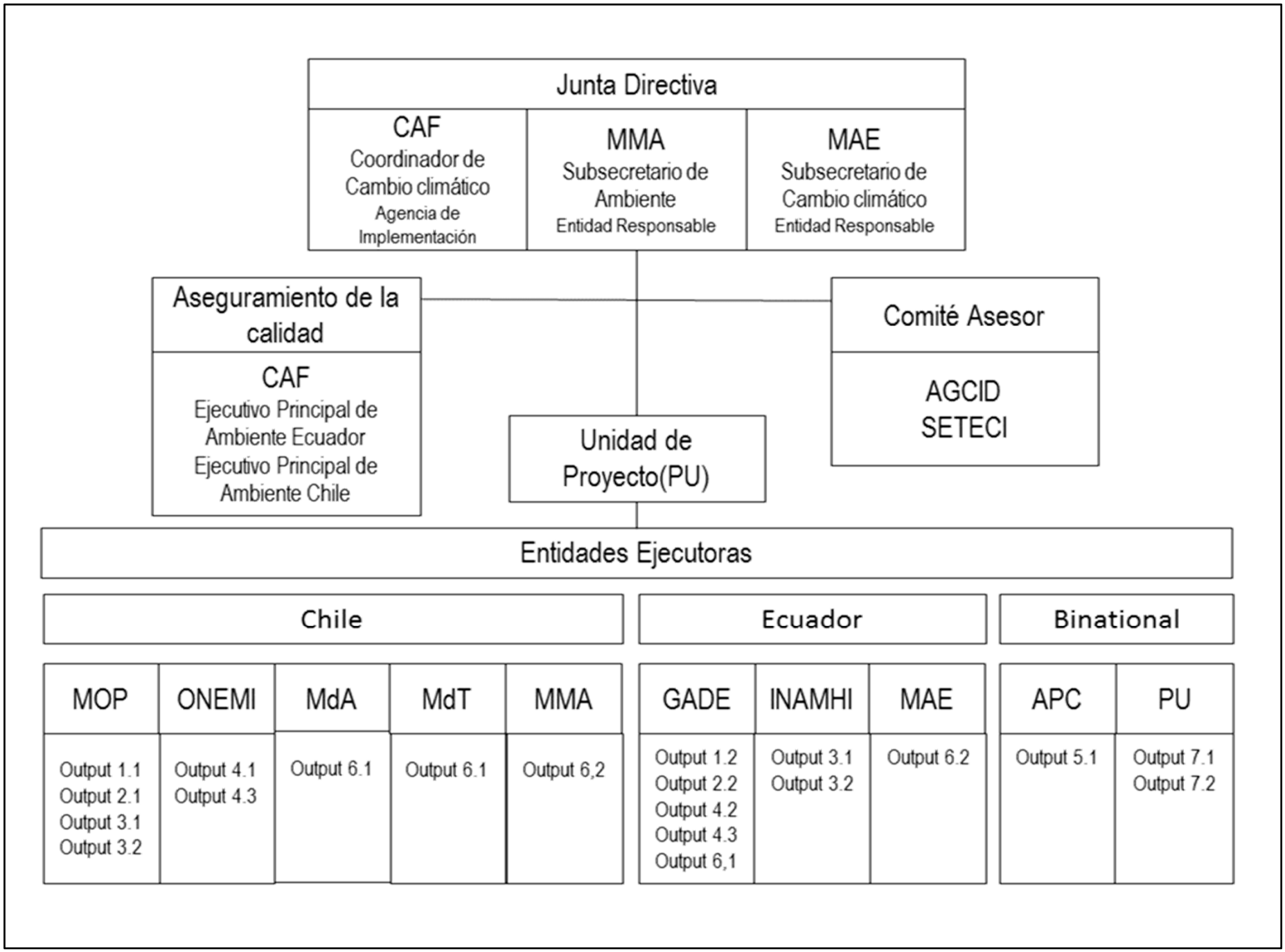
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	Número de personas (hombres y mujeres) cubiertos por señalización de rutas de evacuación en respuesta a inundaciones (Esmeraldas), deslaves (Esmeraldas) y aluviones (Antofagasta y Taltal)	Antofagasta = 0 Taltal = 0 Esmeraldas (inundación) = 0 Esmeraldas (deslaves) = 0	Fin de proyecto: Antofagasta = 380,000 Taltal = 10,000 Esmeraldas (inundación) = 161,000 Esmeraldas (deslaves) = 161,000	▪ Reporte de instalación de sirenas y señalización de rutas de evacuación ▪ Mapas de evacuación fácilmente accesibles ▪ Señalización de rutas evacuación instalada ▪ Procedimientos y guías de evacuación fácilmente accesibles.	▪ Las autoridades de gestión de riesgos integran las nuevas herramientas en sus sistemas de alerta temprana para alertar a la población ▪ Las entidades pertinentes incorporan en sus planes financieros los recursos para la futuro operación y mantenimiento de sirenas y señales de evacuación

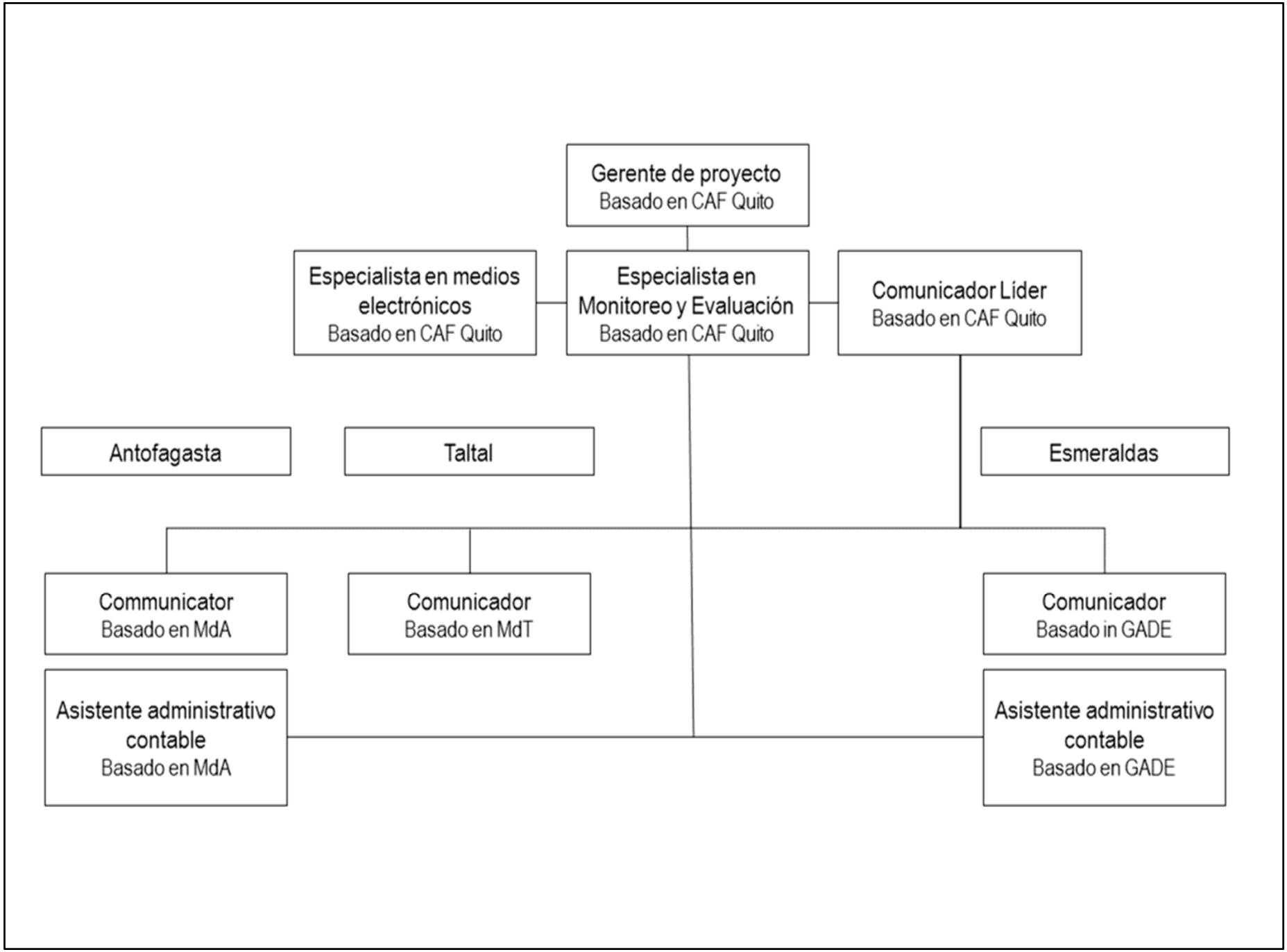
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Componente 2. Fortalecer capacidades de adaptación					
Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	Número de personal (hombres y mujeres) de gobiernos locales y entidades pertinentes entrenados en adaptación basada en riesgos en ciudades costeras	Antofagasta = 0 Taltal = 0 Esmeraldas = 0 Otras ciudades costeras Chile = 0 Otras ciudades costeras Ecuador = 0	Fin de proyecto: Antofagasta = XX Taltal = XX Esmeraldas = XX Otras ciudades costeras Chile = XX Otras ciudades costeras Ecuador = XX	▪ Plan de curso y materiales de capacitación en adaptación basada en riesgos en ciudades costeras ▪ Reporte de la capacitación de capacitadores ▪ Reportes de cada evento de entrenamiento (incluyendo lista de participantes)	▪ El personal de los gobiernos locales y entidades pertinentes está dispuesto a participar en la capacitación e incorporar la adaptación basada en riesgos en su trabajo

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	Número de personas (hombres y mujeres) que han participado en actividades y eventos de sensibilización	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto: Antofagasta = XX Taltal = XX Esmeraldas = XX	▪ Estrategias de comunicación y educación pública para Antofagasta, Taltal y Esmeraldas. ▪ Reporte de cada actividad y evento de sensibilización (incluyendo lista de participantes) ▪ Reportes trimestrales de implementación de cada estrategia de comunicación y educación.	▪ La población local es sensible a los mensajes sobre riesgos climáticos y adaptación al cambio climático ▪ Las entidades pertinentes están dispuestas a mantener a largo plazo estrategia de sensibilización ciudadana y la iniciativa de los narradores.
	Número de narradores (hombres y mujeres) capacitados para mantener la memoria cultural de riesgos y desastres vinculados con el clima	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto: Antofagasta = 10 Taltal = 5 Esmeraldas = 10	▪ Materiales de capacitación ▪ Acuerdos de largo plazo para mantener la iniciativa de los narradores en las tres ciudades ▪ Reportes trimestrales de avance en la implementación de la iniciativa de los narradores	

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Componente 3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina					
Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	Número de personas (hombres y mujeres, por nacionalidad) que han participado en eventos para la diseminación de lecciones y buenas prácticas (e.g., talleres, visitas guiada, seminarios)	0	Medio término >100 personas ≥ 50% mujeres Fin de proyecto: >200 personas ≥ 50% mujeres	▪ Memorias / reportes de eventos virtuales y presenciales (incluyendo lista de participantes)	▪ La información es atractiva, útil y accesible a actores clave y grupos de interés
	Número de visitantes por mes (media anual) registrada en la red de canales electrónicos de la plataforma regional en línea que se usa para diseminar los aprendizajes y buenas prácticas del Proyecto	Visitas 0 Visitas únicas 0	Medio término Visitas ≥2000 Visitas únicas ≥1600 Fin de proyecto: Visitas ≥4000 Visitas únicas ≥3200	▪ Reporte mensual del administrador de la plataforma	▪ Las comunidades costeras tienen adecuado acceso a internet


Noticias
Información y documentos del proyecto
Bitácoras web
Documentos de lecciones aprendidas
Sitio web
vínculo
Sitios web de socios y portales de información
Facebook, Twitter y otras plataformas de redes sociales
Plataforma electronica del proyecto
Plataforma de comunicación en línea
Canal de YouTube
Lista de distribución por correo electrónico


Junta Directiva
CAF
Coordinador de Cambio climático
Agencia de Implementación
MMA
Subsecretario de Ambiente
Entidad Responsable
MAE
Subsecretario de Cambio climático
Entidad Responsable
Aseguramiento de la calidad
CAF
Ejecutivo Principal de Ambiente Ecuador
Ejecutivo Principal de Ambiente Chile
Unidad de Proyecto(PU)
Comité Asesor
AGCID
SETECI
Entidades Ejecutoras
Chile
Ecuador
Binational
MOP
Output 1.1
Output 2.1
Output 3.1
Output 3.2
ONEMI
Output 4.1
Output 4.3
MdA
Output 6.1
MdT
Output 6.1
MMA
Output 6,2
GADE
Output 1.2
Output 2.2
Output 4.2
Output 4.3
Output 6,1
INAMHI
Output 3.1
Output 3.2
MAE
Output 6.2
APC
Output 5.1
PU
Output 7.1
Output 7.2


Gerente de proyecto
Basado en CAF Quito
Especialista en medios electrónicos
Basado en CAF Quito
Especialista en Monitoreo y Evaluación
Basado en CAF Quito
Comunicador Líder
Basado en CAF Quito
Antofagasta
Taltal
Esmeraldas
Communicator
Basado en MdA
Comunicador
Basado en MdT
Comunicador
Basado in GADE
Asistente administrativo contable
Basado en MdA
Asistente administrativo contable
Basado en GADE

El proyecto debe enviarse
Viernes 29 de julio de 2016

PENDIENTES

1. Número y probable ubicación de estaciones meteorológicas [¿automáticas?] Validar con recursos disponibles.
2. Revisar asignación de recursos para incluir instalaciones complementarias para el radar meteorológico.
3. Ratificar que INAMHI se encargará de operación y mantenimiento de equipos (radar y estaciones meteorológicas). Asegurar flujo de información a sistemas de alerta temprana locales.
4. Identificar posibles sitios para piloto de sistema de alerta de inundaciones.
5. Número de personas que pueden ser capacitadas por curso regional
6. Número de personas a las que se puede llegar con las estrategias de comunicación y sensibilización
7. Validar que se puede ubicar personal dentro de municipio de Esmeraldas

Comentarios del Secretariado del Fondo de Adaptación
[PARA TENER EN CUENTA]

1. Justificación suficiente para un programa regional	LISTO
2. En componentes 1 y 2 clarificar cómo las actividades de los dos países conformaran un enfoque regional en lugar de dos o tres proyectos separados. Cómo el proyecto abordará los desafíos de la adaptación a nivel regional	LISTO
3. Clarificar y de ser necesario robustecer la innovación del proyecto	LISTO
4. Clarificar el papel de la Agencia de Cooperación Internacional de Chile (AGCI) [NIE]	LISTO

Elementos pendientes del taller anterior
[PARA TENER EN CUENTA]

1. Proyecto debe estar listo al 15 de julio de 2016. Decidir si presentar concepto o propuesta completa — LISTO
2. Precisar sitios de intervención y presupuesto [detalles] — LISTO
3. Arreglos de implementación [quién ejecuta qué, cómo se canalizan los fondos] — LISTO

GRACIAS

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Componentes y financiamiento

Componente	Resultados esperados	Productos esperados	Países	Presupuesto (USD)
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 545,000]	Chile	10,237,800 (81.71%)
		1.2. Plan de infraestructura verde de Esmeraldas [USD 425,000]	Ecuador	
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,917,200]	Chile	
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,820,000]	Ecuador	
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 910,000]	Chile and Ecuador	
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 140,000]	Chile and Ecuador	
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,000]	Chile	
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,600]	Ecuador	
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas	Chile and Ecuador	

		[USD 110.000]		
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 213,000]	Chile and Ecuador	1,305,200 (10.42%)
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 474,200]	Chile and Ecuador	
		6.2. Iniciativa de Narradores iniciada [USD 618,000]	Chile and Ecuador	
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 424,000]	Chile and Ecuador	987,000 (7.88%)
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 563,000]	Chile and Ecuador	
6. Costos de ejecución del Proyecto / Programa				350,000
7. Costo total del Proyecto/Programa				12,880,000
8. Cuota de manejo de ciclo de Proyecto/Programa de la Agencia de Implementación (si aplica)				1,030,400
Monto de financiamiento solicitado				13,910,400

Calendario propuesto

Hitos	Fechas esperadas
Inicio de implementación del proyecto	Enero 2017
Revisión de medio-término	Junio 2019
Cierre del Proyecto	Diciembre 2021
Evaluación final	Septiembre 2021

Marco de resultados

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
Objetivo del proyecto: Reducir la vulnerabilidad a inundaciones relacionadas con el cambio climático en tres ciudades costeras por medio de incorporar un enfoque de adaptación basada en riesgos, construir colaboración y desarrollar una cultura de adaptación	Número de personas (hombres y mujeres) protegidas por medidas mejoradas de reducción del riesgo en Antofagasta, Taltal and Esmeraldas.	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto Antofagasta = 380,000 Taltal = 10,000 Esmeraldas = 161,000	▪ Informe de desempeño del proyecto	▪ Apoyo político de autoridades locales y nacionales ▪ Las entidades responsables de construir la infraestructura pertinente y de los sistemas de alerta temprana están dispuestas a incorporar medidas de adaptación en sus planes y acciones ▪ La población local y actores clave se interesan y colaboran
Componente 1. Acciones prioritarias para incrementar resiliencia					
Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	Número de planes que incorporan previsiones para adaptación al cambio climático	Planes de manejo de aguas lluvias[1] Antofagasta = 0 Plan de infraestructura verde plan[2] Esmeraldas = 0	Medio término: 1 Fin de proyecto: 2	▪ Plan de manejo de aguas lluvias ▪ Plan de infraestructura verde ▪ Instrumentos legales adoptando los planes	▪ Interés y apoyo de las autoridades locales ▪ Autoridades locales y nacionales comprometidas en financiar e implementar los planes.
Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y	Número de infraestructuras construidas para soportar condiciones resultantes de la variabilidad y cambio climático	Antofagasta = 0 Esmeraldas = 0	Medio término: 1 Fin de proyecto: 2	▪ Diseños e informe de construcción de infraestructura de control aluvional en la quebrada Bonilla (Antofagasta)	▪ Autoridades locales y nacionales garantizan control de calidad de los diseños y proceso constructivo

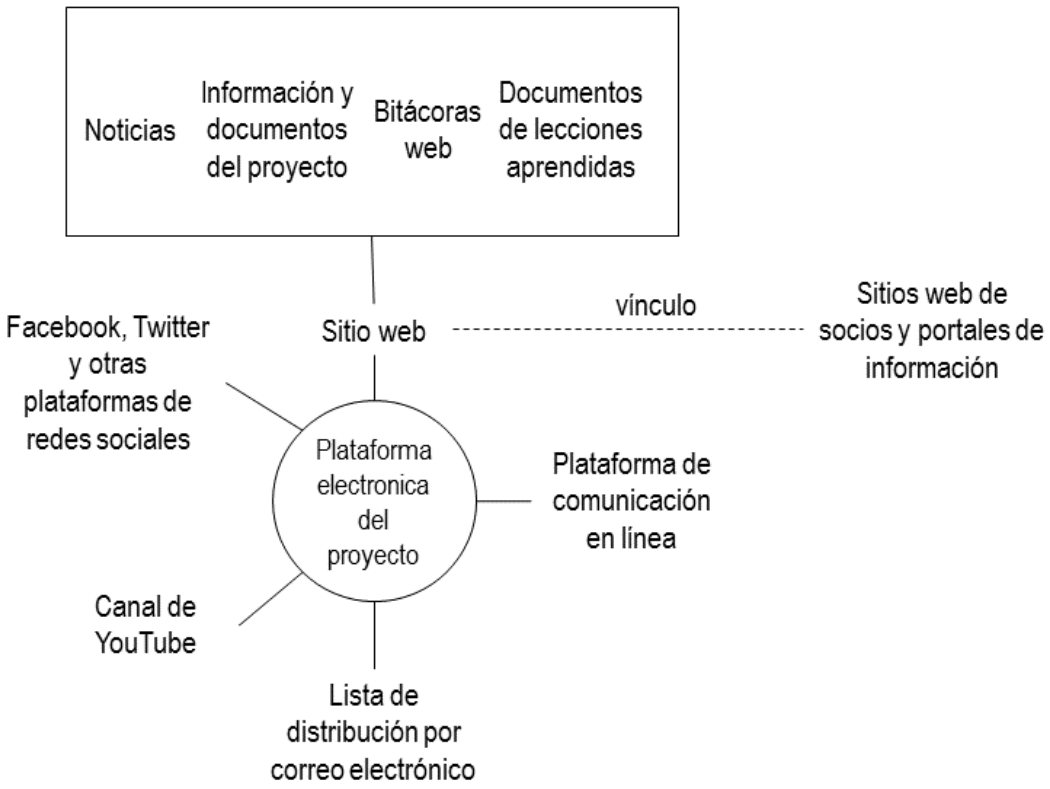
[1] Antofagasta tiene un plan de manejo de aguas lluvias que fue preparado en 2004 y que no incorpora el factor climático. Taltal también tiene un plan de gestión de aguas lluvias, pero los aluviones del 26 de marzo de 2015 causados por una precipitación inusual mostraron que la planificación e infraestructura no son suficientes para resistir los futuros impactos del cambio climático.

[2] La estrategia de adaptación y mitigación (ONU-HABITAT, 2011) y la estrategia de gestión de riesgos y desastres (GAD Esmeraldas, 2012) incluyen elementos para siembra de manglares y reforestación de laderas. Sin embargo, no hay un esquema para operativizar una red de espacios verdes que contribuyan a proteger a la población de inundaciones y deslaves y generar beneficios adicionales (i.e., plan de infraestructura verde).

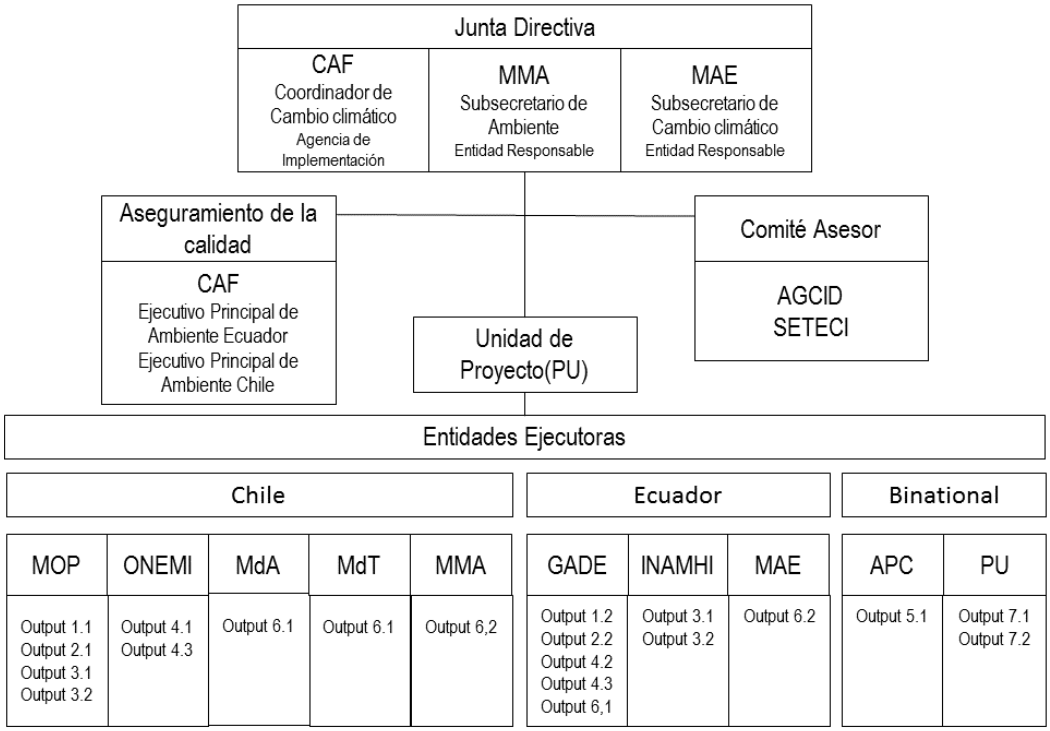
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
aluviones en dos ciudades costeras				▪ Diseños e informe de construcción de infraestructura de control de deslaves en Cerro Gataso (Esmeraldas)	▪ Las autoridades locales y nacionales pertinentes incorporar en sus planes financieros los recursos para mantenimiento futuro de la nueva infraestructura
	Número de personas (hombres y mujeres) protegidas por infraestructura mejorada para soportar presiones de variabilidad y cambio climático.	Antofagasta = 0 Esmeraldas = 0	Fin de proyecto: 12,840 Antofagasta = (ca., 50% mujeres) Esmeraldas = 500 (ca., 50% mujeres	▪ Encuesta de personas que viven en áreas protegidas por la infraestructura mejorada (quebrada Bonilla y cerro Gataso) ▪ Porcentaje de mujeres en Antofagasta y Esmeraldas de las estadísticas nacionales	
Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	Número de radares meteorológicos para monitorear precipitación, vinculados con los sistemas de alerta temprana	Antofagasta = 0 Esmeraldas = 0	Medio término Antofagasta = 1 Esmeraldas = 1	▪ Reportes de análisis de ubicación de radares ▪ Reportes de instalación de radares ▪ Reportes trimestrales de operación de radares ▪ Acuerdo para asegurar el flujo de información a los sistemas de alerta temprana ▪ Acuerdo de largo plazo para operación y mantenimiento.	▪ Las entidades responsables ejecutan puntualmente los trabajos complementarios para albergar y operar los equipos (e.g., torre de radar, link de comunicación). ▪ Las entidades pertinentes incorporar en sus planes financieros los recursos para la operación y mantenimiento del Nuevo equipo meteorológico ▪ Las autoridades de gestión de riesgos incorporan la nueva información en sus sistemas de alerta temprana para alertar a la población local.
	Número de estaciones meteorológicas para monitorear precipitación que afecta a las ciudades, vinculadas a los sistemas de alerta temprana	Antofagasta = XX Taltal = XX Esmeraldas = XX	Medio término Antofagasta = XX Taltal = XX Esmeraldas = XX	Reportes de instalación Reportes trimestrales de operación Acuerdo para asegurar el flujo de información a los sistemas de alerta temprana Acuerdo de largo plazo para operación y mantenimiento.	
Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	Número de personas (hombres y mujeres) cubiertos por señalización de rutas de evacuación en respuesta a inundaciones (Esmeraldas), deslaves (Esmeraldas) y aluviones (Antofagasta y Taltal)	Antofagasta = 0 Taltal = 0 Esmeraldas (inundación) = 0	Fin de proyecto: Antofagasta = 380,000 Taltal = 10,000	▪ Reporte de instalación de sirenas y señalización de rutas de evacuación ▪ Mapas de evacuación fácilmente accesibles	▪ Las autoridades de gestión de riesgos integran las nuevas herramientas en sus sistemas de alerta temprana para alertar a la población

	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
		Esmeraldas (deslaves) = 0	Esmeraldas (inundación) = 161,000 Esmeraldas (deslaves) = 161,000	▪ Señalización de rutas evacuación instalada ▪ Procedimientos y guías de evacuación fácilmente accesibles.	▪ Las entidades pertinentes incorporan en sus planes financieros los recursos para la futuro operación y mantenimiento de sirenas y señales de evacuación
Componente 2. Fortalecer capacidades de adaptación					
Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	Número de personal (hombres y mujeres) de gobiernos locales y entidades pertinentes entrenados en adaptación basada en riesgos en ciudades costeras	Antofagasta = 0 Taltal = 0 Esmeraldas = 0 Otras ciudades costeras Chile = 0 Otras ciudades costeras Ecuador = 0	Fin de proyecto: Antofagasta = XX Taltal = XX Esmeraldas = XX Otras ciudades costeras Chile = XX Otras ciudades costeras Ecuador = XX	▪ Plan de curso y materiales de capacitación en adaptación basada en riesgos en ciudades costeras ▪ Reporte de la capacitación de capacitadores ▪ Reportes de cada evento de entrenamiento (incluyendo lista de participantes)	▪ El personal de los gobiernos locales y entidades pertinentes está dispuesto a participar en la capacitación e incorporar la adaptación basada en riesgos en su trabajo
Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	Número de personas (hombres y mujeres) que han participado en actividades y eventos de sensibilización	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto: Antofagasta = XX Taltal = XX Esmeraldas = XX	▪ Estrategias de comunicación y educación pública para Antofagasta, Taltal y Esmeraldas. ▪ Reporte de cada actividad y evento de sensibilización (incluyendo lista de participantes) ▪ Reportes trimestrales de implementación de cada estrategia de comunicación y educación.	▪ La población local es sensible a los mensajes sobre riesgos climáticos y adaptación al cambio climático ▪ Las entidades pertinentes están dispuestas a mantener a largo plazo estrategia de sensibilización ciudadana y la iniciativa de los narradores.
	Número de narradores (hombres y mujeres) capacitados para mantener la memoria cultural de riesgos y desastres vinculados con el clima	Antofagasta = 0 Taltal = 0 Esmeraldas = 0	Fin de proyecto: Antofagasta = 10 Taltal = 5 Esmeraldas = 10	▪ Materiales de capacitación ▪ Acuerdos de largo plazo para mantener la iniciativa de los narradores en las tres ciudades	

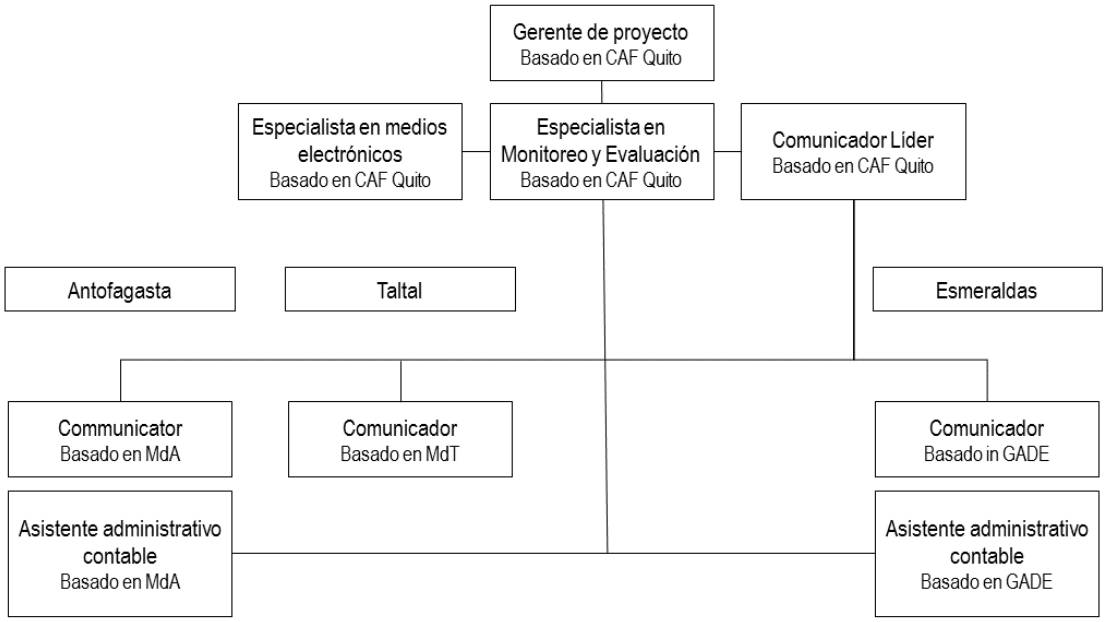
	Indicadores de objetivo y resultado	Línea base	Metas de medio término y final	Medios de verificación	Supuestos
				▪ Reportes trimestrales de avance en la implementación de la iniciativa de los narradores	
Componente 3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina					
Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	Número de personas (hombres y mujeres, por nacionalidad) que han participado en eventos para la diseminación de lecciones y buenas prácticas (e.g., talleres, visitas guiada, seminarios)	0	Medio término >100 personas ≥ 50% mujeres Fin de proyecto: >200 personas ≥ 50% mujeres	▪ Memorias / reportes de eventos virtuales y presenciales (incluyendo lista de participantes)	▪ La información es atractiva, útil y accesible a actores clave y grupos de interés
	Número de visitantes por mes (media anual) registrada en la red de canales electrónicos de la plataforma regional en línea que se usa para diseminar los aprendizajes y buenas prácticas del Proyecto	Visitas 0 Visitas únicas 0	Medio término Visitas ≥2000 Visitas únicas ≥1600 Fin de proyecto: Visitas ≥4000 Visitas únicas ≥3200	▪ Reporte mensual del administrador de la plataforma	▪ Las comunidades costeras tienen adecuado acceso a internet



Plataforma electrónica del proyecto

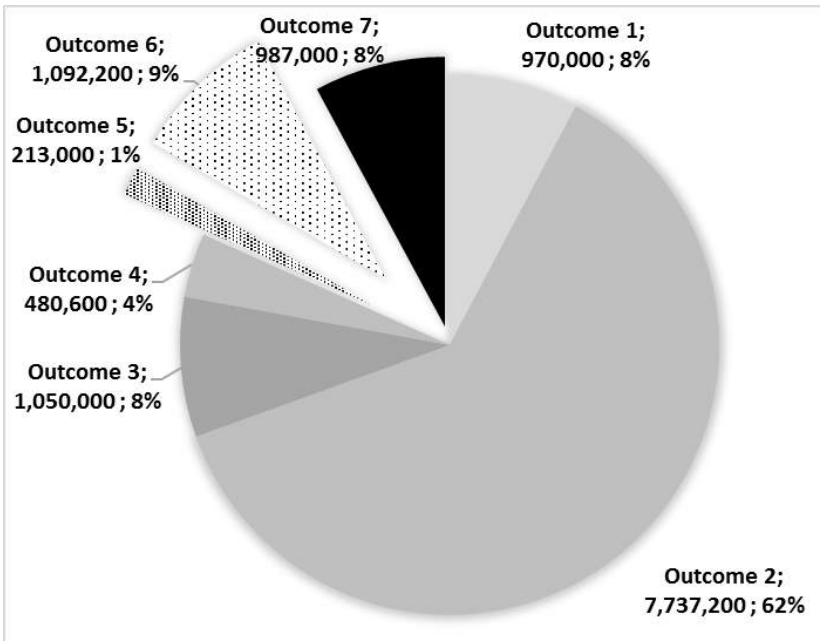


Estructura organizativa del proyecto



Conformación del equipo de proyecto

Costo del proyecto: USD 13,910,400



- Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras
- Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras
- Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local
- Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones
- Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación
- Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)
- Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región

Presupuesto por resultados

Presupuesto en pre-concepto y documento completo

Outcome	Output	Chile	Ecuador	Binational	Total	Outcome total	Chile	Ecuador		Total	Outcome total	Difference
Outcome 1. Enhanced plans and green infrastructure reduces vulnerability to floods, landslides and mudflows in three coastal cities	1.1. Stormwater management plans for Antofagasta and Taltal	1,500,000			1,500,000	2,500,000	545,000			545,000	970,000	-1,530,000
	1.2. Green infrastructure plan for Esmeraldas		1,000,000		1,000,000			425,000		425,000		
Outcome 2. Reduced vulnerability to floods, landslides and mudflows in two coastal cities (ca., 574.000 people protected)	2.1. Mudflow control infrastructure in Antofagasta	3,938,000			3,938,000	6,230,000	4,917,200			4,917,200	7,737,200	1,507,200
	2.2. Landslide mitigation works in Esmeraldas		2,292,000		2,292,000			2,820,000		2,820,000		
Outcome 3. Improved climate monitoring and means to alert the local population	3.1. Weather radars in Antofagasta and Esmeraldas	600,000	400,000		1,000,000	1,000,000	530,000	380,000		910,000	1,050,000	50,000
	3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas						70,000	70,000		140,000		
Outcome 4. Improved means to respond to floods, landslides and mudflows	4.1. Enhanced public warning system in Antofagasta and Taltal	350,000	150,000		500,000	500,000	250,000			250,000	480,600	-19,400
	4.2. Pilot flood warning system in Esmeraldas							120,600		120,600		
	4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas						77,000	33,000		110,000		
Outcome 5. Local governments with improved capacity to design and implement adaptation measures	5.1. Course on risk-based adaptation in coastal cities			200,000	200,000	200,000			213,000	213,000	213,000	13,000
Outcome 6. Local population and government personnel with increased awareness of climate-related risks (floods, landslides, mudflows)	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	350,000	150,000		500,000	500,000	330,800	143,400		474,200	1,092,200	
	6.2. Narrators´ initiative initiated	400,000	200,000		600,000	600,000	418,000	200,000		618,000		
Outcome 7. Lessons and best practice on reducing vulnerability to climate related flooding, landslides and mudflows in coastal cities have been shared in the region.	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice			1,000,000	1,000,000	1,000,000			424,000	424,000	987,000	
	7.2. Lessons and best practice documented and disseminated								563,000	563,000		
TOTAL		7,138,000	4,192,000	1,200,000	12,530,000	12,530,000	7,138,000	4,192,000	1,200,000	12,530,000	12,530,000	

Presupuesto

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
1.1. Stormwater management plan for Antofagasta	MOP	CHI	Contractual services company	500.000					500.000	1
	MOP	CHI	Travel	10.000	2.000				12.000	2
	MOP	CHI	Contractual services individual		10.000				10.000	3
	MOP	CHI	Meetings		20.000				20.000	4
	MOP	CHI	Audiovisual & print production costs		3.000				3.000	5
			Subtotal	510.000	35.000	-	-	-	545.000	
1.2. Green infrastructure plan for Esmeraldas	GADE	ECU	Contractual services company	20.000					20.000	6
	GADE	ECU	Contractual services company	90.000					90.000	7
	GADE	ECU	Contractual services company		80.000				80.000	8
	GADE	ECU	Meetings		20.000				20.000	9
	GADE	ECU	Audiovisual & print production costs		5.000				5.000	10
	GADE	ECU	Contractual services company		100.000	70.000	40.000		210.000	11
			Subtotal	110.000	205.000	70.000	40.000	-	425.000	
2.1. Mudflow control infrastructure in Antofagasta	MOP	CHI	Contractual services company		200.000				200.000	12
	MOP	CHI	Contractual services company			4.633.200			4.633.200	13

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	MOP	CHI	Contractual services company		30.000				30.000	14
	MOP	CHI	Miscellaneous expenses		10.000	30.000			40.000	15
	MOP	CHI	Equipment and furniture	14.000					14.000	16
			Subtotal	14.000	240.000	4.693.200	-	-	4.917.200	
2.2. Landslide mitigation works in Esmeraldas	GADE	ECU	Contractual services company		50.000	150.000			200.000	17
	GADE	ECU	Contractual services company			2.600.000			2.600.000	18
	GADE	ECU	Miscellaneous expenses			20.000			20.000	19
			Subtotal	-	50.000	2.770.000	-	-	2.820.000	
3.1. Weather radars in Antofagasta and Esmeraldas	MOP	CHI	Contractual services company	30.000					30.000	20
	MOP	CHI	Equipment and furniture		500.000				500.000	21
	INAMHI	ECU	Contractual services company	30.000					30.000	22
	INAMHI	ECU	Equipment and furniture		350.000				350.000	23
			Subtotal	60.000	850.000	-	-	-	910.000	
3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas	MOP	CHI	Equipment and furniture	70.000					70.000	24
	INAMHI	ECU	Equipment and furniture	70.000					70.000	25
			Subtotal	140.000	-	-	-	-	140.000	
	ONEMI	CHI	Equipment and furniture		250.000				250.000	26

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
4.1. Enhanced public warning system in Antofagasta and Taltal			Subtotal	-	250.000	-	-	-	250.000	
4.2. Pilot flood warning system in Esmeraldas	GADE	ECU	Contractual services company	10.000					10.000	27
	GADE	ECU	Equipment and furniture	10.000	70.000				80.000	28
	GADE	ECU	Meetings	2.000	6.600	2.000			10.600	29
	GADE	ECU	Miscellaneous expenses		5.000	5.000	5.000	5.000	20.000	30
			Subtotal	22.000	81.600	7.000	5.000	5.000	120.600	
4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	ONEMI	CHI	Contractual services company	10.000					10.000	31
	ONEMI	CHI	Audiovisual & print production costs		3.000				3.000	32
	ONEMI	CHI	Audiovisual & print production costs		40.000				40.000	33
	ONEMI	CHI	Miscellaneous expenses		6.000	6.000	6.000	6.000	24.000	34
	GADE	ECU	Contractual services company	10.000					10.000	35
	GADE	ECU	Audiovisual & print production costs		3.000				3.000	36
	GADE	ECU	Audiovisual & print production costs		20.000				20.000	37
			Subtotal	20.000	72.000	6.000	6.000	6.000	110.000	
5.1. Course on risk-based adaptation in coastal cities	APC	Regional	Local consultants	25.000	50.000	25.000			100.000	38
	APC	Regional	Meetings	8.000					8.000	39
	APC	Regional	Grant		40.000				40.000	40
	APC	Regional	Meetings		20.000				20.000	41

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	APC	Regional	Grant			15.000	15.000	15.000	45.000	42
			Subtotal	33.000	110.000	40.000	15.000	15.000	213.000	
6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	MdA	CHI	Contractual services company	15.000					15.000	43
	MdA	CHI	Local consultants	12.000	12.000	12.000	12.000	12.000	60.000	44
	MdA	CHI	Miscellaneous expenses		50.000	40.000	30.000		120.000	45
	MdA	CHI	Equipment and furniture		3.400				3.400	46
	MdT	CHI	Contractual services company	15.000					15.000	47
	MdT	CHI	Local consultants	10.800	10.800	10.800	10.800	10.800	54.000	48
	MdT	CHI	Miscellaneous expenses		25.000	20.000	15.000		60.000	49
	MdT	CHI	Equipment and furniture		3.400				3.400	50
	GADE	ECU	Contractual services company	15.000					15.000	51
	GADE	ECU	Local consultants	12.000	12.000	12.000	12.000	12.000	60.000	52
	GADE	ECU	Miscellaneous expenses		30.000	20.000	15.000		65.000	53
	GADE	ECU	Equipment and furniture		3.400				3.400	54
			Subtotal	79.800	150.000	114.800	94.800	34.800	474.200	
6.2. Narrators´ initiative initiated	MMA	CHI	Local consultants	12.000	12.000	12.000	12.000	12.000	60.000	55
	MMA	CHI	Local consultants	10.800	10.800	10.800	10.800	10.800	54.000	56
	MMA	CHI	Meetings	8.000					8.000	57
	MMA	CHI	Contractual services company		30.000	20.000	10.000		60.000	58

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	MMA	CHI	Grant		50.000	70.000	60.000	50.000	230.000	59
	MMA	CHI	Local consultants			6.000			6.000	60
	MAE	ECU	Local consultants	10.800	21.600	21.600	21.600	10.800	86.400	61
	MAE	ECU	Contractual services company		10.000	10.000	5.000		25.000	62
	MAE	ECU	Grant		20.000	30.000	19.000	15.000	84.000	63
	MAE	ECU	Local consultants			4.600			4.600	64
			Subtotal	41.600	154.400	185.000	138.400	98.600	618.000	
7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice	CAF	Regional	Equipment and furniture	28.000					28.000	65
	CAF	Regional	Contractual services company	8.600	8.600	8.600	8.600	8.600	43.000	66
	CAF	Regional	Local consultants	22.800	22.800	22.800	22.800	22.800	114.000	67
	CAF	Regional	Local consultants	24.000	24.000	24.000	24.000	24.000	120.000	68
	CAF	Regional	Supplies	1.800	1.800	1.800	1.800	1.800	9.000	69
	CAF	Regional	Audiovisual & print production costs	12.000	12.000	12.000	12.000	12.000	60.000	70
	CAF	Regional	Travel	10.000	10.000	10.000	10.000	10.000	50.000	71
			Subtotal	107.200	79.200	79.200	79.200	79.200	424.000	
7.2. Lessons and best practice documented and disseminated	CAF	Regional	Local consultants	24.000	24.000	24.000	24.000	24.000	120.000	72
	CAF	Regional	Miscellaneous expenses	13.000	15.000	15.000	15.000	15.000	73.000	73
	CAF	Regional	Meetings	20.000					20.000	74
	CAF	Regional	Meetings	5.000					5.000	75
	CAF	Regional	Meetings	5.000					5.000	76
	CAF	Regional	Travel		20.000	20.000	20.000	20.000	80.000	77
	CAF	Regional	Travel			10.000	10.000	10.000	30.000	78
	CAF	Regional	International consultants			30.000		40.000	70.000	79

Output	Responsible entity	Country	Budget description	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget note
	CAF	Regional	Audiovisual & print production costs					30.000	30.000	80
	CAF	Regional	Audiovisual & print production costs					50.000	50.000	81
	CAF	Regional	Meetings					20.000	20.000	82
	CAF	Regional	Meetings					25.000	25.000	83
	CAF	Regional	Meetings					10.000	10.000	84
	CAF	Regional	Meetings					25.000	25.000	85
			Subtotal	67.000	59.000	99.000	69.000	269.000	563.000	
Project execution cost	CAF	Regional	Local consultants	36.000	36.000	36.000	36.000	36.000	180.000	86
	CAF	Regional	Local consultants	14.400	14.400	14.400	14.400	14.400	72.000	87
	CAF	Regional	Local consultants	14.400	14.400	14.400	14.400	14.400	72.000	88
	CAF	Regional	Travel	3.000	3.000	3.000	3.000	3.000	15.000	89
	CAF	Regional	Equipment and furniture	4.500					4.500	90
	CAF	Regional	Miscellaneous expenses	1.300	1.300	1.300	1.300	1.300	6.500	91
			Subtotal	73.600	69.100	69.100	69.100	69.100	350.000	

Total project cost	**1.278.200**	**2.405.300**	**8.103.300**	**516.500**	**576.700**	**12.880.000**

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Memoria

Taller de consulta en Antofagasta

Junta de Vecinos Villa Irarrazabal

Antofagasta

República de Chile

6 de julio de 2017

Tabla de contenido

Anexos

Introducción

El Ministerio de Medio Ambiente de Chile (MMA) y el Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - banco de desarrollo de América Latina - presentaron al Fondo de Adaptación la iniciativa del Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina. Esta iniciativa regional incluye tres ciudades costeras: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador. El Fondo de Adaptación fue establecido en 2001 para financiar proyectos y programas concretos de adaptación en los países en desarrollo. El fondo es un mecanismo financiero de la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Protocolo de Kioto.

La iniciativa en mención fue presentada a consideración del Fondo de Adaptación a nivel de pre-concepto, el cual fue aprobado por dicho fondo a finales del mes de marzo de 2016. A efectos de avanzar en la aprobación final, se requiere formular en detalle el proyecto en colaboración con los actores claves públicos y privados. El 16 de mayo de 2016 se realizó el taller de inicio en la ciudad de Esmeraldas con el objetivo de presentar el pre-concepto a los socios clave, recibir retroalimentación e iniciar el proceso de desarrollo de la propuesta de completa. Un taller de inicio similar se realizó en la ciudad de Antofagasta el 4 de mayo de 2016. El borrador de proyecto fue analizado con los actores clave en Esmeraldas el 22 de julio de 2016, y en Antofagasta el 19 de julio de 2016.

El Fondo de Adaptación ha revisado la propuesta de proyecto y ha requerido que se haga consultas adicionales a los actores clave locales de las comunidades donde intervendrá el proyecto. Consecuentemente, se han organizado reuniones de consulta con los actores locales en las ciudades de Esmeraldas (Cerro Gataso e Isla Luis Vargas Torres), Antofagasta y Taltal.

El proyecto incluye la actualización del diseño y la construcción de obras de control aluvional en la quebrada Bonilla. Por tanto, se organizó una reunión de consulta con los pobladores asentados en el área de afectación por aluviones en la quebrada Bonilla.

La presente memoria presenta los resultados de la reunión de consulta realizada con los actores locales en el área de afectación por aluviones en la quebrada Bonilla en la ciudad de Antofagasta. La reunión fue convocada por la SEREMI de Medio Ambiente, en coordinación con la municipalidad, y los demás socios del proyecto. Se convocó a las juntas de vecinos y directivas de las organizaciones de los campamentos del sector. La reunión se realizó en el centro comunitario de la Junta de Vecinos Villa Irarrazabal de la ciudad de Antofagasta (Foto 1). En ella participaron vecinos y representantes del Ministerio de Medio Ambiente (MMA), el Ministerio de Obras Públicas (MOP) y la Oficina Nacional de Emergencia del Ministerio del Interior (ONEMI)

Agenda

La reunión tuvo los siguientes elementos:

15:00	Registro de participantes
15:30	Bienvenida
15:40	Estado del proceso de preparación del proyecto
16:00	Presentación del borrador de proyecto
16:40	Plenaria
17:00	Cierre del evento

Foto 1. Centro comunitario de la Junta de Vecinos Villa Irarrazabal.

Bienvenida

La bienvenida estuvo a cargo de Mirna Aguilar de la SEREMI de Medio Ambiente y Carolina Cortés de CAF. Ellas agradecieron la asistencia de los participantes y proveyeron información sobre el marco general de la reunión. Participaron en la reunión 12 personas, de las cuales seis fueron vecinas del sector. Las vecinas representaron a la Junta de Vecinos Bonilla Alto, a la Junta de Vecinos Villa Irarrazabal y a la Junta de Vecinos Balmaceda. El registro de asistencia está en el Anexo 1.

Estado del proceso de preparación del proyecto

Carolina Cortés de CAF, resumió el proceso de preparación de la propuesta de proyecto. El concepto de proyecto fue aprobado en marzo de 2016, y la propuesta completa fue presentado en octubre de 2017. Los comentarios y

observaciones del Fondo de Adaptación se están procesando y se prevé presentar la nueva versión del documento de proyecto en agosto de 2017. En caso de ser aprobado, el proyecto iniciaría la ejecución en 2018.

Presentación del borrador del proyecto regional

La presentación estuvo a cargo de Segundo Coello, consultor de CAF para la preparación del documento de proyecto. La presentación está en el Anexo 2. Los participantes recibieron una copia del marco de resultados, la misma que se adjunta en el Anexo 3.

Se indicó que este es un proyecto regional con financiamiento no-reembolsable del Fondo de Adaptación, cuyo fin es apoyar la implementación de medidas de adaptación al cambio climático global. En el proyecto colaboran los gobiernos de Chile y Ecuador. La agencia implementadora es la CAF, y la entidad ejecutora en Ecuador es el Ministerio del Ambiente.

El objetivo del proyecto es “reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.” Es un proyecto de cinco años, con un financiamiento total de USD12,880,000. El proyecto implementará acciones en tres ciudades: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador.

Se recordó que el proyecto fue presentado y aprobado por el Fondo de Adaptación como pre-concepto. Los sitios de intervención y principales ideas de acción se delinearon en el taller de inicio que se realizó en Esmeraldas el 16 de mayo de 2016. Posteriormente, se afinó la propuesta y se la presentó para validación y ajustes finales en el taller realizado el 22 de julio de 2016 en Esmeraldas. Se destacó que varios de los presentes participaron en estas reuniones.

Se explicó cada uno de los resultados y productos incluidos en la propuesta de proyecto, y que se resumen en el Anexo 3.

Plenaria

Los participantes hicieron varias preguntas para aclarar dudas respecto a la propuesta del proyecto. Se indicó que es una buena idea instalar un radar para poder dar alertas rápidas a los pobladores. Igualmente, estuvieron de acuerdo con que se construyan obras de control aluvional en la quebrada Bonilla.

Se recordó que los pobladores están familiarizados con las sirenas de alarma de tsunami. Por lo que se recomendó que las sirenas tengan un sonido diferente.

Se mencionó que ONEMI ya realizó un simulacro de aluvión anteriormente. Sin embargo, se recomendó capacitar a las personas para que puedan actuar adecuadamente en caso de emergencia. Igualmente, se advirtió que los planes de evacuación deben tener en cuenta a los niños, personas mayores y personas con discapacidad.

Cierre del evento

La clausura estuvo a cargo de Mirna Aguilar de la SEREMI de Medio Ambiente y Carolina Cortés de CAF. Ellas agradecieron la participación y contribuciones de los asistentes.

Foto 2. Foto grupal al cierre del evento.

SEREMI
Región de Antofagasta

Ministerio del Medio Ambiente

Anexo 1. Registro de participantes

LISTADO DE ASISTENCIA
TALLER PROYECTO REDUCCIÓN DE LA VULNERABILIDAD CLIMÁTICA Y RIESGO DE INUNDACIONES EN ÁREAS COSTERAS URBANAS Y SEMIURBANAS EN LAS CIUDADES DE AMÉRICA LATINA

Fecha: 06/07/2017
Hora de inicio: 14:00 hr.
Lugar: Sede Junta de Vecinos Villa Irarrázaval

Nombre	Villa/Población	Teléfono	mail
Rusmery Arón Alvarez	Junta Vecinos Bonilla alto 1	96363575	rusmery.raa@gmail..com
Juan C. Reyes H.	D.O.H- M.O.P	2422018	juan.reyes.h@mop.gov.cl
Lorena Valdebenito A.	ONEMI	44150552	lvaldebenito@onemi.gov.cl
Mantza Robledo	Junta Vecino Villa. Irrazaval.	26802298	mantza.robledo@.IIVE.CL
Nelly Astudillo M.	Junta Vecino Villa Irarrazaval	95057037	—
Lorena Herrera L.	MOP - SEREMI MOP.	552422208	lorena.herrera@mop.gov.cl
MIRNA Aguilera Lara	Fiscalía del M. Ambiente	82515961	maguilera.z@mma.gob.cl
SEGUNDO COELLO	CONSULTOR CAF	5939-99776169	SEGUNDO.COELLO@ECOBIOTEC.ORG
Carolina Cortés	CAF	593987883698	acortes@caf.com

SEREMI
Región de
Antofagasta

Ministerio del
Medio Ambiente

LISTADO DE ASISTENCIA
TALLER PROYECTO REDUCCIÓN DE LA VULNERABILIDAD CLIMÁTICA Y RIESGO DE INUNDACIONES EN ÁREAS COSTERAS URBANAS Y SEMIURBANAS EN LAS CIUDADES DE AMÉRICA LATINA

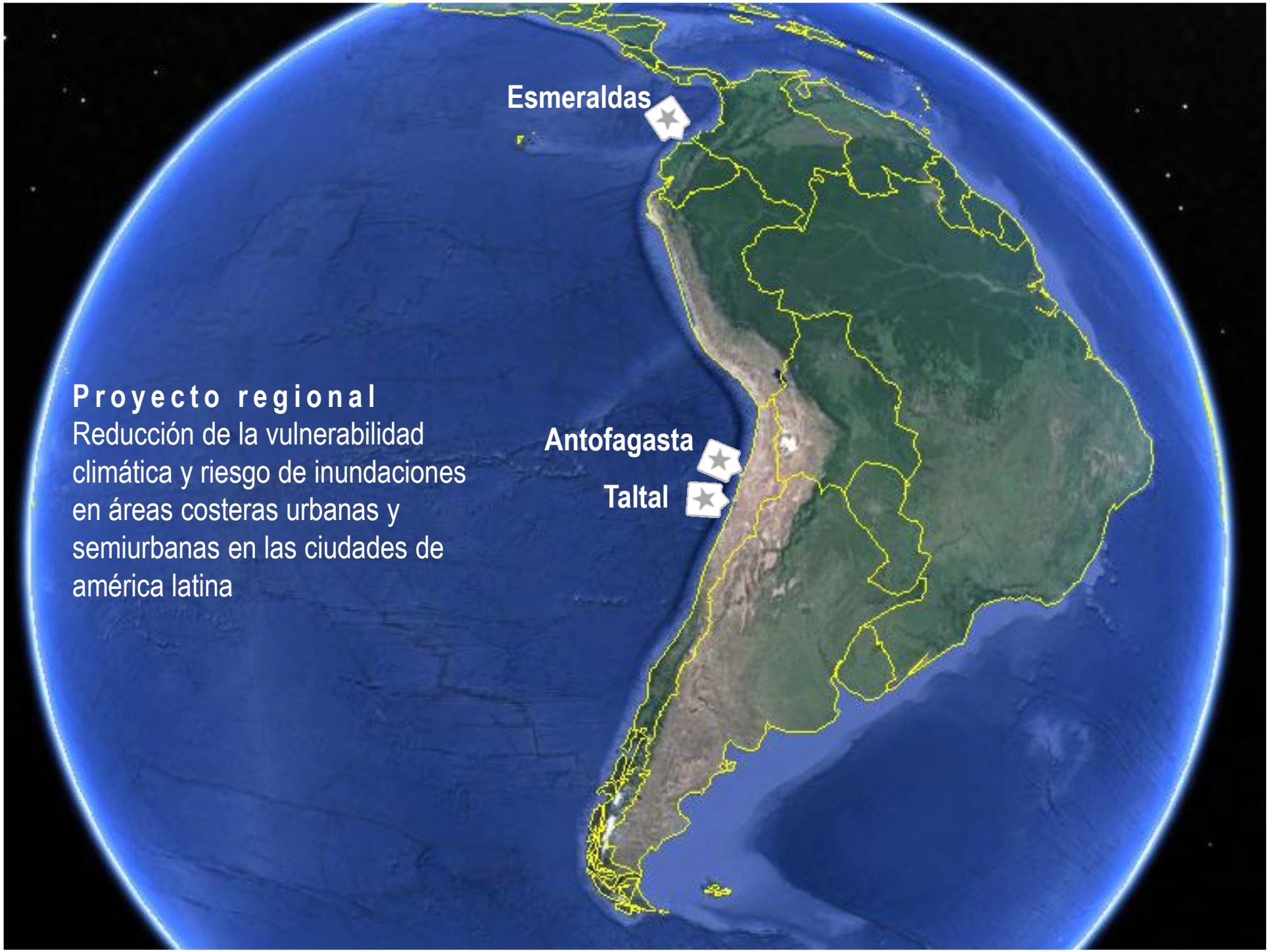
Fecha: 06/07/2017
Hora de inicio: 10:00 hr.
Lugar: Sede Junta de Vecinos Villa Irarrazabal

Nombre	Villa/Población	Teléfono	mail
Jacqueline Gonzalez	Bolnuevedo	965799574	DAVID.ECHEVERRIA@UTK.NET
Tonya Gonzalez	Bolnuevedo	96365730	DAVID.ECHEVERRIA@UTK.NET
Glenda Lopez	Bolnuevedo	996474884 996467413	glendalopez

PRESENTACIÓN DEL BORRADOR DE PROYECTO REGIONAL

Taller de consulta

Proyecto Regional Chile – Ecuador



Proyecto regional

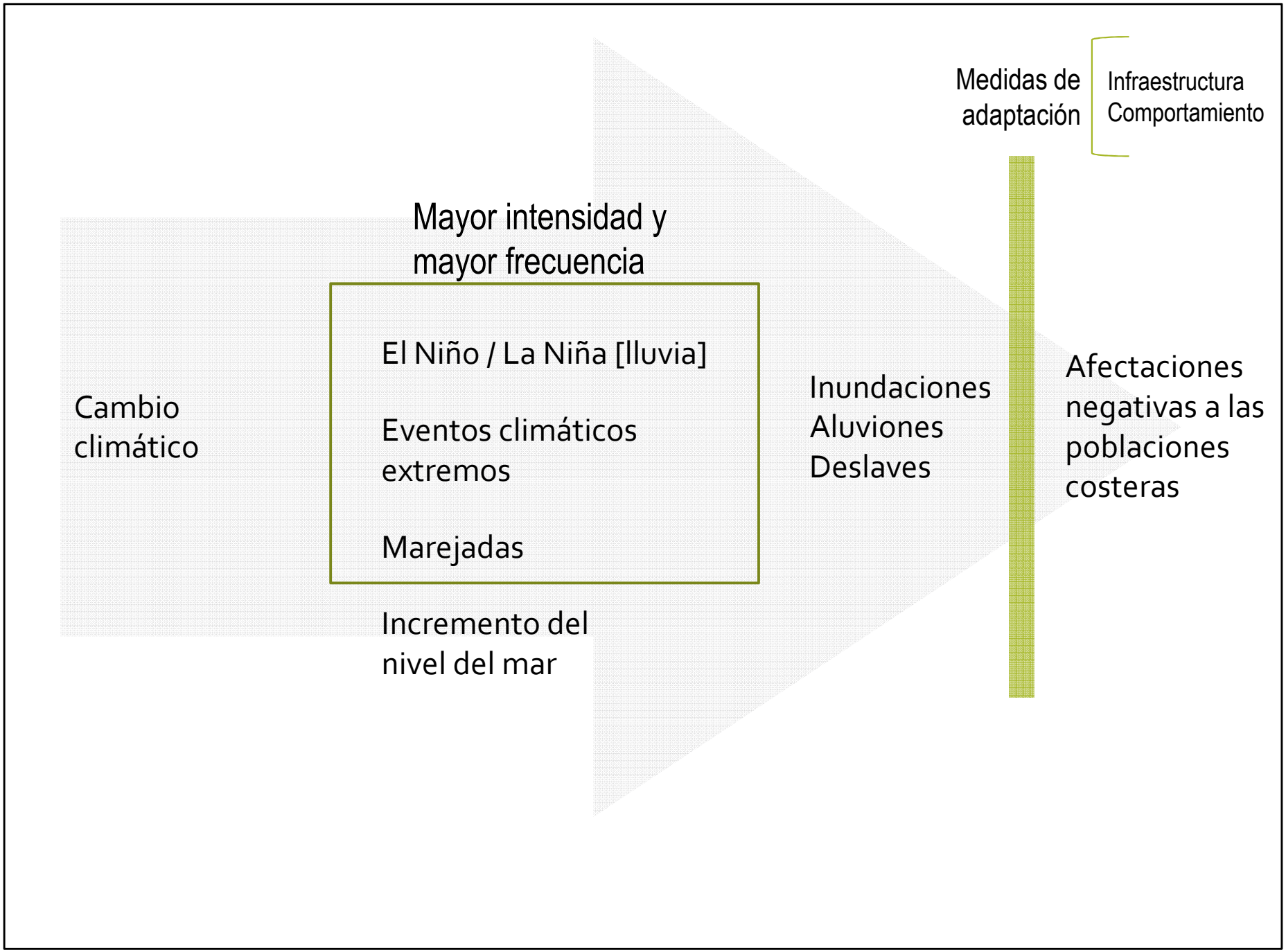
Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Similitudes

1. Ciudades costeras
2. Vulnerables a impacto de El Niño / La Niña = inundaciones, deslaves, aluviones
3. Vulnerables a tsunamis
4. Vulnerables a incremento en el nivel del mar

Diferencias

1. Índice de capacidad de adaptación. Antofagasta 9.40 / Esmeraldas 4.44 / Taltal no datos
2. Cultura y costumbres. Esmeraldas – clima tropical húmedo / afroecuatoriana. Antofagasta – clima árido templado
3. Tamaño y población: Antofagasta 390 mil / Esmeraldas 174 mil / Taltal 10 mil.
4. Economía. Antofagasta centrada en minería cobre. Esmeraldas mixta: pesca, turismo, portuaria petróleo.


Medidas de adaptación
Infraestructura
Comportamiento
Mayor intensidad y mayor frecuencia
El Niño / La Niña [lluvia]
Eventos climáticos extremos
Marejadas
Incremento del nivel del mar
Cambio climático
Inundaciones
Aluviones
Deslaves
Afectaciones negativas a las poblaciones costeras

Objetivo

Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.

5 años
USD 12,880,000

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador

Componente	Resultados esperados	Productos esperados	País
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
		6.2. Iniciativa de Narradores iniciada [USD 585,937]	Chile Ecuador
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 440,937]	Chile Ecuador
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 589,937]	Chile Ecuador
Subtotal			11,914,926
Costos administración			965,04
Total			12,880,000

GRACIAS

Anexo 3. Marco de resultados del proyecto.

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costera urbanas y semiurbanas en las ciudades de América Latina

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
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3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 440,937]	Chile Ecuador
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Subtotal			11,914,926
Costos administración			965,04
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Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Memoria

Taller de consulta en Antofagasta

Junta de Vecinos Esperanza Nuestra

Antofagasta

República de Chile

7 de julio de 2017

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Anexos

Introducción

El Ministerio de Medio Ambiente de Chile (MMA) y el Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - banco de desarrollo de América Latina - presentaron al Fondo de Adaptación la iniciativa del Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina. Esta iniciativa regional incluye tres ciudades costeras: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador. El Fondo de Adaptación fue establecido en 2001 para financiar proyectos y programas concretos de adaptación en los países en desarrollo. El fondo es un mecanismo financiero de la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Protocolo de Kioto.

La iniciativa en mención fue presentada a consideración del Fondo de Adaptación a nivel de pre-concepto, el cual fue aprobado por dicho fondo a finales del mes de marzo de 2016. A efectos de avanzar en la aprobación final, se requiere formular en detalle el proyecto en colaboración con los actores claves públicos y privados. El 16 de mayo de 2016 se realizó el taller de inicio en la ciudad de Esmeraldas con el objetivo de presentar el pre-concepto a los socios clave, recibir retroalimentación e iniciar el proceso de desarrollo de la propuesta de completa. Un taller de inicio similar se realizó en la ciudad de Antofagasta el 4 de mayo de 2016. El borrador de proyecto fue analizado con los actores clave en Esmeraldas el 22 de julio de 2016, y en Antofagasta el 19 de julio de 2016.

El Fondo de Adaptación ha revisado la propuesta de proyecto y ha requerido que se haga consultas adicionales a los actores clave locales de las comunidades donde intervendrá el proyecto. Consecuentemente, se han organizado reuniones de consulta con los actores locales en las ciudades de Esmeraldas (Cerro Gataso e Isla Luis Vargas Torres), Antofagasta y Taltal.

El proyecto incluye la actualización del diseño y la construcción de obras de control aluvional en la quebrada Bonilla. Por tanto, se organizó una reunión de consulta con los pobladores asentados en el área de afectación por aluviones en la quebrada Bonilla.

La presente memoria presenta los resultados de la reunión de consulta realizada con los actores locales en el área de afectación por aluviones en la quebrada Bonilla en la ciudad de Antofagasta. La reunión fue convocada por la SEREMI de Medio Ambiente, en coordinación con la municipalidad, y los demás socios del proyecto. Se convocó a las juntas de vecinos y directivas de las organizaciones de los campamentos del sector. La reunión se realizó en la sede social de la Junta de Vecinos Esperanza Nuestra de la ciudad de Antofagasta (Foto 1). En ella participaron vecinos y representantes del Ministerio de Medio Ambiente (MMA) y CAF.

Agenda

La reunión tuvo los siguientes elementos:

18:00	Registro de participantes
18:10	Bienvenida
18:20	Estado del proceso de preparación del proyecto
18:40	Presentación del borrador de proyecto
19:10	Plenaria
19:30	Cierre del evento

Foto 1. Sede social de la Junta de Vecinos Esperanza Nuestra.

Bienvenida

La bienvenida estuvo a cargo de Mirna Aguilar de la SEREMI de Medio Ambiente y Carolina Cortés de CAF. Ellas agradecieron la asistencia de los participantes y proveyeron información sobre el marco general de la reunión. Participaron en la reunión 20 vecinos del sector (17 mujeres y 3 hombres). Los vecins representaron a la Junta de Vecinos Balmaceda. El registro de asistencia está en el Anexo 1.

Foto 2. Mirna Aguilar de la SEREMI de Medio Ambiente da la bienvenida a los participantes.

Estado del proceso de preparación del proyecto

Carolina Cortés de CAF, resumió el proceso de preparación de la propuesta de proyecto. El concepto de proyecto fue aprobado en marzo de 2016, y la propuesta completa fue presentado en octubre de 2017. Los comentarios y observaciones del Fondo de Adaptación se están procesando y se prevé presentar la nueva versión del documento de proyecto en agosto de 2017. En caso de ser aprobado, el proyecto iniciaría la ejecución en 2018.

Presentación del borrador del proyecto regional

La presentación estuvo a cargo de Segundo Coello, consultor de CAF para la preparación del documento de proyecto. La presentación está en el Anexo 2. Los participantes recibieron una copia del marco de resultados, la misma que se adjunta en el Anexo 3.

Se indicó que este es un proyecto regional con financiamiento no-reembolsable del Fondo de Adaptación, cuyo fin es apoyar la implementación de medidas de adaptación al cambio climático global. En el proyecto colaboran los gobiernos

de Chile y Ecuador. La agencia implementadora es la CAF, y la entidad ejecutora en Ecuador es el Ministerio del Ambiente.

Foto 3. Carolina Cortés de CAF explica el proceso de preparación del proyecto.

El objetivo del proyecto es “reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.” Es un proyecto de cinco años, con un financiamiento total de USD12,880,000. El proyecto implementará acciones en tres ciudades: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador.

Se recordó que el proyecto fue presentado y aprobado por el Fondo de Adaptación como pre-concepto. Los sitios de intervención y principales ideas de acción se delinearon en el taller de inicio que se realizó en Esmeraldas el 16 de mayo de 2016. Posteriormente, se afinó la propuesta y se la presentó para validación y ajustes finales en el taller realizado el 22 de julio de 2016 en Esmeraldas. Se destacó que varios de los presentes participaron en estas reuniones.

Se explicó cada uno de los resultados y productos incluidos en la propuesta de proyecto, y que se resumen en el Anexo 3.

Plenaria

Los participantes hicieron varias preguntas para aclarar dudas respecto a la propuesta del proyecto. Se indicó que la población no está consciente del cambio climático y cómo se relaciona con los aluviones. Se recomendó que el proyecto apoye a informar a la población al respecto.

Se indicó que es bueno que se construyan obras de control aluvional en la quebrada Bonilla. Se mencionó que la población que vive en los campamentos

del sector son los más vulnerables por la precaridad de las viviendas. Sin embargo, es difícil lograr su participación.

Se mencionó que parece interesante la iniciativa de los narradores. Se recomendó promover en esta iniciativa la participación de niños y personas mayores.

Finalmente, se pidió hacer las gestiones pertinentes para concretar el financiamiento del proyecto y poder iniciarlo en 2018.

Cierre del evento

La clausura estuvo a cargo de Mirna Aguilar de la SEREMI de Medio Ambiente y Carolina Cortés de CAF. Ellas agradecieron la participación y contribuciones de los asistentes.

Foto 4. Fotos grupales al cierre del evento.

SEREMI
Región de Antofagasta

Ministerio del Medio Ambiente

Anexo 1. Registro de participantes

LISTADO DE ASISTENCIA
TALLER PROYECTO REDUCCIÓN DE LA VULNERABILIDAD CLIMÁTICA Y RIESGO DE INUNDACIONES EN ÁREAS COSTERAS URBANAS Y SEMIURBANAS EN LAS CIUDADES DE AMÉRICA LATINA

Fecha: 07/07/2017
Hora de inicio: 17:30
Lugar: Junta de vecinos

Nombre	Villa/Población	Teléfono	mail
MARIA CASTRO	NUEVA BALMACEDA	2926933	
Paola Ahumada	Nueva Balmaceda.	2839556.	
graciela oca	nueva Balmaceda.	972919328.	
CINTHIA COLEDÓN	NUEVA BALMACEDA.	974422820	
RODRIGO ORELLANA	Nueva Balmaceda	78912202	
TAMYA GONZALEZ	Poblacion BALMACEDA.	99963992	
JUAN ASTUDILLO	POBLACIÓN BALMACEDA	9~~38~~934135	

SEREMI
Región de Antofagasta

Ministerio del Medio Ambiente

LISTADO DE ASISTENCIA
TALLER PROYECTO REDUCCIÓN DE LA VULNERABILIDAD CLIMÁTICA Y RIESGO DE INUNDACIONES EN ÁREAS COSTERAS URBANAS Y SEMIURBANAS EN LAS CIUDADES DE AMÉRICA LATINA

Fecha: 07/07/2017
Hora de inicio: 17:30
Lugar: Junta de vecinos

Nombre	Villa/Población	Teléfono	mail
Gilberto Valenzuela	Pobl. Nueva Balmaceda	952593177	
Jayuelin Gonzalez Q.	Ana Maria Ibaceta #8132	954143244	
Nancy Molina	Rio Blanco 8195	9013213-k	
Glenda Lopez	Rio Blanco 8115	964674113	
Seimy Yañez	Rio Blanco #8196	963739305	
Rosana Yañez	Rio Blanco Nº 8095	978568015	
Liliana cortes Rivas	Rio Blanco 818	994143433	

SEREMI
Región de Antofagasta

Ministerio del Medio Ambiente

LISTADO DE ASISTENCIA
TALLER PROYECTO REDUCCIÓN DE LA VULNERABILIDAD CLIMÁTICA Y RIESGO DE INUNDACIONES EN ÁREAS COSTERAS URBANAS Y SEMIURBANAS EN LAS CIUDADES DE AMÉRICA LATINA

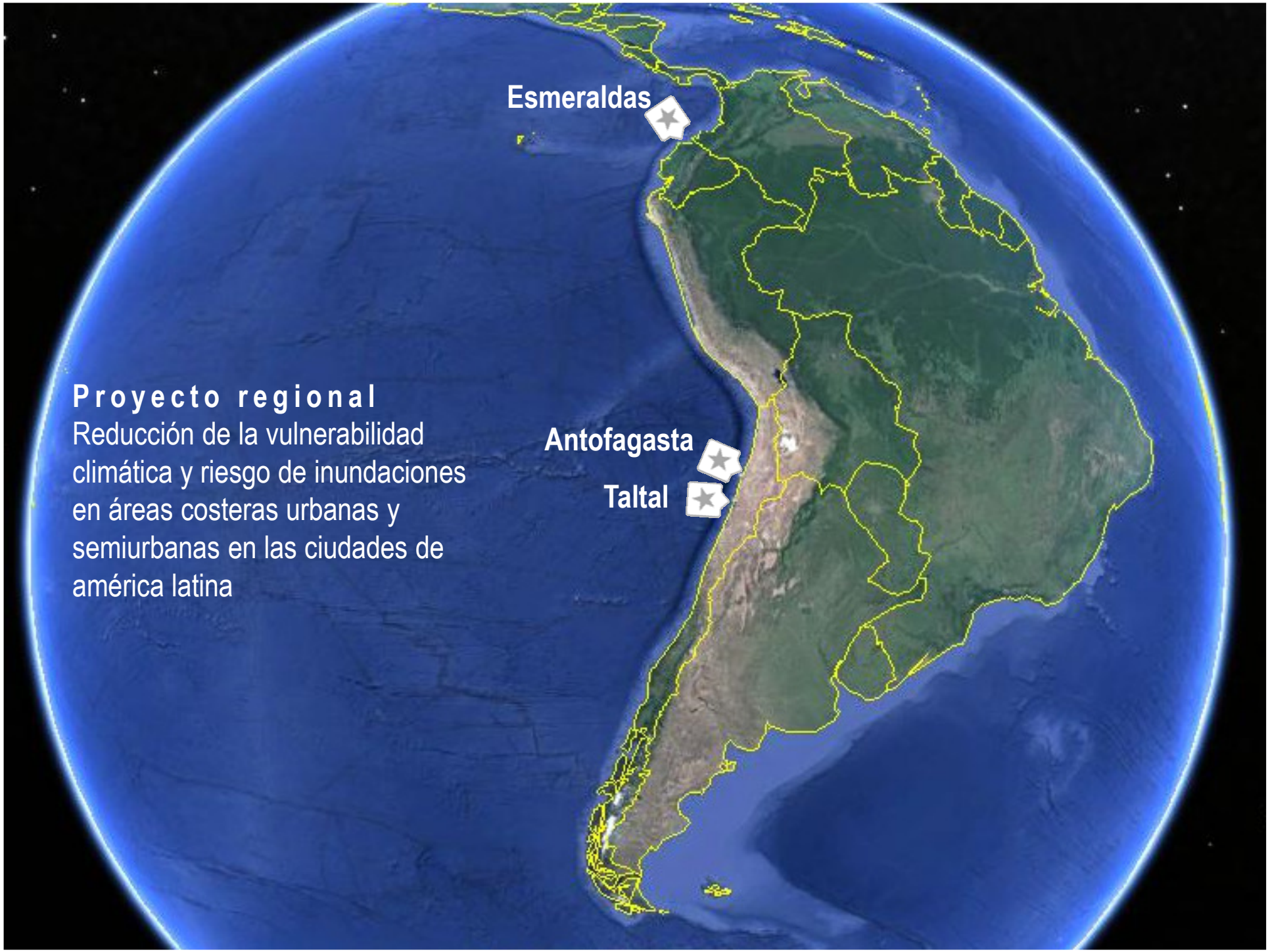
Fecha: 07/07/2017
Hora de inicio: 17:30
Lugar: Junta de vecinos

Nombre	Villa/Población	Teléfono	mail
Elsa Rojas Tapia	Ana Maria Ibacache #8066	552230095	
María segura M	Juan Ferra 8158	764601	
Doris Salazar G.	A. María Ibacache 8158	~~705~~	
Lorena Nuyare.	Río blanco # 7988	9,9997451	
barbara cHalkele	Río blanco # 8115	42698421.	
Leyla Herrera	A maría Ibacache 8078	[redacted]	

PRESENTACIÓN DEL BORRADOR DE PROYECTO REGIONAL

Taller de consulta

Proyecto Regional Chile – Ecuador



Proyecto regional

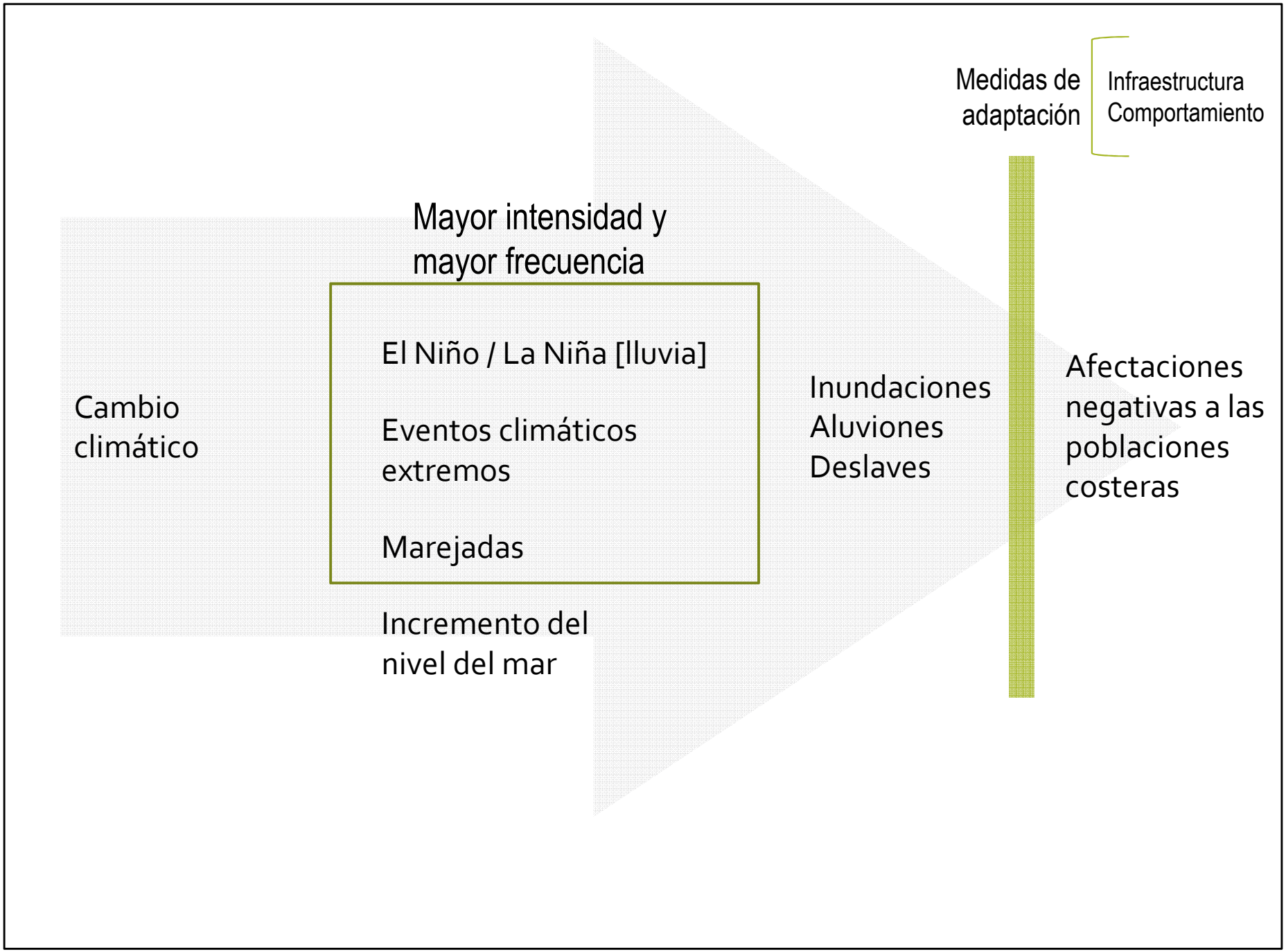
Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Similitudes

1. Ciudades costeras
2. Vulnerables a impacto de El Niño / La Niña = inundaciones, deslaves, aluviones
3. Vulnerables a tsunamis
4. Vulnerables a incremento en el nivel del mar

Diferencias

1. Índice de capacidad de adaptación. Antofagasta 9.40 / Esmeraldas 4.44 / Taltal no datos
2. Cultura y costumbres. Esmeraldas – clima tropical húmedo / afroecuatoriana. Antofagasta – clima árido templado
3. Tamaño y población: Antofagasta 390 mil / Esmeraldas 174 mil / Taltal 10 mil.
4. Economía. Antofagasta centrada en minería cobre. Esmeraldas mixta: pesca, turismo, portuaria petróleo.


Medidas de adaptación
Infraestructura
Comportamiento
Mayor intensidad y mayor frecuencia
El Niño / La Niña [lluvia]
Eventos climáticos extremos
Marejadas
Incremento del nivel del mar
Cambio climático
Inundaciones
Aluviones
Deslaves
Afectaciones negativas a las poblaciones costeras

Objetivo

Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.

5 años
USD 12,880,000

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador

Componente	Resultados esperados	Productos esperados	País
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
		6.2. Iniciativa de Narradores iniciada [USD 585,937]	Chile Ecuador
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 440,937]	Chile Ecuador
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 589,937]	Chile Ecuador
Subtotal			11,914,926
Costos administración			965,04
Total			12,880,000

GRACIAS

Anexo 3. Marco de resultados del proyecto.

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costera urbanas y semiurbanas en las ciudades de América Latina

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
		6.2. Iniciativa de Narradores iniciada [USD 585,937]	Chile Ecuador
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 440,937]	Chile Ecuador
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 589,937]	Chile Ecuador
Subtotal			11,914,926
Costos administración			965,04
Total			12,880,000

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Memoria

Taller de consulta en Antofagasta

Centro Cultural de Taltal

Taltal

República de Chile

7 de julio de 2017

Tabla de contenido

Anexos

Introducción

El Ministerio de Medio Ambiente de Chile (MMA) y el Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - banco de desarrollo de América Latina - presentaron al Fondo de Adaptación la iniciativa del Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina. Esta iniciativa regional incluye tres ciudades costeras: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador. El Fondo de Adaptación fue establecido en 2001 para financiar proyectos y programas concretos de adaptación en los países en desarrollo. El fondo es un mecanismo financiero de la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Protocolo de Kioto.

La iniciativa en mención fue presentada a consideración del Fondo de Adaptación a nivel de pre-concepto, el cual fue aprobado por dicho fondo a finales del mes de marzo de 2016. A efectos de avanzar en la aprobación final, se requiere formular en detalle el proyecto en colaboración con los actores claves públicos y privados. El 16 de mayo de 2016 se realizó el taller de inicio en la ciudad de Esmeraldas con el objetivo de presentar el pre-concepto a los socios clave, recibir retroalimentación e iniciar el proceso de desarrollo de la propuesta de completa. Un taller de inicio similar se realizó en la ciudad de Antofagasta el 4 de mayo de 2016. El borrador de proyecto fue analizado con los actores clave en Esmeraldas el 22 de julio de 2016, y en Antofagasta el 19 de julio de 2016.

El Fondo de Adaptación ha revisado la propuesta de proyecto y ha requerido que se haga consultas adicionales a los actores clave locales de las comunidades donde intervendrá el proyecto. Consecuentemente, se han organizado reuniones de consulta con los actores locales en las ciudades de Esmeraldas (Cerro Gataso e Isla Luis Vargas Torres), Antofagasta y Taltal.

La presente memoria presenta los resultados de la reunión de consulta realizada con los actores locales de la ciudad de Taltal. La reunión fue convocada por la SEREMI de Medio Ambiente, en coordinación con la municipalidad, y los demás socios del proyecto. Se convocó a las juntas de vecinos y directivas de las organizaciones de los campamentos del sector. La reunión se realizó en el Centro Cultural de Taltal (Foto 1). En ella participaron vecinos, el alcalde de la ciudad y representantes del Ministerio de Medio Ambiente (MMA), Oficina Nacional de Emergencia del Ministerio del Interior (ONEMI) y CAF.

Agenda

La reunión tuvo los siguientes elementos:

10:00	Registro de participantes
10:10	Bienvenida
10:20	Estado del proceso de preparación del proyecto
10:40	Presentación del borrador de proyecto
11:10	Plenaria
11:30	Cierre del evento

Foto 1. Centro Cultural de Taltal.

Bienvenida

La bienvenida estuvo a cargo de Mirna Aguilar de la SEREMI de Medio Ambiente y Carolina Cortés de CAF. Ellas agradecieron la asistencia de los participantes y particularmente del alcalde de la ciudad.

proveyeron información sobre el marco general de la reunión. Participaron en la reunión 17 vecinos de la ciudad 17 mujeres y 10 hombres). Los vecinos representaron varios sectores como Quebrada el Hueso, Junta de Vecinos El Salitre, y Junta de Vecinos San Lorenzo a la Junta de Vecinos Balmaceda. El registro de asistencia está en el Anexo 1.

Estado del proceso de preparación del proyecto

Carolina Cortés de CAF, resumió el proceso de preparación de la propuesta de proyecto. El concepto de proyecto fue aprobado en marzo de 2016, y la propuesta completa fue presentado en octubre de 2017. Los comentarios y observaciones del Fondo de Adaptación se están procesando y se prevé presentar la nueva versión del documento de proyecto en agosto de 2017. En caso de ser aprobado, el proyecto iniciaría la ejecución en 2018.

Foto 2. Carolina Cortés de CAF explica el proceso de preparación del proyecto.

Presentación del borrador del proyecto regional

La presentación estuvo a cargo de Segundo Coello, consultor de CAF para la preparación del documento de proyecto. La presentación está en el Anexo 2. Los participantes recibieron una copia del marco de resultados, la misma que se adjunta en el Anexo 3.

Se indicó que este es un proyecto regional con financiamiento no-reembolsable del Fondo de Adaptación, cuyo fin es apoyar la implementación de medidas de adaptación al cambio climático global. En el proyecto colaboran los gobiernos

de Chile y Ecuador. La agencia implementadora es la CAF, y la entidad ejecutora en Ecuador es el Ministerio del Ambiente.

El objetivo del proyecto es “reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.” Es un proyecto de cinco años, con un financiamiento total de USD12,880,000. El proyecto implementará acciones en tres ciudades: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador.

Se recordó que el proyecto fue presentado y aprobado por el Fondo de Adaptación como pre-concepto. Los sitios de intervención y principales ideas de acción se delinearon en el taller de inicio que se realizó en Esmeraldas el 16 de mayo de 2016. Posteriormente, se afinó la propuesta y se la presentó para validación y ajustes finales en el taller realizado el 22 de julio de 2016 en Esmeraldas. Se destacó que varios de los presentes participaron en estas reuniones.

Se explicó cada uno de los resultados y productos incluidos en la propuesta de proyecto, y que se resumen en el Anexo 3.

Plenaria

Los participantes hicieron varias preguntas para aclarar dudas respecto a la propuesta del proyecto. Se preguntó respecto a la conformación de los equipos de trabajo del proyecto. Se explicó que los varios socios del proyecto se harán cargo de partes del proyecto, por ejemplo, ONEMI tendrá a cargo el sistema de alerta temprana, la Dirección Meteorológica de Chile administrará el radar para identificación de riesgos de tormentas, y el Ministerio de Medio Ambiente se hará cargo de la iniciativa de los narradores. Se indicó que los municipios de Antofagasta y Taltal, han ofrecido espacio para albergar personal del proyecto. Habrá una persona basada en Taltal.

Se indicó que será muy valioso tener un sistema de alerta temprana que pueda alertar a la población con suficiente tiempo de antelación para poder tomar medidas de protección o evacuar. Se recordó que el aluvión de 2015 fue devastador, el flujo de lodo corrió a través de la ciudad y la dejó aislada.

Se mencionó que los campamentos son vulnerables, pero que su condición de informalidad limita las acciones. Se recomendó que las rutas y procedimientos de evacuación tengan en cuenta las necesidades de niños, adultos mayores y personas con discapacidad.

Se destacó como muy positivo que el proyecto incluya aspectos culturales en la iniciativa de narradores. Se indicó que este es un aspecto que muchas veces se deja de lado. Se considera valioso cultivar y desarrollar manifestaciones culturales que contribuyan a fortalecer la memoria colectiva de la población. Hay varios grupos locales que podrán contribuir para este propósito.

Cierre del evento

La clausura estuvo a cargo de don Sergio Orellana Montejo, alcalde de Taltal, Mirna Aguilar de la SEREMI de Medio Ambiente y Carolina Cortés de CAF (Foto 3). Ellos agradecieron la participación y contribuciones de los asistentes.

Foto 3. El alcalde de Taltal, don Sergio Orellana Montejo, en la clausura del evento.

Foto 4. Foto grupal al cierre del evento.

SEREMI
Región de Antofagasta
Ministerio del Medio Ambiente

Anexo 1. Registro de participantes

LISTADO DE ASISTENCIA
TALLER PROYECTO REDUCCIÓN DE LA VULNERABILIDAD CLIMÁTICA Y RIESGO DE INUNDACIONES EN ÁREAS COSTERAS URBANAS Y SEMIURBANAS EN LAS CIUDADES DE AMÉRICA LATINA

Fecha: 07/07/2017
Hora de inicio: 10:00 hr.
Lugar: Centro Cultural de Taltal

Nombre	Villa/Población	Teléfono	mail
Doris Gahona Aracibia	J.J.V.V. N°10 El Salitre Taltal	612929. 62393086.	DorisGAHONA@HOTMAIL.COM
Norza Alicia Gómez Gómez	J.J.V.V. N°10 El Salitre.—	63975602	Alicia Gómez G.
LUIS BECERRA ELIZALDE	JJVV. SN. LORENZO.	94735607.- 552612513.-	[illegible]
Pablo Zepeda Orellana	Prat 1369	993166586.-	[illegible]
María José Mejías M.	ONEMI	954164132	mmejias@onemi.gov.cl
Deisy Cortés Araya.	I. Municipalidad Taltal	996941259	[illegible]
MIRNA Aguilar LARA	SEREMI del M. Ambiente	92515861	[illegible]

SEREMI
Región de Antofagasta

Ministerio del Medio Ambiente

Nombre	Villa/Población	Teléfono	mail
[illegible]	Poblacion Algama Quiroz	942023340	
Sonia Rojas Valderrama	Los Loros		
Leonardo Vasquez Q.	Pje Penales # 761	984259672	Lvasquez@municipalidadtaltal.cl
Carlos Iriarte M	Pje [illegible] # 773	988157947	ciriarte@[illegible]
Esteban Vargas Cortés	Poblacion El Vigil. Boletin "El Wachyman"	997615235	evargasfoto@gmail.com
Francisca Meza J.	Sgto. Aldea Nº 555	9-89002047	franciscaomezaj@redsalud.gov.cl
Sergio Milla Cabañas	23 de enero # 562	9-71642975	PRsergomilla@Gmail.com
Emilie Espinoza García	Juncal Nº1515 Asociación los Loros Agricultores	57150418 emipily@Gmail.com	emipily@Gmail.com
Carlos Arancibia Urquieta	Jorge [illegible] 295		CarlosLasdunas@Hotmail.com

SEREMI
Región de Antofagasta

Ministerio del Medio Ambiente

LISTADO DE ASISTENCIA
TALLER PROYECTO REDUCCIÓN DE LA VULNERABILIDAD CLIMÁTICA Y RIESGO DE INUNDACIONES EN ÁREAS COSTERAS URBANAS Y SEMIURBANAS EN LAS CIUDADES DE AMÉRICA LATINA

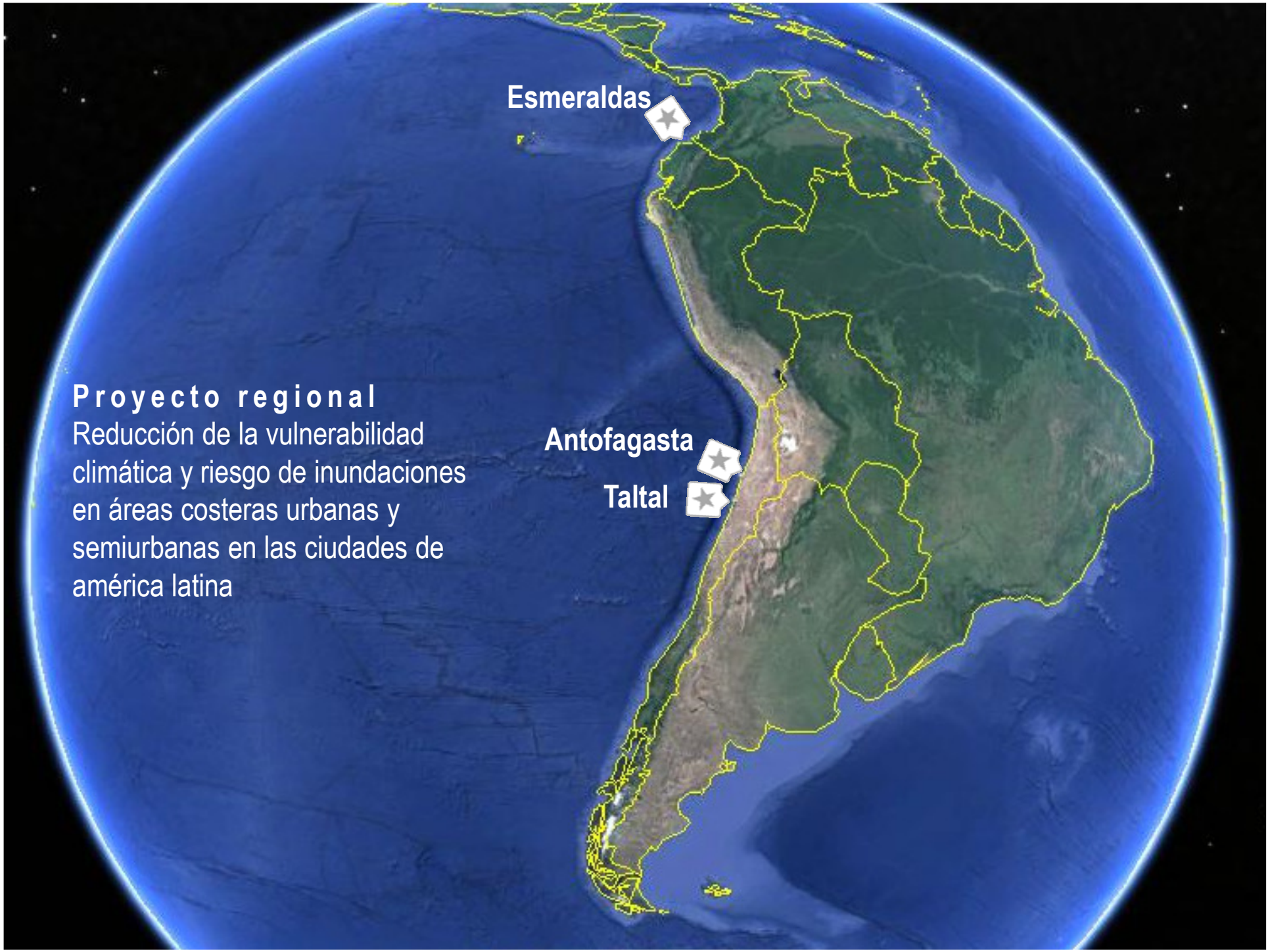
Fecha: 07/07/2017
Hora de inicio: 10:00 hr.
Lugar: Centro Cultural de Taltal

Nombre	Villa/Población	Teléfono	mail
Cristian Quintana	Avenida Matta 1695	97370 86 94	
[illegible]	Presidente "Quebrada el [illegible]"	977055961	[illegible]@gmail.com.
CHRISTIAN FUENZALIDA	REPUBLICA 557	981991526	CAFUENZALIDA@VTR.NET

PRESENTACIÓN DEL BORRADOR DE PROYECTO REGIONAL

Taller de consulta

Proyecto Regional Chile – Ecuador



Proyecto regional

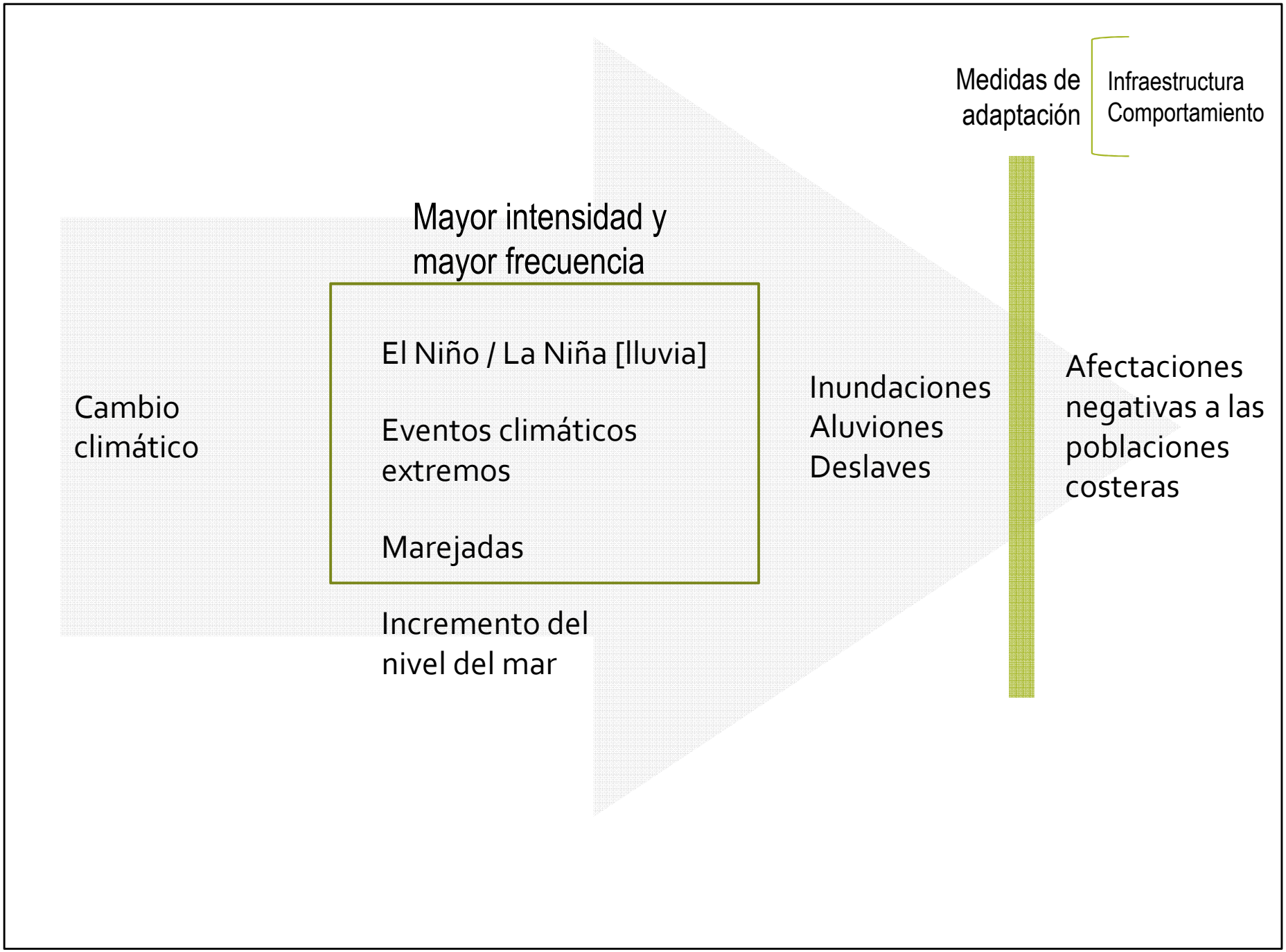
Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Similitudes

1. Ciudades costeras
2. Vulnerables a impacto de El Niño / La Niña = inundaciones, deslaves, aluviones
3. Vulnerables a tsunamis
4. Vulnerables a incremento en el nivel del mar

Diferencias

1. Índice de capacidad de adaptación. Antofagasta 9.40 / Esmeraldas 4.44 / Taltal no datos
2. Cultura y costumbres. Esmeraldas – clima tropical húmedo / afroecuatoriana. Antofagasta – clima árido templado
3. Tamaño y población: Antofagasta 390 mil / Esmeraldas 174 mil / Taltal 10 mil.
4. Economía. Antofagasta centrada en minería cobre. Esmeraldas mixta: pesca, turismo, portuaria petróleo.


Medidas de adaptación
Infraestructura
Comportamiento
Mayor intensidad y mayor frecuencia
El Niño / La Niña [lluvia]
Eventos climáticos extremos
Marejadas
Incremento del nivel del mar
Cambio climático
Inundaciones
Aluviones
Deslaves
Afectaciones negativas a las poblaciones costeras

Objetivo

Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.

5 años
USD 12,880,000

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador

Componente	Resultados esperados	Productos esperados	País
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
		6.2. Iniciativa de Narradores iniciada [USD 585,937]	Chile Ecuador
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 440,937]	Chile Ecuador
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 589,937]	Chile Ecuador
Subtotal			11,914,926
Costos administración			965,04
Total			12,880,000

GRACIAS

Anexo 3. Marco de resultados del proyecto.

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costera urbanas y semiurbanas en las ciudades de América Latina

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
		6.2. Iniciativa de Narradores iniciada [USD 585,937]	Chile Ecuador
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 440,937]	Chile Ecuador
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 589,937]	Chile Ecuador
Subtotal			11,914,926
Costos administración			965,04
Total			12,880,000

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Memoria

Taller de consulta en Cerro Gataso

Esmeraldas

República de Ecuador

23 de junio de 2017

Tabla de contenido

Anexos

Introducción

El Ministerio de Medio Ambiente de Chile (MMA) y el Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - banco de desarrollo de América Latina - presentaron al Fondo de Adaptación la iniciativa del Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina. Esta iniciativa regional incluye tres ciudades costeras: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador. El Fondo de Adaptación fue establecido en 2001 para financiar proyectos y programas concretos de adaptación en los países en desarrollo. El fondo es un mecanismo financiero de la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Protocolo de Kioto.

La iniciativa en mención fue presentada a consideración del Fondo de Adaptación a nivel de pre-concepto, el cual fue aprobado por dicho fondo a finales del mes de marzo de 2016. A efectos de avanzar en la aprobación final, se requiere formular en detalle el proyecto en colaboración con los actores claves públicos y privados. El 16 de mayo de 2016 se realizó el taller de inicio en la ciudad de Esmeraldas con el objetivo de presentar el pre-concepto a los socios clave, recibir retroalimentación e iniciar el proceso de desarrollo de la propuesta de completa. Un taller de inicio similar se realizó en la ciudad de Antofagasta el 4 de mayo de 2016. El borrador de proyecto fue puesto analizado con los actores clave en Esmeraldas el 22 de julio de 2016, y en Antofagasta el 19 de julio de 2016.

El Fondo de Adaptación ha revisado la propuesta de proyecto y ha requerido que se haga consultas adicionales a los actores clave locales de las comunidades donde intervendrá el proyecto. Consecuentemente, se han organizado reuniones de consulta con los actores locales en las ciudades de Esmeraldas (Cerro Gataso e Isla Luis Vargas Torres), Antofagasta y Taltal.

La presente memoria presenta los resultados de la reunión de consulta realizada con los actores locales de Cerro Gataso (ciudad de Esmeraldas). La reunión fue convocada por la Dirección Provincial de Esmeraldas del Ministerio del Ambiente, en coordinación con la directiva del Barrio 20 de Noviembre. La reunión se realizó en la casa comunal del Barrio 20 de Noviembre el 23 de junio de 2017 a las 15:00 h (Foto 1).

Agenda

La reunión tuvo los siguientes elementos:

15:00	Registro de participantes
15:30	Bienvenida
15:40	Estado del proceso de preparación del proyecto
15:50	Presentación del borrador de proyecto
16:15	Mesas de trabajo acciones para el proyecto
17:15	Plenaria
18:00	Cierre del evento

Foto 1. Casa comunal del Barrio 20 de Noviembre y convocatoria pública a la población local.

Bienvenida

La bienvenida estuvo a cargo del Señor Víctor Ayoví presidente del Barrio 20 de Noviembre, Rosa Ana González del Ministerio del Ambiente, y Dayana Vega de la Corporación Andina de Fomento (CAF) (Foto 2). Ellos agradecieron la asistencia de los participantes y proveyeron información sobre el marco general de la reunión. Participaron en la reunión 37 moradores del barrio (28 mujeres y 9 hombres), el registro de asistencia está en el Anexo 1.

Estado del proceso de preparación del proyecto

Dayana Vega, de CAF, resumió el proceso de preparación de la propuesta de proyecto. El concepto de proyecto fue aprobado en marzo de 2016, y la propuesta completa fue presentado en octubre de 2017. Los comentarios y observaciones del Fondo de Adaptación se están procesando y se prevé presentar la nueva versión del documento de proyecto en agosto de 2017. En caso de ser aprobado, el proyecto iniciaría la ejecución en 2018.

Foto 2. Bienvenida a cargo de Víctor Ayoví (arriba), Rosa Ana González (medio), y Dayana Vega (abajo).

Presentación del borrador del proyecto regional

La presentación estuvo a cargo de Segundo Coello, consultor de CAF para la preparación del documento de proyecto. La presentación está en el Anexo 2. Los participantes recibieron una copia del marco de resultados, la misma que se adjunta en el Anexo 3.

Se indicó que este es un proyecto regional con financiamiento no-reembolsable del Fondo de Adaptación, cuyo fin es apoyar la implementación de medidas de adaptación al cambio climático global. En el proyecto colaboran los gobiernos de Chile y Ecuador. La agencia implementadora es la CAF, y la entidad ejecutora en Ecuador es el Ministerio del Ambiente.

El objetivo del proyecto es “reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.” Es un proyecto de cinco años, con un financiamiento total de USD12,880,000. El proyecto implementará acciones en tres ciudades: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador.

Se recordó que el proyecto fue presentado y aprobado por el Fondo de Adaptación como pre-concepto. Los sitios de intervención y principales ideas de acción se delinearon en el taller de inicio que se realizó en Esmeraldas el 16 de mayo de 2016. Posteriormente, se afinó la propuesta y se la presentó para validación y ajustes finales en el taller realizado el 22 de julio de 2016 en Esmeraldas. Se destacó que varios de los presentes participaron en estas reuniones.

Se explicó cada uno de los resultados y productos incluidos en la propuesta de proyecto, y que se resumen en el Anexo 3.

Los participantes hicieron varias preguntas para aclarar dudas respecto a la propuesta del proyecto. Un elemento principal de preocupación fue la urgencia de intervención que requiere el sitio ante el riesgo de deslaves. Se indicó que unas 45 casas se perdieron en los deslaves del año pasado. En 2017, el invierno no fue tan fuerte, por lo que no se generaron deslaves de consideración. Pero, es urgente que el municipio intervenga.

Se explicó que la intervención en control de deslaves en cerro Gataso será ejecutado con el municipio de Esmeraldas, que es la autoridad local de desarrollo. La Prefectura de Esmeraldas, se ofrecido a hacerse cargo del manejo del radar meteorológico y las estaciones meteorológicas para identificar riesgos de lluvias y crecidas de ríos, y con esto alertar con anticipación a la población.

Trabajo en grupos

Los participantes conformaron tres grupos. En cada grupo, los participantes revisaron en detalle el marco de resultados del proyecto. Una persona del equipo de trabajo acompañó cada grupo para proveer información y aclarar dudas. Cada grupo nombró un relator, quien presentó los resultados en la plenaria.

Foto 3. Trabajo en grupos.

Plenaria

El primer grupo presentó sus análisis y propuestas. Primero, indicó estar de acuerdo con que se siembren árboles en la parte alta del cerro y que se tomen medidas para evitar que el agua se empoce. También estuvieron de acuerdo con que se tomen medidas de protección del talud, tal vez muros de hormigón. Se destacó que hay que tomar en cuenta el mal estado de las calles del sector y la necesidad de mejorarlas. También se propuso considerar la construcción de un mirador en la parte alta para incentivar la visita al sector.

Foto 4. Presentación de resultados del grupo 1.

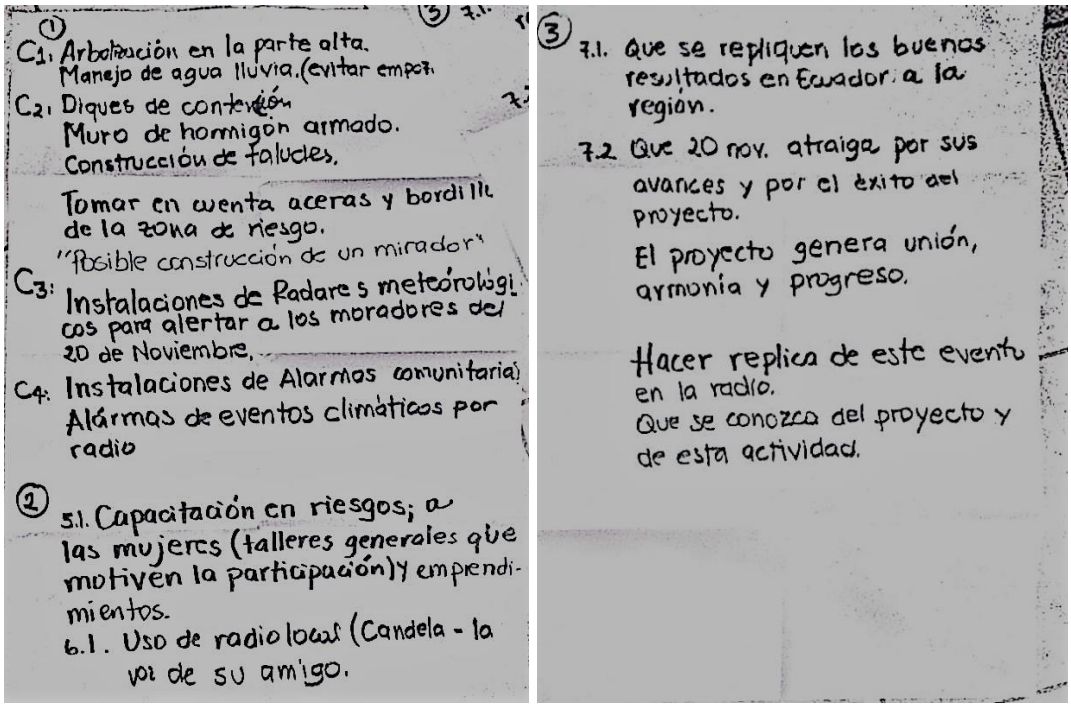


Foto 5. Papelógrafos del grupo 1.

También estuvieron de acuerdo con la instalación del radar meteorológico para poder alertar a la población de situaciones climática anómalas. Se recomendó que se usen las radios locales que tienen mayor sintonía como Candela o La voz de su amigo.

Se indicó que para motivar a las mujeres a que participen en la capacitación sobre riesgos se incluya elementos de interés para ellas, por ejemplo, actividades para emprendimiento.

Finalmente, se indicó que se espera que el proyecto motive unión y armonía en la comunidad, y que pueda servir de ejemplo para otros.

A continuación, el segundo grupo presentó sus resultados (Foto 6 y Foto 7). El relator del grupo indicó que el Municipio de Esmeraldas debería hacerse cargo de realizar los estudios para la obra de protección del barrio. Esto permitiría que cuando inicie el proyecto se pueda implementar las medidas rápidamente. También se indicó que las calles del sector deben ser arregladas. La dirigencia del barrio ha insistido al municipio para el arreglo de las calles, pero se ha indicado que no se las puede reparar hasta que no se haya tomado medidas para el control de deslaves.

En el mismo grupo también hubo la propuesta de que todo el costo de la protección del barrio sea cubierto por el Gobierno Nacional.

Finalmente, el grupo 2 mencionó que hay que tener en cuenta espacios adecuados para albergar a las personas en caso de desastres. En situaciones anteriores los albergues han sido improvisados. Las familias afectadas por el último deslave no tienen todavía solucionada su situación.

Foto 6. Presentación del grupo 2.

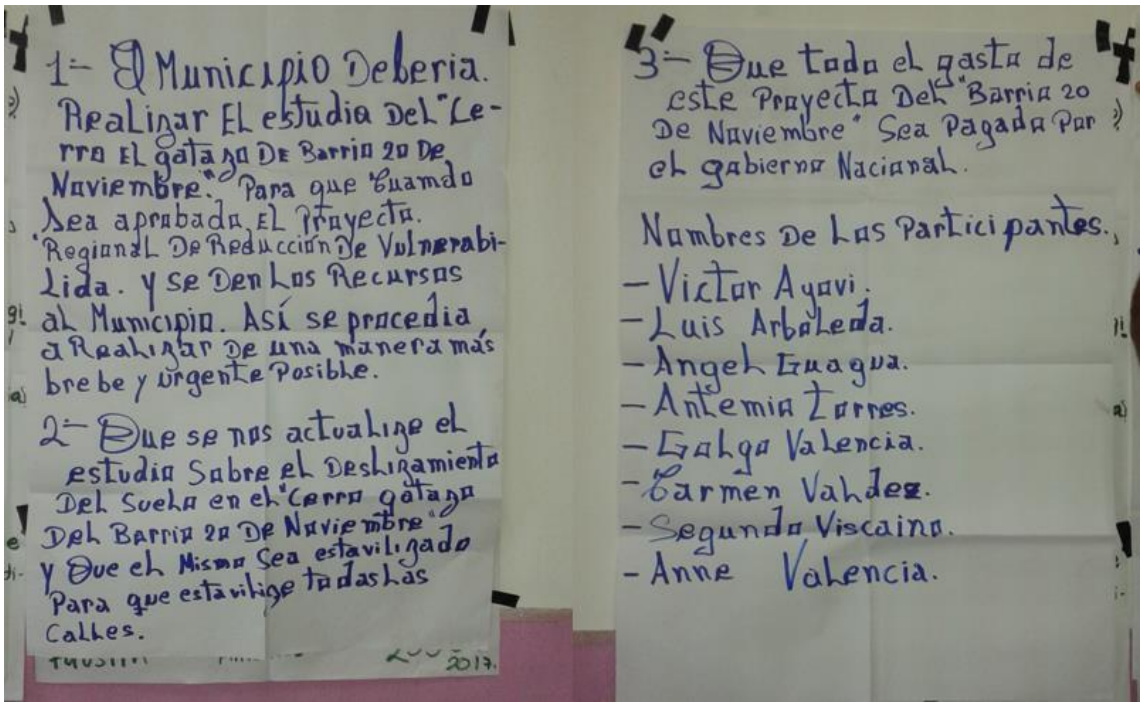


Foto 7. Papelógrafos del grupo 2.

Foto 8. Presentación del grupo 3.

Seguidamente, presentó sus resultados el grupo 3 (Foto 8 y Foto 9). El grupo estuvo de acuerdo en que se prepare un plan de infraestructura verde para la ciudad. Indicaron estar dispuestos a colaborar en la siembra de árboles. Se sugirió sembrar guayacán, laurel, balsa, guabo y fruta de pan.

Con respecto a las medidas de control de deslaves, se recomendó replicar el trabajo realizado en la Guacharaca, donde se hicieron terrazas y se tendió una malla. Se indicó que el barrio 20 de Noviembre está destrozado, el municipio no colabora.

Con respecto al sistema de alerta temprana, se mencionó que es necesario saber para donde evacuar. Es necesario que los pobladores estén organizados para actuar. Ahora es salvese quien pueda. También se recomienda que los planes de evacuación considern las necesidades de las personas con discapacidad. También es necesario que haya albergue sseguros.

Finalmente, se indicó que las personas viven en zonas de riesgo porque no hay donde más vivir.

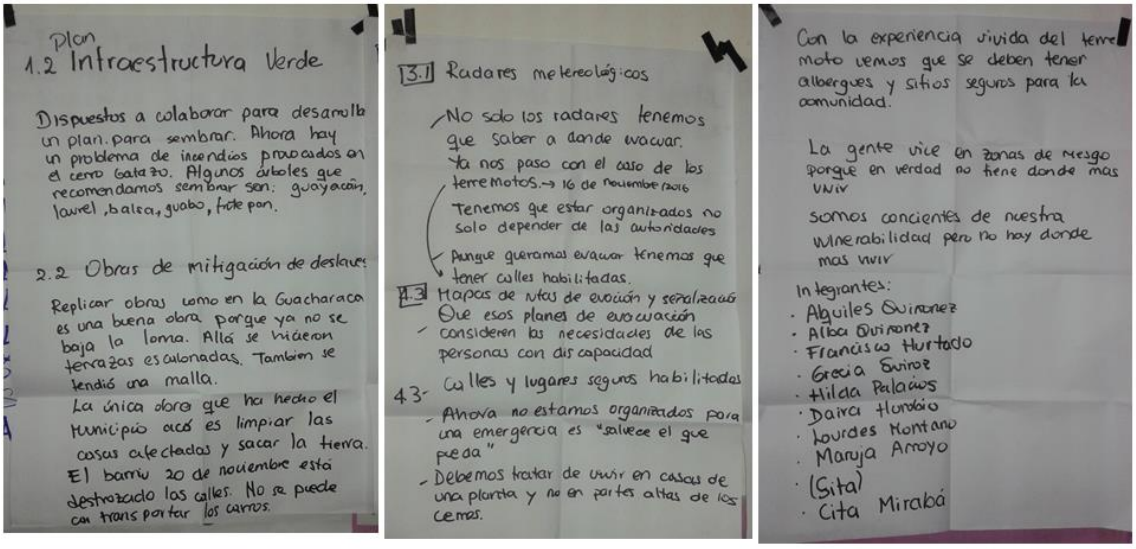


Foto 9. Papelógrafos del grupo 3.

Cierre del evento

La clausura estuvo a cargo del Señor Víctor Ayoví presidente del Barrio 20 de Noviembre, Rosa Ana González del Ministerio del Ambiente, y Dayana Vega de la Corporación Andina de Fomento (CAF) (Foto 2). Ellos agradecieron la participación y contribuciones de los asistentes.

Foto 10. Foto grupal al cierre del evento.

Anexo 1. Registro de participantes

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
Fecha de revisión:	REGISTRO DE ASISTENCIA	Código: MAE-REG-PRO-01.6
Versión: 02		Página:

EVENTO:

LISTA DE PARTICIPANTES 20 de Noviembre

FECHA: 23/06/2017

HORA:

Nº	NOMBRE	EDAD/GENERO ~~CARGO~~	INSTITUCIÓN / ÁREA MAE	CONADIS ~~ELECTRONICO~~	TELEFONOS	FIRMA
1	Agripina Congá Ayoví	80/F				
2	Pepita Vivas	53/F	20 DE NOVIEMBRE		0968588283	[firma]
3	Carmen Recado	38/F	BARRIO. 20 DE NOVIEMBRE		0980159653	[firma]
4	Gina Bolaño	38/F	20 de Noviembre.		0985493006	Gina Bolaño R.
5	Lourdes Montaño	49/F	20 de Noviembre		0985551310	Lourdes M
6	Alba Quiñonez	53/F	20 de Noviembre		0801909637	[firma]
7	Cito Mirok...	68/F	20 de N		0154092	Cito Mirok
8	Faustin Valencia	68/M	20 de noviembre		0984383287	[firma]
9	Leandra Narvaí	79/F	" "			Leandra [firma]

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
Fecha de revisión:	REGISTRO DE ASISTENCIA	Código: MAE-REG-PRO-0[illegible].6
Versión: 02		Página:

EVENTO: ----------

LISTA DE PARTICIPANTES 20 de Noviembre FECHA: 23/06/2017 HORA: ----------

Nº	NOMBRE	EDAD/GENERO	INSTITUCIÓN / ÁREA MAE	CONADIS ~~ELECTRONICO~~	TELEFONOS	FIRMA
1	Luis Arboleda Borrero	26 / M	Barrio 20 de Noviembre		0939693343	
2	Ines Arizala	59 / F	" "		0997308348	
3	Nelson Quintana	70, años	20 d Noviembre		2455617	
4	Maria Arroyo	66 / F	" "		—	
5	Julia Cuero	66/F	" "		0981221820	
6	Segunda Caicedo V	69/F	" "		0988067182	
7	Ana Ayovi V.	60/F	20 de Noviembre		0800579989	
8	Dayra Vasquez	61/F	20 de Noviembre		0968139806	
9	[illegible]	72/F	" "			

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
Fecha de revisión:	REGISTRO DE ASISTENCIA	Código: MAE-REG-PRO-01.6
Versión: 02		Página:

EVENTO: ---------------------------

LISTA DE PARTICIPANTES 20 de Noviembre FECHA: 23/06/2017 HORA: ---------------

Nº	NOMBRE	~~CARGO~~ EDAD / GENERO	INSTITUCIÓN / ÁREA MAE	CONADIS ~~ELECTRONICO~~	TELEFONOS	FIRMA
1	Hilda Palacios	59 — F	Barrio 20 Noviembre	—	450292	[firma]
2	Francisco Hurtado	61 / Masculino	" " "	0800517138 08.11343	0994864167	[firma]
3	Carmen Valde	64 Femenina	20 de Noviembre	0800323 69-7	455-688	[firma]
4	Angel [illegible]	74 / Masculino	[illegible]		0995299734	[firma]
5	Carmen Q. Muñoz	72				
6				0800142879	450-441	[firma]
7	Eva Olavijo	55 / Femenino	20 de noviembre		0993872503	Eva Olavijo A
8	Maria Bone	54 / Femenino	" "		0981834046	[firma]
9	Antonio Angulo	42 / Masculino	" "		0981035584	[firma]

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
Fecha de revisión: Versión: 02	REGISTRO DE ASISTENCIA	Código: MAE-REG-PRO-01.6 Página:

EVENTO: ----------

FECHA: 23/06/17 HORA: ----------

LISTA DE PARTICIPANTES

N	NOMBRE	CARGO	INSTITUCIÓN / ÁREA MAE	EDAD/CONADIS ELECTRONICO	TELEFONOS	FIRMA
1	Golgo Valencia	coordinador barrial	Barrio 20 de noviembre	84 / 0800301681 08.4020	0990238967 451613	
2	Maria Rodriguez	vecina	barrio 20 de noviembre	63 / Femenino	484683	
3	Victor Ayora C.	Presidente del B.	B. 20 de Noviembre		450339	
4	Amelia Loor Montaño	moradora	Barrio 20 de noviembre	55 / Femenino	0982591159	
5	MARCELINO VIZCAINO G	MORADOR	BARRIO 20 Nov.		0968396736	
6	Grecia Ramos	Morador	20 de novi	46 / Femenino	0801647983	
7	Zaida Ramos	57 años / Femenino		57 años	0800963787	
8	ARTEMIO TOARES	MORADOR	20 NOVIEMBRE	2.455.758	0800061948-2	
9	Maria Caicedo	morador	20 de noviembre	77 / Femenino	0990238967	Maria caicedo

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
Fecha de revisión:	REGISTRO DE ASISTENCIA	Código: MAE-REG-PRO-01.6
Versión: 02		Página:

EVENTO: ----------

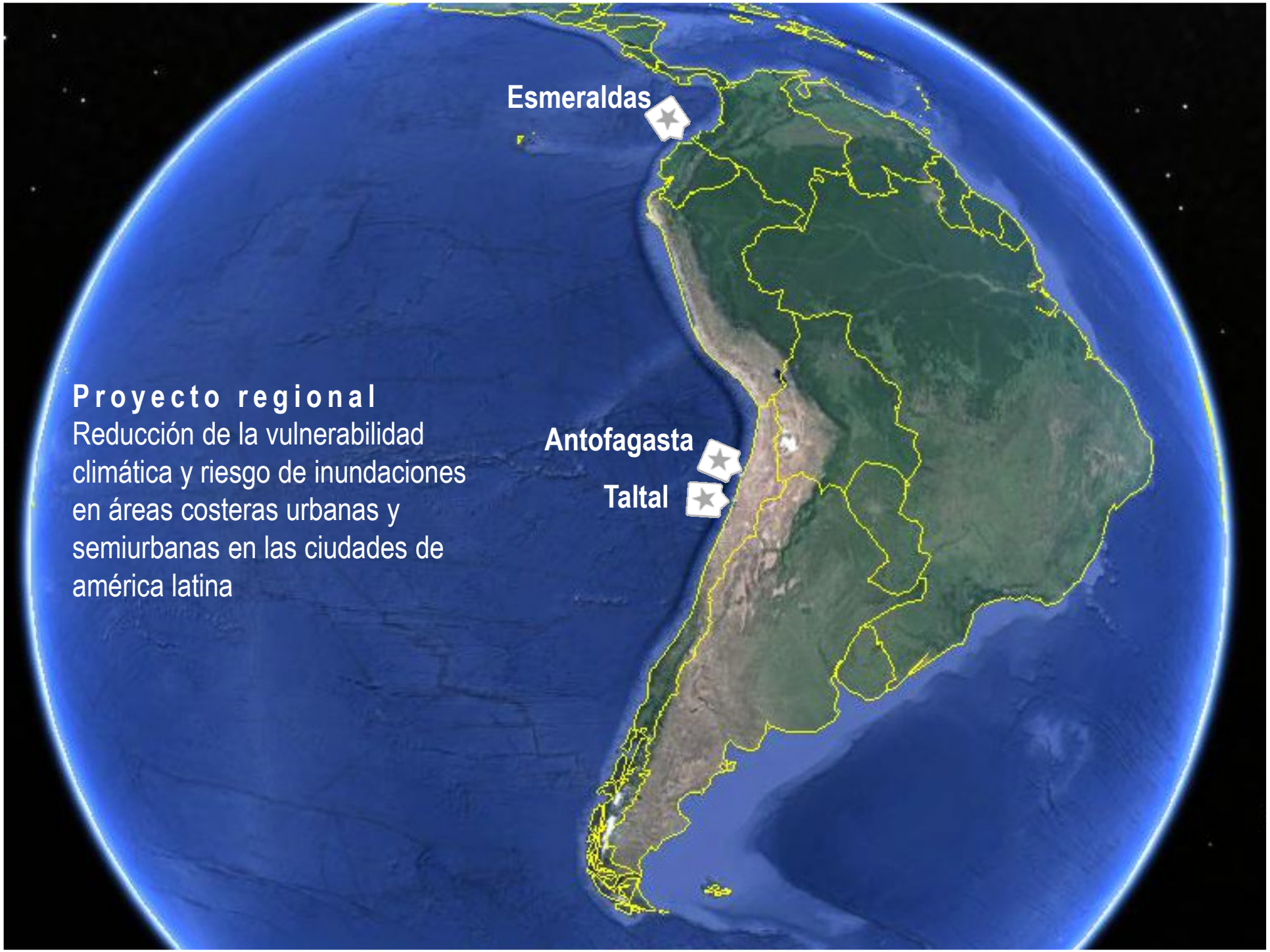
LISTA DE PARTICIPANTES 20 de Noviembre FECHA: 23/06/2017 HORA: ----------

N	NOMBRE	edad / CARGO	INSTITUCIÓN / ÁREA MAE	CORREO ELECTRONICO / organización	TELEFONOS	FIRMA
1	SEGUNDO COELLO	CONSULTOR	CAF	SEGUNDO.COELLO @ECOBIOTEC.ORG	0999756169	
2	ANDRE VALENCIA C.	EDAD 56 / FEMENINO	BARRIO 20 NOVIEMBRE	Andre.valencia@hotmail.com	0959972581	
3	Tanya Estupiñan	51 / Femenino	20 de Noviembre			
4						
5						
6						
7						
8						
9						

PRESENTACIÓN DEL BORRADOR DE PROYECTO REGIONAL

Taller de consulta

Proyecto Regional Chile – Ecuador



Proyecto regional

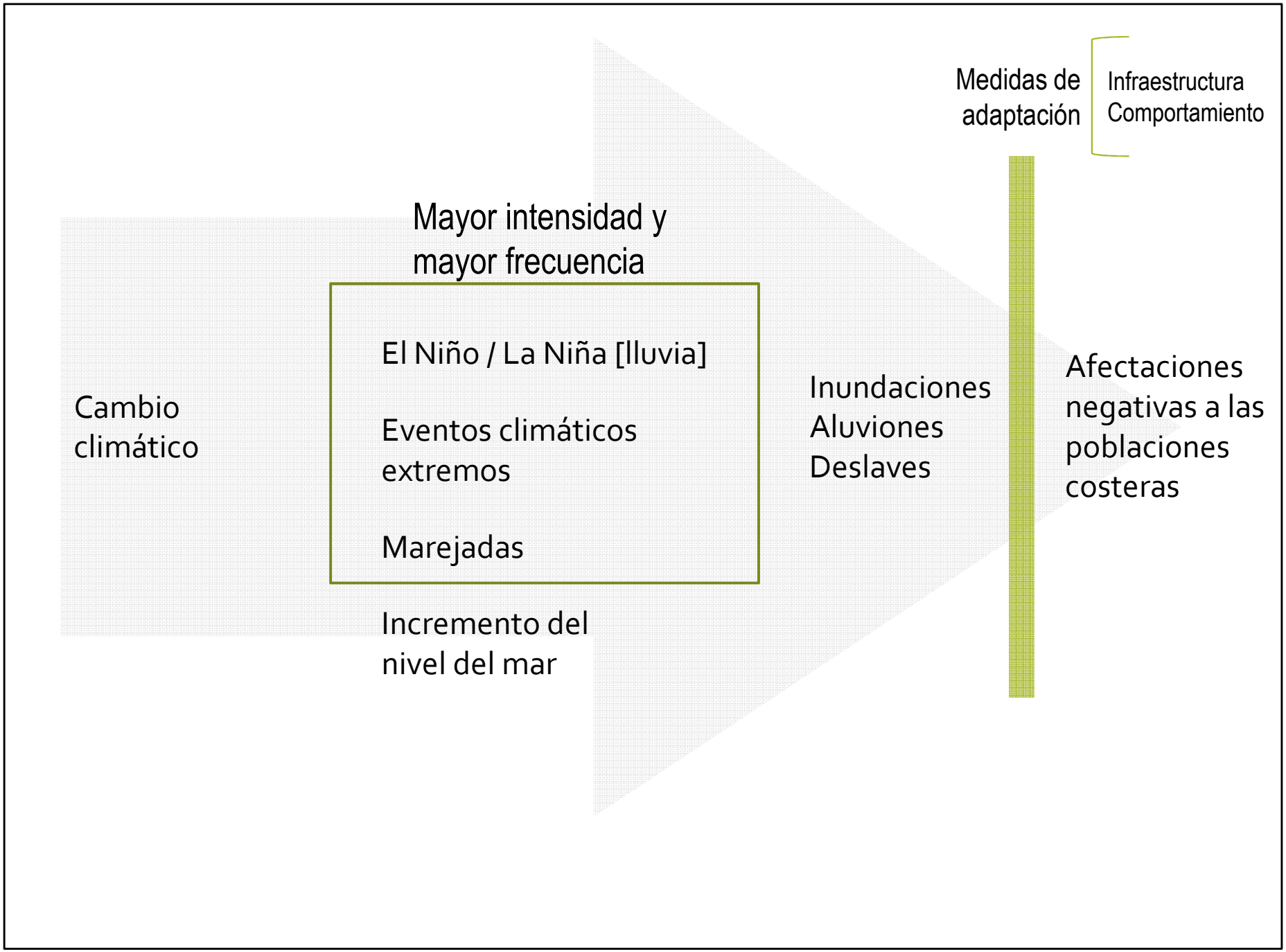
Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Similitudes

1. Ciudades costeras
2. Vulnerables a impacto de El Niño / La Niña = inundaciones, deslaves, aluviones
3. Vulnerables a tsunamis
4. Vulnerables a incremento en el nivel del mar

Diferencias

1. Índice de capacidad de adaptación. Antofagasta 9.40 / Esmeraldas 4.44 / Taltal no datos
2. Cultura y costumbres. Esmeraldas – clima tropical húmedo / afroecuatoriana. Antofagasta – clima árido templado
3. Tamaño y población: Antofagasta 390 mil / Esmeraldas 174 mil / Taltal 10 mil.
4. Economía. Antofagasta centrada en minería cobre. Esmeraldas mixta: pesca, turismo, portuaria petróleo.


Medidas de adaptación
Infraestructura
Comportamiento
Mayor intensidad y mayor frecuencia
El Niño / La Niña [lluvia]
Eventos climáticos extremos
Marejadas
Incremento del nivel del mar
Cambio climático
Inundaciones
Aluviones
Deslaves
Afectaciones negativas a las poblaciones costeras

Objetivo

Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.

5 años
USD 12,880,000

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador

Componente	Resultados esperados	Productos esperados	País
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
		6.2. Iniciativa de Narradores iniciada [USD 585,937]	Chile Ecuador
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 440,937]	Chile Ecuador
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 589,937]	Chile Ecuador
Subtotal			11,914,926
Costos administración			965,04
Total			12,880,000

GRACIAS

Anexo 3. Marco de resultados del proyecto.

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costera urbanas y semiurbanas en las ciudades de América Latina

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
		6.2. Iniciativa de Narradores iniciada [USD 585,937]	Chile Ecuador
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Subtotal			11,914,926
Costos administración			965,04
Total			12,880,000

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina

Memoria

Taller de consulta en la Isla Luis Vargas Torres

Esmeraldas

República de Ecuador

24 de junio de 2017

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Anexos

Introducción

El Ministerio de Medio Ambiente de Chile (MMA) y el Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - banco de desarrollo de América Latina - presentaron al Fondo de Adaptación la iniciativa del Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de América Latina. Esta iniciativa regional incluye tres ciudades costeras: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador. El Fondo de Adaptación fue establecido en 2001 para financiar proyectos y programas concretos de adaptación en los países en desarrollo. El fondo es un mecanismo financiero de la Convención Marco de las Naciones Unidas sobre el Cambio Climático y el Protocolo de Kioto.

La iniciativa en mención fue presentada a consideración del Fondo de Adaptación a nivel de pre-concepto, el cual fue aprobado por dicho fondo a finales del mes de marzo de 2016. A efectos de avanzar en la aprobación final, se requiere formular en detalle el proyecto en colaboración con los actores claves públicos y privados. El 16 de mayo de 2016 se realizó el taller de inicio en la ciudad de Esmeraldas con el objetivo de presentar el pre-concepto a los socios clave, recibir retroalimentación e iniciar el proceso de desarrollo de la propuesta de completa. Un taller de inicio similar se realizó en la ciudad de Antofagasta el 4 de mayo de 2016. El borrador de proyecto fue analizado con los actores clave en Esmeraldas el 22 de julio de 2016, y en Antofagasta el 19 de julio de 2016.

El proyecto incluye el desarrollo de un piloto de sistema de alerta temprana en la isla Luis Vargas Torres. Para esto, seis barrios de la isla comprometieron su participación y contribución al proyecto: 12 de mayo, Cordero Crespo, 20 de noviembre, Pianguapi, 29 de agosto, y Habana.

El Fondo de Adaptación ha revisado la propuesta de proyecto y ha requerido que se haga consultas adicionales a los actores clave locales de las comunidades donde intervendrá el proyecto. Consecuentemente, se han organizado reuniones de consulta con los actores locales en las ciudades de Esmeraldas (Cerro Gataso e Isla Luis Vargas Torres), Antofagasta y Taltal.

La presente memoria presenta los resultados de la reunión de consulta realizada con los actores locales de los barrios con los que trabajará el proyecto en la isla Luis Vargas Torres (ciudad de Esmeraldas). La reunión fue convocada por la Dirección Provincial de Esmeraldas del Ministerio del Ambiente, en coordinación con las directivas de los barrios. La reunión se realizó en la Escuela Leonidas Grueso George el 24 de junio de 2017 a las 10:00 h (Foto 1).

Agenda

La reunión tuvo los siguientes elementos:

09:30	Registro de participantes
10:00	Bienvenida
10:15	Estado del proceso de preparación del proyecto
10:30	Presentación del borrador de proyecto
11:15	Mesas de trabajo acciones para el proyecto
12:15	Plenaria
13:00	Cierre del evento

Foto 1. Escuela Escuela Leonidas Grueso George en la Isla Luis Vargas Torres.

Bienvenida

La bienvenida estuvo a cargo del Señor Exon Bone Lasso, director de la escuela Leonidas Grueso George, Rosa Ana González del Ministerio del Ambiente, y Dayana Vega de la Corporación Andina de Fomento (CAF) (Foto 2). Ellos agradecieron la asistencia de los participantes y proveyeron información sobre el marco general de la reunión. Participaron en la reunión 44 moradores del barrio (37 mujeres y 7 hombres), hubo un amplio rango de edades entre 21 y 91 años. El registro de asistencia está en el Anexo 1.

Estado del proceso de preparación del proyecto

Dayana Vega de CAF, resumió el proceso de preparación de la propuesta de proyecto (Foto 3). El concepto de proyecto fue aprobado en marzo de 2016, y la propuesta completa fue presentado en octubre de 2017. Los comentarios y observaciones del Fondo de Adaptación se están procesando y se prevé presentar la nueva versión del documento de proyecto en agosto de 2017. En caso de ser aprobado, el proyecto iniciaría la ejecución en 2018.

Foto 2. Bienvenida a cargo de Exon Bone (arriba), Dayana Vega (medio), y Rosa Ana González (abajo).

Presentación del borrador del proyecto regional

La presentación estuvo a cargo de Segundo Coello, consultor de CAF para la preparación del documento de proyecto. La presentación está en el Anexo 2. Los participantes recibieron una copia del marco de resultados, la misma que se adjunta en el Anexo 3.

Foto 3. Dayana Vega de CAF explica los avances en la preparación del proyecto.

Se indicó que este es un proyecto regional con financiamiento no-reembolsable del Fondo de Adaptación, cuyo fin es apoyar la implementación de medidas de adaptación al cambio climático global. En el proyecto colaboran los gobiernos de Chile y Ecuador. La agencia implementadora es la CAF, y la entidad ejecutora en Ecuador es el Ministerio del Ambiente.

El objetivo del proyecto es “reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.” Es un proyecto de cinco años, con un financiamiento total de USD12,880,000. El proyecto implementará acciones en tres ciudades: Antofagasta y Taltal en Chile, y Esmeraldas en Ecuador.

Se recordó que el proyecto fue presentado y aprobado por el Fondo de Adaptación como pre-concepto. Los sitios de intervención y principales ideas de acción se delinearon en el taller de inicio que se realizó en Esmeraldas el 16 de mayo de 2016. Posteriormente, se afinó la propuesta y se la presentó para validación y ajustes finales en el taller realizado el 22 de julio de 2016 en Esmeraldas. Se destacó que varios de los presentes participaron en estas reuniones.

Se explicó cada uno de los resultados y productos incluidos en la propuesta de proyecto, y que se resumen en el Anexo 3.

Los participantes hicieron varias preguntas para aclarar dudas respecto a la propuesta del proyecto. Se expresó la urgencia de tomar medidas para resguardar a las personas durante las inundaciones. La gente se da cuenta cuando el agua ya está subiendo y se dañan las cosas de las casas.

Trabajo en grupos

Los participantes conformaron cuatro grupos (Foto 4). En cada grupo, los participantes revisaron en detalle el marco de resultados del proyecto. Una persona del equipo de trabajo acompañó cada grupo para proveer información y aclarar dudas. Cada grupo nombró un relator, quien presentó los resultados en la plenaria.

Plenaria

El primer grupo presentó sus análisis y propuestas (Foto 5 y Foto 6). El grupo estuvo de acuerdo en que se prepare un plan de infraestructura verde para la ciudad. Pero, les preocupó cómo sembrar árboles en las riveras si la tierra se está yendo. Sugirieron considerar construir un muro en las riveras, que sostenga la tierra, y luego sembrar los árboles.

Para el sistema de alerta temprana se sugirió que el botón de alerta esté en un lugar seguro, con responsabilidad, para evitar falsas alarmas. También se sugirió que el aviso de evacuación sea por mensaje celular y que haya albergues seguros. Sin embargo, se mencionó que hay que tener en cuenta que la luz es lo primero que se va cuando hay inundación.

Se indicó que los puentes peatonales que sirven para evacuar están en mal estado. El municipio debería construir un quinto puente.

El grupo estuvo de acuerdo con la preparación de un plan de infraestructura verde para la ciudad. Sin embargo, sugieren que se construya muros or rellenos para proteger la isla. Luego sembrar árboles como chiparos, mambla y mangle.

También estuvieron de acuerdo con la instalación del radar, pero sugirieron que se tenga en cuenta la precisión y durabilidad del equipo.

Sobre el piloto de alerta temprana, indicaron que falta capacitación en la población sobre las rutas de evacuación. Indicaron que hay que tener en cuenta que las vías de acceso estén en buen estado y de ser posible que se amplíen.

El tercer grupo presentó sus resultados. Estuvieron de acuerdo con preparar el plan de infraestructura verde para la ciudad. Para esto recomendaron sembrar árboles en la ribera del río y proteger las áreas de manglar existentes.

Con respecto al sistema de alerta temprana, sugiriron que se instale el radar en el sitio más adecuado. Además, la alarma debe darse con suficiente tiempo para tomar medidas.

Foto 4. Trabajo en grupos.

Foto 5. Presentación de resultados del grupo 1.

Para el piloto en la isla, se sugirió confomar un grupo de mujeres organizadas y capacitadas para que trabajen y capaciten con la comunidad.

Al grupo le interesó la idea de los narradores. Indicaron que es muy importante informar lo vivido y las experiencias a los hijos y nietos.

El cuarto grupo destacó que en la inundación del 25 de enero de 2016 se inundó toda la isla y las familias perdieron sus cosas. Creen que se necesita un relleno hidráulico para subir el nivel de la isla.

Con respecto al sistema de alerta temprana, se recomendó que se avise a la población con por lo menos una hora de anticipación. Indicaron que muchos moradores ya conocen la ruta de evacuación, pero que que es necesario que todos sepan por donde evacuar.

Finalmente, consideraron importante que se continúe la siembra de manglar en la ribera para proteger la isla.

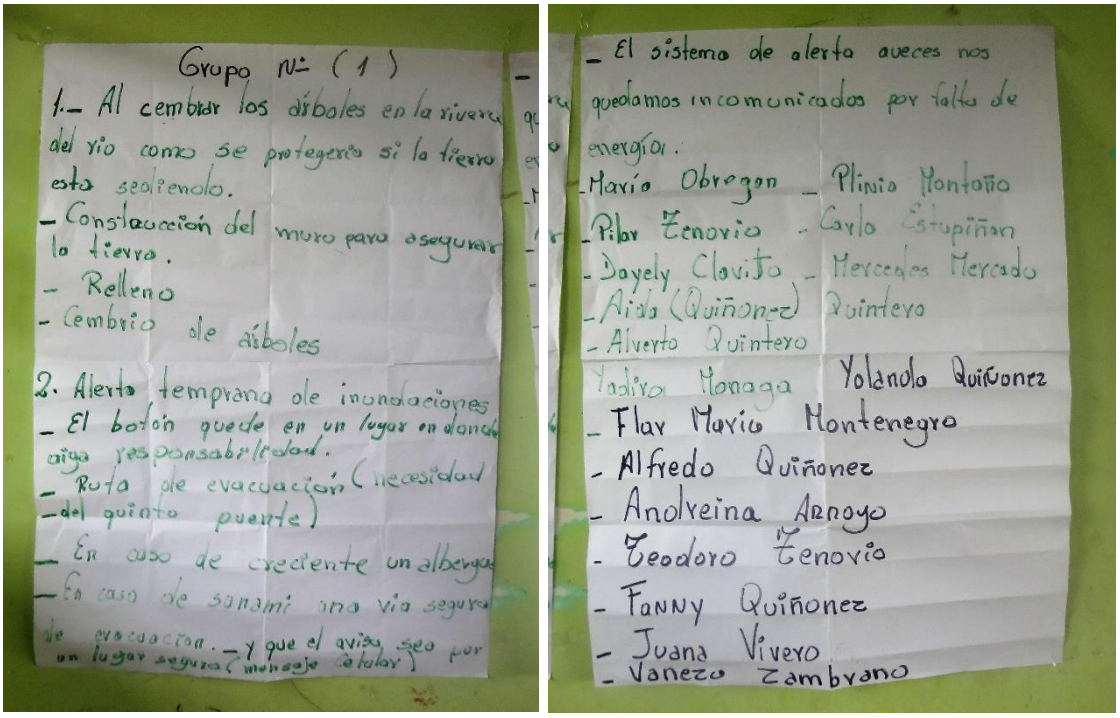

Foto 6. Papelógrafos del grupo 1.

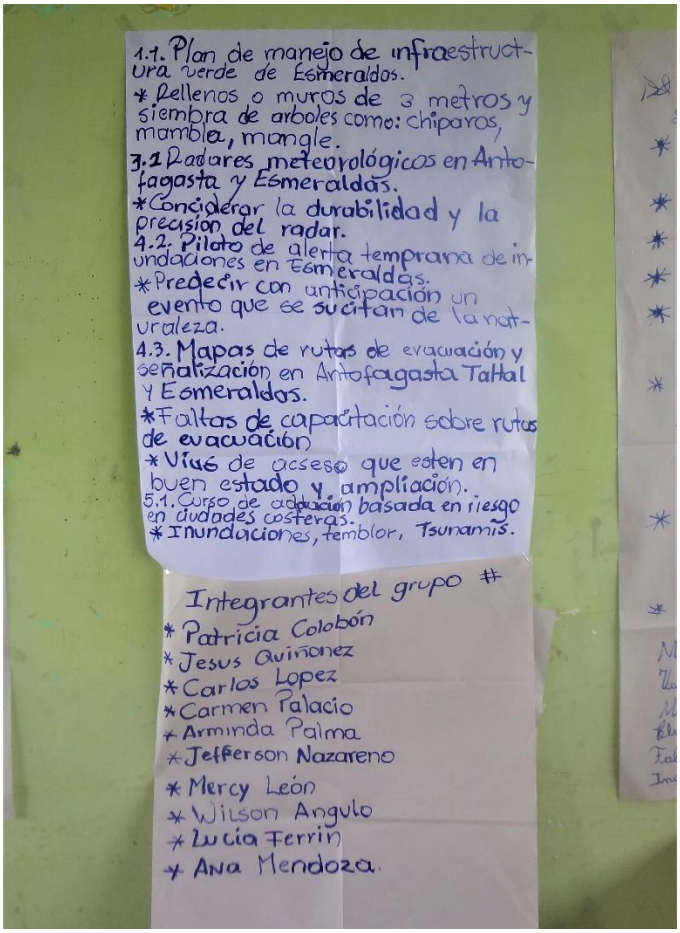

Foto 7. Papelógrafos del grupo 2.

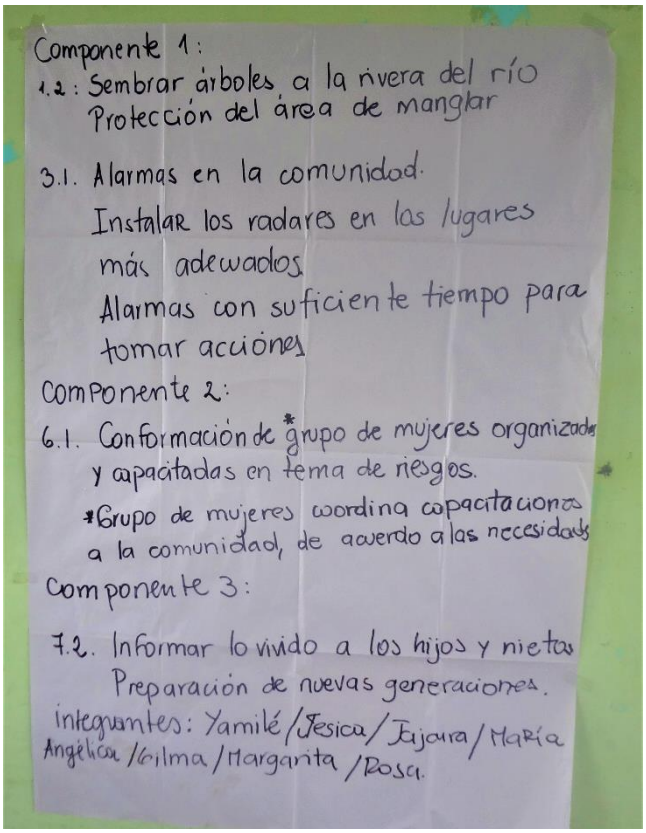

Foto 8. Papelógrafos del grupo 3.

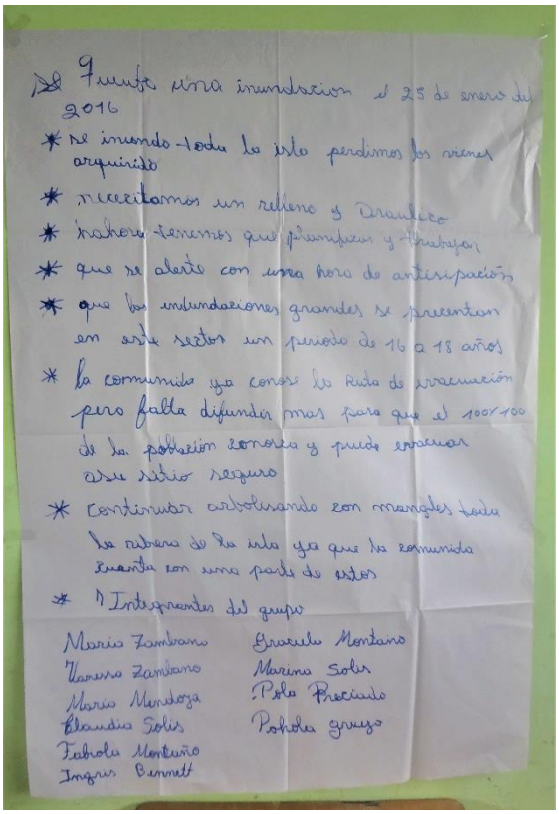

Foto 9. Papelógrafos del grupo 4.

Foto 10. Presentación del grupo 2.

Foto 11. Presentación del grupo 3.

Foto 12. Presentación del grupo 4.

Cierre del evento

La clausura estuvo a cargo del Señor Exon Bone Lasso, director de la escuela Leonidas Grueso George, Rosa Ana González del Ministerio del Ambiente, y Dayana Vega de la Corporación Andina de Fomento (CAF). Ellos agradecieron la participación y contribuciones de los asistentes.

Foto 13. Dayana Vega (CAF) y Rosa Ana González (MAE) en la clausura del evento.

Foto 14. Foto grupal al cierre del evento.

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
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Versión: 02		Página:

EVENTO: Reuniones consultivas. Proyecto Regional: Isla Luis Vargas Torres - Esmeraldas.

LISTA DE PARTICIPANTES

FECHA: 24/06/2017 HORA:

N°	NOMBRE	CARGO	INSTITUCIÓN / ÁREA MAE	CORREO ELECTRONICO	TELEFONOS	FIRMA
1	Mario Zambrano	56	Isla Luis Vargas Torres		0999105777	Mario Zambrano
2	Lucia Ferrin	34	Isla Luis Vargas T.		096920 1910	Lucia Ferrin
3	Claudia Solis	37	Isla Luis Vargas T.		0939254898	Claudia Soto
4	FABiola montaño	50	Isla Luiz Balgador		0991152029	FABiola
5	Gracilla Montaño	50	isla Lus Bolgodor		0959747794	Gracilla Montaño
6	Nifforon Nazareno	32	Isla Luis Vargas T.		0967566174	[signature]
7	Ana Mendoza	24	Isla Luis V.	AnitalaBonita1993@hotmail	0990842416	[signature]
8	PATRICIA COLOBON	21	ISLA L. TORRES		0993796621	[signature]
9						

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
Fecha de revisión:	REGISTRO DE ASISTENCIA	Código: MAE-REG-PRO-01.6
Versión: 02		Página:

EVENTO: Reuniones consultivas, Proyecto Regional en la Isla Luis Vargas Torres.

FECHA: 29/06/2017 HORA: ----------

LISTA DE PARTICIPANTES

Nº	NOMBRE	CARGO	INSTITUCIÓN / ÁREA MAE	CORREO ELECTRONICO	TELEFONOS	FIRMA
1	Ingrid Maribel Bennett Mina	28	Isla Luis Vargas T.		0959595251	Ingrid Bennett M
2	Angelica Toma Mina	28	Isla Luis vargas T.			Angelica Toma
3	Morima Solis.	49	Isla Luis Vargas T.			Morima Solis
4	Margarita Bateja	67	Isla Luis Vargas T.		0997095761	Margarita Bateja
5	Diona Mercado	31	Isla Luis V. T.			
6	Rosa Mina	47	isla luis			Rosa M
7	Apolinaria Preciado	65	isla luis vargas T.		0985091622	
8	JANAIRA QUIÑONEZ	22	isla luis V. T.		0985091622	
9	Carlos Lopez Molina	63	Isla Luis V. T.		0800411183	Carlos Lopez

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
Fecha de revisión: Versión: 02	REGISTRO DE ASISTENCIA	Código: MAE-REG-PRO-01.6 Página:

EVENTO: Reuniones consultivas Proyecto Regional Luis Vargas Torres

FECHA: 24/06/2017 HORA: ----------

LISTA DE PARTICIPANTES

N	NOMBRE	CARGO	INSTITUCIÓN / ÁREA MAE	CORREO ELECTRONICO	TELEFONOS	FIRMA
1	Yolanda Quiñonez	48	Isla bargot		0971992025-1	
2	Andreina Arroyo	21	Isla luis Vargas Torres	andreinaarroyo@hotmail.	0997517325	
3	Flor María Montenegro	50	Isla luis Vargas torres		0968394463	Flor Montenegro
4	Gloria Quiñonez	62	Isla luis Vargas to		0997517325	Gloria Quiñonez
5	Yadira Monaca	25	Isla luis Vargas tores			Yadira Monaca.
6	Yamileth Giron	18	Isla l u t		0939232960	Yamileth Giron
7	Jessica Quiñonez	19	Isla luis Vargas torre	Jessicitalahermosha@hot	0939968317	Jessica Quiñonez
8	Cinthia Arroyo	23	Isla Luis Vargas Torres		0967274716	Cinthia Arroyo
9	Arminda Palma	37	Isla luis Vargas		0989729084	Arminda Palma

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
Fecha de revisión:	REGISTRO DE ASISTENCIA	Código: MAE-REG-PRO-01.6
Versión: 02		Página:

EVENTO: Reuniones consultivas proyecto Regional en Isla Luis Vargas T.

LISTA DE PARTICIPANTES

FECHA: 24/06/2017 HORA:

Nº	NOMBRE	CARGO	INSTITUCIÓN / ÁREA MAE	CORREO ELECTRONICO	TELEFONOS	FIRMA
1	[illegible]	80 años	[illegible]			[firma]
2	Carmen J. Palacio	59 años	Isla luis V. torres	nuevo desporto2658@hotmail.com	0992629162	[firma]
3	Alberto Quiñonez Valencia	Dirigente de la FECHE	Isla Luis Borges Torres	—	0994663533	[firma]
4	Plinio Montaño	91 años	" " "		0997813548	[firma]
5	Aida Quintero	50	Isla Borgatorre		0994274964	[firma]
6	Dayely Clavijo Quintero	13	Isla Luis Vargas Torres	clavijodayely@gmail.com	0994274964	Dayely Clavijo.
7	Carla Estupiñan	20 años	" " "			Carla Estupiñan
8	Mercedes Mercado	58	Isla luis Borgo		0994704633	[firma]
9	[illegible] Luis Vera	76	isla luis borgoto			[firma]

Ministerio del Ambiente	MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos	
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EVENTO: Reuniones consultivas Luis Vargas Torres

FECHA: 24/06/2017 HORA: ----------

LISTA DE PARTICIPANTES

N°	NOMBRE	CARGO	INSTITUCIÓN / ÁREA MAE	CORREO ELECTRONICO	TELEFONOS	FIRMA
1	Tommi Tenorio	49 / Femenino Morador	Isla Vargas		0967371295	Tenorio
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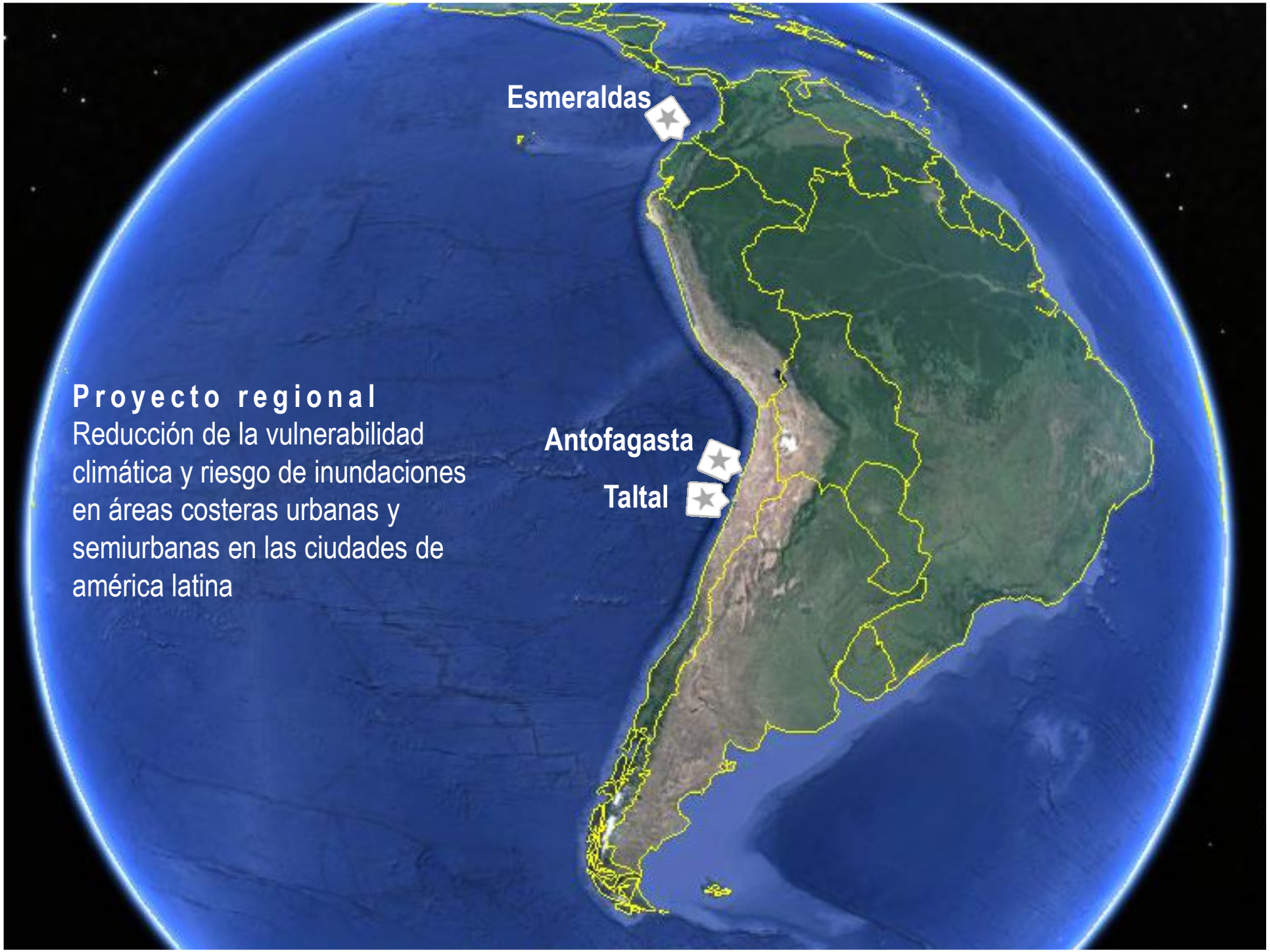
3	Vanessa Zambrano	34 Femenino Moradora	isla Luis VargasT		0990527429	Vanessa Zambrano
4	Dilsa Tenorio	64	Isla Luis Vargas		0971929192	Dilsa Tf
5	Maribel Quiñonez	39	isla Vargas Torres		0988373154	~~Maribel~~
6	Elodoria Tenorio	74	isla Luis Vargas			Elodoria Tenorio
7	Juana Viveros	32 / F	" "		0987479588	Juana Viveros
8	Alexandra Miranda Tenorio	21	isla Luis Vartorres			Miranda
9	Jesus M Ortiz.	75	Isla Bongotora			Jesus M Ortiz

PRESENTACIÓN DEL BORRADOR DE PROYECTO REGIONAL

Taller de consulta

Proyecto Regional Chile – Ecuador



Proyecto regional

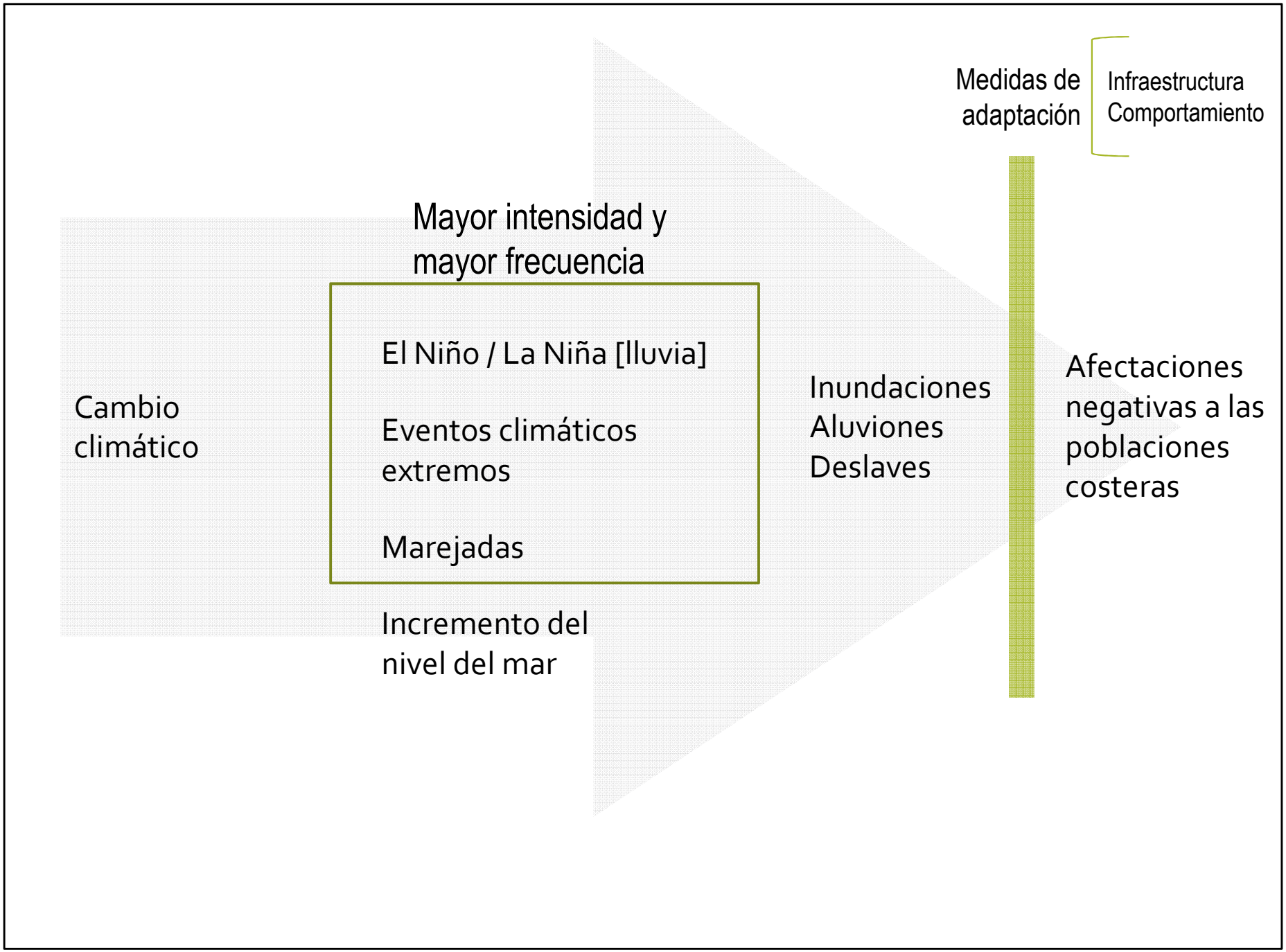
Reducción de la vulnerabilidad climática y riesgo de inundaciones en áreas costeras urbanas y semiurbanas en las ciudades de américa latina

Similitudes

1. Ciudades costeras
2. Vulnerables a impacto de El Niño / La Niña = inundaciones, deslaves, aluviones
3. Vulnerables a tsunamis
4. Vulnerables a incremento en el nivel del mar

Diferencias

1. Índice de capacidad de adaptación. Antofagasta 9.40 / Esmeraldas 4.44 / Taltal no datos
2. Cultura y costumbres. Esmeraldas – clima tropical húmedo / afroecuatoriana. Antofagasta – clima árido templado
3. Tamaño y población: Antofagasta 390 mil / Esmeraldas 174 mil / Taltal 10 mil.
4. Economía. Antofagasta centrada en minería cobre. Esmeraldas mixta: pesca, turismo, portuaria petróleo.


Medidas de adaptación
Infraestructura
Comportamiento
Mayor intensidad y mayor frecuencia
El Niño / La Niña [lluvia]
Eventos climáticos extremos
Marejadas
Incremento del nivel del mar
Cambio climático
Inundaciones
Aluviones
Deslaves
Afectaciones negativas a las poblaciones costeras

Objetivo

Reducir la vulnerabilidad a inundaciones relacionadas con el clima en tres ciudades costeras por medio de incorporar un enfoque adaptación basada en gestión de riesgos, construir colaboración y redes, y desarrollar una cultura de adaptación.

5 años
USD 12,880,000

Componente 1. Acciones prioritarias para incrementar la resiliencia.

Componente 2. Fortalecer capacidades para adaptación.

Componente 3. Tecnologías de información y colaboración y alianzas entre ciudades costeras de Latinoamérica.

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador

Componente	Resultados esperados	Productos esperados	País
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
		6.2. Iniciativa de Narradores iniciada [USD 585,937]	Chile Ecuador
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 440,937]	Chile Ecuador
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 589,937]	Chile Ecuador
Subtotal			11,914,926
Costos administración			965,04
Total			12,880,000

GRACIAS

Anexo 3. Marco de resultados del proyecto.

Proyecto Regional de Reducción de la Vulnerabilidad Climática y Riesgo de Inundaciones en áreas costera urbanas y semiurbanas en las ciudades de América Latina

Componente	Resultados esperados	Productos esperados	País
1. Acciones prioritarias para incrementar la resiliencia	Resultado 1. Planes mejorados e infraestructura verde reducen la vulnerabilidad a inundaciones, deslaves y aluviones en tres ciudades costeras	1.1. Plan de manejo de aguas lluvias de Antofagasta [USD 418,472]	Chile
		1.2. Plan de infraestructura verde de Esmeraldas [USD 323,392]	Ecuador
	Resultado 2. Menor vulnerabilidad a inundaciones, deslaves y aluviones en dos ciudades costeras	2.1. Infraestructura de control aluvional en Antofagasta [USD 4,637,592]	Chile
		2.2. Obras de mitigación de deslaves en Esmeraldas [USD 2,440,392]	Ecuador
	Resultado 3. Mejoras en el monitoreo climático y formas de alertar a la población local	3.1. Radares meteorológicos en Antofagasta y Esmeraldas [USD 1,136,937]	Chile Ecuador
		3.2. Mayor número de estaciones meteorológicas en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
	Resultado 4. Formas mejoradas para responder a inundaciones, deslaves y aluviones	4.1. Sistemas de alerta temprana robustecidos en Antofagasta Taltal [USD 250,392]	Chile
		4.2. Piloto de alerta temprana de inundaciones en Esmeraldas [USD 120,992]	Ecuador
		4.3. Mapas de rutas de evacuación y señalización en Antofagasta, Taltal y Esmeraldas [USD 136,937]	Chile Ecuador
2. Fortalecer capacidades de adaptación	Resultado 5. Gobiernos locales con mayor capacidad para diseñar e implementar medidas de adaptación	5.1. Curso de adaptación basada en riesgos en ciudades costeras [USD 229,937]	Chile Ecuador
	Resultado 6. Población local y personal gubernamental con mayor conocimiento de riesgos climáticos (inundación, deslave, aluvión)	6.1. Estrategias de comunicación y educación ciudadana para Antofagasta, Taltal and Esmeraldas. [USD 436,137]	Chile Ecuador
		6.2. Iniciativa de Narradores iniciada [USD 585,937]	Chile Ecuador
3. Tecnologías de comunicación e información y alianzas entre ciudades costeras de América Latina	Resultado 7. Las lecciones y buenas prácticas sobre reducir la vulnerabilidad eventos climáticos de inundación, deslaves y aluviones en ciudades costeras han sido compartidas en la región	7.1. Plataforma electrónica para facilitar la comunicación entre actores clave y la diseminación de lecciones y buenas prácticas [USD 440,937]	Chile Ecuador
		7.2. Lecciones y buenas prácticas documentadas y diseminadas [USD 589,937]	Chile Ecuador
Subtotal			11,914,926
Costos administración			965,04
Total			12,880,000

Annex 5. Terms of reference

Project Board

The Project Board will oversee and provide strategic guidance to the project. The Project Board will be formed by the Undersecretary of Environment (MMA, Chile), the Undersecretary of Climate Change (MAE, Ecuador), and CAF´s Climate Change Coordinator. The Project Manager will act as secretary and participate in the meetings without voting.

The Project Board will make management decisions when guidance is required by the Project Manager, including recommendation for CAF/Responsible Entities approval of project plans and revisions. Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. Decision will be taken by consensus. In case a consensus cannot be reached within the Board, final decision shall rest with CAF´s Climate Change Coordinator.

The Project Board will be responsible for: (1) monitoring the implementation of the project, (2) approving the annual budget and annual work plan prepared by the Project Manager, (3) review the annual project report (PPR) and provide comments and recommendations, (4) approve major changes to the plan or project strategy, (5) evaluate the performance of the project, analyse the mid-term review and terminal evaluation of the project, and provide comments and recommendations, and (6) arbitrate conflicts that may arise.

The Project Board shall have in-person or virtual meetings at least twice a year. The chair of the board will alternate annually between the Undersecretary of Environment (MMA, Chile) and the Undersecretary of Climate Change (MAE, Ecuador)). The Project Board may be extraordinarily convened by the chairperson upon request by members.

Project Manager

The Project Manager (PM) leads the project unit and runs the project on behalf of the Responsible Entities to ensure that the project produces the outputs and outcomes specified in the project document to the required standard of quality and within the specified constraints of time and cost. This person will work in close cooperation and coordination with, and oversee, the Executing Entities in Chile and Ecuador.

The PM will be contracted for 60 months with Adaptation Fund resources. This will supervise the eight specialists that conform the project unit. The Project Manager function will end when the final project terminal evaluation report, and

other documentation required by the Adaptation Fund and CAF, has been completed and submitted to CAF (including operational closure of the project).

The PM will:

a. Be the signing authority of requests for disbursements of project funds.
b. Ensure the logistical, administrative and financial effectiveness of the executing entities in fulfilling its roles set out above
c. To this end, provide monitoring, supervision and guidance to the country teams.
d. Promote incidence in and coordination with the executing entities, the responsible entities, the donor agencies that support them, and any other relevant entity.

In addition, the PM -- with the assistance of the responsible entities -- will manage the following:

a. Preparation of project reports, work plans, budgets and accounting records.
b. Drafting of terms of reference, technical specifications and other documents.
c. Identification of consultants and supervision of consultants and suppliers,
d. Overseeing the implementation of project activities in a timely and efficient way.
e. Supervise and provide administrative support to the national platform coordinators.
f. Maintain contacts with project partners at the national and international level.
g. Organization of seminars, workshops and field trips, which are linked to project activities.

The PM will provide leadership and guidance for the implementation of the project´s adaptation measures. This person, in close coordination with the responsible entities, will produce in a timely fashion annual work plans and budgets to be approved by the Project Board, and quarterly operational and annual progress reports (PPR) for submission to the Project Board. The reports will provide details about the progress made, any shortcomings and the necessary adjustments made to achieve project outcomes. The Project Manager will also be responsible for any national or international service provider and the recruitment of specialist services.

The Project Manager will have strong experience in (i) climate change adaptation (preferably in coastal zones), and (ii) project administration. This person must have deep understanding of development of communities of practice and disaster risk reduction. This person must be fully bilingual (Spanish and English).

Electronic Media Specialist

The Electronic Media Specialist (EMS) will be responsible for the development and operation of the project´s electronic platform, which includes a web-based communication platform to facilitate interaction and virtual meetings among project participants and an array of media to document and disseminate information and lessons. This person will ensure that the corresponding outputs and outcomes specified in the project document are generated to the required standard of quality and within the specified constraints of time and cost.

The EMS will be contracted for 60 months with AF resources. This person will be supervised by the Project Manager. The EMS will ensure close collaboration and team work with the Lead adaptation specialist, the three local adaptation specialists and the Monitoring and Evaluation Specialist.

The Electronic Media Specialist will be responsible to:

a. Provide strategic advice on electronic means for knowledge management, communication among project participants and dissemination of information of the project.
b. Establish and operate the web-based communication platform (e.g., SKYPE for business / WebEx) to facilitate interaction and virtual meetings among project participants.
c. Establish and operate the platforms of information and communication of the project (e.g., website, YouTube channel, accounts in social networks, email distribution list) and will ensure linkage with the websites of participating entities.
d. Ensure that the information and the communication platform are secure.
e. Provide technical support and advice to project participants to better use and have the maximum benefit from the project´s electronic platform.
f. Ensure prompt delivery of project outputs and the generation of project outcomes.
g. Maintain proper communication and collaboration with key stakeholders, responsible entities, and executing entities.
h. Maintain proper collaboration and coordination with the other members of the project team.
i. Contribute to the preparation of the proposed annual work plan and budget for component 3 of the project.
j. Provide information and support for the mid-term and final project assessments.

The Electronic Media Specialist will have experience in the development and operation of websites and electronic channels and media, preferably with prior experience in climate change, disaster risk management and/or coastal management and participation in international projects.

Lead adaptation specialist

The Lead adaptation specialist (LAS) will (i) provide support for the implementation of the project´s adaptation measures, (ii) facilitate coordination and articulation among project partners, and (iii) guide the development of communication and education on project activities. This person will ensure that the corresponding outputs and outcomes specified in the project document are generated to the required standard of quality and within the specified constraints of time and cost.

The LAS will be contracted for 60 months with AF resources. This person will be supervised by the Project Manager. The LAS will supervise the work of the three adaptation specialists based in Antofagasta, Taltal and Esmeraldas, and will ensure close collaboration and team work with the Electronic Media Specialist and the Monitoring and Evaluation Specialist.

The Lead adaptation specialist will be responsible to:

a. Provide strategic guidance for the implementation of the project´s adaptation measures.
b. Provide strategic advice and guidance for the development and implementation of strategies on public education, communication, participation, and articulation among key stakeholders and project participants.
c. Oversee the preparation and implementation of the communication strategy for specific groups and sites.
d. Establish the methods and procedure to systematically document the project experience and prepare learning experience documents.
e. Provide technical support and advice to project participants to facilitate the development of the communities of practice and documenting their experience and lessons.
f. Prepare materials for the press, write content and news for the project website, and maintain the social media accounts of the project´s electronica platform (e.g., YouTube channel, Facebook).
g. Ensure a continuous flow of information and news towards project web portal and other media channels.
h. Organize in-person and virtual meetings and exchange visits to facilitate networking and exchange among project´ participants.
i. Organize and communicate project events (e.g., meetings, workshops).
j. Closely collaborate with the Electronic Media Specialist to ensure that news and information is posted and disseminated, in different formats, through the project´s electronic platform.
k. Ensure prompt delivery of project outputs and the generation of project outcomes.

l. Maintain proper communication and collaboration with key stakeholders, responsible entities, and executing entities.
m. Maintain proper collaboration and coordination with the other members of the project team.
n. Contribute to the preparation of the proposed annual work plan and budget for the project.
o. Provide information and support for the mid-term and final project assessments.

The Lead adaptation specialist will have strong practical experience in climate change adaptation, preferably in coastal zones. In addition, this person must have practice in educational communication, preferably with prior experience in disaster risk management, climate change and / or coastal management. Previous participation in international projects will be a major asset. Previous experience and deep knowledge of the development of communities of practice will be a major quality. This person must be fully bilingual (Spanish and English).

Adaptation specialist

The Adaptation specialist will contribute to coordination of local activities and the development of communication and education on project activities. This person will ensure that the corresponding outputs and outcomes specified in the project document are generated to the required standard of quality and within the specified constraints of time and cost.

There will be three adaptation specialists to be based in Antofagasta, Taltal and Esmeraldas. Each adaptation specialist will be contracted for 60 months with AF resources, and will be supervised by the Lead adaptation specialist. The adaptation specialist will ensure close collaboration and team work with the Electronic Media Specialist and the Monitoring and Evaluation Specialist.

The adaptation specialist based in Antofagasta will oversee the work of the specialist based in Taltal, ensuring coordinated team work. This person will also lead the narrators´ initiative in the two countries, under the supervision of the Lead adaptation specialist. This person will coordinate and catalyse implementation of the narrators´ initiative in Antofagasta and Taltal, and will supervise, on this matter, the specialist based in Esmeraldas.

The adaptation specialist will be responsible to:

a. Coordinate local actions to ensure prompt implementation of the project´s adaptation measures.
b. Contribute to the development and implementation of strategies on public education, communication, participation, and articulation among key stakeholders and project participants.

c. Participate in the preparation and implementation of the communication and public education strategy for specific groups and sites.
d. Apply the established methods and procedures to systematically document the project experience and prepare learning experience documents.
e. Give technical support and advice to project participants to facilitate the development of the communities of practice and documenting their experience and lessons.
f. Organize in-person and virtual meetings and exchange visits to facilitate networking and exchange among project´ participants.
g. Closely collaborate with the Electronic Media Specialist to ensure that news and information is posted and disseminated, in different formats, through the project´s electronic platform.
h. Ensure prompt delivery of project outputs and the generation of project outcomes.
i. Maintain proper communication and collaboration with key stakeholders, responsible entities, and executing entities.
j. Maintain proper collaboration and coordination with the other members of the project team.
k. Contribute to the preparation of the proposed annual work plan and budget for the project.
l. Provide information and support for the mid-term and final project assessments.

The adaptation specialist will have practical experience in climate change adaptation, preferably with prior experience in climate change, disaster risk reduction, and / or coastal management. Prior experience in educational communication is a key requirement. Also, previous experience and deep knowledge of the development of communities of practice will be a major asset.

Monitoring and Evaluation Specialist

The Monitoring and Evaluation Specialist (MES) will be contracted with AF resources for 60 months, and will be responsible for monitoring the progress of the project to ensure that the products and results are achieved within the specified constraints of time and cost. This person will be supervised by the Project Manager.

The Monitoring and Evaluation Specialist will be responsible to:

a. Compile and systematize information on the indicators of the project and the Adaptation Fund Results Tracker.
b. Monitor and document the development to the site-specific actions.
c. Verify that the activities are implemented according to the annual work-plan and budget.

d. Ensure the implementation of the project´s monitoring and evaluation plans.
e. Warrant that the Adaptation Fund Results Tracker is updated at mid-term and at the end of the project.
f. Provide necessary information, input and support for the mid-term review and terminal evaluation of the project.
g. Prepare quarterly reports with recommendations for the Project Manager.

This person will have experience in monitoring and evaluation of projects and initiatives related to climate change, disaster risk management and / or coastal management, preferably with prior experience in monitoring international projects. This person must be fully bilingual (Spanish and English).

Accounting and administration assistant

There will be two Accounting and Administration Assistants to be based in Antofagasta and Esmeraldas. This post will be hired with AF resources for 60 months, and will be supervised by the Project Manager. The Accounting and Administration Assistant will keep the required records, prepare financial and operational information, consolidate accounting information, and will provide direct administration, logistics and finance support to the activities being implemented in both countries. This person must have experience in administration of international projects, and at least working knowledge of English.

Annex 6. Multiyear workplan

Output	Activities	Project partner[1]	Year 1				Year 2				Year 3				Year 4				Year 5			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.1. Stormwater management plans for Antofagasta	Prepare terms of reference and contract specialised firm	MOP		x	x																	
	Update stormwater management plan for Antofagasta				x	x																
	Prepare guidelines to update stormwater management plans to cope with climate-related mudflows in coastal cities.						x	x														
	Workshop to validate the guidelines							x														
	Disseminate guidelines through MOP portal and project´s platform								x	x	x	x	x	x	x	x	x	x	x	x	x	x
1.2. Green infrastructure plan for Esmeraldas	Training on green infrastructure planning for climate-related risk reduction in coastal cities	GADE		x																		
	Situation analysis and recommendations for green infrastructure enhancement in Esmeraldas			x	x																	
	Design of green infrastructure plan with emphasis in protection from flooding and landslides.					x	x	x	x													
	Socialise and adopt green infrastructure plan								x	x												
	Update municipal regulations to foster implementation of green infrastructure								x	x												
	Demonstration pilot stabilization of cerro Gataso hillsides to control landslides.									x	x	x	x	x	x	x	x					
	Declare protected forests the reforested hillsides													x	x	x	x					
2.1. Mudflow control infrastructure in Antofagasta	Prepare terms of reference and contract specialised firm	MOP					x	x														
	Updated the design for mudflow control infrastructure in quebrada Bonilla incorporating climate-related variables							x	x													
	Prepare terms of reference and contract construction firm									x	x											
	Obtain environmental permit for construction works									x												
	Construct mudlflow control infrastructure in quebrada Bonilla										x	x	x	x								
	Control and oversight of construction works										x	x	x	x								
	Prepare terms of reference and contract specialised firm	GADE			x	x																

[1] The entity responsible for the delivery of the output. This entity leads actions and collaborate with the project team (PT) and other project partners.

Output	Activities	Project partner[1]	Year 1				Year 2				Year 3				Year 4				Year 5			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
2.2. Landslide mitigation works in Esmeraldas	Updated the design for landslide mitigation infrastructure in cerro Gataso incorporating climate-related variables					x	x															
	Prepare terms of reference and contract construction firm							x	x													
	Obtain environmental permit for construction works							x														
	Construct for landslide mitigation infrastructure in cerro Gataso								x	x	x	x										
	Control and oversight of construction works								x	x	x	x										
3.1. Weather radar in Esmeraldas and a storm detection system in Antofagasta	Contract and execute study for best storm detection system siting in Antofagasta (supervised by DMC)	DMC			x																	
	Purchase and install storm detection system in Antofagasta				x	x	x															
	Construction of storm detection system and communication facilities					x	x															
	Training and tutoring of personnel for storm detection system operation and maintenance					x	x	x	x													
	Antofagasta storm detection system operating linked to early warning system									x	x	x	x	x	x	x	x	x	x	x	x	x
	Quarterly storm detection system operation reports.									x	x	x	x	x	x	x	x	x	x	x	x	x
	Contract and execute study for best radar siting in Esmeraldas (supervised by INAMHI)	GADPE			x																	
	Obtain environmental permit for radar in Esmeraldas					x																
	Purchase and install weather radar in Esmeraldas				x	x	x															
	Construction of radar station and communication facilities					x	x															
	Training and tutoring of personnel for radar operation and maintenance					x	x	x	x													
	Esmeraldas weather radar operating linked to early warning system									x	x	x	x	x	x	x	x	x	x	x	x	x
	Quarterly radar operation reports.									x	x	x	x	x	x	x	x	x	x	x	x	x
	INAMHI´s technical assistance and oversight				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas	Prepare analysis for best location of meteorological stations in Antofagasta and Taltal	MOP			x																	
	Purchase and install meteorological stations in Antofagasta and Taltal					x	x															
	Meteorological stations operating linked to early warning system						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Quarterly operation reports.						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Prepare analysis for best location of meteorological stations in Esmeraldas (supervised by INAMHI)	GADPE			x																	
	Obtain environmental permit for meteorological stations in Esmeraldas																					
	Purchase and install meteorological stations in Esmeraldas					x	x															

Output	Activities	Project partner[1]	Year 1				Year 2				Year 3				Year 4				Year 5			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	Meteorological stations operating linked to early warning system						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Quarterly operation reports.																					
	INAMHI´s technical assistance and oversight				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4.1. Enhanced public warning system in Antofagasta and Taltal	Identify best products and technology to complement existing warning systems in Antofagasta and Taltal (focused on mudflows alert) (i.e., sirens, communication network and control centre).	ONEMI			x	x																
	Purchase and install sirens and complementary equipment in Antofagasta and Taltal						x	x														
4.2. Pilot flood warning system in Esmeraldas	Select site for pilot trial	GADE			x																	
	Design flooding early warning system and procedures within existing institutional framework				x	x																
	Assess the condition of the three footbridges and provide basic maintenance					x																
	Identify best equipment for flood warning system (i.e., sirens, communication network and control centre) in collaboration with SGR					x	x															
	Purchase and install sirens and complementary equipment in pilot site							x	x													
	Socialise flooding alert and emergency procedures with local community of the pilot site					x	x	x	x	x	x											
	Flood emergency drills with local community									x				x				x				x
4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	Update mudflows evacuation maps for Antofagasta and Taltal	ONEMI			x	x																
	Publicise evacuation maps in high-transit locations in collaboration with municipal governments and local interest groups.						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Evacuation maps easily available in local websites and social media (i.e., Municipalidad de Antofagasta, Municipalidad de Taltal)						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Signal mudflow evacuation routes and safe areas in Antofagasta and Taltal, coordinated with municipal governments.						x	x														
	Mudflow evacuation drills in Antofagasta and Taltal, coordinated with municipal governments.								x				x				x				x	
	Prepare flooding evacuation map for Esmeraldas (evacuation zones, evacuation routes, and shelters).	GADE			x	x																
	Prepare landslide risk map for Esmeraldas				x	x																
	Signal flooding evacuation routes and safe areas in Esmeraldas						x	x														
	Signal landslide risk areas in Esmeraldas						x	x														

Output	Activities	Project partner[1]	Year 1				Year 2				Year 3				Year 4				Year 5			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	Publicise flooding evacuation map and landslide risk map in high-transit locations in collaboration with local interest groups.								x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Flooding evacuation map and landslide risk map easily available in local websites and social media								x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.1. Course on risk-based adaptation in coastal cities	Analyse existing experience on this type of training[2].	APC		x																		
	Joint workshop Chile – Ecuador, to delineate training contents and structure, and agree working procedures			x																		
	Identify key partners and establish agreements (e.g., local universities, international cooperation) to prepare and implement online course (mix of instructor-led and self-guided)			x	x																	
	Prepare course plan and training materials on risk-based adaptation in coastal cities for municipal officers. Initial focus on Chile and Ecuador, with perspective to be used by other countries.					x	x	x														
	Training of trainers of both countries								x													
	Offer three training courses										x				x				x			
	Follow-up of participants (document their post-training experience and their recommendations)											x	x	x	x	x	x	x	x	x	x	x
	Document and disseminate experience and lessons																			x		
6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	Needs assessment to strengthen community awareness and ownership of climate-related risks in Antofagasta	MdA		x																		
	Prepare communication and education strategy for Antofagasta				x																	
	Implement communication and education strategy in Antofagasta					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Prepare quarterly progress reports					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Annual assessment and adjustment of the strategy									x				x				x				
	Needs assessment to strengthen community awareness and ownership of climate-related risks in Taltal	MdT		x																		
	Prepare communication and education strategy for Taltal				x																	
	Implement communication and education strategy in Taltal					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Prepare quarterly progress reports					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Annual assessment and adjustment of the strategy									x				x				x				

[2] For example, NOAA´s digitalcoast, UNEP´s Disaster Risk Reduction training for coastal zone managers in Asia, CATIE´s course on vulnerability and design of adaptation measures in coastal zones

Output	Activities	Project partner[1]	Year 1				Year 2				Year 3				Year 4				Year 5			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	Needs assessment to strengthen community awareness and ownership of climate-related risks in Esmeraldas	GADE		x																		
	Prepare communication and education strategy for Esmeraldas				x																	
	Implement communication and education strategies in Esmeraldas					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Prepare quarterly progress reports					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Annual assessment and adjustment of the strategy									x				x				x				
	Annual on-line meeting to exchange lessons and coordinate strategies	Project team (PT)								x				x				x				
6.2. Narrators´ initiative initiated	Analyse existing local and international experience on strengthening cultural memory for climate-related disaster risk reduction	MMA		x																		
	Identify promising initiatives, potential partners and exiting training resources			x	x																	
	Joint workshop Chile – Ecuador, to share national and international experience and convene work strategy				x																	
	Compile and systematise memories of climate-related disasters in the three cities and prepare training plan and materials to prepare narrators					x																
	Train narrators and implement first round of actions						x	x	x	x	x	x	x	x								
	Assess progress, analyse lessons and adjust narrators´ strategy													x								
	Implement second round of actions														x	x	x	x	x	x	x	x
	Document and disseminate experience and lessons						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Annual on-line meeting to exchange lessons and coordinate strategies	PT								x				x				x				
7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice	Develop and operate a web-based communication platform (e.g., WebEx, SKYPE for business) to facilitate collaboration and virtual meetings among project partners	PT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Develop and maintain the project website, linked partners´ portals		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Create and maintain a YouTube channel to document and disseminate experiences and lessons			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Create and maintain multi-purpose social networking platforms (e.g., Twitter, Facebook) to disseminate information to stakeholders and interest groups			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Create and maintain a mailing list server to disseminate information to stakeholders and interest groups		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Output	Activities	Project partner[1]	Year 1				Year 2				Year 3				Year 4				Year 5			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	Create and support blogs to document the project´s experience[3]			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7.2. Lessons and best practice documented and disseminated	Launch the project in both countries (binational inception workshop and national workshop with key stakeholders on each country)	PT	x																			
	Systematically document the project experience and prepare learning experience documents[4]		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Exchange visits between project partners[5]. Visits will be open to participants from other countries.								x				x				x			x		
	Annual meeting of project board (webinar)						x				x				x				x			
	Presentation of project results in national or international events (to be defined)										x	x	x	x	x	x	x	x	x	x		
	Implementation of monitoring and evaluation plan		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Mid-term review and terminal evaluation of the project											x									x	
	Prepare and disseminate project´s memoirs																			x	x	x
	Project board closure meeting and public event on each country																					x

[3] Blogs will be accessible through the project´s website and will serve as field journals to document the experience and lessons of the main Project interventions. Responsible Entities will maintain a blog of each output under its responsibility. Additional blogs will be open if needed (e.g., individual blogs for narrators´ experience on each of the three city).

[4] There will be nine learning experience documents: 1. incorporating the climate change factor into stormwater management plans in Chile, 2. preparation of green infrastructure plan in Esmeraldas, 3. incorporating the climate change factor into mudflow control infrastructure in Antofagasta, 4. incorporating the climate change factor into landslide control in cerro Gataso (Esmeraldas), 5. Use of weather radar and storm detection system to enhance early warning systems, 6. mudflows warning system in Antofagasta and Taltal, 7. pilot flood warning system in Esmeraldas, 8. communication and education strategies to increase public awareness of climate-related disaster risk, and 9. contribution of narrators to sustain cultural memory on climate-related risks and disasters.

[5] At least following thematic exchange visits are planned: 1. pilot stabilization of cerro Gataso to control landslides (in Ecuador), 2. early warning and response systems to climate-related events (in Chile), 3. public awareness strategies (in Chile), 4. narrators' initiative (in Ecuador).

Annex 7. Photographs.

Types of houses in campamentos in Antofagasta

Photographs of quebrada Bonilla sur (Antofagasta)

Taken from the site indicated in Figure 11.

Downhill view of quebrada Bonilla Sur

Uphill view of quebrada Bonilla sur

Neighbourhood close to quebrada Bonilla Sur

Photographs of Taltal´s mudflow of March 2015

Source: Diario El Mercurio de Antofagasta

Photographs of cerro Gataso´s landslide of 2016

Source: Diario El Comercio

Photographs of cerro Gataso´s landslide of 2010

Source: http://vdeesmeraldas.blogspot.com/2010_05_01_archive.html

Source: Diario El Universo

Photographs flooding of Isla Luis Vargas Torres in 2016

Source: Diario El Comercio

ANNEX 8.

STAKEHOLDER ANALYSIS IN ANTOFAGASTA AND TALTAL (CHILE)

STAKEHOLDERS ANALYSIS

REGIONAL PROJECT

Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America

ANF Corporation

María-José Godoy, Sociologist

Fernando Zúñiga, Anthropologist

Talca, Chile

CONTENTS

I. Introduction

A project´s preliminary concept submitted to the Adaptation Fund by the Chile and Ecuador governments was approved in March 2016. The aim of this preliminary concept is to abating vulnerability to climate change-originating flooding in three coastal cities by incorporating an adaptation approach which is based on risk management and co-operation, and fosters enforcement of an adaptation-driven culture. This project is intended to be implemented in the cities of Antofagasta and Taltal in Chile, and Esmeraldas in Ecuador, bearing in mind that these cities are likely to be most impaired by sea level rise, and are highly vulnerable to floods and flash floods caused by heavy rain resulting from El Niño event, as well as extreme weather events. There is a likelihood for climate change impacts to becoming more frequent and harsher, thus further exacerbating climate change-linked risks to local populations and public and private infrastructure.

The process of expanding upon this project proposal entails singling out key stakeholders having a particular concern for these areas, sectors and communities vulnerable to climate change and, insofar the final approval is accorded to the project for it to get implemented, then those areas, sectors and communities shall reckon with improvements in adaptation activities as envisaged.

For this objective to be achieved, this Report intends to identifying and mapping key stakeholders in Antofagasta and Taltal cities who are related both, with areas, sectors and communities vulnerable to climate change, and with the implementation of adaptation measures as being anticipated in the preliminary concept. Singling out the willingness of key stakeholders to getting involved and implementing adaptation measures, besides identifying both, the role that women, Indigenous Peoples and age groups play in the implementation of these measures, as well as the cultural and social hurdles, and other barriers and problems constraining their involvement and commitment, and suggesting actions to address those barriers and constraints.

Finally, and on the basis of secondary data (i.e., population and housing censuses) the socio-economic status of the Antofagasta and Taltal population shall be characterised with a particular focus on areas, sectors and communities most vulnerable to climate change impacts.

II. Methodology

A review of the stakeholders mapping as a methodological tool will allow for qualitative data about the insights and concerns of key stakeholders to be collected, which should be borne in mind at the time measures stipulated in the preliminary concept are to be carried through.

Stakeholders to be singled out are deemed to be individuals or institutions having some sway vis-à-vis the scope and reach (preliminary concept measures) of the project to be implemented and executed. Likewise, those persons or groups of people expected to be materially influenced by these activities are also deemed to be stakeholders.

2.1. Preliminary Stakeholders breakdown proposal

To start with, a definition should be made of those institutions, civil society organisations, or individuals to be involved in the implementation and / or promotion of measures being defined in the project´s preliminary concept. A brainstorming meeting should be held to produce a listing of all stakeholders having a direct or indirect bearing on the project, so that they may be classified into groups, attaching to each group the bearing key stakeholders should have in the project´s intervention. To this end, the following stakeholders´ breakdown is suggested:

The first breakdown of stakeholders is defined vis-à-vis the type of organisation or institution, and should be based upon definitions as spelled out below:

• "*Government Stakeholders*". Attached to local, regional and / or central government entities.

• "*Non-Government Stakeholders*". Attached to grassroots organisations, private sector, productive sector, foundations, corporations, universities, organisms, etc.

Both, government or non-government stakeholders shall be attached four action or incidence levels: Territorial / Local; Communal; Regional; National.

Depending upon the review´s fine-tuning needs, a second category is set down in which stakeholders could also be classified as follows:

• Primary stakeholders: Those groups directly involved in the problematics or project to be looked into because of their specific interests (institutional, personal, community stakeholders).

• Secondary stakeholders: Representative groups of communities under the project´s direct influence, political pressure organisations endeavouring to address socio-environmental problems; or having some territorial competence in the area in which any of these problems may become apparent.

• Backup stakeholders: Citizen or government organisations which, due to their grasp of some technical know-how, or project and social activities management, have a particular knowledge vis-à-vis some environmental or project-related issues.

2.2. Identification of Stakeholder´s Roles and Duties

The end-goal is to becoming aware of the main roles social and institutional stakeholders play in the intervention proposal; also, to identifying actions that social and institutional stakeholders could implement by outlining a network of inter-institutional alliances vis-à-vis the intervention proposal.

Stakeholders review

To undertake the stakeholders review according to the following two categories: i) prevailing relationships; and ii) authority levels. The aim is to conduct a qualitative review of the different stakeholders vis-à-vis participatory processes.

i) Prevailing relationships: In the intervention proposal these are defined as affinity (trust) relationships vis-à-vis the opposite (conflict). The following three aspects are borne in mind:

- Pro: Trust and mutual collaboration relationships are prevalent
- Indecisive / Unconcerned: Affinity relationships prevail, but antagonistic relationships show a higher incidence.
- Against: Conflict prevails in relationships.

- Ii) Power hierarchy ranking: The ability stakeholders have to constrain or facilitate the actions being undertaken through the intervention. Power rankings are considered as follows:

- High: A high influence over other stakeholders is prevalent
- Medium: Influence is moderately accepted
- Low: No influence over other stakeholders

III: Characterisation of the socio-economic and demographic status of the Antofagasta and Taltal communes. A description.

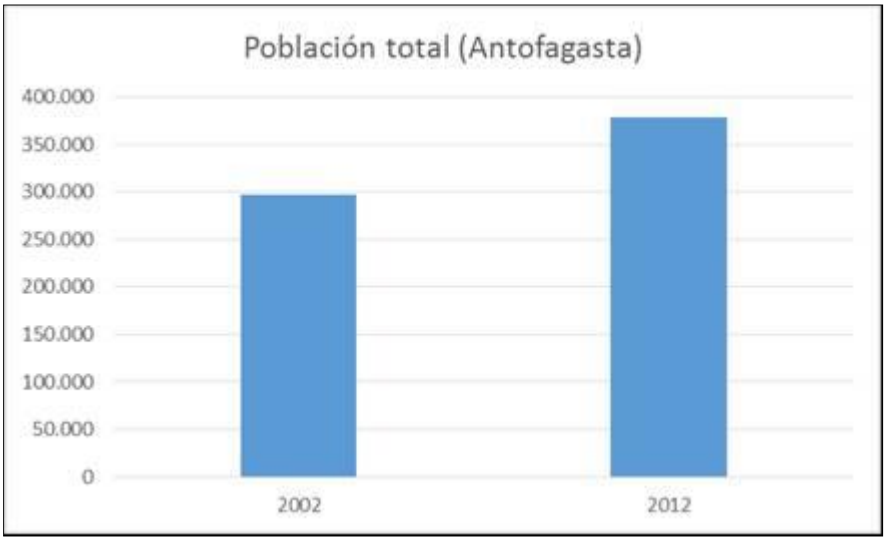
A description is made below of some social, economic and demographic indicators of the Antofagasta and Taltal communes, located in the Antofagasta Province, in the Antofagasta region.

Most data have been collected locally, the main source being the 2002 Census, bearing in mind that this Census has been attached more legitimacy vis-à-vis the Census performed in in 2012, the

validity of which has been put into question. Furthermore, different CASEN survey measurements outcomes have been perused through, as summarized in the Statistical and Communal Reports published by the National Congress Library, which, together with some other public institutions sources have been perused through.

1. *Total population*

According to 2002 Census data, the population of the Antofagasta region at the time was 493,984 people, while a total of 588,130 inhabitants was projected for year 2012[1]. According to projections of this same Census, the regional population would reach 594,555 inhabitants by 2013, and 613,093 inhabitants by year 2016[2].



Total Population (Antofagasta)

Figure 1. Source: Statistical and Communal Reports 2012, Antofagasta, National Congress Library. Authors´.

However, as shown in Figure 1, the Antofagasta Commune´s population increased from 296.905 people, in 2002, to a projected 378.923 inhabitants, for year 2012.

According to Figure 2 below, and in line with forecasts, the Taltal Commune population was 11.100 people in 2002, declining to 10.511 people by 2012.

Total Population (Taltal)

[1] Data collected from *Statistical and Communal Reports 2012, Antofagasta y Taltal,* National Congress Library.

[2] Chilean data collected from: *Proyecciones y Estimaciones de Población, 1990-2020,* National Statistics Institute.

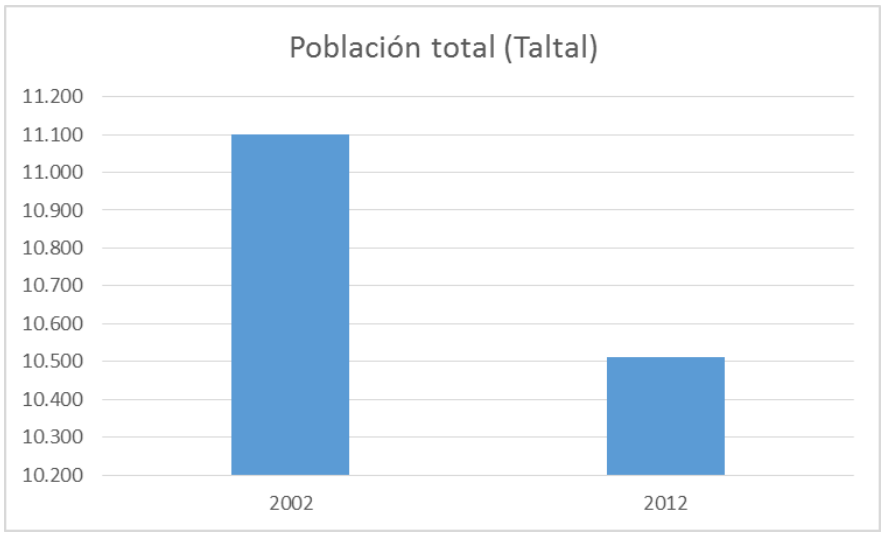
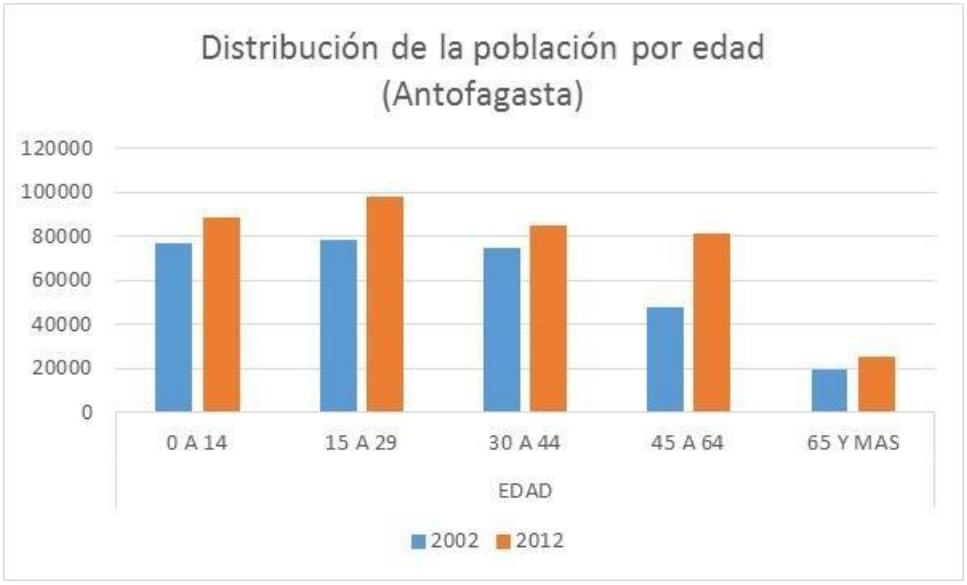


Figure 2. Source: Statistical and Commune Reports 2012, Taltal, National Congress Library. Authors´.

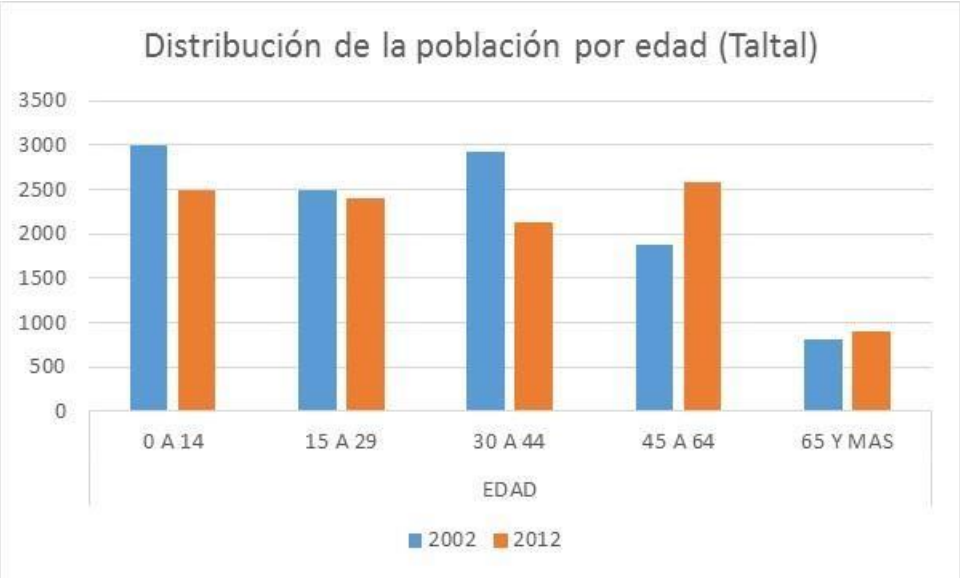
2. Age-based Population Distribution



Age-based Population Distribution (Antofagasta)

Figure 3. Source: Statistical and Commune Reports 2012, Antofagasta, National Congress Library. Authors´.

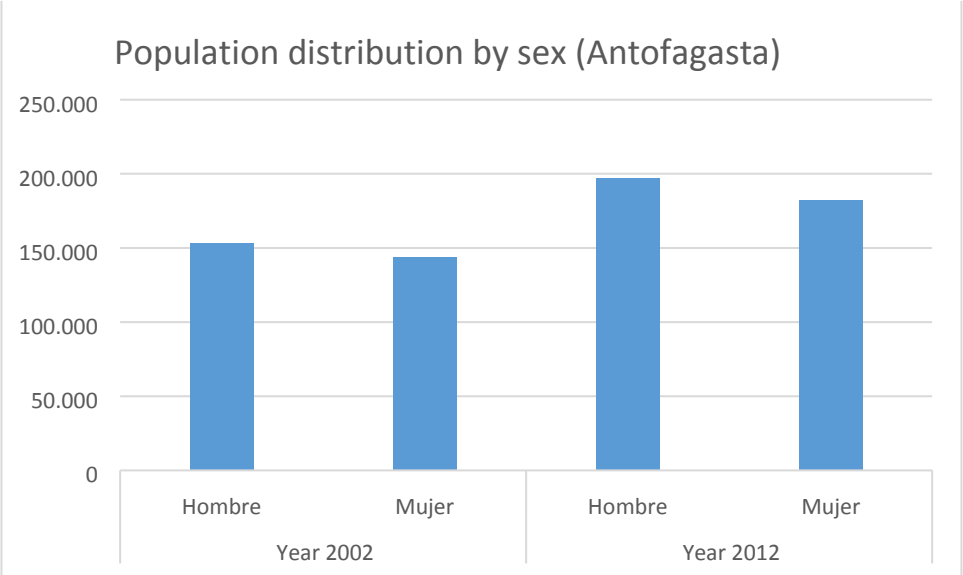
The population distribution by age ranges shows that the Antofagasta commune population has increased in all age ranges over the corresponding period between 2002 and 2012. Figure 3 shows that the 0 – 14 years range has increased from 76,734 to 88,795 inhabitants; the 15 - 29 years range has increased from 18,608 to 97,848; the 30 – 44 years range has increased from 74,754 to 85,124; the 45 – 64 years range rose from 47,585 to 81,614 inhabitants; while the 65 years and over group shows an increase from 19,224 to 25,542 people.



Age-based Population distribution (Taltal)

Figure 4. Source: Statistical and Commune Reports 2012, Tantal, National Congress Library. Authors'.

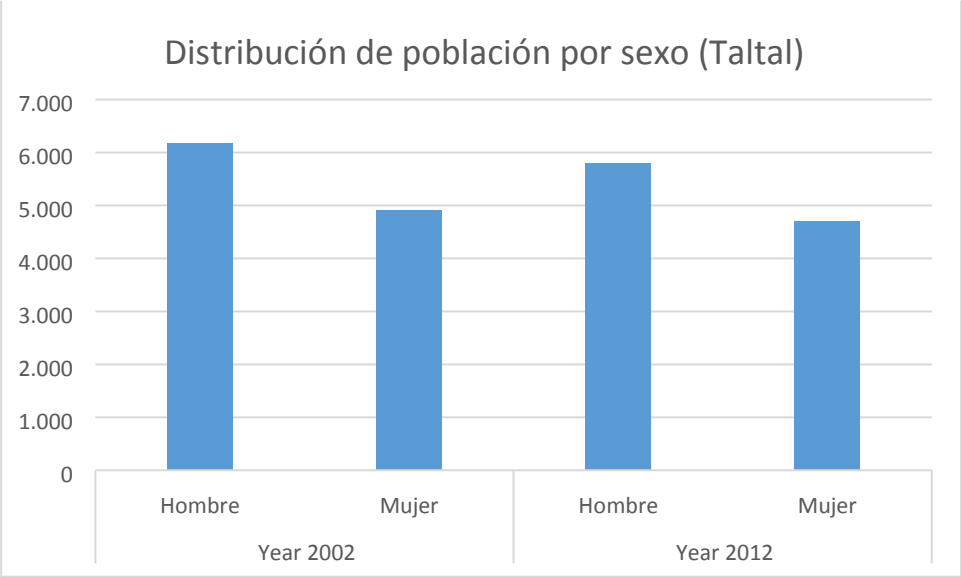
As regards the Taltal, commune, Figure 4 shows that over the same period, the 0 - 14 years of age range decreased from 2.997 to 2.490 inhabitants; the 14 - 29 years of age range decreased from 2.491 to 2.401 people; the range for ages 30 – 44, has decreased from 2.935 to 2.135 people; that for ages 45 – 64, increased from 1.871 to 2.590 people; while the group of people 65 years old and over, has increased from 806 to 895 people.



3. Age-based Population Distribution

Figure 5. Source: S*tatistical and Commune Reports 2012* National Congress Library. Authors'.

Concerning distribution of the population by sex, Figure 5 shows that the number of men has increased from 153,220 in 2002 to 196,952 in 2012 in the Commune of Antofagasta. On the other hand, according to projections for 2012, the women population has grown from 143,685 in 2002 to 181,971 as stated in year 2012 forecasts.

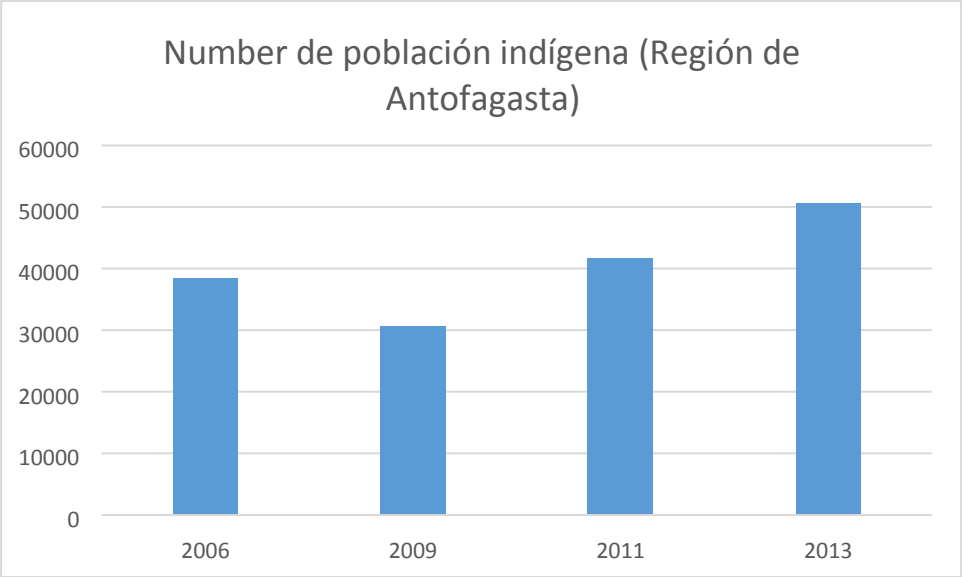


Age-based Population distribution (Taltal)
Figure 6. Source: Statistical and Commune Reports 2012, Taltal, National Congress Library. Authors'

Regarding Taltal, Figure 6 shows that the number of men has decreased from 6.182 in 2002, to 5.807 in 2012; and women-reated figures show a decrease from 4.918 in 2002, to 4.704 in 2012.

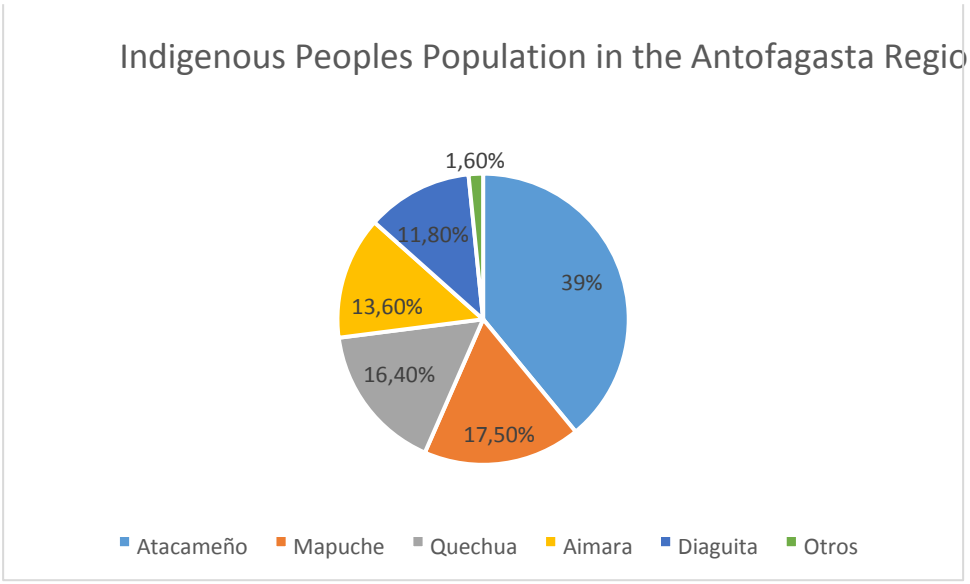
4. *Population according to Indigenous Populations*

Concerning the number of inhabitants deemed as Indigenous Populations, regional data collected by the 2006, 2009, 2011 and 2013 CASEN Surveys have been taken into account. In this regard, Indigenous Populations as follows have been recognized: *Atacameño, Aymara, Mapuche , Rapanui, Diaguita* and others. On the other hand, and bearing in mind that more up-to-date data was not available, only the data collected in the 2011 Commune Statistical Reports have been taken into account for the commune-addressed review conducted.



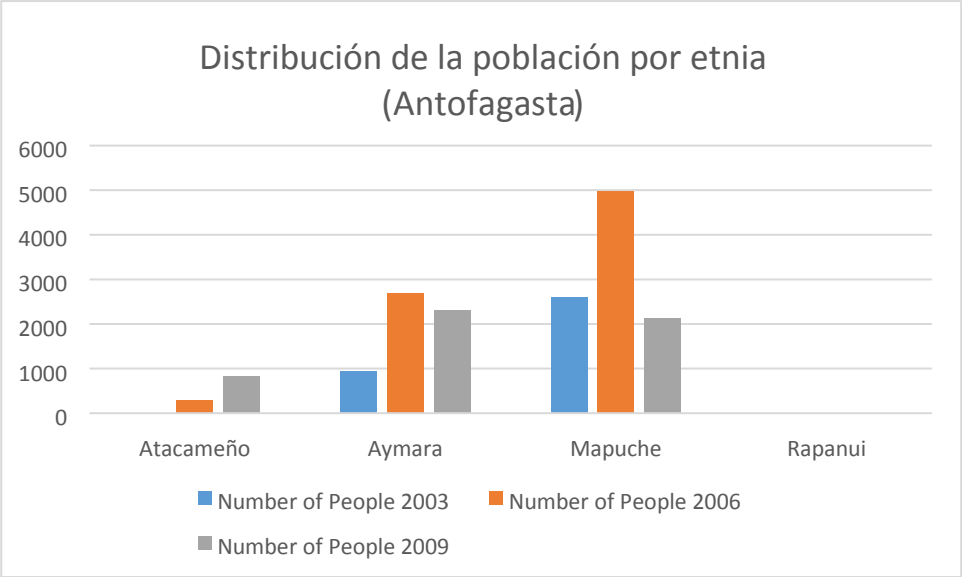
Number of Indigenous Peoples´ Population (Antofagasta Region)
Figure 7. Source: Results Synthesis - CASEN 2013 Survey, Indigenous Peoples´ Populations, Ministry of Social Development. Author´s.

Results in Figure 7 show that between 2006 and 2009, the Indigenous People´s population recorded in the Antofagasta Region decreased from 38,485 to 30,609, respectively. By 2011, this population increased to 41,611 inhabitants, showing a further increase in 2013 to 50,623.



Indigenous Peoples Population in the Antofagasta Region
Figure 8. Source: Results Synthesis CASEN 2013, Indigenous Peoples, Ministry for Social Development. Authors´.

The total indigenous population in the Region of Antofagasta for year 2013 was 50,623 inhabitants. Figure 8 shows that 39% of this population is made up by 39% *Atacameñas*; 18% *Mapuches*; 16% *Quechuas*; 14% *Aymara*; and 12% *Diaguita*. Finally, those claiming to belong to some other ethnic group account for 2% of the total indigenous population in the Region.



Population distribution by ethnic origin (Antofagasta)
Figure 9. Source: Statistical and Communal Reports 2011, Antofagasta, National Congress Library. Authors´.

As regards the Antofagasta commune and according to figure above, the people being deemed as having been born in Atacama and recognised as Indigenous People to the region are not included in the 2003 statistics; however, by 2006 they were 283 people; by 2009, this figure showed an increase to 822. Regarding the Aymaras, between 2003 and 2006 the population increased from 931 to 2,680, to then decrease to 2,296 in 2009. The Mapuche ethnic group was recognized as having 2,589 inhabitants in the region in 2003, a figure increasing to 4,968 in 2006 and decreasing to 2,120 in 2009, while the Rapanuis are unaccounted for in all measurements. Finally, the point should be stressed that according to 2009 data, the total population considered as Indigenous Populations was made by 5,238 people, out of a total of 373,236 inhabitants, or 1.4% of the total population.

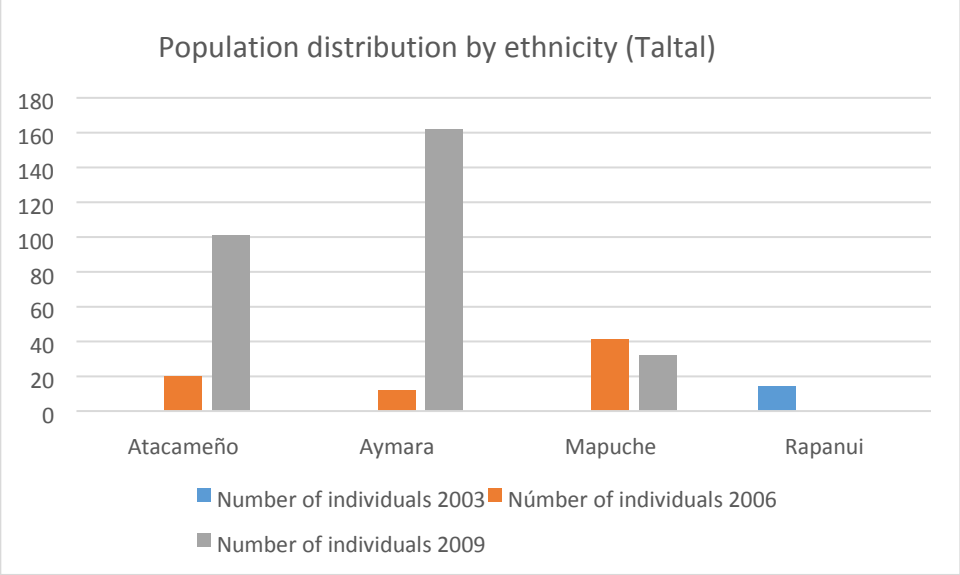


Figure 10. Population distribution by ethnicity (Taltal)
Source: Statistical and Communal Reports 2011, Taltal, National Congress Library. Authors´.

According to Figure 10, and regarding the Taltal commune, Indigenous Population being recognized as born in Atacama were not accounted for in 2003. By 2006 their number had increased to 20 people, while by 2009, their population was 101 inhabitants. The Aymaras, on their part, were unaccounted for in 2003, but in 2006 their population was made up by 12 people, a figure increasing to 162, in 2009. In 2003, the Mapuches were not recognized in the territory, but in 2006 its population was recorded as 41 People, showing a decrease in 2009 to 32 inhabitants. The Rapanuis, meanwhile, were 14 individuals in 2003, later on disappearing from all measurements therefrom. The point should be stressed that, in 2009, out of a total of 12,842 inhabitants, 295 of them are linked with some ethnic group, i.e., only 2.3% of the total population.

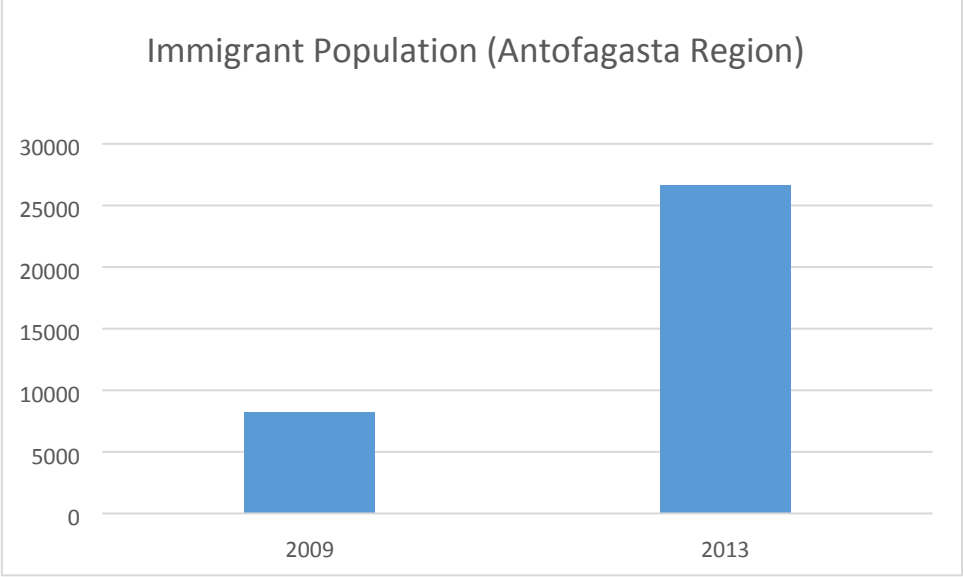


Figure 11. Source: results Synthesis CASEN 2013, Immigrants, Ministry of Social Development. Authors´.

5. Migration

Notwithstanding that the migratory phenomenon in the Antofagasta Region has been deemed as a historical milestone, a particular weight has been attached to it in recent years. Although communal level-disaggregated data is no available, the regional CASEN 2013 Survey figures have been considered. However, as shown in Figure 11, the number of immigrant population in the Antofagasta region was recorded as 8,257 people in year 2009. This figure increased to 26,624 people in the 2013 survey.

6. Population according to poverty

The CASEN Survey up to 2011 measured poverty by income, taking into account the traditional methodology applied by the Economic Commission for Latin America and the Caribbean (CLAC, for its acronym in Spanish). From that 2013 survey onwards, poverty has been measured through a new methodology. Regarding the latter, a definition will be made in this paper of data collected on the Antofagasta Region. For communal area details, the 2011 Communal Statistical Report data will be used.

According to the CASEN 2013 Survey, the total number of households (people living in private homes) in the Region is 151,534, of which 1% are in extreme poverty by income; 2.2% are living in non-extreme poverty by income; 3.2% is in a situation of poverty by

income: while 14.8% is in a multidimensional poverty situation[3]. On the other hand, the total population (in private homes) in the Region is 562,941 people, out of which 1.1% are in extreme poverty, 2.8% are in non-extreme poverty, 4% are in poverty, and 20.7% are in multidimensional poverty[4].

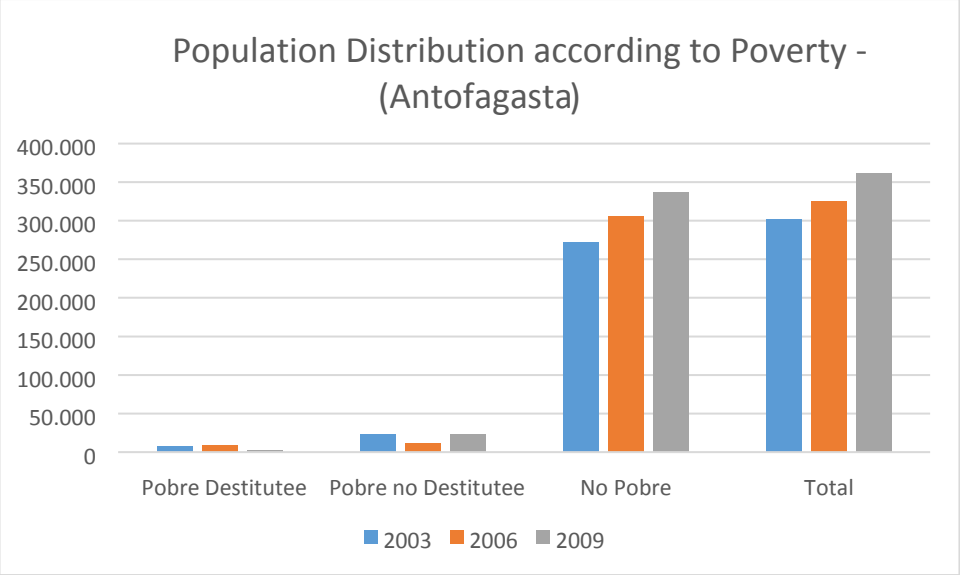


Figure 12. Source: Statistical and Communal Reports 2011, Antofagasta National Congress Library. Authors.
Poverty-based distribution of population

According to Figure 12, concerning the Antofagasta commune, in 2009 the destitute poor were 2,370 people, the non-destitute poor were 22,601 people, and the non-poor were 336,814 inhabitants, adding to a total population of 361,785. In other words, according to the 2009 Census, 7% of the total population of the Antofagasta commune is in a situation of poverty (destitute poor people destitute plus not destitute poorer people).

[3] CASEN 2013 Survey data, Profile of the Antofagasta Region. Ministry of Social Development.
[4] CASEN 2013 Survey data, Profile of the Antofagasta Region. Ministry of Social Development.

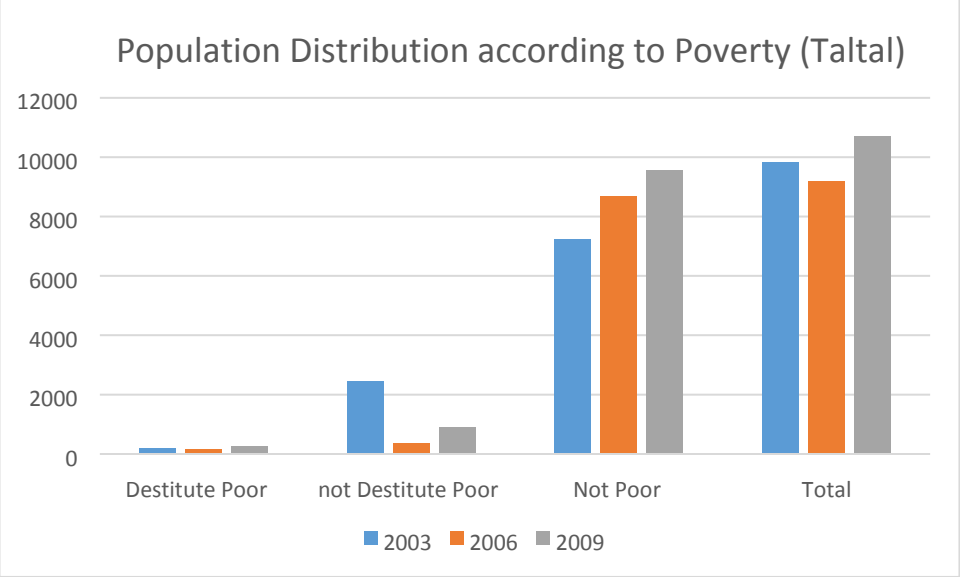


Figure 13. Source: Statistical and Communal Reports 2012, Taltal, National Congress Library. Authors.

Concerning Taltal, Figure 13 shows that the destitute poor are 242 people; the non-destitute poor are 898; and the non-poor make up a 9,564 inhabitants, within a total population of 10,704. In percentage terms, for 2009, the population in poverty constitutes accounts for 11% of the total figure.

7. Schooling

7. Escolaridad

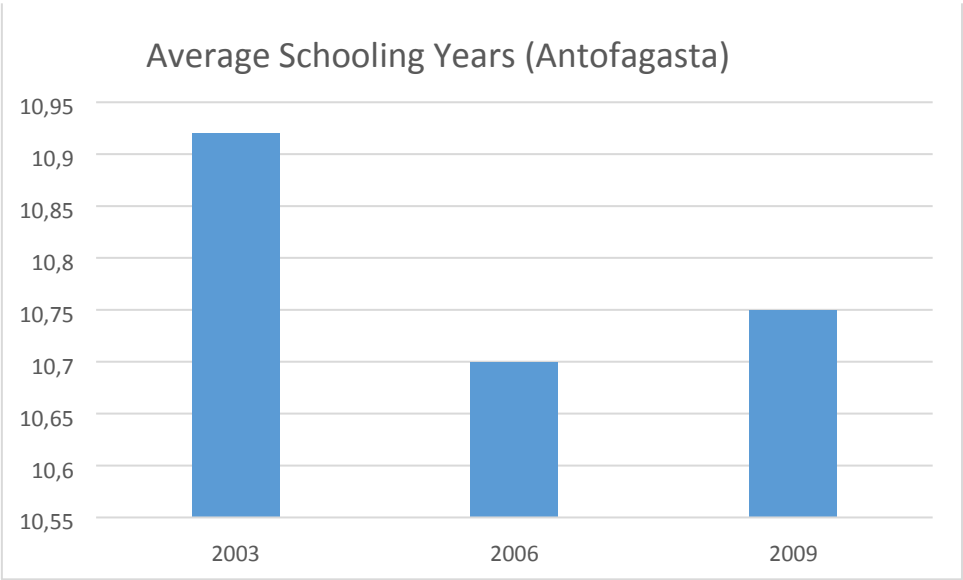


Figure 14. Source: Statistical and Communal Reports 2011, Antofagasta, National Congress Library. Authors.

According to Figure 14, the average schooling years of the Antofagasta population were 10.92 years, in 2003, while in 2006 and 2009 this figure decreased to 10.70 and 10.75 years, respectively.

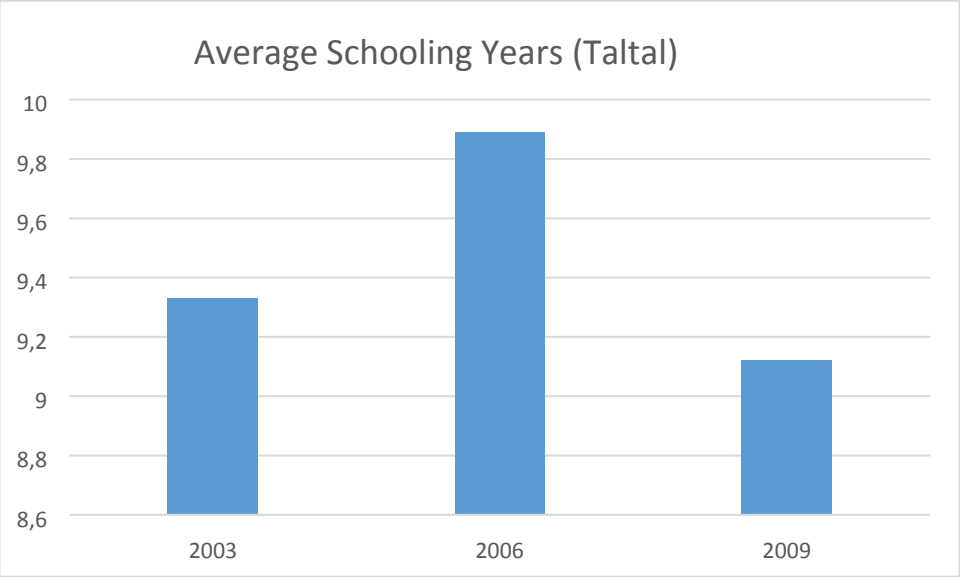


Figure 15. Source: Statistical and Communal Reports 2012, Taltal, National Congress Library. Authors.

According to Figure 15, the Taltal numbers show 9.33 years of schooling in 2003; 9.89 years in 2006; while for 2009, this variable corresponds to 9.12 years.

8. Housing

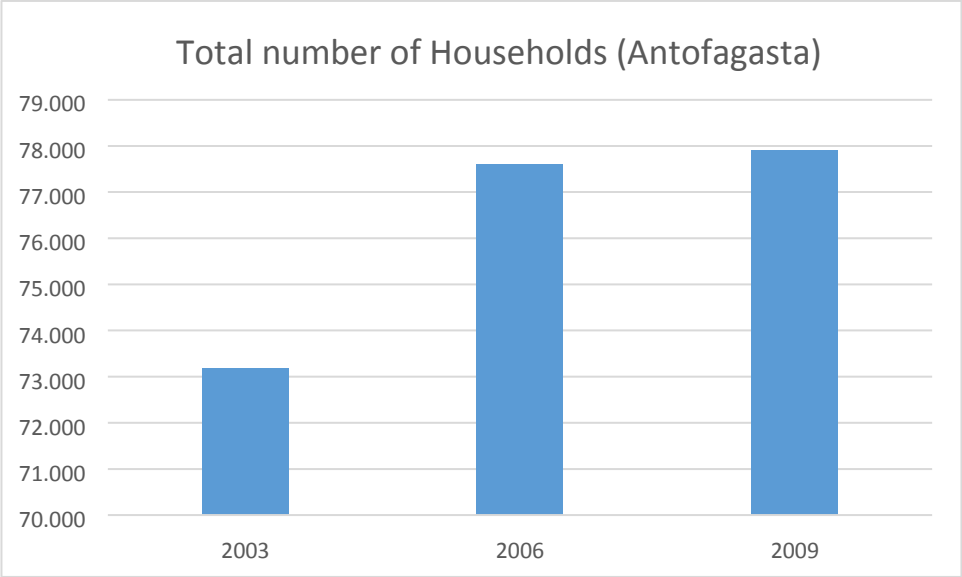


Figure 16. Source: Statistical and Communal Reports 2011, Antofagasta, National Congress Library. Authors.

In accordance with data supplied by the CASEN Survey, Figure 16 indicates that the number of households in the Antofagasta commune increased from 73,171 in 2003 to 77,594 in 2006, and then to 77.907 in 2009.

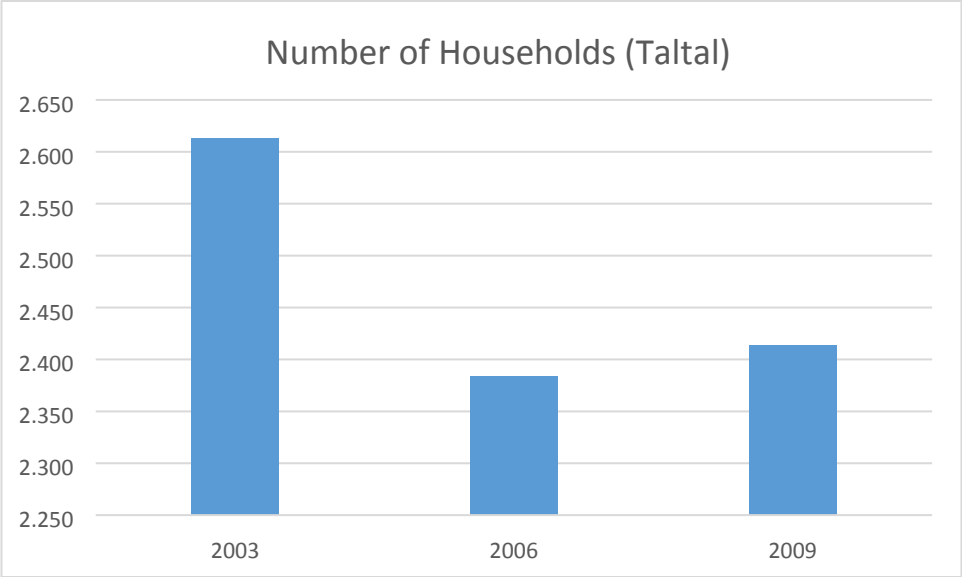


Figure 17. Source: Statistical and Communal Reports 2011, Taltal, National Congress Library. Authors.

Meanwhile, the number of households in the Taltal commune, according to Figure 17, were 2,613 in 2003; this number decreased to 2,384 in 2006, to again increase to 2,414 in 2009.

9. Transportation

With regard to transportation, two variables are described below based on the 2005 Vehicles in Circulation Yearbook, supplied by the National Statistics Institute.

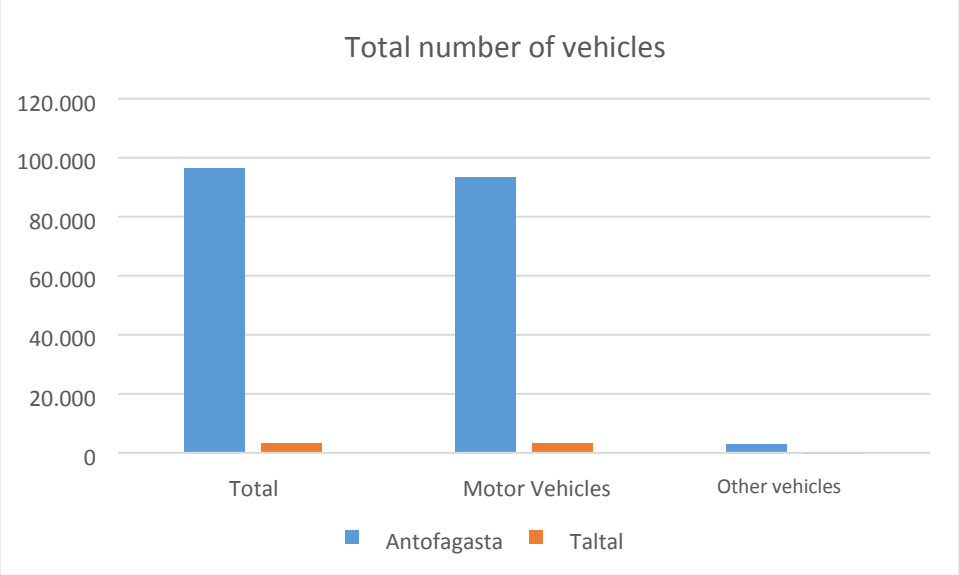


Figure 18. Source: Vehicles in Circulation Yearbook 2015, National Statistics Institute. Authors.

As regards the total number of both, motorized and non-motorized vehicles in the Antofagasta Region, Figure 18 shows a total of 107,980 vehicles, of which 96,372 were circulating in the Antofagasta commune and 3,394 in the Taltal commune.

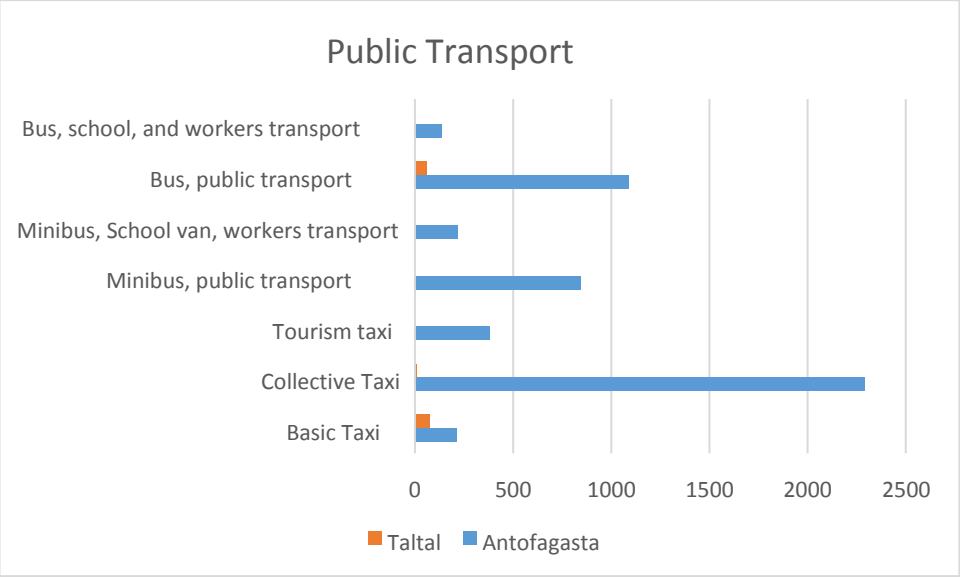


Figure 19. Source: Vehicles in Circulation Yearbook 2015, National Statistics Institute. Authors.

As regards collective transport circulating in the Antofagasta commune, Figure 19 shows that 214 vehicles are basic taxis, 2,292 are collective taxis, 381 are tourist taxis, 844 are public transport vans, 215 are minibuses used as school or workers transport vans; 1,087 are collective transport

buses, and 135 buses are used for school or workers´ transportation. Regarding Taltal, some of these types of transport were recorded, corresponding to 76 basic taxis, 1 collective taxi, and 60 public transport buses.

10. Basic Services Coverage

a) Drinking water

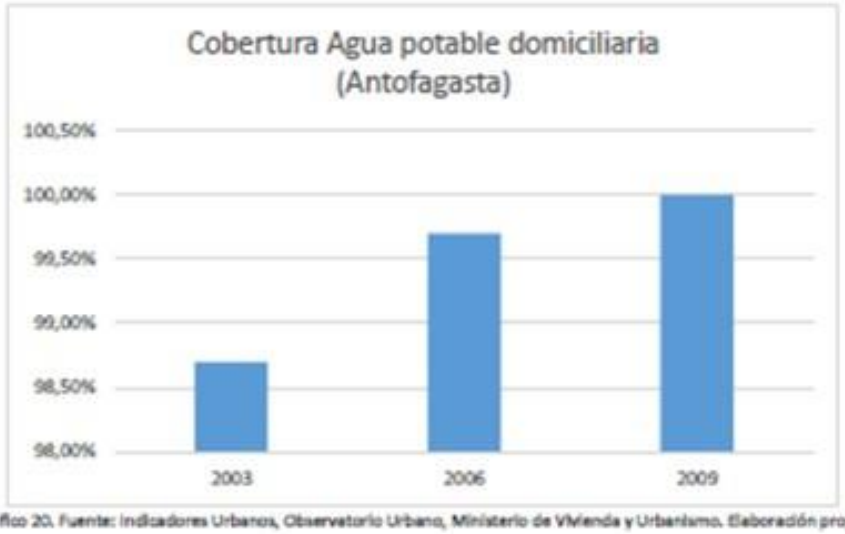


Gráfico 20. Fuente: Indicadores Urbanos, Observatorio Urbano, Ministerio de Vivienda y Urbanismo. Elaboración propia.

Figure 20. Source: Urban Indicators, Urban Observatory, Ministry of Housing and Urban Planning. Authors.

Regarding domestic drinking water coverage, Figure 20 shows that Antofagasta commune indexes have gradually increased: from 98.7% in 2003, to 99.7% in 2006, to then reach a 100% increase during 2009.

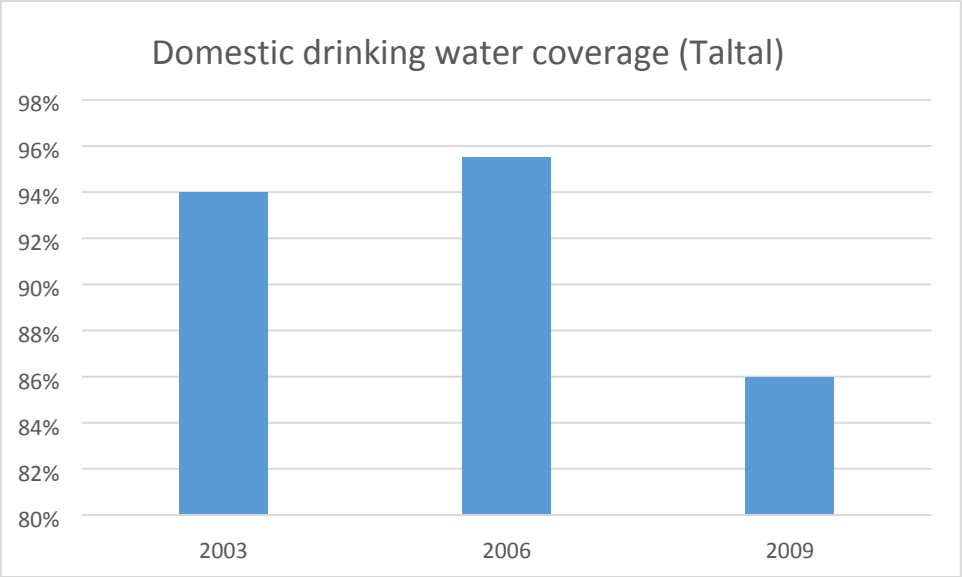


Figure 21. Source: Urban Indicators, Urban Observatory, Ministry of Housing and Urban Planning. Authors.

Figure 21 shows that during year 2003, the domestic drinking water coverage in the Tatal commune reached a 94% figure. This level increased to 95.5% in 2006, to record a fall in the 2009 measurement, to a 86% coverage.

b) Electricity

Domestic Electricity Coverage (Antofagasta)

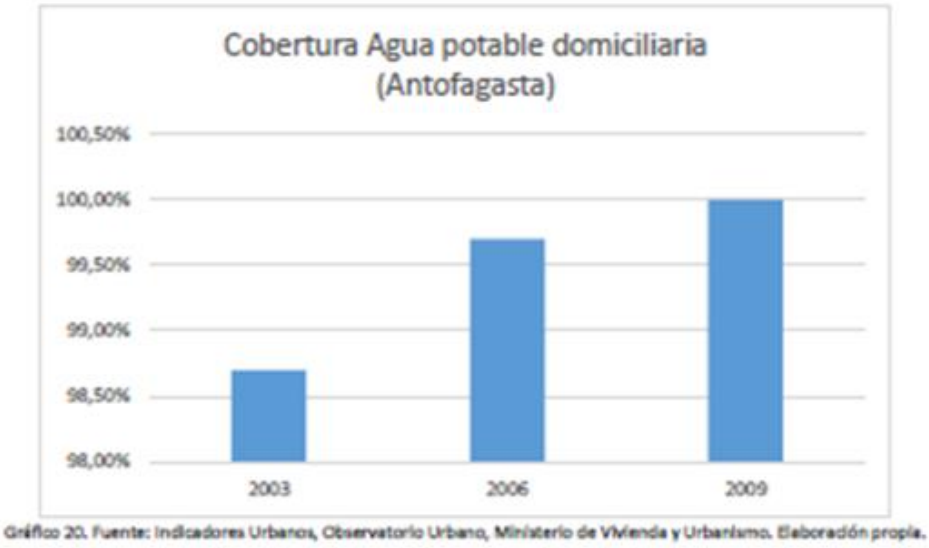


Figure 22. Source: Urban Indicators, Urban Observatory, Ministry of Housing and Urban Planning. Authors.

Domestic Electricity Coverage (Taltal)

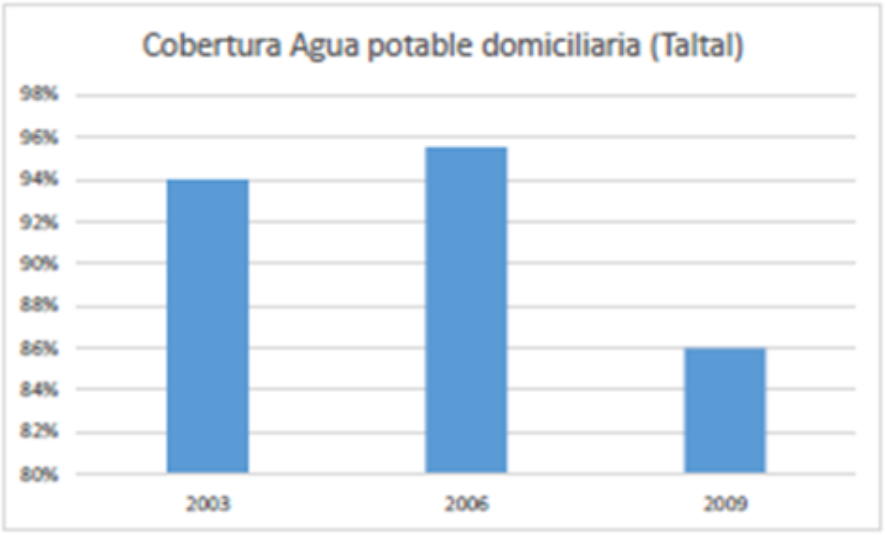


Gráfico 21. Fuente: Indicadores Urbanos, Observatorio Urbano, Ministerio de Vivienda y Urbanismo. Elaboración propia.

Figure 23. Source: Urban Indicators, Urban Observatory, Ministry of Housing and Urban Planning. Authors.

According to data in Figure 22, coverage of domestic electricity in the Antofagasta commune reached 98.4%. Meanwhile, and as recorded in the CASEN Survey, in years 2006 and 2009 coverage was 99.7% and 100%, respectively. Figure 23 below, which also compiles data collected by the Ministry of Housing and Urban Planning´s Urban Observatory, records the same data for the case of Taltal.

11. Average household income

In this document, the household income is being referred to in accordance with the new CASEN 2013 Survey measurement in the case of the Antofagasta Region, as well as according to parameters in older measurements (2003, 2006 and 2009), for the Antofagasta and Taltal communes separately.

Concerning the monthly average household income, the CASEN 2013 survey set forth the amount of 1,040,617 pesos for the Antofagasta Region. To measuring the CASEN 2009 Survey, this income was 852,786 pesos[5].

[5] Data collected from the CASEN Survey. Profile, Antofagasta Region.

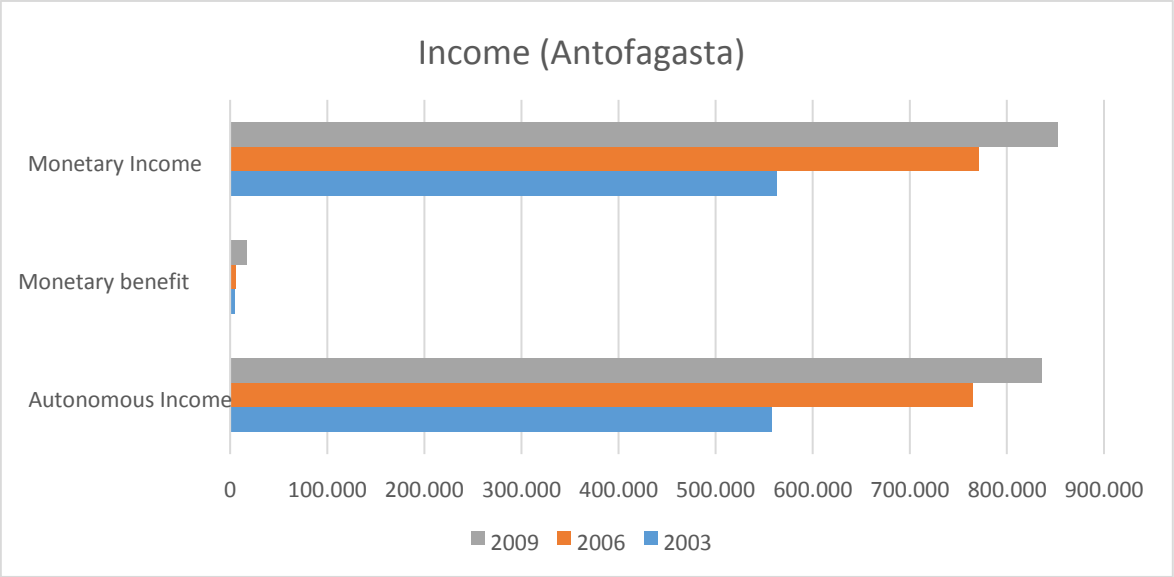


Figure 24. Source: Statistical and Communal Reports 2011, Antofagasta, National Congress Library. Authors.

However, concerning the Antofagasta commune, the average autonomous income of households was 557,858 pesos in 2003; 764,781 pesos in 2006; and 835,887 pesos in 2009.

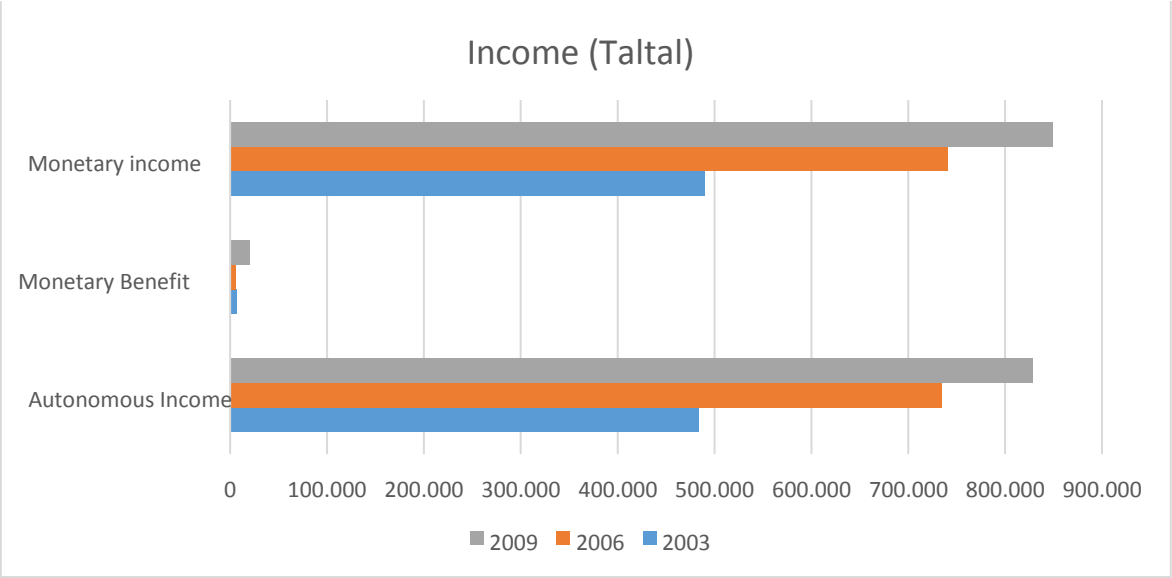


Figure 25. Source: Statistical and Communal Reports 2011, Taltal, National Congress Library. Authors.

As regards the Taltal commune, this variable corresponded to the following values: 483,618 pesos in 2003; 734,526 pesos in 2006; and 828,873 pesos in the 2009 CASEN Survey measurement.

Concerning the migrant phenomenon

Notwithstanding the fact that official government research has been undertaken on the subject, such as the National Statistical Yearbook; Migration in Chile 2005 – 2014, the migratory phenomenon in the Antofagasta region has been scantily explored by the different fields of study concerned with this subject. This is the reason why the phenomenon has been lacking systematisation and research at both regional and communal level. While the *Migration in Chile 1005 – 2014* paper incorporates the following (most recent) regional outlook of the migratory phenomenon, the figures therein could add to an enhanced understanding of territorial migration processes being undertaken in the Antofagasta and Taltal communes.

In the Antofagasta region, 4.6% of the population is made by people coming to the region who are identified as migrants. When this figure is scaled up at the national level, it accounts for 6.9% of the migrant population in the whole country. The Antofagasta region is, after Santiago, the city recording the highest number of immigrants, and the point should be stressed that the migration growth is a process inscribed at the northern macro zone level.

If a comparison is made between the percentage of migrants at regional level between years 2005 and 2014, an explosive growth is apparent of the migrant population in the region, reaching a 327% figure, and entailing an increase from 6,612 to 28,236 inhabitants under a migration status, corresponding to a growth of **21.624** new migrants into the region over a nine-year period.

Concerning the sex-based distribution of people in the region, the number of women is higher than that for men, a situation which has been prevailing since 2005.

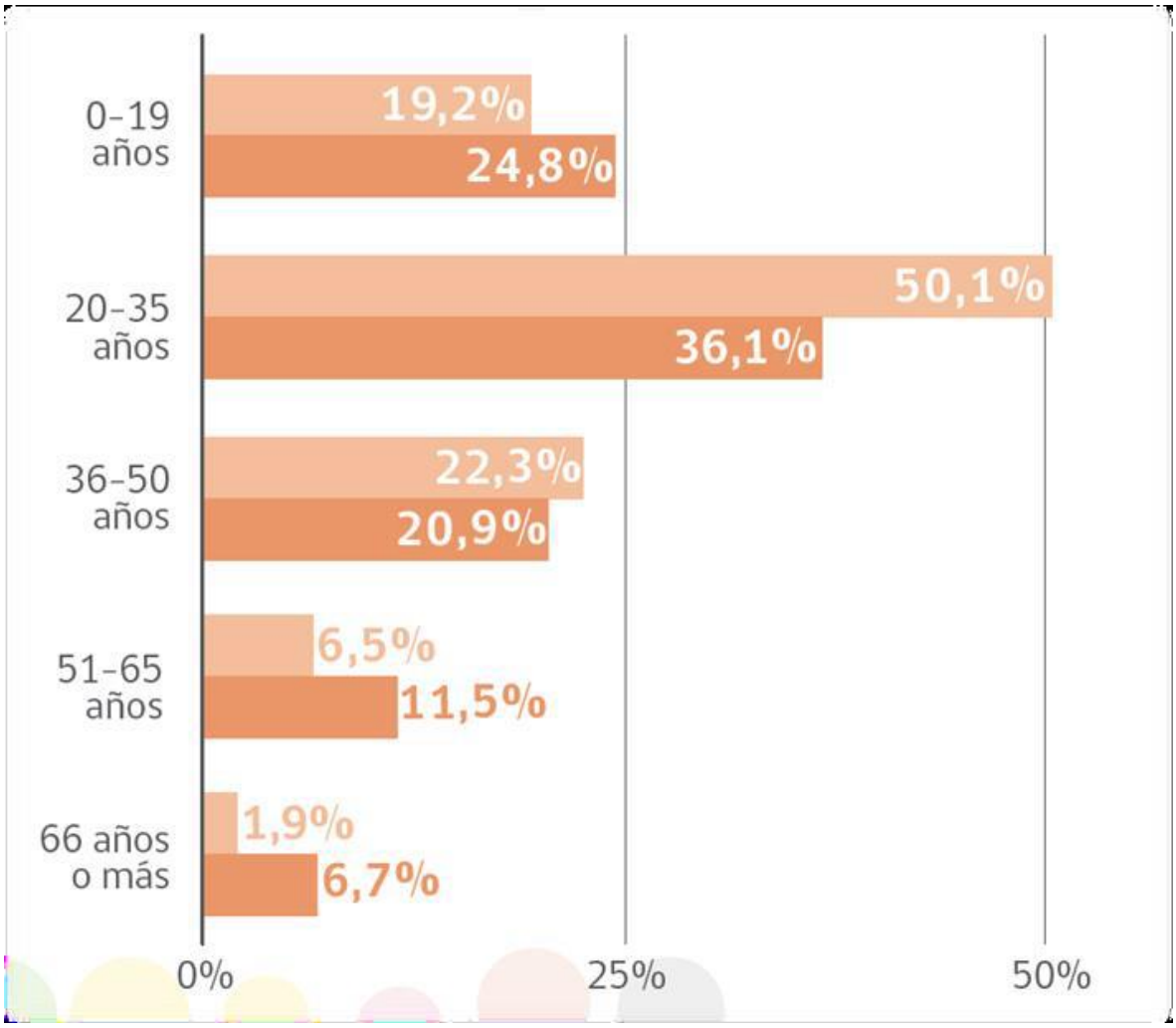
"Meaningful changes have become apparent within the age-related framework, mainly the growth of migrants between 20 and 35 years of age, which, in this case, recorded an increase from 36.1%, in 2005 to 50.1%, in 2014. For migrants over 51 years of age, an approximate 10 percentage points decrease was recorded, while the number of minors has decreased by 5.6 percentage points vis-à-vis year 2015. In both cases, the increase recorded stresses the economic importance of the region, as well as its particular characteristic of being an important pole of attraction for both, international and internal migration."

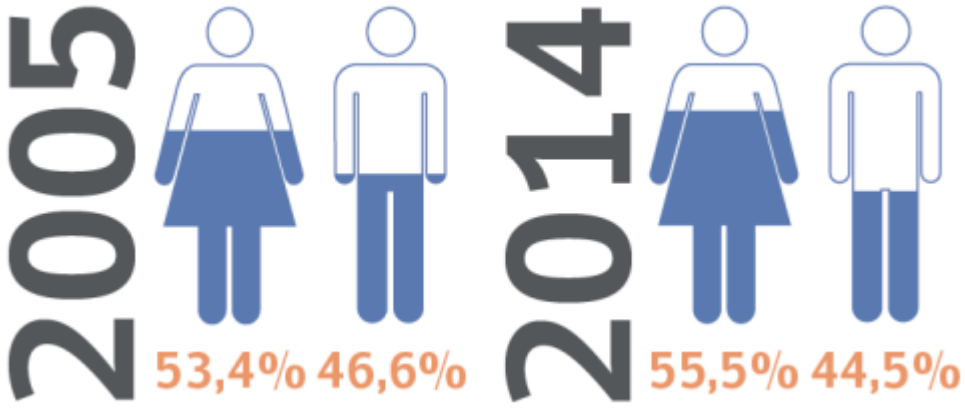
"Again. most important migratory flows in the region coincide with border countries: Bolivia: with 41.8%; Peru: 28.6%; and Argentina: 5.7%. The steady inflow of Colombian migrants is beginning to become relevant from Antofagasta to the Southern region, accounting for a 11.0% share: equivalent to a 9.4 percentage points increase over year 2005 (National Statistical Yearbook, Migration in Chile 2005 - 2014)".

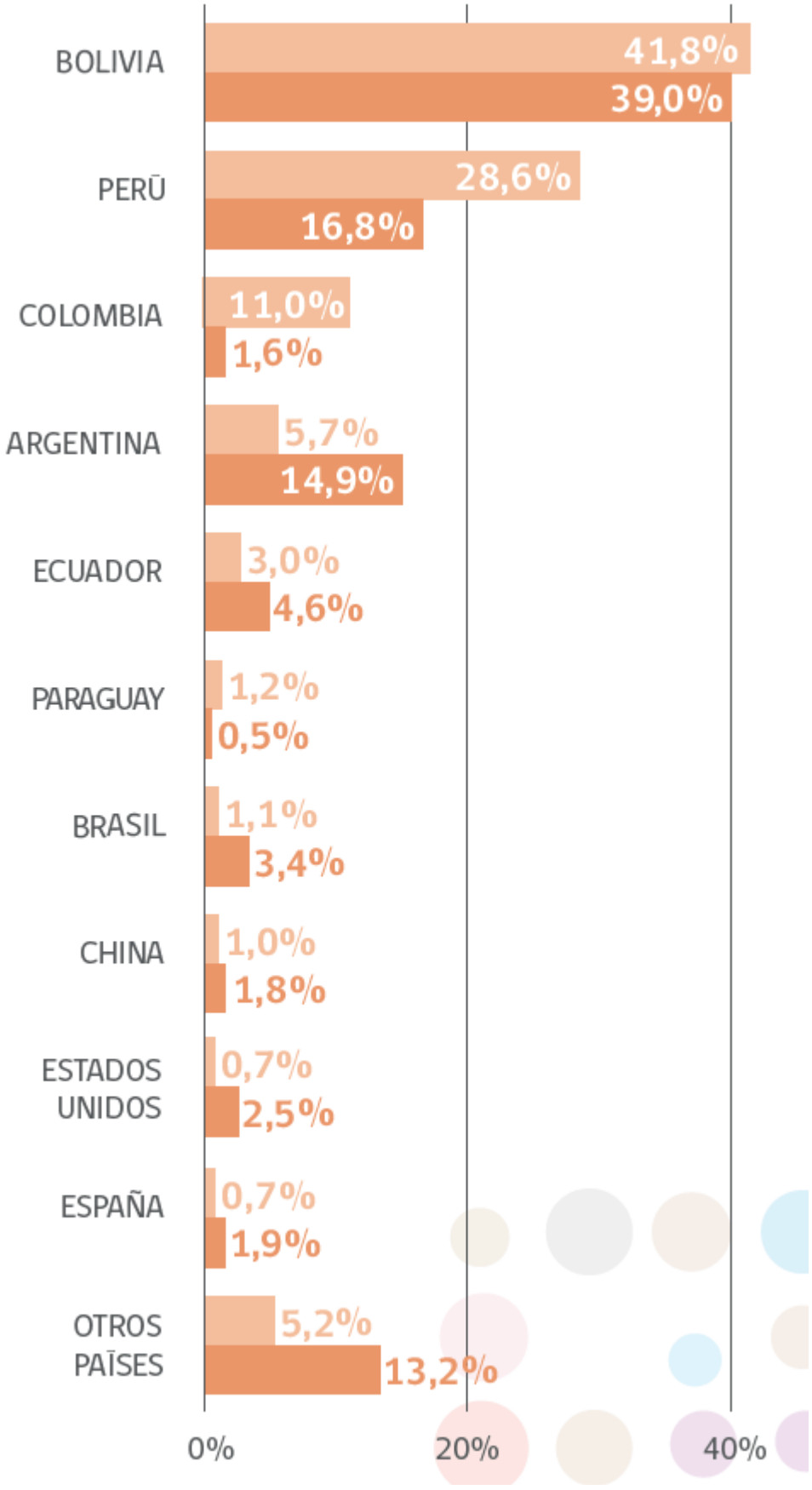
Concerning the legal status of immigrants in the region, from 2005 (to 2014 the region has granted:

- 22.512 Residence Permits
- 27 Student visas
- 46.918 Visas subject to working contracts, in the region

- 52. 272 Temporary Visas






BOLIVIA
41,8%
39,0%
PERÚ
28,6%
16,8%
COLOMBIA
11,0%
1,6%
ARGENTINA
5,7%
14,9%
ECUADOR
3,0%
4,6%
PARAGUAY
1,2%
0,5%
BRASIL
1,1%
3,4%
CHINA
1,0%
1,8%
ESTADOS UNIDOS
0,7%
2,5%
ESPAÑA
0,7%
1,9%
OTROS PAÍSES
5,2%
13,2%
0%
20%
40%

At the level of perception the phenomenon is perceived as a negative feature of globalization in the region, putting in tension the social, economic and political dynamics. The community, by not understanding the phenomenon and being bombarded by the media and speculative processes of the media, as well as by contrasting with other cultures and phenotypic expressions, in space with those coming from Colombia, has operated under the logic of discrimination And segregation, an act that is reinforced by the labor field and housing sectors developed and occupied by the migrant population (service area and camp).

Still some other relevant data in the processes are figures published in 2011, reporting that 10% (283 children) of births in the regional hospital of the city of Antofagasta corresponded to mothers of foreign nationality, or that over the same year, another reference to the presence of foreigners in the commune of Antofagasta was that 12% of students enrolled at the Mario Bahamonde men´s Lyceum, were foreigners.

This phenomenon has become so important that the National Government is working on a new Migration Law for further approval by the Legislative Authority and enactment. This action was reinforced in a headline in the newspaper *Mercurio*, on 4 March 2016, stating that:

"**A National Defence Commission will arrive in Antofagasta to look into the migratory phenomenon**: On Monday 14th March, Parliament members Alejandro Guillier, Pedro Araya, Carlos Bianchi, Víctor Pérez Varela and Baldo Prokurica will be meeting with local authorities to discuss how the community is being affected by migration."

With regard to multidimensional poverty

Multidimensional poverty corresponds to and is understood to be the end product of the sum of different aspects which, together, describe and account for poverty, as opposed to one-dimensional instruments such as GDP.

For CASEN, as defined in its 2013 policy, "multidimensional poverty" is understood on the basis of four dimensions, which in turn are composed of three indicators, the first dimension corresponding to:

- Education
  - Attendance
  - Education underachievement
  - Schooling
- Health
  - Child Malnutrition
  - Adscription to the Health System
  - Health Care

- Work and social security
  - Employment
  - Social security
  - Retirement pension
- Housing
  - Overcrowding
  - Housing conditions
  - Basic services

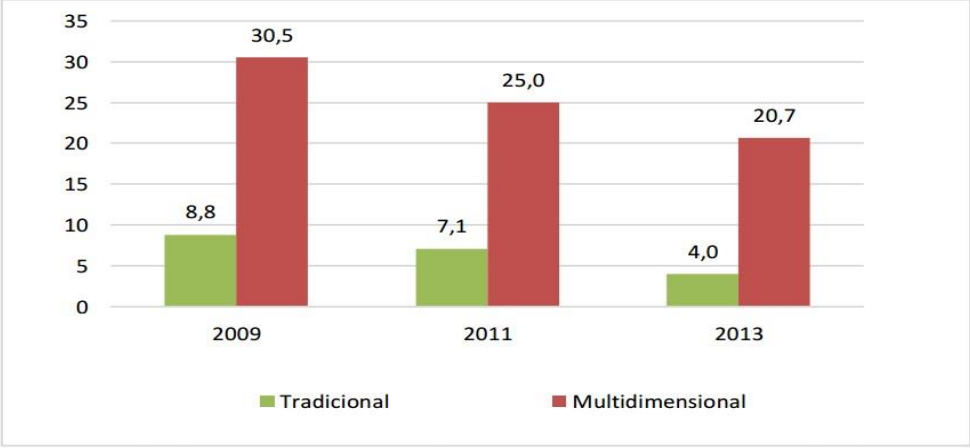
For analytical and weighting purposes, these four dimensions have the same weight: 25%

.

In line with these criteria, table below shows the multidimensional poverty index in the Antofagasta region for year 2013.

Region	**Multidimensional Poor**			
	Persons		**Households**	
	Number	**Percentage**	**Number**	**Percentage**
II Antofagasta	112.187	20,7	21.579	14,8

Figure below shows the evolution and comparison between poverty and multidimensional poverty from 2009 to 2013.



Fuente: Elaboración propia a partir de datos encuesta CASEN 2013

Source: Authors, from CASEN 2013 Survey data

"If we bear in mind how poverty calculations have evolved in the Antofagasta region, the decrease in poverty would seem more relevant considering multidimensional poverty measuring: showing a decrease from 30.5% in 2009 to 20.7% in 2013, with a decrease close to 5% for each year. The size of this decrease according to the traditional approach is considerably lower, going from 8.8% in 2009 to 4.0% in 2013, Antofagasta Region; Regional synthesis 2015".

Concerning the shantytown phenomenon

Over the last four years, the shantytown phenomenon (illegal occupations of land) has been widely spread in the Antofagasta city. This is due to economic conditions prevailing in cities or regions where mining activities are under way, and internal and external migration has become into a particular feature attached to this activity.

According to Un Techo para Chile programme (A Roof for Chile), fifty-five shantytowns have spread over the Antofagasta over some time in the region housing more than 4,100 families[6]. While no official or updated data of this condition is available in the cities of Antofagasta and Taltal, an estimation has been made that in the city of Antofagasta alone, there are more than 40 shantytowns housing more than 4000 people.

This phenomenon is linked to a huge immigration into the city, the largest wave being recorded in recent years with the arrival of Colombian nationals. The main reasons for the huge proliferation of shantytowns is the high rental costs of housing leases and expensive living conditions in the city. This is the reason why, many families, mainly migrants, are forced to establish their homes in illegal settlements, where utilities such as electricity, water or sewage are non-available.

Added to these conditions is a permanent risk linked to the fact that the shantytowns are settled mainly on hill slopes, which have been flattened by backhoes, becoming into the place where people build makeshift houses with light material. Along ravines and electricity antennas houses are built providing a home to thousands of families in Antofagasta.

Jacqueline Fey, an Ecuadorian woman and leader of the "America Unida" (United America) shantytown located along the Bonilla ravine, says in an interview for the newspaper La Tercera: "It is very frightening to live here, knowing that at any moment our house can collapse downhill because of an earthquake or a flooding. Even so, people make arrangements to build [a home], because the need and the desire to get ahead are bigger"[7].

[6] http://chile.techo.org/cis/monitor/#

[7] http://www.latercera.com/noticia/nacional/2016/03/680-672951-9-antofagasta-la-peligrosa-expansion-de-los-campamentos-hacia-los-cerros.shtml

Most foreigners living in these places do not harbour a "memory" to making them ponder the risk of setting up their homes in places devoid of the necessary safety conditions in case of floods.

IV. Stakeholders Maps - Antofagasta and Taltal Communes

A description is made in this section of key stakeholders involved in the development and enhancement of the territory, who in turn represent the human capital required for viability, reflection and submission of proposals being set forth in the preliminary concept. Processes linked to setting up social networks made up by keystakeholders, predominant relations and power relations, focus groups and, lastly, classification of keystakeholders in both Antofagasta and Taltal are further described.

Thus, a table was drawn up listing the stakeholders identified and having a territorial relevance, or according to the competencies and capacity for development and decision-making at the communal and territorial level.

Seven variables are presented in table "**Key Stakeholders Factsheet**" as follows:

1. **Name**: The nominal classification with which the stakeholder is recognized.
2. **Classification**: The stakeholder´s organisational legal status, as well as its classification vis-à-vis its link-up (see Annex N ° 1)
3. **Role**: The mission the organisation should accomplish

4. Function: The factual actions the key stakeholders should undertake

5. **Standing**: The attitude that the estakeholder has vis-à-vis the project, which can be either in favour, Unconcerned, or against.
6. **Authority**: Understanding this as a (high, medium or low) formal or informal influence, Stakeholders have vis-à-vis aspects of the project.
7. Concern: The (high, Unconcerned or low) level and type of expectation of gain or loss that a stakeholder has vis-a-vis the execution or implementation of a project or activity.

4.1. Stakeholders maps: The Antofagasta and Taltal case

Concerning the preliminary concept for the project to be executed, the following classification of a social stakeholders group having a territorial relevance and scope is submitted as defined vis-à-vis the stakeholders classification.

4.1.1. Key Stakeholders Factsheets

Key Stakeholders Factsheet	
Institution / Organisation Name	Regional Government. Antofagasta Region
Classification	Primary Stakeholder / Government
Role	**Duties**
An entity responsible for the Higher management of the region, it is made up by the Mayor and the Regional Council, has a legal status and manages its own Equity, a fact making it into a territorially decentralised body, i.e., it is not subject to a hierarchical dependency to the President of the Republic and is thus autonomous in the exercise of its duties and attributions, without prejudice to the monitoring and protection systems pursuant to the Chilean legal system.	Those assigned to the Major and to the Regional Council.
Authority	High
Standing	Pro
Concern	High

Key Stakeholders Factsheet	
Institution / Organisation Name	*Major. Antofagasta Region*
Classification	*Principal Stakeholder / Government*
Role	**Duties**
The Major is accountable for leading the work attached to the Interior Government Position in the Region, according to the directions, orders and instructions being issued by the Head of State, either directly or through the Minister of the Interior. The Major position enjoys full confidence of the President of the Republic.	1. To issue and approve regional policies, plans and development programmes, as well as a draft budget, all of which should be in line with the national development policy and the National Budget. 2. To manage investment of resources corresponding to the region according to the National Fund for Regional Development allocation. 3. Making decisions vis-à-vis the allocation to specific projects of sector investment programmes resources for regional allocation pursuant to the annual Nation Budget Law. 4. Issuing general rules to regulate subjects under its competence. 5. Advising municipal authorities when they so require, and in particular concerning the design of development plans and programmes. 6. Adopting measures as required to deal with emergency and disaster emergencies, and implementing disaster prevention and protection programmes, without prejudice to the powers of the competent national authorities. 7. Participating in international cooperation activities in the region, within the framework set forth by treaties and agreements that the Government of Chile enters into for this purpose and in accordance with the procedures regulated in relevant legislation. 8. Exercising legal powers as may be transferred to it. 9. Maintaining a permanent relationship with the national government and its different agencies, in order for the implementation of their respective duties is duly complemented.

Key Stakeholders Factsheet	
Institution / Organisation Name	*Regional Council. Antofagasta Region*
Classification	*Principal Stakeholder / Government*
Role	**Duties**
The Regional Council is responsible for ensuring the effective participation of the regional community in the Regional Government, which is democratically elected. The Council is invested with normative, operative and auditing powers, and should be buttressed on equity, efficiency and effectiveness principles in the allocation and use of public resources.	1. Approving regional urban development plans, metropolitan regulatory plans and intercommunal regulatory plans being proposed by the regional secretariat attached to the Ministry of Housing and Urban Planning 2. Approving the communal regulatory plans and sectional plans of communes not forming part of a territory regulated by a metropolitan or intercommunal regulatory plan, as previously agreed upon by the municipalities, and pursuant to the General Law of Urban Planning and Constructions, based on a Technical report to be issued by the respective ministerial regional secretariat attached to the Department of Housing and Urban Planning. 3. Based on the Major´s proposal, deciding upon the allocation of the National Fund of Regional Development´s resources corresponding to the region; sector investment programmes resources regionally allocated; and internally-generated resources that the Regional Government collects pursuant to the provision Number 20 of Article 19 of the Political Constitution of the Republic.
Authority	Medium
Standing	Likely to be pro to the project
Concern	Likely to be high vis-à-vis the Project´s contingency

Key Stakeholders Factsheet	
Institution / Organisation Name	*Ministry of Public Works. Antofagasta Region*
Classification	*Primary Stakeholder / Government*
Role	**Duties**

Recovering, strengthening up and moving along in the provision and management of infrastructure works and services for connectivity, protection of people and the territory, public building and the best use of water resources; ensuring the provision and care of water resources and the environment, to making a contribution to economic, social and cultural development, fostering equity, quality of life and equal opportunities for people.	The Ministry of Public Works is responsible for planning, design, construction, expansion, repair, preservation and operation of public works under its care, such as roads, highways, bridges, tunnels, airports, airfields, ramps, irrigation reservoirs, river defences, rainwater collectors, rural drinking water, new public building works, valuation of existing public patrimonial property, coastline, among others. Furthermore, it is responsible for the implementation of the Concessions Law and the Water Code. The Ministry also acts by mandate, since it is responsible for the survey, projection, construction, extension and repair of works commissioned by Ministries which, by Law, have been empowered to build works; the State institutions or companies; companies in which the State has an equity stake; the Regional Governments and the Municipalities; agreeing upon the works conditions, modalities and funding.

Authority	High
Standing	Likely to be pro to the project
Concern	High

Key Stakeholders Factsheet	
Institution / Organisation Name	*Ministry of the Environment*
Classification	*Primary Stakeholder / Government*
Role	**Duties**
The Ministry of the Environment of Chile is the State body responsible for cooperating with the President of the Republic in drafting up and enforcing environmental policy, plans and programmes, as well as in the protection and conservation of biological diversity and Renewable natural resources and water, promoting sustainable development, the integrity of environmental policy and its normative regulation.	A particular duty concerning the Project is to bringing forward Policy and formulating climate change-addressed plans, programmes and action plans. The Ministry´s competence also entails co-operating with the different State Administration organs at the national, regional and local level, in order to determine the bearing those entities have on the local level, as well as to establishing adaptation and

	mitigation measures as required.
Authority	Medium/High
Standing	Pro to the project
Concern	High

Key Stakeholders Factsheet	
Institution / Organisation Name	*ONEMI*
Classification	*Primary Stakeholder / Government*
Role	**Duties**
The National Emergency Office of the Ministry of Interior and Public Security is the technical agency of the State of Chile responsible for the coordination of the National Civil Protection System. Its mission is to plan, promote, articulate and implement prevention, response and rehabilitation actions in situations of collective risk, emergencies, disasters and catastrophes of natural origin or caused by human action. Its vision is to be the institution that leads at the national, regional and communal level the coordinated interaction of all members of the National Civil Protection System making Disaster Risk Reduction a national priority; Achieve sustainable development with resilient communities and be a benchmark in the management of the cycle of risks and emergencies.	Strategic pillars have been defined for ONEMI representing the strategic focus and the major issues of concern for the organisation. 1. Operational Excellence: High quality management and productivity in the timely delivery of goods and services to the community. 2. Leadership in the National System for Civil Protection: Articulating and coordinating stakeholders within the National System for Civil Protection. 3. Resilient Community: Encouraging the implementation of a preventive culture in the community.
Authority	High
Standing	Likely to be pro to the project
Concern	Likely to be high

Key Stakeholders Factsheet	
Institution / Organisation Name	*SHOA*
Classification	*Primary Stakeholder / Government*

Role	**Duties**
The core mission of the Hydrographic and Oceanographic Service attached to the Chilean Navy is to supply technical elements, information and technical assistance so as to ensure safe navigation in waterways and lakes, inland waters, territorial sea and in the high seas adjacent to the Chilean seacoast. Further, it is the official, technical and permanent State service in all matters referring to hydrography; maritime, river and lacustrine hydrographic survey; nautical charting; elaboration and publication of navigation charts of national waters; oceanography, planning and coordination of all oceanographic activities related to physical-chemical research, tides, currents and tsunamis; nautical geography, navigation, astronomy, official time signals, aerophotogrammetry applied to the nautical chart. SHOA is also responsible for advancing research toward the implementation and promotion of some other related national and international activities, which are of particular interest to the country.	Among Duties, the following are mentioned: • Drafting up newsletters and publishing research papers • Teaching • Publishing tides-related information • Making Radio warnings • Making Tsunami warnings • El Niño Phenomenon • Information on sea surface temperature • Updating of navigation charts

Authority	Medium
Standing	Likely to be pro to, or Unconcerned to the project
Concern	Likely to be High or Unconcerned

Key Stakeholders Factsheet	
Institution / Organisation Name	*ASEMUCH Association of Municipalities in the Antofagasta Region*
Classification	*Backup Stakeholder / Non-Government*

Role	**Duties**
The Association´s general objectives are based on helping facilitate the search for solving common problems and making the best use of resources available, ensuring the promotion of municipal autonomy, local interests, and a deepening of the democratic process. The Board is made up of twelve (12) members: nine mayors, and three councillors representing member communes (each councillor represents one of the three provinces making up the Antofagasta Region)	1. Making operational proposals vis-à-vis the Associations of municipalities contribution to decentralisation and sub-regional and local management. 2. Designing and implementing management tools suitable to the structure and duties of associations of municipalities. 3. Encouraging exchange of experiences and horizontal cooperation between municipal associations in the national and international setting. 4. Conducting capacity-building programmes on subjects related to associative management. 5. Management, monitoring and evaluation of the impact of the PFAM and the "Innovation and local entrepreneurship capital" finance funds. 6. Providing institutional support to the Associations of municipalities vis-à-vis their relationship with public institutions. 7. Technical assistance to Associations of municipalities so that they are granted legal status and management of the Private Law Corporation " instrument. 8. Managing the "Single Register of Municipal Associations with Legal Status".

Authority	Medium
Standing	Likely to be pro, or Unconcerned to the project, since management is Focused on strengthening up the municipal administration
Concern	Likely to be High or Unconcerned

Key Stakeholders Factsheet	
Institution / Organisation Name	*Ministry of Housing and Urban Planning*
Classification	*Primary Stakeholder / Government*
Role	**Duties**
Providing access to quality housing solutions and contributing to the establishment of equitable, integrated and sustainable neighbourhoods and cities, in line with decentralisation, participation and development criteria, so that people, families and communities may improve their quality of life and enhance their wellbeing	1. Reducing the housing deficit of most vulnerable sectors. 2. Recovering neighbourhoods, with a focus on vulnerable people living under dilapidating housing and / or urban decay conditions; generating investments that reduce common spaces deficit, strengthening up social networks and allowing for a balanced insertion of these people in the cities. 3.- Ensuring the development of cities, fostering the way they are planned, increasing investment in infrastructure for connectivity, and public spaces encouraging social integration. 4.- Providing citizens with quality products and services in housing areas, neighbourhoods and city, by means of the implementation of a quality management system. 5.- Warranting proper and timely standardised information to citizens. and strengthening up instances for responsible participation in the management and use of investments in housing, neighbourhoods and city.
Authority	Medium
Standing	Likely be pro or Unconcerned to the project, since management is Focused on strengthening up municipal management.
Concern	Likely to be High or Unconcerned

Key Stakeholders Factsheet	
Institution / Organisation Name	*Antofagasta Municipality*
Classification	*Primary Stakeholder / Government*
Role	**Duties**
Municipalities are autonomous public-law corporations with a legal status and their own equity, the end goal of which is to addressing the needs of the local community and ensure its participation in the economic, social and cultural progress of the communes concerned	1. Drafting up, approving and revising the communal development plan the implementation of which should be in line with regional and national plans; 2. The commune´s planning and regulation and the drafting up of the communal regulatory plan, in accordance with legal regulations in force; 3. The promotion of community development; 4. To enforce provisions on public transport and transit within the commune, in line with the wording of the laws and general technical standards enacted by the ministry concerned; 5. To enforce provisions on construction and urban planning as stipulated by Law, and subject to the general technical standards being issued by the ministry concerned; and 6. Cleaning and Ornate of the commune.
Authority	High (at communal level)
Standing	Likely to be pro to the project, since its organisation chart includes an Emergency and Operations Management.
Concern	**High**

Key Stakeholders Factsheet	
Institution / Organisation Name	*Emergency and Operations Management* *Antofagasta Municipality*
Classification	*Primary Stakeholder / Government*
Role	**Duties**
Having access to an administrative and executive system which, in general, is equipped with the human and material resources required to addressing community emergency situations and, in particular, to undertaking preventive action tasks in the	1. Designing and putting forward an Emergency Communal Plan and / or its subsequent changes. 2. Coordinating preventive communal emergency action with the provincial and regional emergency offices. 3. Undertaking at communal level all those

event of catastrophes and mass accidents. Whenever the municipality operational capacity is exceeded, undertaking precautionary measures vis-à-vis the maintenance of the municipal heritage through a direct and subsidized action.	preventive actions allowing for the community to be prepared in case of possible mass accidents or catastrophes. 4. Operating an emergency items provisioning and storage system, allowing to address those shortages arising from mass accidents or catastrophes. 5. Having a human team equipped with material resources to efficiently and in a timely manner react in emergency situations such as: storms, earthquakes, tsunamis, etc. 6. Carrying out tasks addressing the availability and use of the Municipality's communication means. 7. Programming and controlling industrial safety systems designed to prevent risks and contingencies to which municipal officials, infrastructure, and material resources could be exposed. 8. Supplying materials and equipment required in ceremonies and special events likely to be held at the Municipality premises, or somewhere else under the Municipality´ sponsorship. 9. Directing, coordinating and monitoring the maintenance, security and cleanliness of municipal premises. 10. Directing, coordinating and monitoring the work of local agencies, butlers, and stewards at municipal premises. 11. Providing ongoing attention on the proper working and conditions of municipal offices, through basic services carpentry, electricity, plumbing, and others. 12. Managing workforce contractual arrangements for minor works being overseen by the Municipal Production Centre (CEPRO) unit, or any other similar unit that is set up and arranged to implementing light infrastructure plans, supplying assistance, repair and maintenance of Real estate owned by the Municipality. 13. Other duties as may be assigned by Law or by the higher authority.

Authority	Medium
Standing	Likely to be pro to the project, since its organisation chart includes An Emergency and Operations Management.
Concern	High

Key Stakeholders Factsheet	
Institution / Organisation Name	*The Environment, Cleaning and Ornate Management, Municipality of Antofagasta*
Classification	*Primary Stakeholder / Government*
Role	**Duties**
The purpose of the Environment, Cleaning and Ornate Department is to enforce environmental regulations to be implemented in the commune, and these are the responsibility of Municipal authorities; they involve, cleaning of public roads, parks, squares, gardens and, in general, all public use, and municipal administration goods existing in the commune; construction, preservation and management of green areas, and oversight of the final disposal site of solid wastes being produced in the commune.	1. Putting forward and applying measures intended to implement environment-related actions and programmes. 2. Enforcing environmental regulations in the commune. Applying environmental standards to be implemented in the commune that are within its competence. 3. Drafting up the preliminary environmental ordinance project. 4. With own resources or through third parties, taking care of the cleaning of public roads, parks, squares, gardens and, in general, of the national assets for public, and municipal administration use, existing in the commune. 5. Monitoring with own resources or through third parties, the collection service, transport and disposition of solid household waste. 6. Monitoring with own resources or through third parties, the administration of the final disposal site of solid household waste. 7. Ensuring the construction, preservation and management of green areas in the commune. 8. Drafting up the technical basis regarding cleaning, green areas and other services concessions for which Management is responsible. 9. Proposing to the Mayor's authority, for further enforcement, regulations conducive to

	the maintenance of the cleanliness of the city. 10. Providing backup in all emergency situations, with all the human and material resources attached to the Mayor´s office, in order to provide aid to the affected community, according to the Mayor´s instructions or orders.

Authority	Medium
Standing	Likely to be pro to the project, since this Unit could be involved in the construction of green areas, afforestation programmes, and cleaning of streams, or areas to be intervened.
Concern	Likely to be High

Key Stakeholders Factsheet	
Institution / Organisation Name	*Green Antofagasta Programme, DIDECO. Municipality of Antofagasta*
Classification	*Backup Stakeholder / Government*
Role	**Duties**
Generating instances for dialogue, consultation and neighbourhood participation in environmental issues through making proposals and community projects that empower organisations in solving their environmental problems, incorporating the community´s own capacities and tools for an autonomous management of their own problems, needs and initiatives.	1. Identifying and attaching priority to collective needs vis-à-vis the quality of life and the setting where the population live, bearing in mind both, the dispersion and segregation prevailing in the commune, and their differences and contrasts. 2. Advising social organisations and their leaders in the drafting up of participative proposals which are in line with the needs detected and prioritized. 3. Advising social organisations and their leaders in the drafting up of social projects for further submission to current Competitive Funds, incorporating the environmental dimension in their intervention lines. 4. Empowering civil society through awareness-raising and environmental education activities, as well as courses and workshops aimed at generating key knowledge for the sustainable development of their territory, as well as improving quality of life of people.

	5. Fostering actions and habits addressed to generating more respectful behaviours to the environment, through educational actions, contests and projects aimed at achieving this purpose.

Authority	Medium
Standing	Likely to be pro to the project, since Duties are directly linked to awareness-rising and education of the community vis-à-vis the environment.
Concern	Se deduce que High

Key Stakeholders Factsheet	
Institution / Organisation Name	*FIREFIGHTING BRIGADE* *Municipality of Antofagasta*
Classification	*Backup Stakeholder / Government*
Role	**Duties**
To bolster integration, involvement and development of neighbours in a locality. The neighbourhood council is constituted and made operational on the basis of By-laws, which have a legal basis, but may be subject to the particular forms of an organisation.	Acting on behalf of neighbours before the authorities to achieving development agreements. • Managing problem solving with the authorities. • Putting forward and implementing projects that benefit the neighbours. • Identifying infrastructure deficiencies (sewage, lighting, etc.), among others.

Authority	Low
Standing	Pro
Concern	High / Unconcerned

Key Stakeholders Factsheet	
Institution / Organisation Name	*Mounted Police of Chile*
Classification	*Backup Stakeholder / Non-Government*

Role	**Duties**
The Chilean Mounted Policy is in place to attach effectiveness to Law; warrant public order, and internal public security throughout the Republic Territory.	Duties involve working lines as follows: - Crime prevention - Investigation - National Integration - Education - Social solidarity - Public security - Control of public order

Authority	Low
Standing	Pro to the project
Concern	High / Unconcerned

Key Stakeholders Factsheet	
Institution / Organisation Name	*Armed Forces of Chile*
Classification	*Backup Stakeholder / Non-Government*

Role	**Duties**
The Armed Forces of Chile are made up by the Army (1810), the Navy (1817) and the Air Force (1930), and are attached to the National Defence Ministry. The Constitution entrusts them with the defence of the country, setting forth its essential nature vis-à-vis national security.	Their Duties are mainly addressed to maintenance of the order. This is the reason why it is essential to understand the duty according to which the Armed Forces, subordinated to civil power, abide by the latter´s order to act in some extreme case, in which the validity of the Constitution and laws, or even the very existence of the State, may be at risk because of a threat from within the country. The Armed Forces must then fulfil the orders of the constituted powers and act in the internal setting, which apparently is foreign to them. It goes without saying that this extreme resource shall be resorted to by the legally constituted authority whenever all other dissuasive and repressive alternatives available to the State have been surpassed.

Authority	Low

Standing	Pro
Concern	High / Unconcerned

Key Stakeholders Factsheet	
Institution / Organisation Name	*Overcoming Poverty Foundation*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
The Overcoming Poverty Foundation (FSP, for its acronym in Spanish) is a private, non-profit and public-interest institution, established in 1994. The FSP contribution to national development is buttressed on action and knowledge generation, tools and proposals addressed to policy and social intervention with a view to overcoming poverty and social exclusion. Our mission is to fostering enhanced equity and social integration in the country so as to ensure a sustainable development of people living in poverty and social exclusion. A key factor in shaping up our strategic identity has been the option to calling upon young people who are undertaking their professional capacity-building to get involved in COUNTRY SERVICE as professionals, practitioners, or volunteers, contributing as direct intervention agents. To achieve this goal, we are being backed up by the State of Chile, through the inclusion of some in the Budget of the Nation Law of a pool of funds for the FSP.	1. Country Service 2. Country Proposals (Thesis): The Country Thesis programme is set up within the framework of these goals. Young pre- and post-graduate students are invited to get involved year after year; they are also encouraged to writing their thesis work and papers with a particular focus on poverty, social policy, equity and social integration, with a more in-depth approach into the theoretical, methodological and practical knowledge about the poverty phenomenon, its manifestations, constraints, and coping strategies, within the framework of FSP national and regional objectives and priorities. At the same time, Country Thesis seeks to having a bearing on student capacity-building, contributing to the awareness and motivation of new professionals vis-à-vis an understanding and intervention of the poverty phenomenon of poverty and its solution. 3. Communication and Poverty Alliance: To provide communication-focused journalists and students with tools allowing them to address from a qualified perspective those issues related to social exclusion, poverty, and how to overcome them.

Authority	Low
Standing	Likely to be pro or Unconcerned, depending upon whether the project is executed in an area where the Foundation is undertaking community work.

Concern	**H**igh or Unconcerned

Key Stakeholders Factsheet	
Institution / Organisation Name	*Christ Home Foundation*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
The Christ Home Foundation is a private, non-profit and public-interest institution, established in 1994. The Christ Home contribution to national development is buttressed on action and knowledge generation, tools and proposals addressed to policy and social intervention with a view to overcoming poverty and social exclusion. Our mission is to fostering equity and social integration in the country so as to ensure a sustainable development of people living in poverty and social exclusion. A key factor in shaping up our strategic identity has been the option to calling upon young people who are undertaking their professional capacity-building to get involved in COUNTRY SERVICE as professionals, practitioners, or volunteers, contributing as direct intervention agents. To achieve this goal, we are being backed up by the State of Chile, through the inclusion of some in the Budget of the Nation Law of a pool of funds for Christ Home.	1. Country Service 2. Country Proposals (Thesis): The Country Thesis programme is set up within the framework of these goals. Young pre- and post-graduate students are invited to get involved year after year, they are also encouraged to writing their thesis work and papers with a particular focus on poverty, social policy, equity and social integration, with a more in-depth approach into the theoretical, methodological and practical knowledge about the poverty phenomenon, its manifestations, constraints, and coping strategies, within the framework of FSP national and regional objectives and priorities. At the same time, Country Thesis seeks to having a bearing on student capacity-building, contributing to the awareness and motivation of new professionals vis-à-vis an understanding and intervention of the poverty phenomenon of poverty and its solution. 3. Communication and Poverty Alliance: To provide communication-focused journalists and students with tools allowing them to address from a qualified perspective those issues related to social exclusion, poverty, and how to overcome them.
Authority	Low
Standing	Likely to be in favour or unconcerned, depending upon whether the Project is executed in an area where the Foundation is operating.
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	*A ROOF FOR CHILE Foundation*
Classification	*Backup Stakeholder / Non-Government*

Role	**Duties**
The Roof for Chile Foundation (RFCh, for its acronym in Spanish) is a private, non-profit and public-interest institution, established in 1994. The RFCh contribution to national development is buttressed on action and knowledge generation, tools and proposals addressed to policy and social intervention with a view to overcoming poverty and social exclusion. Our mission is to fostering equity and social integration in the country so as to ensure a sustainable development of people living in poverty and social exclusion. A key factor in shaping up our strategic identity has been the option to calling upon young people who are undertaking their professional capacity-building to get involved in COUNTRY SERVICE as professionals, practitioners, or volunteers, contributing as direct intervention agents. To achieve this goal, we are being backed up by the State of Chile, through the inclusion of some in the Budget of the Nation Law of a pool of funds for RFCh.	1. Country Service 2. Country Proposals (Thesis): The Country Thesis programme is set up within the framework of these goals. Young pre- and post-graduate students are invited to get involved year after year, they are also encouraged to writing their thesis work and papers with a particular focus on poverty, social policy, equity and social integration, with a more in-depth approach into the theoretical, methodological and practical knowledge about the poverty phenomenon, its manifestations, constraints, and coping strategies, within the framework of FSP national and regional objectives and priorities. At the same time, Country Thesis seeks to having a bearing on student capacity-building, contributing to the awareness and motivation of new professionals vis-à-vis an understanding and intervention of the poverty phenomenon of poverty and its solution. 3. Communication and Poverty Alliance: To provide communication-focused journalists and students with tools allowing them to address from a qualified perspective those issues related to social exclusion, poverty, and how to overcome them.

Authority	Low
Standing	Likely to be in favour or Unconcerned, depending upon whether the Project is executed in an area where the organisation is operating.
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	*FRACTAL Schools*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
To be a group which, through a critical praxis, makes a contribution to implementing processes for change in a search for a society which is buttressed on good living.	FRACTAL Action lines are: - Childhood: Schools buttress their work on a Children's and Youngers´ Rights outlook, and on the Non-formal and Intercultural Education Model. Current objectives are as follows: a) Making a contribution to creating a space for participation, expression and development, that is managed and organised by youngsters, girls and boys living in the Villa Esperanza Shantytown; b) Together with group members, generating significant instances for individual and collective development that is buttressed on respect, acceptance, aesthetic exploration, and strengthening up of the individual; c) Urging the implementation of spaces for active participation by Latin American migrant children. - Migration: The migration line was set up in late April 2013, originating on the concern of group members and independent individuals for the migration situation of South American men and women who have arrived in the country and in the region, and who are enduring social, labour and educational precariousness conditions. - Student education: The adult education area was set up in 2013, as a literacy instance based on the concern shown by people living in the Bonilla alto sector, who expressed their interest in solving the educational needs of many of them, who do not know how to read and write. - Extension: We understand it as a process and strategy allowing us to bringing to public debate those issues and problems concerning us and / or that are associated with our community praxis. In this sense, the extension activities seek to address the current work being undertaken by the social area, and helping make visible the group standing as a viable social work alternative. Critical and with an emancipatory perspective.
Authority	Low
Standing	Likely to be pro or Unconcerned, depending upon whether the project is executed in an area where FRACTAL is operating.
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	*CULTAM*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
CULTAM, is a private, autonomous, non-for profit entity, not related to any political and / or religious doctrine, the purpose of which is to promote and encourage within the community the appreciation, conservation and sustainable use of the cultural and natural heritage of the Great North of Chile, through the design, management and execution of projects, the implementation of surveys, consultancy, services, or strategies.	Production of educational material, talks, capacity-building, and holding of events. Its members are professionals working in fields such as culture, environment, and education, with a strong background in project formulation and execution.
Authority	Low
Standing	Likely to be pro or Unconcerned, depending upon whether the project is executed in an area where CULTAM is operating.
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	*CREO Antofagasta*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
CREO Antofagasta is a Project the end goal of which is to addressing the growth challenge the city is facing, with a strong sense of improvement in the community quality of life. The *Creo Antofagasta´*s aim is to envisioning a city in which we want to live, through a Master Plan setting forth a sustainable urban growth of Antofagasta up to year 2035.	To accomplishing the end goal to building up a city that becomes into a national and international model, the Project works on the basis of a public-private governance system incorporating Regional Government stakeholders, the Municipality of Antofagasta, and the community as a whole, so that through a participatory dialogue, the needs and expectations of all those people making up the city are fully met. The Project management entails the involvement of: - A public-private Committee

	- An Executive Committee - A Working Team The Executive Committee is coordinated by the CREO Antofagasta Plan Chairman, the Mayor, and the Intendent.
Authority	Medium / High
Standing	Likely to be in favour
Concern	Likely to be High

Key Stakeholders Factsheet	
Institution / Organisation Name	*My Park Foundation*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
This Foundation seeks to creating a community sense through the participatory recovery of Green areas in neglected neighbourhoods needing Green areas the most.	Drafting up a "Green Squares" project: - Seeking funds. - Involving municipalities in a search for land and maintenance of Green areas. - Participatory design. - Accompaniment, seeking to set up a neighbourhood committee to be in charge of the protection, care and implementation of the new Green Square. Drafting up projects for "Educational Backyards": - Fund-rising - Selection of communities: Gardens or schools interested in improving their backyards Participatory design Participatory construction Accompaniment.
Authority	Low
Standing	Likely to be pro or Unconcerned, depending upon whether the project is executed in an area where My Park Foundation is operating.
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	Antofagasta *Productive Development Corporation*
Classification	*Backup Stakeholder / Non-Government*

Role	**Duties**
A private non-profit organisation working on the Sustainable Development of the Antofagasta Region, and cooperating with socially responsible entities in the design, execution and evaluation of surveys, projects and shared-value programmes. Thus, the organisation seeks to contributing to policymaking and design of strategic definitions for regional development.	Making a contribution to the sustainable development of the Antofagasta Region, on the basis of projects and programmes, incorporating as strategic guidelines those being set forth in the Regional Development Strategy, as follows: - Education: Building up an innovative human capital. Comprehensive development of people. - A sustainable region: Ensuring the environmental sustainability of the territory. - Social cohesion and quality of life: Social cohesion to improving quality of life within the framework of a development-generating economic growth. - Territorial economic development: Cluster consolidation; productive diversification; entrepreneurship. - Economic integration: Consolidating and strengthening up the region´s internationalisation as a business platform. - Updating and participation: Integration of the different territorial stakeholders vis-à-vis regional development. - Regional Identity: Based on rescuing and appraisement of the natural, historical, and cultural heritage.

Authority	Low
Standing	Likely to be pro or Unconcerned, depending upon whether the Project is executed in an area where the Corporation is operating.
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	*CEITSAZA. Northern Catholic University*

Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
The Desert Water Technology Research Centre, (CEITSAZA, for its acronym in Spanish) is working on research and technological development toward an environmentally-friendly sustainable and efficient management of water resources, mainly in arid areas. The CEITSAZA´s key objective is to be the leading institution working in research and technological development for a sustainable and efficient management of water resources, which is based on innovation, protection, and respect for both, people and the environment.	The Centre is meeting its objective to assessing and projecting the availability of water resources by generating management indicators buttressing decision-making; the Centre further develops technological solutions vis-à-vis the use of the resource, and makes a contribution to the strengthening up regional capacity. The Centre working areas are: • Water treatment • Mining • Agriculture
Authority	Low
Standing	Likely to be pro or Unconcerned, depending upon whether the Project is executed in an area where *CEITSAZA* is operating (green areas).
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	*Shantytown Eradication Plan* *Regional Government(REGO)*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
The regional government office in charge of the local shantytown area-related matters was established some three years ago, as an outcome of a demographic explosion the city has sustained on account of the proliferation of illegal settlements in the city. This office is responsible for identifying and characterizing shantytowns in the city, the number of which has grown to more than 40 settlements, housing more than 4000 people living in below-normal conditions, without access to basic utilities.	- Getting in close contact with the population identified - Making a diagnosis and a characterisation of their situation - Addressing key demands of the population - Giving an early warning in case of risks
Authority	Medium

Standing	Pro
Concern	Likely to be High, since the Project would benefit people in shantytowns who could be at risk

Key Stakeholders Factsheet	
Institution / Organisation Name	*Women United Shantytown*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
The aim of this institution is to regularise housing demands for a group of people. Established in 2006, this institution is currently housing about 40 people, more than half of whom are migrants from Colombia, Peru and Bolivia)	Unifying the housing demand for a group of people. Following the regular channels through the Ministry of Housing and Urban Planning MHUP to qualify for housing funding and benefits. Coordinating shantytown activities.
Authority	Low
Standing	Pro
Concern	High

Key Stakeholders Factsheet	
Institution / Organisation Name	*Officer in charge of shantytowns. Municipality of Antofagasta (I.M.A.)*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
Unit attached to DIDECO Community Organisations, which is in charge of coordinating and addressing demands, consultations, etc. from these functional organisations made up of people living in shantytowns.	Guidance vis-a-vis the legal constitution of the organisation. Consultation guidance. Addressing needs in case of emergency. Keeping a cadastre record of shantytowns in the city, their location, organisational system, contact with leaders. Beneficiaries of municipal activities.

Authority	Low
Standing	Likely to be pro or Unconcerned, depending upon whether the Project is to be executed in an area being intervened by the DIDECO.
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	*Board of Neighbours CaRol Urzúa*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
To foster integration, participation and advance of neighbours in a community. Neighbours boards are made up and work on the basis of By-laws which, while having a legal basis, may be subject to particular organisational ways.	- Representing neighbours before the authorities to having access to development agreements. - Managing the solution of problems before concerned authorities. - Putting forth and implementing projects to the benefit of neighbours. - Identifying infrastructure deficiencies (sewerage, lighting, etc.), among others.

Authority	Low
Standing	Likely to be pro or Unconcerned, depending upon whether the Project is to be executed in an area being intervened by the Board of Neighbours.
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	*Board of Neighbours Esperanza Nuestra*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
To foster integration, participation and advance of neighbours in a community. Neighbours boards are made up and work on the basis of By-laws which, while	• Representing neighbours before the authorities to having access to development agreements. - Managing the solution of problems before

having a legal basis, may be subject to particular organisational ways.	concerned authorities. - Putting forth and implementing projects to the benefit of neighbours. - Identifying infrastructure deficiencies (sewerage, lighting, etc.), among others.
Authority	High
Standing	Likely to be pro or Unconcerned, depending upon whether the Project is to be executed in an area being intervened by the Board of Neighbours.
Concern	Likely to be Unconcerned or Low

Key Stakeholders Factsheet	
Institution / Organisation Name	*Board of Neighbours Villa Valdivieso*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
To foster integration, participation and advance of neighbours in a community. Neighbours boards are made up and work on the basis of By-laws which, while having a legal basis, may be subject to particular organisational ways.	• Representing neighbours before the authorities to having access to development agreements. - Managing the solution of problems before concerned authorities. - Putting forth and implementing projects to the benefit of neighbours. - Identifying infrastructure deficiencies (sewerage, lighting, etc.), among others.
Authority	Low
Standing	Pro
Concern	High

Key Stakeholders Factsheet	
Institution / Organisation Name	*Municipality of Taltal*
Classification	*Primary Stakeholder / Government*
Role	**Duties**
Municipalities are autonomous public-	1. To draft up, approve and modify the communal

law corporations with legal personality and their own assets, whose purpose is to meeting the needs of the local community and ensuring their participation in the economic, social and cultural progress of the respective communes	development plan the implementation of which should be in agreement with regional and national plans; 2. The planning and regulation of the commune and the drafting up of the communal regulatory plan, in accordance with current legal norms; 3. The promotion of community development; 4. To enforce public transport and transit provisions within the commune, in a way pursuant to the laws and technical standards of a general nature as stipulated by the respective ministry; 5. To apply provisions ruling construction and urban planning, in the way determined by law, and subject to the general technical standards as stipulated by the respective ministry, and 6. Cleaning and decoration of the commune.
Authority	High (at communal level)
Standing	Pro
Concern	High

Key Stakeholders Factsheet	
Institution / Organisation Name	*Board of Neighbours Gabriela Mistral. Taltal*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
To promoting the integration, participation and development of neighbours in a community. The Neighbourhood Board is constituted and operates on the basis of the Board´s own By-laws, which, while having a legal basis, may be subject to particular organisational standards.	• Representing neighbours before the authorities to entering into development agreements. • Managing problem solving before the authorities. • Proposing and executing projects beneficial to the community. • Identifying infrastructure deficiencies (sewage, lighting, etc.), among others.
Authority	Low
Standing	Pro
Concern	High

Key Stakeholders Factsheet	
Institution / Organisation Name	*Vista Hermosa Shantytowns (Taltal)*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
To promoting the integration, participation and development of neighbours in a community. The Neighbourhood Board is constituted and operates on the basis of the Board´s own By-laws, which, while having a legal basis, may be subject to particular organisational standards.	• Representing neighbours before the authorities to entering into development agreements. • Managing problem solving with vis-a-vis authorities. • Proposing and executing projects beneficial to the community. • Identifying infrastructure deficiencies (sewage, lighting, etc.), among others.
Authority	Low
Standing	Pro
Concern	High

Key Stakeholders Factsheet	
Institution / Organisation Name	*Board of Neighbours Juan Cortés Shantytown (Taltal)*
Classification	*Backup Stakeholder / Non-Government*
Role	**Duties**
To promoting the integration, participation and development of neighbours in a community. The Neighbourhood Board is constituted and operates on the basis of the Board´s own By-laws, which, while having a legal basis, may be subject to particular organisational standards.	• Representing neighbours before the authorities to entering into development agreements. • Managing problem solving with vis-a-vis authorities. • Proposing and executing projects beneficial to the community. • Identifying infrastructure deficiencies (sewage, lightening, etc.), among others.
Authority	Low
Standing	Pro
Concern	High

4.1.2. Summary Table

Summary table below has been constructed on the basis of Key Stakeholders Datasheets as above, showing itemised data, such as: Name, category, incidence level, authority, standing, and concern.

Antofagasta Case

Institution Name	Category	Incidence Level	Authority	Standing	Concern
Regional Government	Basic/Government	Regional	High	Pro	High
Major	Basic/Government	Regional	High	Pro	High
Regional Council	Basic/Government	Regional	Medium	Pro	High
Ministry of Public Works	Basic/Government	Regional/ National	High	Pro	High
Ministry of the Environment	Basic/Government	Regional/ National	Medium/ High	Pro	High
ONEMI	Basic/Government	National/ Regional/ Communal	High	Pro	High
SHOA	Basic/Government	National	Medium	Pro	High
ASEMUCH	Backup/Non-Government	Regional	Medium/ low	Pro	Unconcerned
Ministry of Housing and Urban Planning	Basic/Government	Regional/ National	Medium/ High	Pro	High
Municipality of Antofagasta	Basic/Government Communal		High (at communal level)	Pro	High
Emergencies and Operations Directorate (I.M.A.)	Basic/Government	Communal	Medium	Pro	High
Environment, Cleaning, and Ornate Directorate (I.M.A.)	Backup/Government	Communal	Medium	Pro	High/Unconcerned

Green Antofagasta Programme DIDECO. I.M.A.	Backup/Government	Communal	Low	Pro	High/Unconcerned
Chilean Mounted Police	Backup/Government	Communal Regional/ National	Low	Pro	High/Unconcerned
Chilean Army	Backup /Government	National	Low	Pro	High/Unconcerned
Overcoming Poverty Foundation	Backup/non-Government	National/ Regional/ Communal	Low	Pro	High/Unconcerned
Christ Home	Backup/non-Government	National/ Regional/ Communal	Low	Pro	Unconcerned
A Roof for Chile	Backup/non-Government	National/ Regional/ Communal	Low	Pro	Unconcerned
FRACTAL	Backup/non-Government	Territorial /local	Low	Pro	High/Unconcerned
CULTAM	Backup/non-Government	Territorial /local	Low	Pro	High/Unconcerned
CREO Antofagasta	Backup/non-Government	Communal	high	Pro	High
MY Park Foundation	Backup/non-Government	National/ Regional/ Communal	Low	Pro	Unconcerned
Corporation for Productive Development	Backup/non-Government	Regional	Low	Pro	Unconcerned
CEITSAZA U.C.N.	Backup/non-Government	Regional	Low	Pro	Unconcerned
Breaking off the Shantytown Shackle Plan (GORE)	Backup/Government	Communal	Low	Pro	High

Officer in charge of Shantytowns I.M.A.	Backup/Government	Communal	Low	Pro	High/Unconcerned
Shantytowns Women United	Basic/Non-Government	Territorial /local	Low	Pro	High
JJ.VV. CaRoleUrzúa	Basic/non-Government	Territorial /local	Low	Pro	High
JJ.VV. Esperanza Nuestra	Basic/non-Government	Territorial /local	Low	Pro	High
JJ.VV. Villa Valdivieso	basic/non-Government	Territorial /local	Low	Pro	High

Some other Stakeholders in the Territory:

- **JJ.VV. Cardenal Zamoré**
- **JJ.VV. Villa México**
- **JJ.VV. Villa Alemania**
- **JJ.VV. Bonilla High**
- **JJ.VV. Bonilla Low**
- **JJ.VV. Jorge Alessandri**
- **JJ.VV. Rubén Infanta**
- **Seniors Home (municipality)**
- **Shantytown Víctor Jara**
- **Shantytown Villa Esperanza**

Taltal Case

Institution	Category	Impact	Authority	Standing	Concern
Firefighting Brigade	Backup/Non-Government	Communal/Regional/National	Low	Pro	High/Unconcerned
Taltal Municipality	Basic/Government	Communal	High (at comunal level)	Pro	High
JJ.VV. Gabriela Mistral	Basic/non-Government	Territorial/local	Low	Pro	High

Shantytown Vista Hermosa	Basic/non-Government	Territorial/local	Low	Pro	High
JJ.VV. Juan Cortés	Basic/non-Government	Territorial/local	Low	Pro	High
Seniors Home Taltal	Basic/non-Government	Territorial/local	Low	Pro	High
Fire Brigade	Basic/non-Government	National/Regional/Communal			

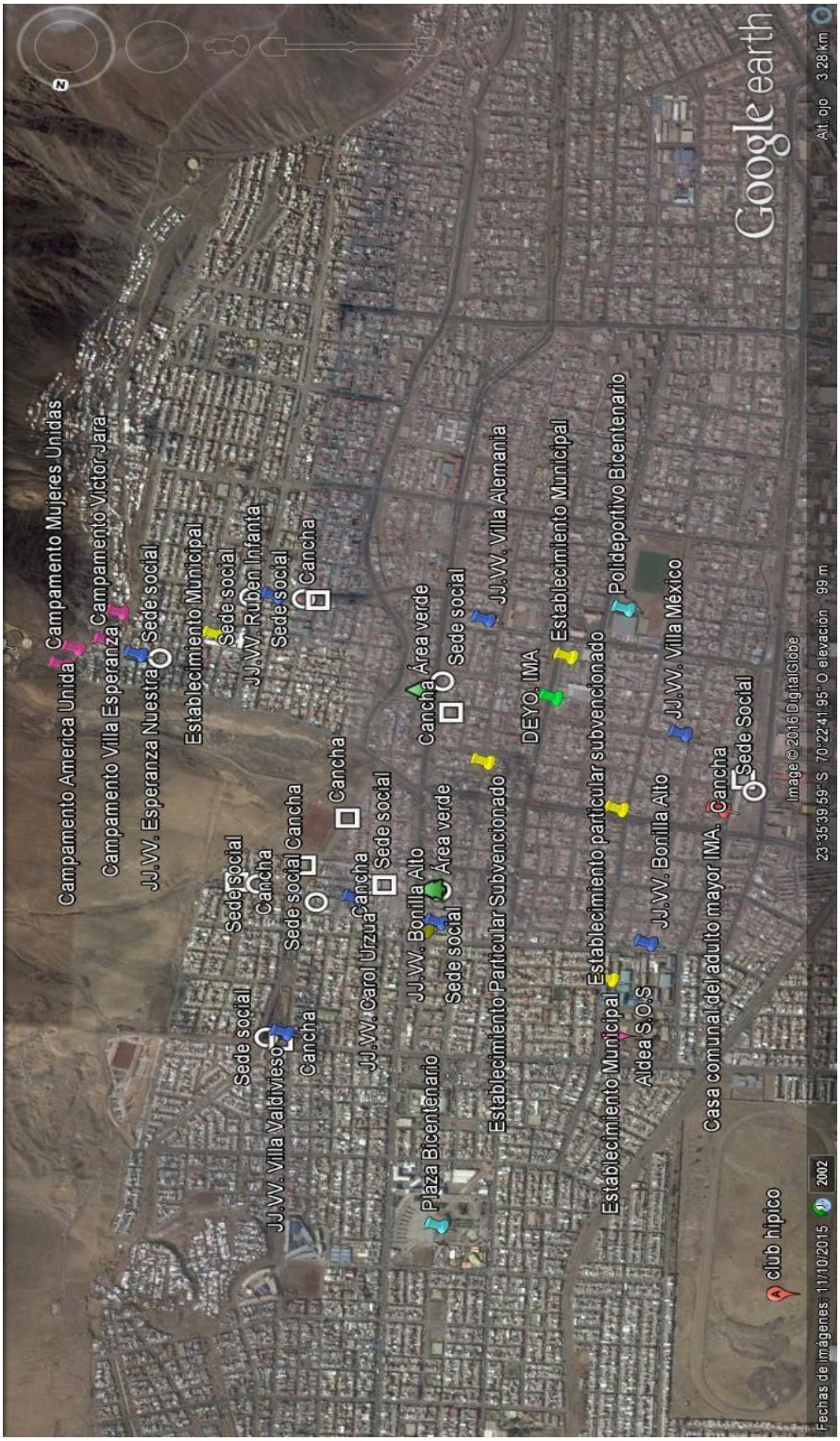
Some Other Stakeholders in the Territory:

- **Toma circunvalación**
- **Shantytowns Tiro al Blanco**
- **Shantytowns Andrés Sabella**
- **Shantytowns Manco moreno**
- **Shantytowns Eusebio Lillo**
- **Shantytowns Salvador Allende**
- **JJ.VV. El Salitre**
- **JJ.VV. La Caleta**
- **JJ.VV. San Lorenzo**
- **Sports Club La Caleta**

4.1.3. Location of stakeholders, community teams and service areas in the territory

Charts below show the dispersion of stakeholders in the territory to be intervened and located in the Quebrada Bonilla area in Antofagasta, and throughout the city of Taltal. In addition, green areas, educational establishments, service areas and community equipment in the territory are identified, such as: headquarters; sports fields; service areas for both Antofagasta and Taltal.

Antofagasta Map



Taltal Map


Fechas de imágenes: 4/12/2016
2005
25°24'29.44" S 70°28'44.93" O elevación 43 m
Alt ojo 2.80 km
Image © 2016 DigitalGlobe
© 2016 Google
Image © 2016 CNES / Astrium
Google earth
Hogar de Ancianos de Taltal
Campamento Salvador Allende
Cancha
Cancha
Av Arturo Prat
Taltal
JJ.VV. Gabriela Mistral
Jorge Montt
O'Higgins
Ilustre Municipalidad de Taltal
Bomberos
Serrano
Riquelme
Barrera
Moreno
Martínez
Campamento Vista Hermosa
Ramírez
Sargento Aldea
Torreblanca
B-898

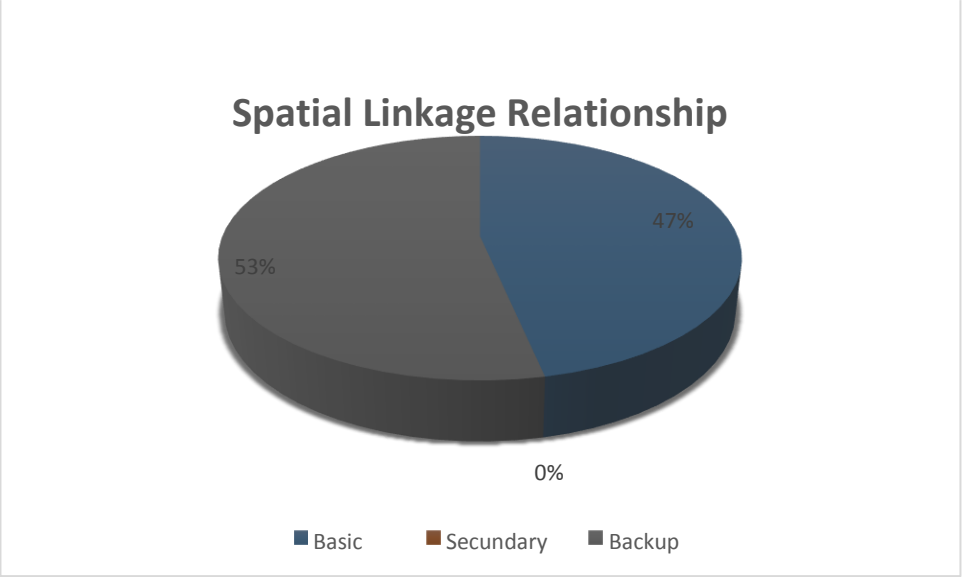
Taltal Shantytowns

4.1.4. Review of Predominant and Power-based Relations

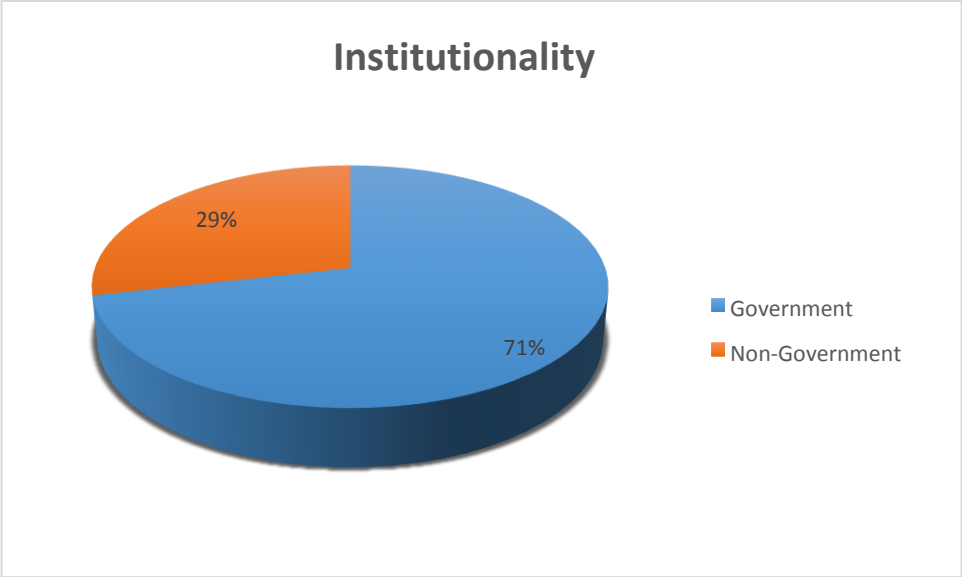
Some trend-focused relations of power dynamics, and predominant relations being held among stakeholders, and consolidated in figures and a matrix recording stakeholders´ dispersion based on predominant relations and stakeholders power ranking for Antofagasta and Taltal are shown below.

Figure-based Consolidation; The Antofagasta Case

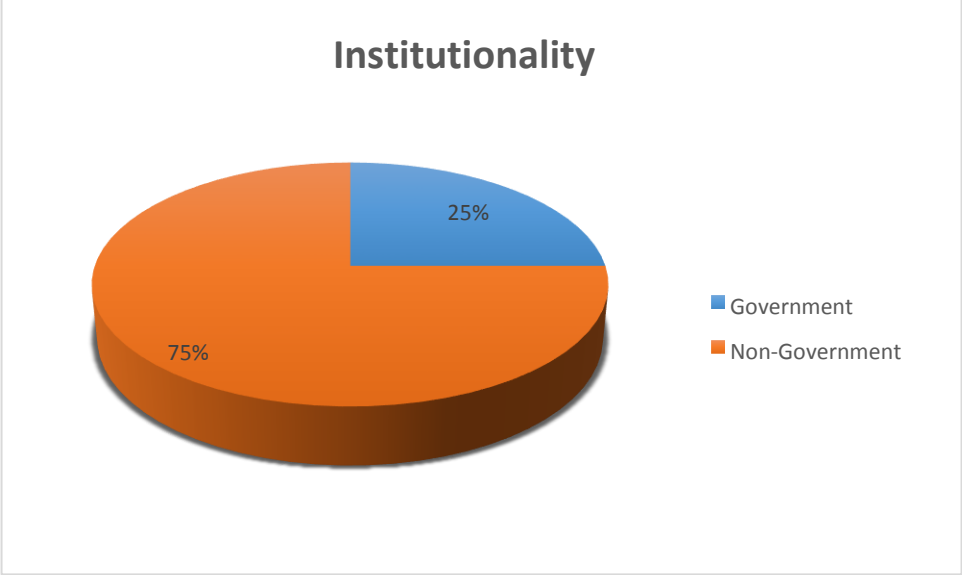
Figure below shows the relationship between primary, secondary and backup stakeholders linked to the measurements. Results show a leadership of backup stakeholders with a 53% ranking.



The institutional level of stakeholders´ distribution was identified insofar primary stakeholders show a distribution with a 21% differentiation in their concentration, ranking first position with 71% vis-à-vis Government-linked stakeholders.

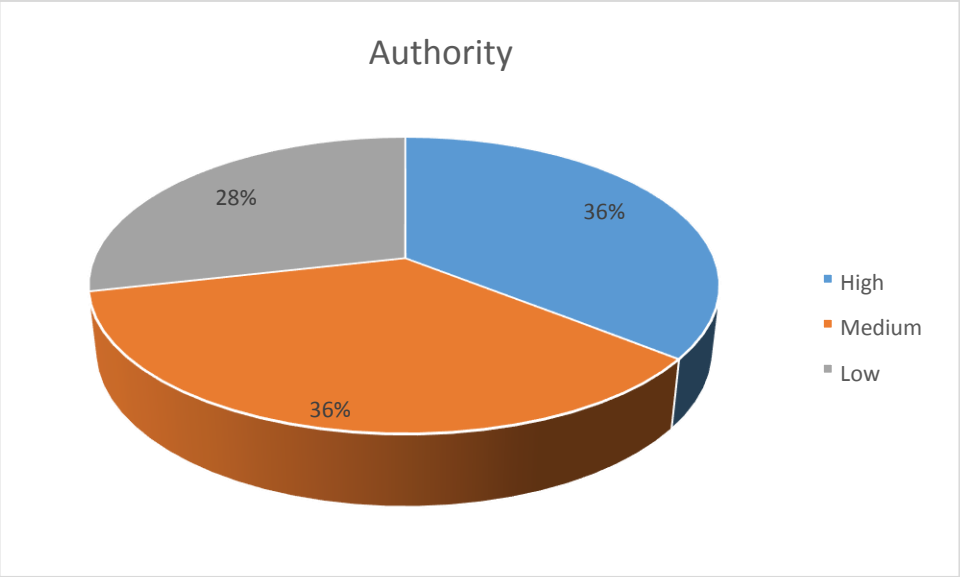


Concerning back-up stakeholders, these show a significant distribution in which a 25% differentiation vis-à-vis the concentration is shown, and non-government-linked backup stakeholders leading with a 76% figure**.**



The distribution and concentration of key, backup and supporting stakeholders vis-à-vis their authority-concern, and standing are concerned, is shown below. The authority being assigned to **Primary stakeholders** is referred to below.

Figure below shows the authority being assigned to primary stakeholders



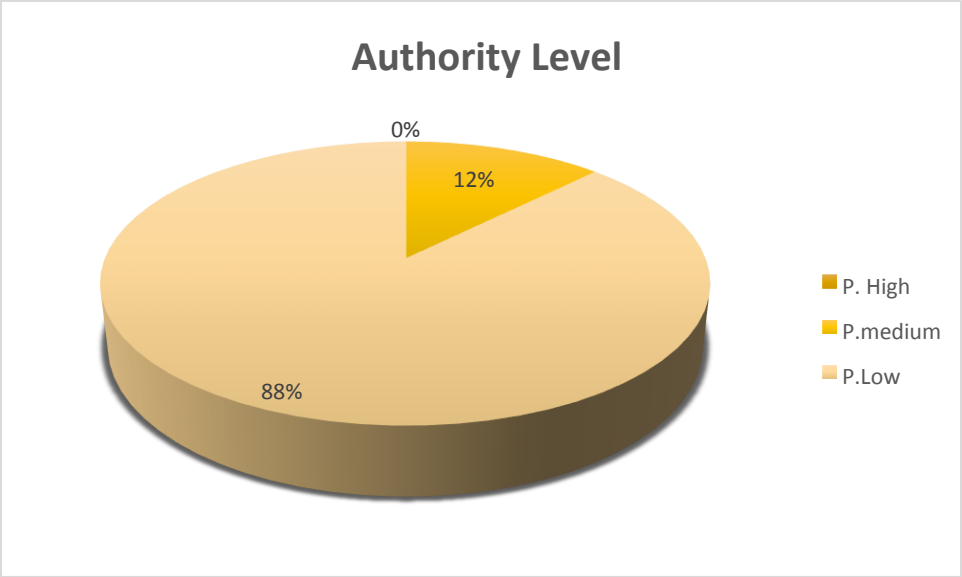
This figure shows how the three categories present an **authority** concentration homogeneity, with no significant differentiation.

As regards concern and positioning among Primary stakeholders, these reached an authority concentration homogeneity by **key stakeholders,** acknowledging a high concern and a favourable (**pro**) standing**.**

Backup Stakeholders

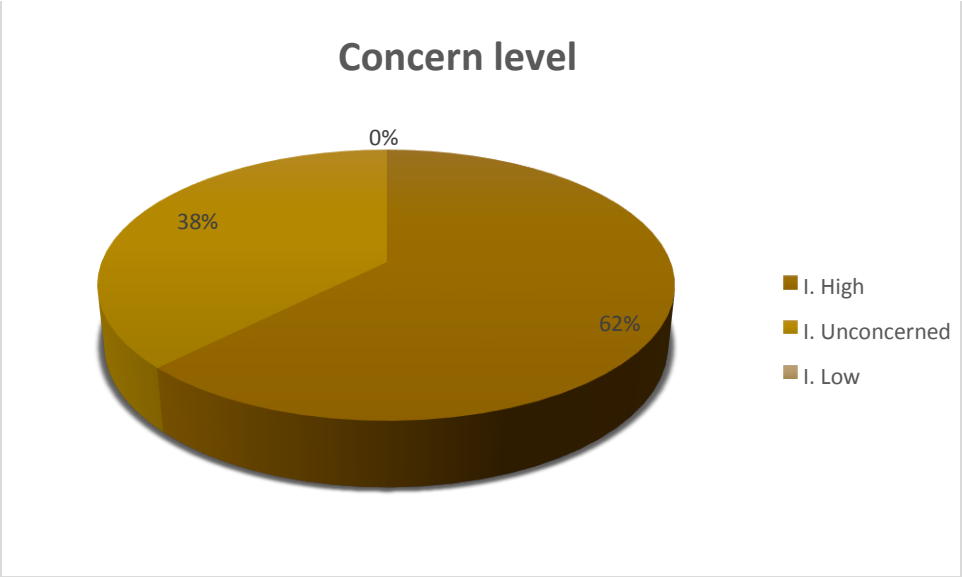
The distribution and concentration of key stakeholders regarding their authority, concern, and standing is shown below.

Figure below shows the percentage **authority** level achieved by backup stakeholders.



This figure shows how backup stakeholders present a low authority level, leading with 88% and a 38 % differentiation

Figure below shows the percentage level of backup stakeholders´ concern

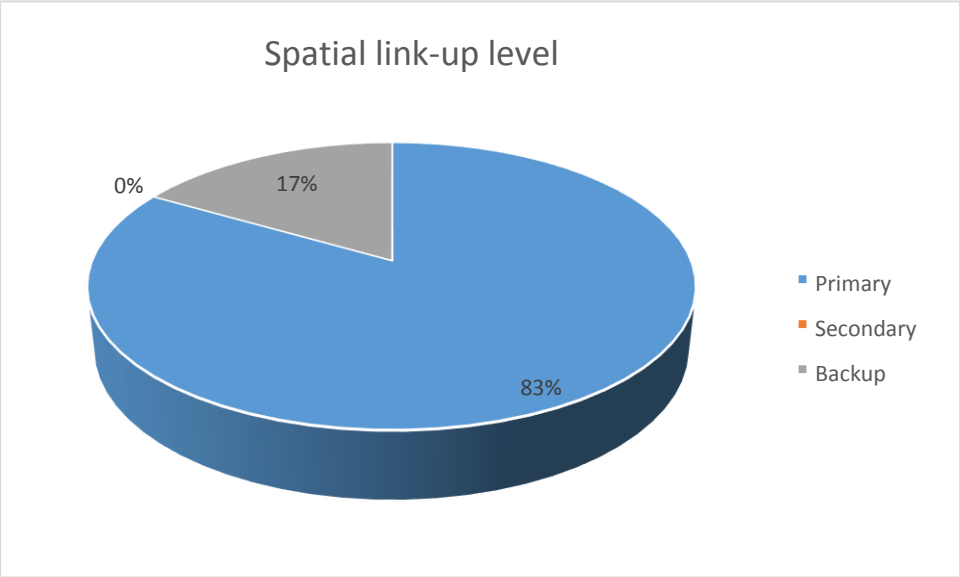


Backup stakeholders show a high concern, leading with a 62%

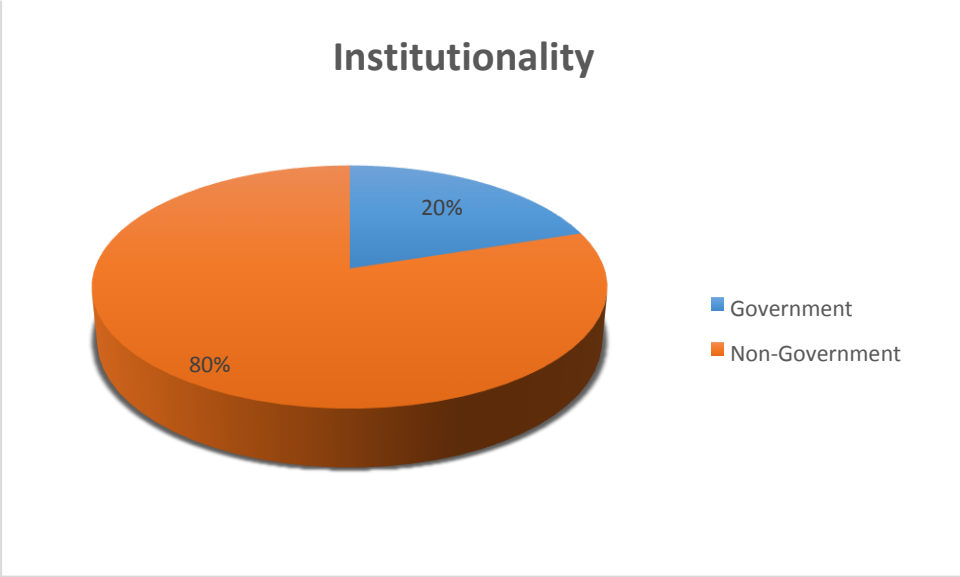
Concerning positioning level within backup stakeholders, the latter reached a unanimous concentration, acknowledging a **favourable (pro) standing**

Figures-based Concentration; the Taltal case

This figure shows the relationship between measure-linked primary, secondary and backup stakeholders. Primary stakeholders are the leaders with an 83% ranking. Also, the absence of secondary stakeholders can be noticed



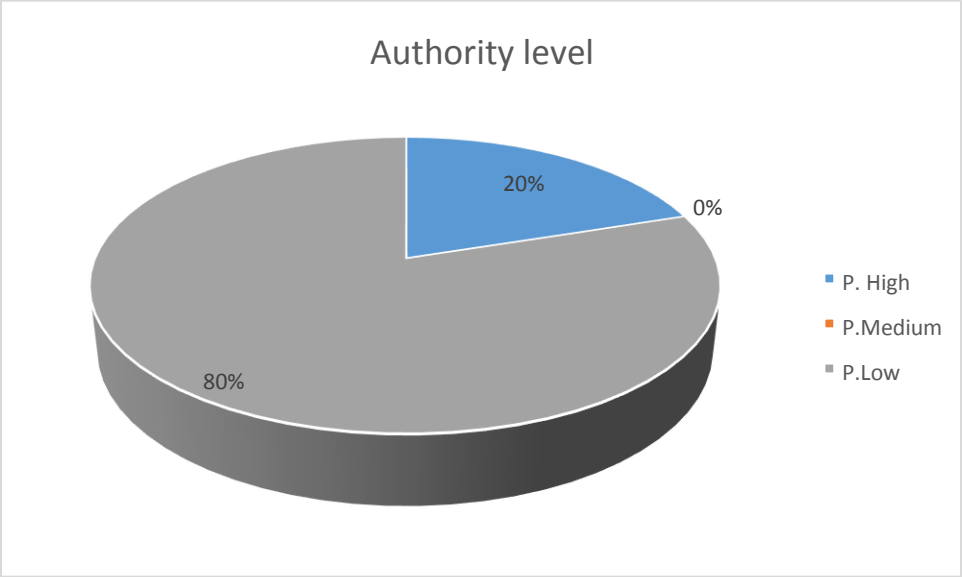
The institutionality level of stakeholders can be seen in the way how they are distributed: Primary stakeholders show a distribution with a 30% concentration differentiation, while Non-government linked stakeholders are the leaders with an 80 % concentration



Concerning backup stakeholders, they show a unanimous non-governmental distribution.

The distribution and concentration of key, basic and backup stakeholders vis-à-vis their authority, concern an standing level is show below. Now, we refer to **Primary stakeholders**.

Figure below shows the authority assigned to Primary stakeholders



This figure shows how only two categories are highlighted in the three authority level categories: High and low, the latter leading with 80%

Regarding the concern and standing levels within Primary Stakeholders these reached a unanimous concentration by key stakeholders, acknowledging a high concern and a favourable standing.

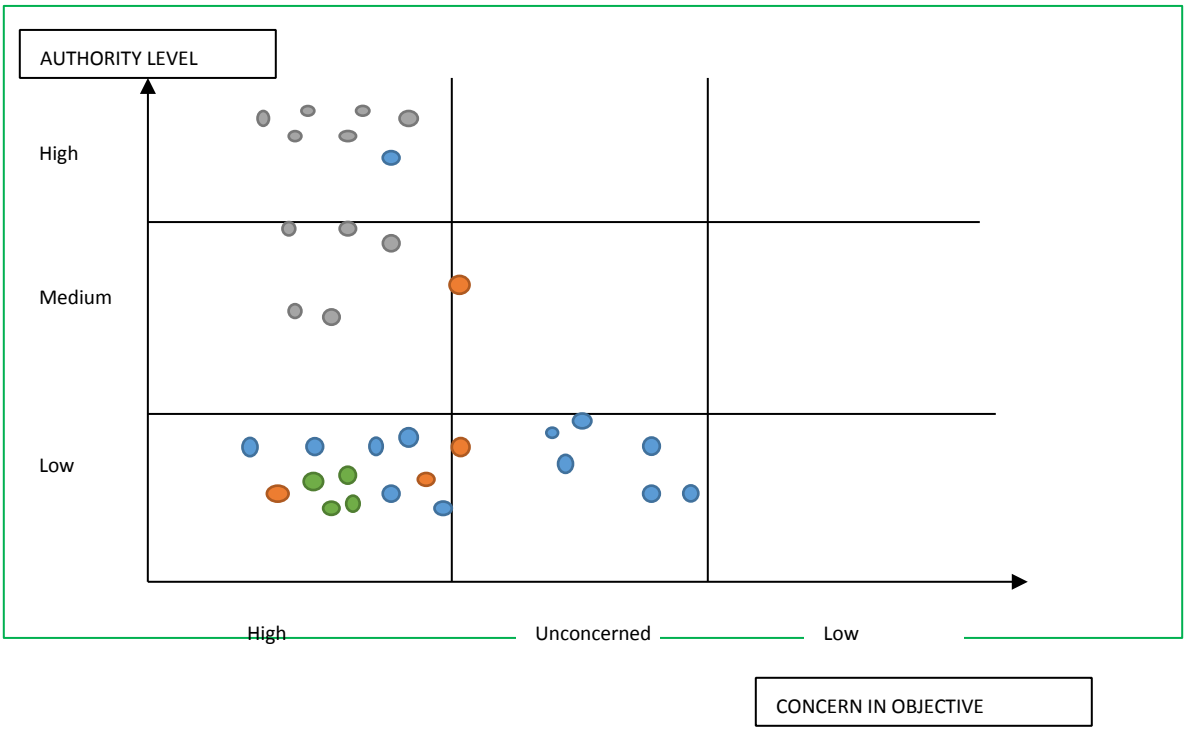
Backup Stakeholders

The distribution and concentration of key stakeholders is shown below vis-a-vis their authority, concern and standing levels.

As regards concern and standing within Backup stakeholders, these reached a unanimous concentration acknowledging a low authority level, a high concern, and a favourable standing

Stakeholders Breakup, predominant relations, and authority ranking Matrix

The Antofagasta Case



Basic/Government: Basic/Non-Government:

Backup /Government Backup /Non-Government

Primary stakeholders / Government: According to the dispersion matrix, Government stakeholders having a direct involvement in the development and implementation of the project preliminary concept measures, are characterized by the medium and high power level they hold, a fact playing in favour of the project´s execution. State agencies belong to this category together with local Government Units attached to the Municipality of Antofagasta that represent the local government. In this particular case, the Municipality holds a High and important power at communal level, since the municipality considers urban planning by way of planning instruments. For this particular paper, it is important for actions between these institutions are articulated. These institutions are characterized by having a high interest in the execution of the project.

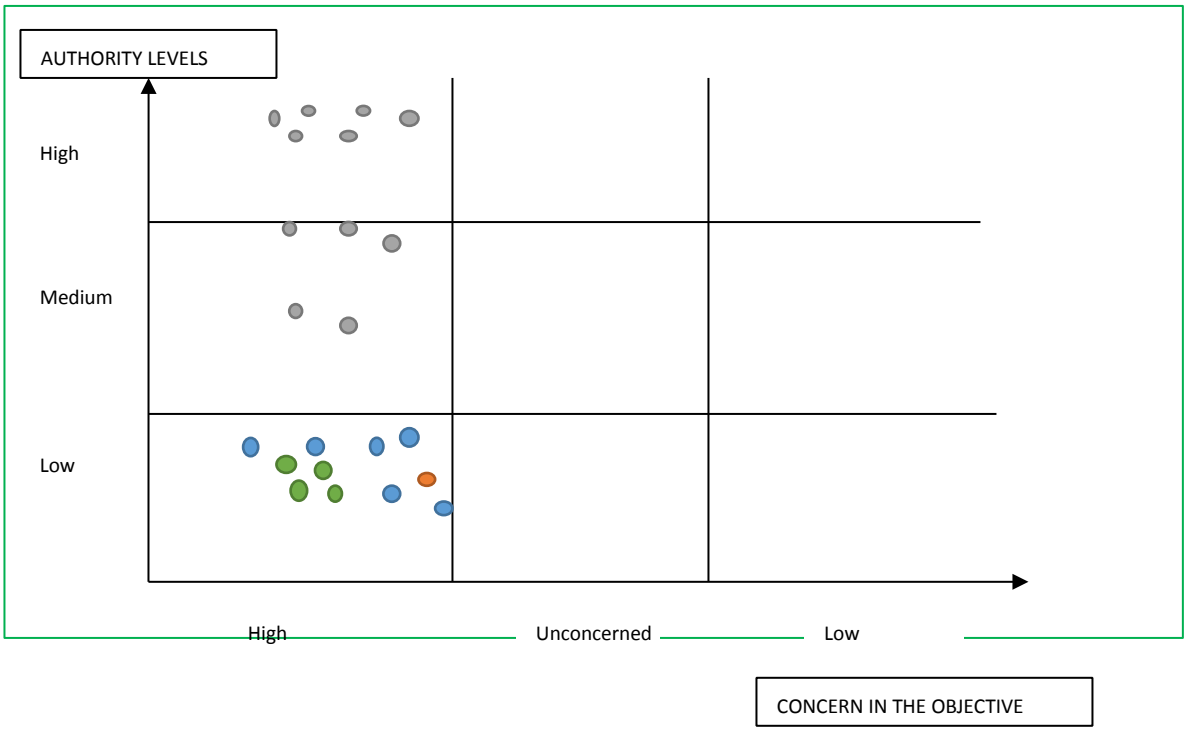
Primary stakeholders/Non-Government: According to the dispersion matrix, these stakeholders are characterised for being directly linked to the development and implementation of the preliminary concept measures, since they are influenced by the implementation of these preliminary measures, bearing in mind that those stakeholders are located in the territory to be intervened. While their power relation is low, they are important stakeholders on account of their being fully knowledgeable vis-à-vis the risk situations in the area. and the perception regarding Government institutions´ actions. They are also deemed as being key stakeholders when

implementing awareness and resilience processes in the community. These stakeholders are characterized by their high concern in the execution of the project.

Backup Stakeholders/Government: These institutions are those entities having a technical knowledge and / or binding backup that is linked to the development and implementation of preliminary concept measures. Among these institutions are municipal units and state agencies. Although their power and interest fluctuates between low and middle, their participation or involvement will be dependent upon the demand for their know-how and / or powers regarding the implementation of measures.

Backup Stakeholders/Non-Government: According to the matrix, these stakeholders have a low authority, a medium concern, or are unconcerned, except for CREO Antofagasta, an institution being considered as the only institution in this category showing a high-level authority vis-à-vis the design of public works intended to improving quality of life of Antofagasta inhabitants. This institution was set up as a private / public institution which, on the basis of a governance executive committee chaired by the Major and the Intendent, intend to coordinating the execution of urban projects in the city. Currently, CREO Antofagasta has undertaken a cadastre of sectors at risk because of heavy rainfall in 2015. With the exception of CREO, these institutions, while devoid of a strong power base, indeed have a relationship and a link with the territory or with actions that can be linked to measures as spelled out in the preliminary concept. The interest being shown by these organisations ranges between Unconcerned and High.

The Taltal Case



Basic/Government:  Basic/Non-Government: 

Backup/Government:  Backup/Non-Government: 

Primary stakeholders/Government: According to the breakup matrix, Government stakeholders having a direct bearing on the design and implementation of the project´s preliminary concept measures, are characterised by having a medium and high authority level, a rating playing in favour of the project execution. State agencies are included in this category, together with Direction Units attached to the Taltal Municipality, representing the local government. In this paper, the Municipality has been attached a High authority rating at communal level, an important rating since the Municipality is bearing in mind urban planning that is based on planning instruments. For this particular case, actions should be articulated among these institutions.

Primary stakeholders/Non-Government: In accordance with the breakup matrix, these stakeholders are characterised for being directly involved in the design and implementation of measures as set forth in the preliminary concept, and bearing in mind the weight that the execution of the project is having on those stakeholders, since they are located in the territory to be intervened. While their power relationship is low, they are important stakeholders since they are aware of risk areas in the region and have an in-depth knowledge of Government institutions actions. Furthermore, they are deemed as key stakeholders at the time community awareness and resilience processes are to be implemented. These stakeholders are characterised for their high interest in the project execution.

Backup Stakeholders/Government: Government backup institutions are those entities having access to technical know-how and /or to a knowledge linked to the development and implementation of the preliminary concept measures. Among these institutions there are Municipal units and Government agencies. While Concern fluctuates between low and medium, their Standing or involvement shall be dependent upon the demand for their know-how and / or power vis-a-vis the implementation of measures.

Backup Stakeholders/Non-Government: In accordance with the matrix, these stakeholders hold a low Authority level, and a medium-level Concern, or are Unconcerned. While these institutions do not hold a High authority level, they indeed have a relationship and a link with the territory or with actions which could be linked to measures as spelled out in the preliminary concept. In the case of Taltal, we are unaware of how close is the link these organisations have with the territory.

Regarding Social Networks: The associativity dynamics, or linkages occurring by and among key stakeholders are spelled out below. Furthermore, social relationships occurring in emergency events have been identified.

Main social networks identified by the interviewees and concerning territorial stakeholders are: Neighbours Boards, Elderly citizen groups, Mother centres, churches and places of worship, schools, and mainly the Municipality officials, as the case was regarding Taltal, bearing in mind that no government institutions are in place in the territory. The same situation applies as regards the Mounted Police and the Firefight Brigade.

Organisations identified as being the first to react vis-à-vis safeguarding the most vulnerable population

Main institutions identified as the first to react vis-à-vis safeguarding and protecting the most vulnerable population are the Municipality and the Fire Brigade, followed by the Armed Forces, the Mounted Police, ONEMI, the Regional Government, Neighbours Boards, and SERVIU, MOP, and the Health Service.

While these reactions were common for Antofagasta and Taltal, for the latter the fact should be stressed that the Municipality was singled out as the main stakeholder in the resolution of problems in the community whenever an emergency arises. Further, the work of the Fire Brigade in Taltal in addressing emergency situations in the city should be highlighted.

Organisations identified vis-à-vis the education process

Main organisations identified in terms of education, awareness-raising and resilience are the Municipality, ONEMI, Regional Government, and MOP. The role that NGO´s are playing in educational processes vis-a-vis their engagement with the territory and the community is also taken into consideration.

Territorial organisations, both for Antofagasta and Taltal, acknowledge that the Municipality is the organism in charge of this processes, because of its proximity to the community but, at the same time, they mention that they lack the competence to do so, this being the reason why they attach a great bearing to measures being implemented in terms of education and capacity-building addressing the local government.

Organisations identified vis-à-vis backup relationships in an emergency situation

Primary Stakeholders/non-governmental mostly linked to the territory state that backup networks in case of emergency mainly occur between the municipality, neighbours and family. In the case of the woman leader of the shantytown, she also points to Regional Government, A Roof for Chile, the Jesuit Migrant Organisation. The perception that people living in shantytowns has is wider, since most assistance and / or shelter is provided to these more vulnerable populations.

In the case of Taltal, territory organisations, family, Armed Forces and the Municipality are the main backup networks in case of emergency.

Regarding Focus Groups: the relationship is explained below as the presence of focus groups within the territory, in which the establishment and involvement of groups as follows is highlighted:

- Women in the territory
- Indigenous Peoples in the territory
- Groups characterized by age in the territory.
- Shantytowns: characterized by settlements of migrant groups

The Antofagasta Case

On the basis of the interviews with stakeholders in the territory located in the Bonilla creek, an identification has been made that organisations, whether of neighbours, or shantytowns, are mainly led by women, a fact showing that organisations and backup relationships in the territories arise from the role that women play in management of those organisations.

Further, some organisations highlight the involvement on entities such as Mother Centres at the social headquarters for which the Neighbours' Boards are responsible.

Seniors club are identified in age groups who use social venues to get together. These groups are characterized by being legally constituted to generating backup and solidarity networks among them. They identify themselves as participatory groups when it comes to promoting activities or calls within the community.

No Indigenous Peoples have been identified in the territory.

A focal group in the territory should be added to this listing which, although not taken into account in the Terms of Reference (TORs), is an important group contingent in the design and implementation of measures to be taken into account in the preliminary concept. This group belongs to the settlements in shantytowns being mainly characterized by the presence of foreigners´ families and by the prevailing precariousness conditions and the vulnerability in the places where are located. In the case of the La Chimba creek, three shantytowns are settled in the area, and more than half of the inhabitants of which are foreigners, according to our interview with Narlyn, a neighbour of the United Women Shantytown.

The Taltal Case

In the Taltal case, an interview was held with the lady in charge of the nursing home located in the city´s outskirts (the sector most affected by a sudden and violent influx of water due to the overflow of a river) and housing ten elderly people. This nursing home is equipped with all implements required, and staff is attached to it to care for the elderly living there. The interviewee reported that they are immediately assisted by the firefighter brigade and / or the mounted police should an emergency arise, besides being provided with health care.

In the case of territorial organisations, a strong leadership is also perceived by women in management positions and, to a lesser extent, groups of women are identified in particular.

No Indigenous Peoples communities are identified in the area.

As in the case of Antofagasta, there is a proliferation of shantytowns in non-suitable areas, which are considered as focus groups vulnerable to climate change.

V. Identification of key stakeholders' insight on adaptation measures foreseen in the preliminary concept.

Two different points of view are discussed in this section, one of them regarding the appraisal attached by the Antofagasta and Taltal communes to measures put forward in the preliminary concept; likewise, (second approach) key stakeholders responsible for measures proposed are considered.

Appraisal of the preliminary concept. Antofagasta Case

All those measures set forth in the preliminary concept were attached a high appraisal rating by key stakeholders interviewed. The point should be stressed that their particularity and differentiation are highlighted in the nature and rating attached to each interviewee, in the sense that the territory- belongingness variable underscored the key difference.

Table below shows the appraisal scale and the rating on the basis of measures and outputs.

Scalable Appraisal Table - Antofagasta																														
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Low approval								M. Low			Medium							M. High				High Approval								

Non-structural Components

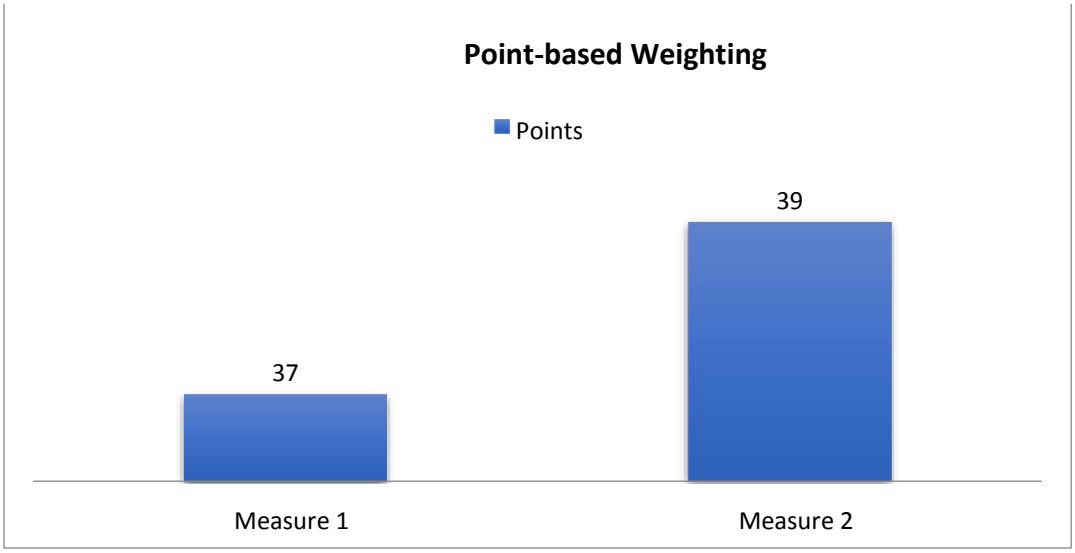
Non-structural components were attached a high appraisal by the interviewees, reaching an average weighting of 39 points

Concerning the specificity of outputs, in relation to:

• **Green infrastructure plans keeping in check or abating the impact of rainwater**: This measure was attached a high appraisal rate equivalent to 37 points, reaching a maximum weighting rating by key territorial stakeholders

• **Updating the Rainwater Master Plan including micro-basins and management of water flows as a climate change impact**: This measure was attached the highest weighting equivalent to 41 points by key regional stakeholders. This rating reached the highest unanimous approval within all products and their components. The point should be stressed that this weighting was the closest to reaching a unanimous high approval within all products and their components.

Table below shows weighting as the appreciation differentiation by each non-structural components´ product



Structural Components

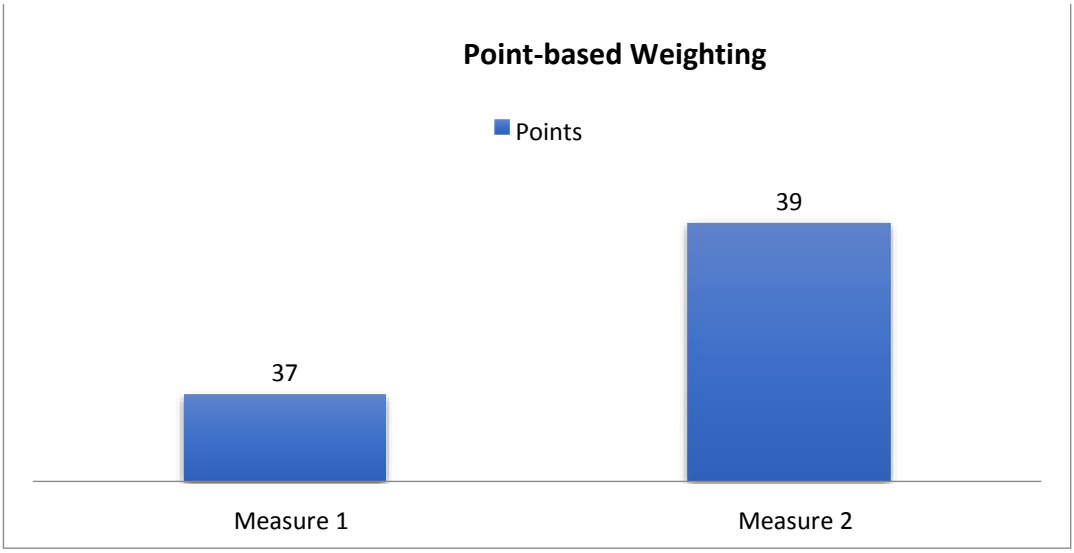
Structural components were attached a high appraisal by interviewees, reaching an average weighting of 38 points

As regards specificity of products, in relation to:

• **Works (works check-up, rainwater channels) in prioritised micro basins**: This measure was given a high appraisal, equivalent to 37 points, reaching the maximum weighting by key territorial stakeholders

• **Procurement of software for monitoring, design and prioritisation of higher risk basins, and flood mapping (e.g., ArcGIS, Aquaveo WMS or Mike She, and / or flood**): This measure was attached a high appraisal equivalent to 39 points, reaching the maximum weighting by key territorial stakeholders.

Table below shows weighting as the appraisal differentiation by each non-structural components´ product

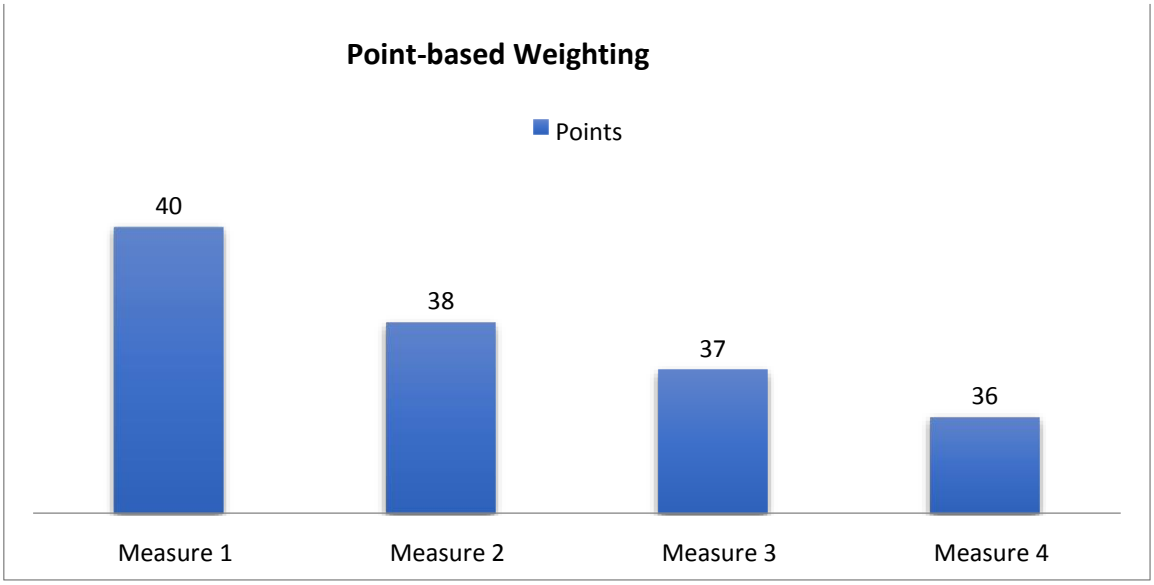


Early Warning System Component

Components in the early warning system were attached a high appraisal by interviewees, reaching an average weighting of 38 points

Concerning product specificity vis-à-vis:

- **Installation of Climate Early Warning Systems (emergency room) and communication devices to alert people during emergencies (eg, sirens, SMS, radio broadcast**): This measure was attached a high appraisal, equivalent to 40 points, reaching the maximum weighting by key territorial stakeholders
- **Increasing the number of monitoring stations showing better parameters**: This measure was attached a high appraisal, equivalent to 38 points, reaching the maximum weighting by key territorial stakeholders
- **Installation of a Meteorological Radar System**: This measure was attached a high appraisal, equivalent to 37 points, reaching the maximum weighting by key territorial stakeholders
- **Implementation of an online platform for meteorological data**: This measure was attached a high appraisal, equivalent to 36 points, reaching the maximum weighting by key territorial stakeholders. The fact that this weighting was close to a "medium high" rating should be stressed.



This figure shows weighting as the appraisal differentiation for each one of the components´ product linked to the "Early warning system"

Emergency Response Components

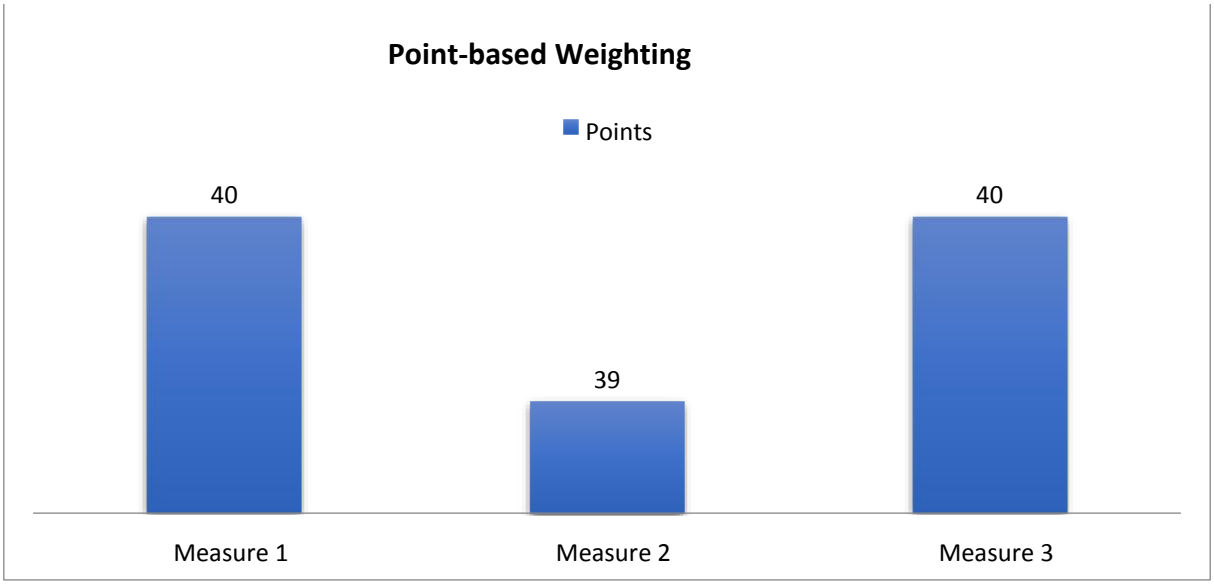
The "Emergency Response" components were attached a high appraisal by the interviewees, reaching an average weighting of 39,6 points

Concerning products specificity, vis-à-vis:

• **Strengthening up Emergency Committees (inter-agency coordination system, i.e., among government institutions**): This measure was attached a high appraisal, equivalent to 40 points, reaching the maximum weighting by key territorial stakeholders

• **Evacuation Warning**: This measure was attached a high appraisal, equivalent to 39 points, reaching the maximum weighting by key territorial stakeholders

• **Flood evacuation maps**: This measure was attached a high appraisal, equivalent to 40 points, reaching the maximum weighting by key territorial stakeholders



This figure shows weighting as the appraisal differentiation for each one of the components´ product linked to the “Emergency Response” component

Local Governments Capacity-building Component (municipality and other authority)

The component linked to the "Local Governments Capacity-building", incorporating a single product: "Climate Change Risk-based Adaptation-addressed Courses and Materials", was attached a high appraisal by the interviewees, achieving a unique weighting of 39 points, and showing its maximum rating by key territorial stakeholders

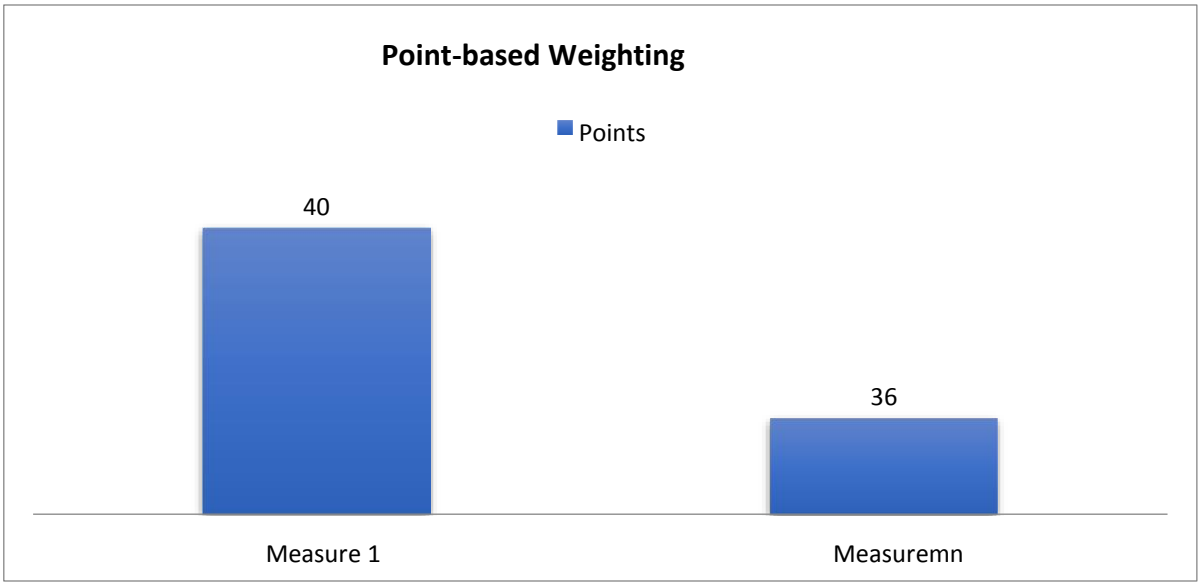
Local Population Capacity-building Component

Components involved in “Local Population Capacity-building”, were attached a high appraisal by the interviewees, reaching a weighting average of 38 points

Concerning products specificity, as regards:

- **Three education and communication strategies designed and implemented (awareness-raising and capacity-building of the local population):** This measure was attached a high appraisal, equivalent to 40 points, reaching the maximum weighting by key territorial stakeholders
- **Experiences about “Storytelling" in three cities (the Japanese method).** Storytellers transmit tacit knowledge about environmental disasters recorded in the region, acknowledging memory and history, the environment, culture, topography, etc. This measure was attached a high appraisal, equivalent to 36 points, reaching the maximum

weighting by key territorial stakeholders. The point should be stressed that this score was close to a "medium high" weighting.



Appraisal of Preliminary Concepts, the Taltal Case

All components, together with their outputs or measures, as set forth in the preliminary concept were attached a high appraisal by stakeholders interviewed, reaching unanimous maximum weighting and showing no changes in their appraisal, thus acknowledging the bearing that the implementation and development of plans as set forth should have.

Regarding the Taltal case, no differences became apparent in appraisals among territorial stakeholders (attached to areas where preliminary concepts were applied), and communal or regional stakeholders.

A summary is shown below including the appraisal vis-à-vis the approval of components and outputs in Taltal.

Project Component	Outputs	**Approval Rating**
Non-structural Measures	Green infrastructure plans restraining/reducing water impact.	High
	Updating the **Master Rainwater Plan including microbasins**, and incorporating management of climate change-originating rainwater flows.	High
Structural Measures	Works in priority micro-basins.	High
	Procurement of software for analysis, design, and prioritisation of higher risk basins, and flood mapping	High

Early warning Systems	Installation of Climate Early Warning Systems and mechanisms as required to alert residents during emergencies	High
	Increasing the number of monitoring stations equipped with technology-enhanced parametres	High
	Installation of a Weather Radar System	High
	Implementation of an online meteorological data platform	High
Emergency Response	Strengthening up Emergency Committees	High
	Evacuation Signage	High
	Flood evacuation maps	High
Local governments capacity-building	Risk-based adaptation courses and materials	High
Local residents capacity-building	Three education and communication strategies designed and implemented	High
	"Storytelling". (The Japanese Method Experience).	High

Key stakeholders involved in the feasibility and responsibility of measures as set forth in the preliminary concept

This section refers to stakeholders that people interviewed have singled out, and who are involved in the execution of the project and / or have a stake in the project. This perception is related to the awareness that stakeholders have of the institutions, their positions and duties, which are appraised by the interviewees and institutions they belong to.

On the basis of this review, and in accordance with the competences of institutions described in scorecards above, a listing has been made of institutions likely to be linked to the execution of the different project outputs.

Antofagasta Case

Component	Non-structural Measures
Outputs	**Key Stakeholders**
Green infrastructure Plans incorporating or abating the water impact.	**Antofagasta Verde IMA.** **Dirección Aseo y Ornato IMA.** **Fundación mi Parque** **CREO** **CEITZASA UCN.** **MOP** **MMA** **MINVU** **STAKEHOLDERS IN THE TERRITORY**
Updating the Master Rainwater Plan including microbasins and incorporating management of climate change-originating rainwater flows.	**MOP**

Component	Structural measures
Outputs	**Key Stakeholders**
Works (monitoring works, rainwater channels) in priority microbasins.	**MOP** **MINVU** **ASEMUCH** **CREO ANTOFAGASTA** **MUNICIPALITY**
Procurement of software for analysis, design and prioritisation of higher risk basins, and flood mapping (e.g., ArcGIS, Aquaveo WMS or Mike She, and / or flood).	**MOP** **ONEMI** **SHOA**

Component	Early Warning System
Outputs	**Key Stakeholders**

Installation of Climate Early Warning Systems (emergency room) and media devises to warn residents during emergencies (e.g., sirens, SMS,, radio broadcasting).	**MOP** **SHOA** **ONEMI** **MUNICIPALITY**
Increasing the number of monitoring stations equipped with enhanced parametres.	**MOP** **ONEMI** **SHOA** **MUNICIPALITY**

Component	Emergency Response
Outputs	**Key Stakeholders**
Strengthening up Emergency Committees (inter-agency coordination system, i.e., among Government institutions)	**MAJOR** **MUNICIPALITY** **ONEMI**
Evacuation signage	**ONEMI** **MUNICIPALITY** **MOP**
Evacuation Maps in case of flooding	**ONEMI** **MUNICIPALITY** **MOP** **MINVU**

Component	Local governments capacity-building (municipalities and other entities)
Outputs	**Key Stakeholders**
Risk-based adaptation-addressed courses and materials.	**MUNICIPALITY** **MMA**

Component	Strengthening up capacity-building of local residents
Outputs	**Key Stakeholders**

Three education and communication strategies designed and implemented (local population awareness-raising and capacity-building)	**IMA** **ONEMI** **MMA** **TERRITORIAL OR TECHNICAL ORGANIZATIONS (JJ.VV.; FRACTAL; CULTAM)**
"Storytellers"	**MMA** **IMA** **NGO´s**

Key stakeholders linked to feasibility and accountability of measures spelled out in the preliminary concept; the Taltal Case

Component	Non-structural Measures
Outputs	**Key Stakeholders**
Green infrastructure plans contemplating or reducing water impact.	**MUNICIPALITY** **MMA** **TERRITORIAL ORGANIZATIONS**
Updating the rainwater Master Plan to incorporate management of climate change-originating flooding.	**MOP**

Component	Structural measures
Outputs	**Key Stakeholders**
Public Works (Monitoring works, rainwater channels) in prioritised microbasins.	**MOP** **MINVU** **ASEMUCH** **MUNICIPALITY**
Procurement of software for analysis, design and prioritisation of higher risk basins, and flood mapping (e.g., ArcGIS, Aquaveo WMS or Mike She, and / or flood).	**MOP** **SHOA** **ONEMI**

Component	Early warning system
Outputs	**Key Stakeholders**
Installation of Early Warning Systems (emergency Room) and media systems to warn residents during emergencies (e.g., sirens, SMS, radio broadcasting).	**MUNICIPALITY** **FIRE BRIGADE** **MOUNTED POLICE** **ONEMI**
Increasing the number of monitoring stations equipped with enhanced parametres	**MOP** **ONEMI** **SHOA**
Installation of the Metorological Radar System (Chile)	**MOP** **ONEMI** **SHOA**
Implementation of a meteorological data online platform.	**MOP** **ONEMI** **SHOA**

Component	Emergency Response
Outputs	**Key Stakeholders**
Strengthening up Emergency Committees (inter-agency coordination system, i.e., among Government institutions	**MUNICIPALITY** **FIRE BRIGADE** **MOUNTED POLICE**
Evacuation signage	**MUNICIPALITY** **ONEMI**
Evacuation maps in case of flooding	**MUNICIPALITY** **ONEMI** **MOP** **FIRE BRIGADE**

Component	Local governments capacity-building (municipalities and other entities)
Outputs	**Key Stakeholders**

Risk-based adaptation courses and educational materials	**MUNICIPALITY** **MMA** **TERRITORIAL AND / OR TECHNICAL ORGANISATION**

Component	Strengthening up Capacity-building for local residents
Outputs	**Key stakeholders**
Three education and communication strategies designed and implemented (awareness-rising and capacity-building of the local population)	**MUNICIPALITY** **MMA** **TERRITORIAL AND / OR TECHNICAL ORGANISATION**
"Storytellers"	**MUNICIPALITY** **MMA** **TERRITORIAL AND/OR TECHNICAL**

VI. Recommendations to engaging and articulating key stakeholders in the implementation of adaptation models

Recommendations as well as complementary actions are shown below to buttressing measures being implemented. These recommendations and complementary actions are relevant to the concerns, failures or reinforcements being spelled out by key stakeholders interviewed, and are also based on the capacity and relevance of key stakeholders vis-à-vis the measures being suggested above.

- The implementation of a multi-dimensional educational programme is deemed to be a priority, since it would allow for the integration and reinforcement of underlying forces in the preliminary concept measures. Therefore, the creation of a "**Heritage-environment education programme**" in educational establishments is being suggested herein for consideration. This programme would be focused on secondary basic cycle students (9 - 12 years old) at regional level, and it is also intended to also reach out to people living in areas at risk.

The strength and innovation being attached this programme is based upon the close link between Heritage and the environmental variable.

Bearing in mind prevailing socioeconomic conditions and the link between the community and the *exo*-environmental setting, this programme should have a substantial bearing and significance for the community; therefore, a recommendation is made to becoming acquainted with the experience, and the work done by the *Ruinas de Huanchaca* Foundation in the field of educational strategies toward the appraising of the region.

- Stakeholders have pointed out to a lack of reinforcement incentives, and the fact is well-known that any action should have a self-control and attachment component, thus allowing for the sustainability of the rationale for intervention, therefore, the generation of playful and significant reinforcement stimuli is recommended that correspond to "**implementation of an educational infographic signage**" in areas under the impact of alluvial events, through which the community will remember, become aware of, and face on a daily basis and in a different way the information and value underlying the measures.

- An epistemological-nature strategy should be abode by, through which work is undertaken on the basis of a deconstruction of the conceptual value of categories related to risk, fear, danger and vulnerability toward the reconstruction of this strategy on the basis on highly legitimate, affective and value-based binding actions. Based on the above, a proposal has been put forward to "**value risks, catastrophe and climate vulnerability as an evaluative element of the cultural and territorial imaginary**."

- The huge proliferation of shantytowns, which is linked to both the migratory process and to multidimensional poverty, highlights a lack of a collective memory by the migrants, who do not know the particularities of the territory they live in, bearing in mind both, the environmental history and the environmental vulnerability. After the last heavy rainfall phenomenon, while the migrant population stated in an interview that they were unaware of the risks and impacts of these phenomena in the area, they have not considering moving out of the place, since they are not only building their houses in the area, but are also creating community bonds based on cooperation, solidarity and protection. **This is why a multifactor programme should be implemented particularly addressing the socialisation of climate change impacts and perhaps, in some cases, the relocation of populations vulnerable to climate change.**

- Closely associated to the above is the low frequency and regularity of climate-related phenomena and, therefore, their impacts, exposing the sector´s vulnerability. This infrequency, and the need for immigrants to occupy territories to settle in the city (shantytowns in the ravines) have led to invisibility and to discard these climatic variables as a decision-making-related factor at the time immigrants settle in the territory. **We return here to the proposal to again assert the vulnerability condition through educational processes and meaningful stimulus, such as infographics.**

- A key factor to be stressed and considered is that populations living in close proximity to ravine areas in which the project is expected to be executed, are "shantytown" dwellers, a figure the government has yet to attach legitimacy to, and still having an illegal status, thus these people are lacking strong government-networks of an official nature to account for them and to assist them in their territorial-nature processes.

  The above notwithstanding, the government has implemented a shantytowns eradication programme, which is currently working on an assessment of the shantytowns status. **This is the reason why we identify the population settled in shantytowns as a project-targeted population, since it is being deemed to be highly vulnerable to climate change impacts**.

- Territorial organisations identify the municipality as the relevant authority, as well as the key stakeholder in the design and enforcement of safeguards and protection measures when problems crop out or climatic disasters are involved; those organisations are also fully aware of the low ability the municipality has to undertaking measures to address environmental impacts and / or to tackle related problems.

  This situation gets increasingly serious in Taltal, where the authority that the regional government holds on the municipality does not extend over the whole territory, and Non-Government institutions such as the fire brigade and the mounted police are the only two organisations duly appointed and legitimized by the community. These two agencies supplied substantial assistance after the latest catastrophic climate event. **This the reason why the municipality should be deemed as a key stakeholder in education and resilience processes vis-à-vis natural events**.

- According to stakeholders interviewed both, regional and communal governments´ relevant bodies are not properly articulated, showing dissociation between them, generating an image of disbelief and low efficiency in cases of environmental conflicts and catastrophes. Notwithstanding, stakeholders believe that both, regional and communal governments are responsible. In Taltalt, the fact that the regional government is lacking an institutional standing in the territory should be added to the above.

- A lack of awareness by people in Taltal vis-à-vis the duties, rights and actual work being done by formal government institutions, has generated a bottleneck at the time the community makes a decision to exercise their right, since most people identify the municipality as the key stakeholder, ignoring that the municipality has neither say not power in all government instances, thus increasing both the negative perception of the communal government by people, and the distance between the community and the institutional authority. **Thus, a recommendation is made for a communication linkage to be created with the community, so that people are fully aware of the role and duties government officers should play in the implementation of measures of all sorts**.

- A lack of commitment and involvement of both, the communal and regional authorities vis-à-vis community measures and projects was noticed. This is a process deeply rooted in supra structural policy dynamics mostly working in favour of partisan trends and results, rather than of a communion of wills and work for a region and a commune. Actions of this sort have a bearing on regional projects execution, delay and rejection.

- The above results in threats and perceived risks vis-à-vis the low associativity, co-operative endeavours, and networking between Government institutions (the State apparatus) and the local government.

- Still, an additional risk is perceived insofar State policy being enforced through Government programmes not always last over time, since State policy is dependent upon how those programmes are implemented by government officers, who adjust public policy to the rhythm of their partisan interests. Moreover, public policy has a centralist nature, which weakens the outlook and particular characterisation of regions´ needs.

- The risk referred to above could be addressed by working in coordination with the Municipality, which has access to urban planning and local development tools. Nowadays, the risks of overflowing or flooding are not incorporated into planning guidelines; still, these guidelines, as well as the duties of municipal entities can be amended to include duties and units in their Organisation Chart, which are focused on the development of risk-addressed awareness-raising, education, warning, and prevention.

- Municipalities have an internal organisational structure which can be modified by incorporating backup units, or units directly linked to socialisation and education processes vis-à-vis climate change impacts. Furthermore, municipalities have access to their own ordinances, which are resolutions, within the regulatory framework being spelled out by the Mayor upon an agreement by the Municipal Council. These ordinances are characterized by being general and mandatory standards applicable to the community, within the commune territory. **Pursuant to this regulatory framework, some project-related measures can be endorsed, ensuring their continuity over time.**

- As far as the Women United Shantytown is concerned, their leader is deeply concerned about the danger they are exposed to on account of landslides, antennas, electricity wiring, and a water pond located right in front of their shantytown. The lady leader of the neighbouring Town Councils states that the ravine is close to a wasteland which is used as a garbage and debris disposal site, entailing a danger to the community.

- Streets and / areas being identified as risk areas on the basis of interviews with stakeholders are: Manuel Silva; Antonio Martínez; Clodomiro Rosas; Novoa; Nicolás Tirado; Emilio Carrera;

Pablo Neruda and Capa Rosa (Antofagasta). Concerning Taltal, the area showing the highest risk impact is the rea at the entrance of the city, splitting this into two sectors.

- For both, Antofagasta and Taltal, the Municipal institution is deemed as a close and highly relevant stakeholder –in case of emergencies- to the protection of the most vulnerable population. At the same time, the municipality is characterized as lacking the conditions and professional standing to better back up its own management in case of emergencies. While the perception of the municipality is more assistance- than prevention-focused, it is within its competences to address this prevention and awareness-rising field. **Thus, we deem education and capacity-building of the communal government to be highly relevant.**

- The role the municipality plays *in situ* is deemed to be important, and from a political perspective, it is considered as the State policy decentralizing instance: in this case, the characterisation of community needs, both concerning Antofagasta and Taltal, vis-à-vis climate change-related risks.

- The Armed Forces, the Fire Brigade, and the Mounted Police are deemed to be relevant stakeholders and are positively perceived by the interviewees in emergency situations. Given the perception of distrust in and disarticulation of the Government institution, **we believe it is relevant to involve these stakeholders in processes linked to awareness-raising, education, and prevention of climate change-related impacts.**

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Annex 9. Stakeholder analysis in Esmeraldas (Ecuador)

Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America

STAKEHOLDERS, CONCERNS, AND MANAGEMENT PROBLEMS

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Listing of Abbreviations and Acronyms

CVRRP	Climate Vulnerability and Risk Reduction Project
RRA	Risk Reduction Agenda
CAF	Bank for Latin American Development
EFFB	Esmeraldas Fire Fighting Brigade
RMC	Risk Management Committee
EOC	Emergency Operations Committee
OTAADC	Organic Territorial Arrangement, Autonomies and Decentralisation CODE
OPPFC	Organic Planning and Public Finance Code
CRE	Constitution of the Republic of Ecuador
AAFF	Armed Forces
DAG	Decentralised Autonomous Government
NMHI	National Meteorology and Hydrology Institute
NOCI	Navy Oceanographic Institute
LVT Island	Luis Vargas Torres Island
MEE	Ministry of the Environment of Ecuador
MPW	Ministry of Public Works
NGLP	National Good Living Plan
PCUEE	Pontifical Catholic University of Ecuador, Esmeraldas Campus
NWS	National Water Secretariat

RMS Risk Management Secretariat

Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America

STAKEHOLDERS, CONCERNS AND MANAGEMENT PROBLEMS

EXECUTIVE SUMMARY

An identification is made in this paper of Stakeholders in the area where the Climate Vulnerability and Risk Reduction Project (CVRRP)[3] [4] is scheduled to be executed, and their perceptions and expectations are assessed as regards risk management, and prevention, mitigation and adaptation to the adverse climate change impacts, a subject falling within the overall scope of this project. A methodological mechanism known as "Stakeholder Review" was applied in drafting up this report. This review was performed through analytical stages, as set forth below:

- Identification and classification of stakeholders,
- Determination of stakeholders´ characteristics, concerns and circumstances,
- Understanding how those concerns and circumstances could have an adverse or beneficial bearing on the Project,
- Identification of points at issue, and suggestions of options to be tackled with and managed; and,
- Suggesting a Project-addressed management strategy or model.

This survey was undertaken in the urban area of the city of Esmeraldas, located in the Esmeraldas province, in Ecuador, and was based on interviews with some sixty people split up among fifty-two local, institutional, citizen and community stakeholders. This exercise allowed for an in-depth look into and mapping of stakeholders regarding the aforementioned initiative, and to linking them around both, their particular concerns, and their institutional, political and social standing as regards the execution of the CVRRP and, in general, the administrative exercise of risk management.

While stakeholders voiced their particular concerns at the interviews, in no way any of them showed any rejection to the implementation of the CVRRP. This was due to the fact that this initiative seeks to making a contribution to addressing specific situations in the city, such as the occurrence of landslides and floods, and to backing up local entities in their endeavours to enhancing their

[3] "Reducing Climate Vulnerability and Flood Risk in Coastal Urban and Semi-Urban Areas in Cities in Latin America" (Reducción de vulnerabilidades y riesgo de inundaciones en zonas costeras urbanas y semiurbanas de ciudades en Latinoamérica).

[4] This Project was scheduled to be executed in the cities of Esmeraldas, Ecuador, and Antofagasta and Taltal, Chile. This Stakeholders Review and Mapping applies to the city of Esmeraldas.

institutional risk management work. In order for these objectives to be achieved, this CVRRP will be implementing technical, regulatory and social techniques.

Stakeholders identified are attached to national, provincial and cantonal public entities, civil society organisations, and urban neighbourhood groups organized around de facto (committees or associations) organisations. All institutional goals that public entities seek to achieve are issues such as: risk management, planning and public works, and water and meteorological management. A look into their objectives, competencies, duties and institutional attributions, as well as into the problems they should be facing up to, has allowed to finding out which stakeholders could have some type of direct involvement in the CVRRP, and which urban groups could directly be under the project´s impact. Likewise, organisations and urban groups have been identified with which the project could have some type of approach over its execution stage. This identification allowed to figure out four types of likely inter-relationships and priorities which could originate bearing in mind the nature and concerns of each stakeholder. They are:

1. Key stakeholders: Those having a high bearing and authority (own decision-making power). The project should be entering into working relationships with these stakeholders, and a proper co-ordination with them should be secured;
2. Stakeholder with authority vis-à-vis the project´s concern issue, but with little bearing at the local level;
3. Stakeholders without authority, but with influence: These are the neighbourhood groups living in areas under the impact of floods and landslides. The problems and expectations of these groups should be monitored over the project execution stage in order to work with key stakeholders in the definition of strategies to address adverse impacts such as those mentioned above. A lack of monitoring of these groups could mean that a feeling of dissatisfaction may become apparent resulting in complaints, social conflicts, and the eventual politicisation of the problem.
4. Other stakeholders are those entities lacking bearing and importance regarding the project's issue. Their institutional objectives could nevertheless be useful to specific issues in the project, so that technical support links could be set up whenever specific needs so require.

Other than the identification and mapping of stakeholders, the work being addressed herein has allowed for cross-cutting issues to be identified vis-à-vis the whole institutional aggregate, and which should be applied in the exercise of their competencies, duties and attributions. These issues should be buttressing an enhanced institutional interrelationship in risk management, gender mainstreaming in risk management, and planning of risk management actions, as well as intervention in specific areas at risk, being considered as the most critical areas in Esmeraldas.

INTRODUCTION

An assessment of concerns, insights and expectations of social and institutional stakeholders having a direct entailment with climate vulnerability and flood risks reduction activities, and needs arising therefrom, in the city of Esmeraldas is being undertaken in this Survey. This assessment of social perceptions has allowed to inquire into and map stakeholders vis-à-vis the aforementioned initiative, so as to understand their concerns and political and social positioning.

This assessment has been undertaken on the basis of analytical stages, as follows:

1. Identification and classification of stakeholders,
2. Definition of stakeholders´ characteristics, concerns and circumstances,
3. Understanding how those concerns and circumstances could have a bearing on, or be beneficial to the Project,
4. Singling out problems and suggesting options to tackle them; and,
5. Suggesting a Project-addressed strategy or management model.

The conceptual approach through which this work was performed is described in the methodological note below.

Methodology Annotation

A "stakeholder review" scheme (see Annex 1) has been applied throughout the preparation of this Survey; this is a methodological tool allowing for qualitative data to be collected to identify those concerns which should be taken into account at the time a programme, or a project is being implemented, or policymaking is under way, as well as to consider the bearing that the different stakeholders or parties involved may have, whether they are project executors, controllers, key observers (i.e., experts), or beneficiaries/affected people. This methodology has been drawn up to establishing two-way relationships between individuals / communities and institutions / projects / policy, the positive or negative bearing of which may be mutual. This exercise is also called "Authority review" and is useful to making visible and empowering disadvantaged groups vis-à-vis a particular problematic situation, as well as identifying key aspects that need to be addressed to allow for the institutional upgrading of government agencies, or that of the projects the latter may undertake. (IIED 2005).

This survey was undertaken on the basis of a review of policy and planning instruments[5], an identification of relevant institutional and socials stakeholders, semi-structured interviews with key stakeholders or those being chosen because of their relevance to the process; and stakeholders mapping vis-à-vis: i) standing; Ii) authority; and iii) concern. Key stakeholders have been selected taking into account characteristics as spelled out below:

[5] Documents as follows were perused through: Political Constitution, Organic Territorial Arrangement, Autonomies and Decentralisation Code (OTAADC), National Good Living Plan 2013-2017, Water Act

a) Persons, communities and entities whose particular concerns are impaired by the project, or have a significant bearing on the project, or on the issue under consideration;

b) Experts having information, know-how and experience on the project´s key subject;

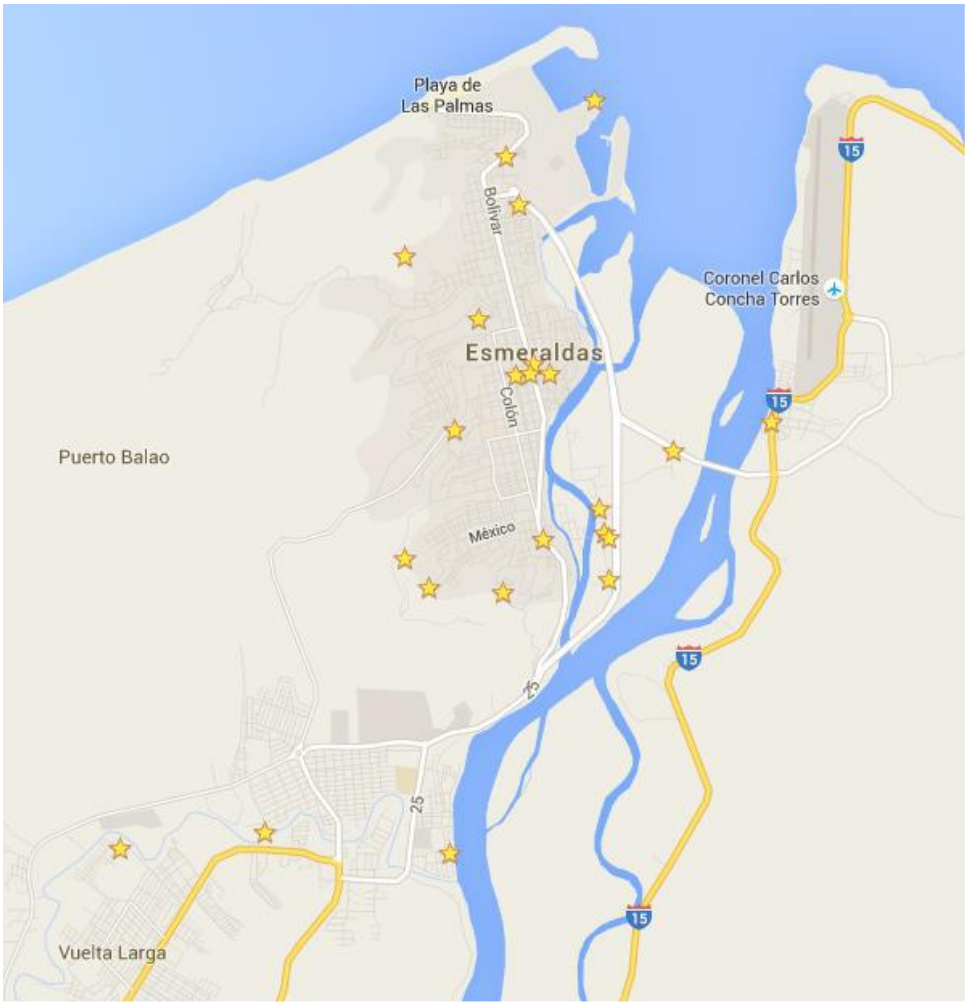
c) Individuals or institutions controlling or influencing the project implementation processes.

In this case, the issue project, or subject under consideration regarding which this Stakeholder Review was carried out, was the "Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in Latin American cities" project, which is being briefly referred to in this document as "Climate Vulnerability Reduction Project" or, simply, CVRRP.

Field Work

Fieldwork for drafting up this Survey was undertaken over the 2 – 14 May 2016 period. In the city of Esmeraldas, public entities empowered to addressing risk management-related matters in the local level were also contacted by experts in the subject, as well as residents living in areas vulnerable to hydro-meteorological phenomena arising from the climate change phenomenon, in the city of Esmeraldas.

Public and civil society entities contacted for the preparation of this report were: Esmeraldas Municipality, Esmeraldas Provincial Council, Risk Management Secretariat, Navy-attached Oceanographic Institute (NOI, for its acronym in Spanish), Ministry of Public Works, National Water Secretariat, Fire Brigade, Red Cross, Pontifical Catholic University of Ecuador (Esmeraldas Campus). Visits were also made to neighbourhoods under the impact or likely to be under the impact of climate change, such as: *Diógenes Mera (Cruzeiro), 20 de noviembre, Unión y Progreso (La Guacharaca), Cocoy, Abril 13, Chone Alto, El Arenal, Propicia 1 y 2, Las 50 Casas, Isla Pianguapi, Cordero Crespo (Isla Vargas Torres), 12 de mayo, Isla Vargas Torres), 20 de noviembre (Isla Vargas Torres), 29 de agosto (Isla Vargas Torres),* and the *Tachina* sector. Interviews were held with local leaders and people facing up to specific emergency events or disasters is these neighbourhoods. Finally, and together with municipal officials and CAF representatives, a tour of critical vulnerability spots in the city was made to becoming aware of the sheer size of climate change impacts in the area, so as to ponder some other intervention lines through this project. (Map 1) A total of fifty-eight people were interviewed such as public officials, experts, neighbourhood leaders and residents.



MAP 1. Interview Sites, and Vulnerable Areas Visited

MAP 1.- SITES - INTERVIEWS WITH STAKEHOLDERS / VULNERABLE AREAS

1. NOI	14. 20 DE NOVIEMBRE NEIGHBOURHOOD
2. RISK MANAGEMENT SECRETARIAT	15. RED CROSS
3. EL ARENAL NEIGHBOURHOOD	16. VARGAS T. ISLAND (12 DE MAYO NEIGHBOURHOOD)
4. CHONE ALTO NEIGHBOURHOOD	
5. Pontifical Catholic University of Ecuador Esmeraldas campus (PUCESE)	17. VARGAS T. ISLAND (20 DE NOVIEMBRE NEIGHBOURHOOD)
6. MUNICIPALITY ESMERALDAS CANTON	18. NIÓN Y PROGRESO NEIGHBOURHOOD (LA GUACHARACA)
7. ESMERALDAS PROVINCIAL COUNCIL	
8. ESMERALDAS FIRE BRIGADE	19. COCOY NEIGHBOURHOOD
9. DIOGENES MERA NEIGHBOURHOOD (LA PROPICIA)	20. VARGAS T. ISLAND (29 DE AGOSTO NEIGHBOURHOOD)
10. 13 DE ABRIL NEIGHBOURHOOD	21. LAS 50 CASAS SECTOR
11. PIANGUAPI ISLAND	22. MINISTRY OF PUBLIC WORKS - PROVINCIAL
12. TACHINA NEIGHBOURHOOD	23. LA PROPICIA 1 Y
13. VARGAS T. ISLAND (CORDERO CRESPO NEIGHBOURHOOD)	Vulnerable Areas are highlighted with a Star sign

I. SOCIAL VULNERABILITY, PUBLIC POLICY AND RISK MANAGEMENT INSTITUTIONALITY

As an essential conceptual background to the stakeholders´ review in this report, a brief description is made in this section of the social vulnerability and risks situation prevailing in the city, current policy and regulations in place vis-à-vis this phenomenon, and risk management-focused institutional arrangements. This introductory review allows to understand the threats being faced by community stakeholders interviewed for this report, as well as the determinants of government stakeholders being approached to carry out this work, who should abide by a specific legal and institutional framework.

A summary of the "Reducing Vulnerability and Flood Risk in Urban and Semi-Urban Coastal Areas of Latin American Cities Project", is set forth in this report as an initiative to making a contribution to the solution of some of the most pressing vulnerability situations to which the population of the city of Esmeraldas is faced up with. This initiative, within the framework of which this work is being done, is part to an international initiative under way which is aligned with a political and legal framework on prevention and adaptation to climate change, as well as with international agreements and mechanisms addressing this area of work, to which Ecuador is a party.

Socio-economic and demographic conditions in Esmeraldas

The city of Esmeraldas, the capital of the province of the same name, is located on the Pacific Ocean coast, at the Esmeraldas River mouth. A seaport and the country's largest oil harbour and hydrocarbon refinery are located within the city´s territorial area: A natural setting with a wealth of natural resources, allowing for trade, tourism and fishing activities, which are the basis of the local economy. The Carlos Concha airport is rated as a first-class airport for national and international operation for passenger and cargo aircraft. In addition, in both the city and the province as a whole there is a highly important ethnic component since both of them are home to Ecuador's largest Afro-descendant population, as well as to three Indigenous Peoples´ nationalities. These cultural components make up an intangible Heritage on which the Emeralds identity is buttressed.

Notwithstanding the natural and cultural wealth and the presence of a large public infrastructure, the Esmeraldas city and province have to cope with acute socioeconomic problems slowing down their developmental process. Some city-wise social indicators are shown below, indicating vulnerability traits in specific social sectors.

1. Current population

According to the latest census, (INEC 2010), the Esmeraldas canton population is made by 189,504 inhabitants, with a projected 208,615 inhabitants to 2015 (INEC 2015). Age Average is 27 years, with 403.9 children under five years old per 1,000 women of reproductive age (15-49 years). The Afro-Ecuadorian population accounts for %42.1%.

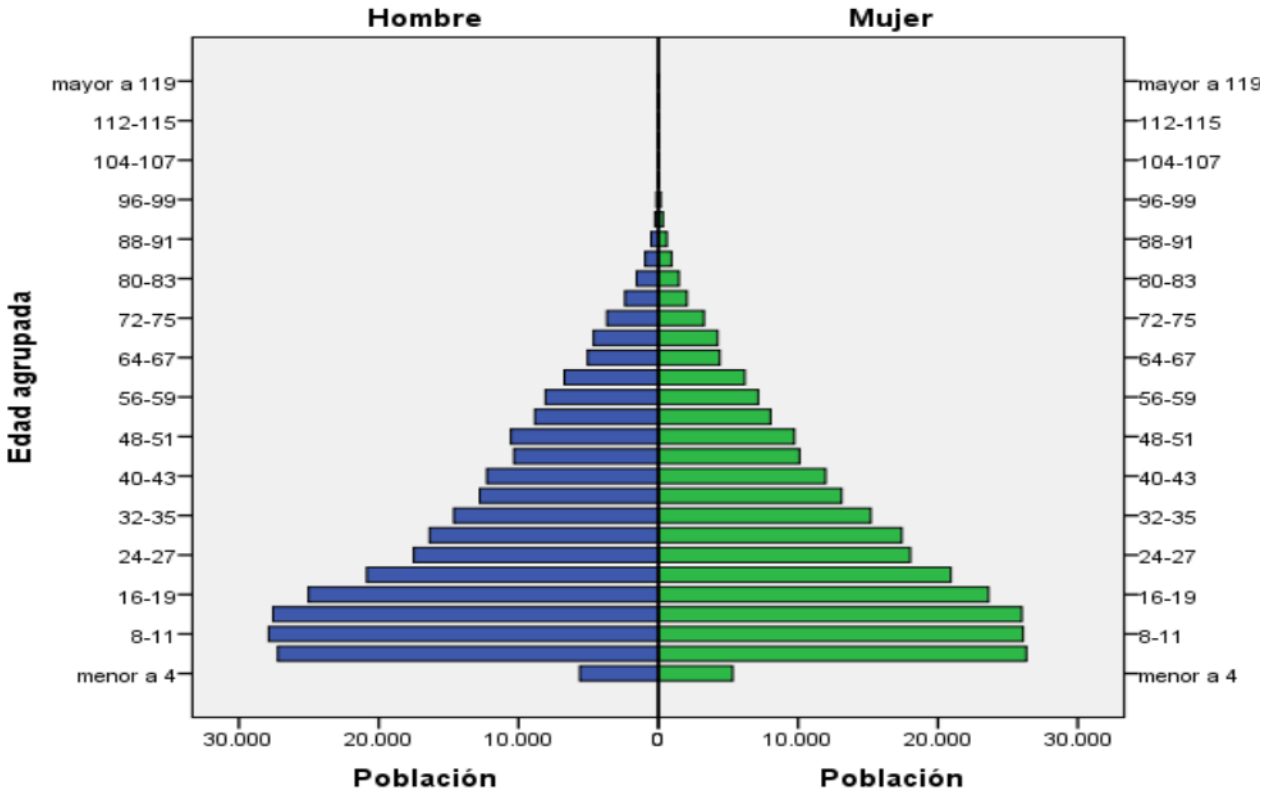
Population in the Esmeraldas Canton

TOTAL	189.504
RURAL	35.469
URBAN	154.035
WOMEN	97.428
MEN	92.076

2. Age-based Population

The distribution of the population in age ranges shows that most of the population is made up by young people, with a significant share in people younger than 30 years of age. However, evidence has cropped up in recent years of a strong decrease in fertility (Figure 1) likely being due to migration of the younger populations.

Figure 1.- Population Pyramid in the Esmeraldas Canton



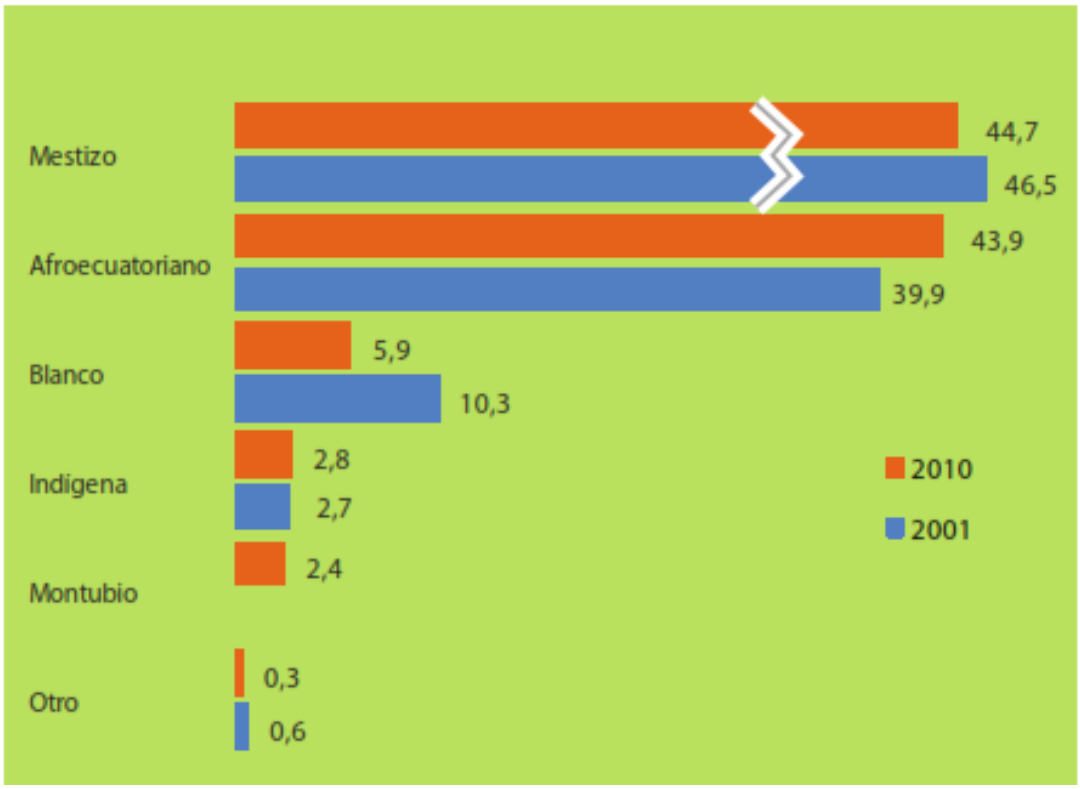
English version: Men Population Women Population

Aggregated Age

3. Population by ethnic group

Ethnic groups present in the Esmeraldas canton are: mestizos, Afro-Ecuadorians, whites, Indigenous Populations, and *Montubios* (Figure 2). The largest communities are mestizos and Afro-Ecuadorian which, together, make up more than 87% of the local population.

Figure 2. – Ethnic Groups



English version: mestizos, Afro-Ecuadorians, whites, Indigenous Populations, *Montubio*, other

4. Migration

A large number of people have moved out of Esmeraldas over the last few years, recording 6,746 people migrating to other cities, both within the country and abroad (PDOT 2015-2020). However, there is also a large population influx, from Colombia in particular, as refugees fleeing from the internal war beleaguering their country for over half a Century. Only between years 2000 and 2005, some 36,665 Colombian nationals arrived in the Esmeraldas canton, and 1162 refuge applications were recorded, although the actual number of immigrants could be higher on account of the Colombian armed conflict could be higher.

5. Population vis-à-vis poverty

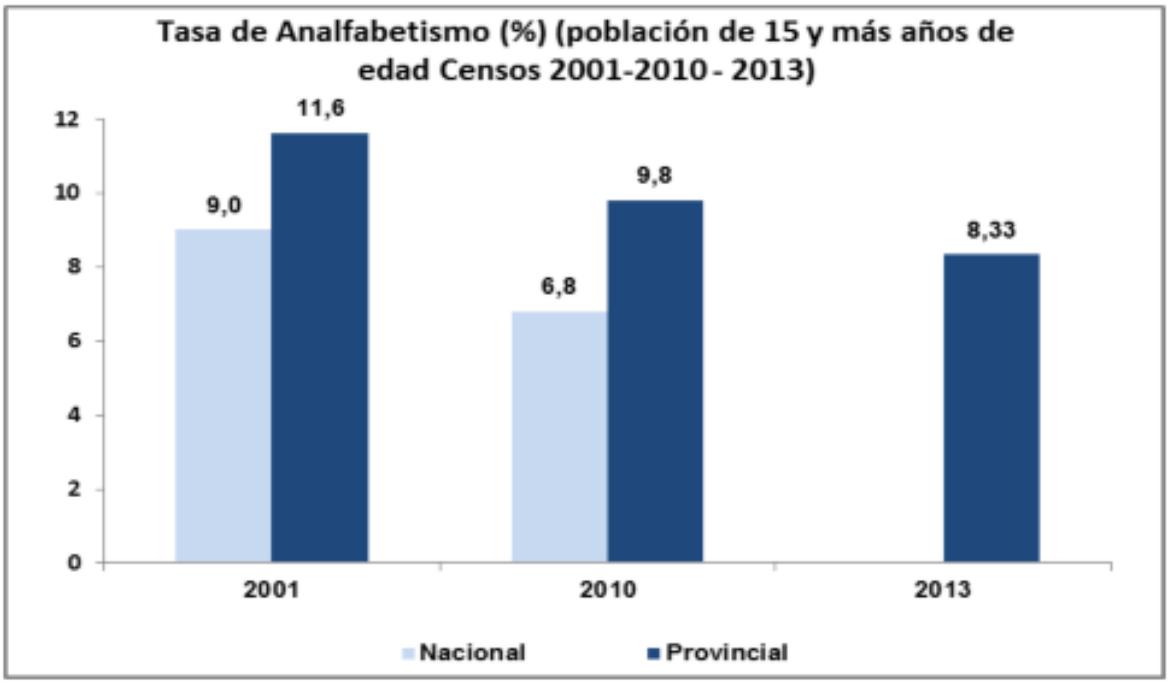
Thirty-four percent of the population in the Esmeraldas canton are recorded as living in poverty; extreme poverty figures account for 11% of the population. In urban areas, the incidence of poverty

is 27%, and that of extreme poverty accounts for 6%. In some other settings, poverty is recorded on the basis of the following indicators:

- Average schooling years for most adults, father and mother, are 5.8 years;
- Approximately 80% of men and women are not registered with social security;
- There are three out-patient health facilities per each 10,000 inhabitants;
- 33.8% of inhabitants live in overcrowded conditions;
- Around 60% of the population has access to health, road and basic utilities infrastructure (TAP 2015-2020)

6. Schooling

The illiteracy rate in the Esmeraldas province is 8.3%. That for the Esmeraldas canton is 5.3%.



English version: Illiteracy Rate (%) Population aged 15 and over. 2001-2010-2013 Censuses.
National Provincial

Source: Territorial Arrangement Plan (TAP) 2015 – 2020

7. Housing

According to the 2010 Population and Housing Census data, collected in the 2015 – 2020 Esmeraldas Development and Territorial Management Plan, 18% of households in this district live in homes showing inadequate physical characteristics, a situation made even worse by a housing shortage. In addition, homes in poor condition in the canton amounted to 4.5%. These data mean that one in every five households is in a situation of vulnerability to natural events.

8. Transportation

The number of motor vehicles registered in the Esmeraldas canton shows a large increase since 2009, when only 9,604 units were registered. For 2010, this figure was 18,680; 31,029 units were recorded in 2012; in 2012, the figure increased to 34,577 units (TAP 2015-2020).

This growth of the automotive park is explained by an expansion of tourism activities, in particular in the southern areas of the canton. Also, mention should be made of the construction of a new airport in Tachina, and the higher number of daily flight frequencies between Esmeraldas and Quito, which has also given rise to a higher number of vehicles in the canton.

9. Public Utilities Coverage

Electrification is the most widespread public utility in the Esmeraldas province, with an 86.04% coverage, which is lower than the national average of 93.19%. No disaggregated data are available by cantons vis-à-vis electricity and all other public utilities as shown in Table 1, below.

Table 1.- Public Utilities Coverage in the Esmeraldas Province

Percentage of households supplied with electricity	93.19	86.04
Percentage of households with sewage disposal by public sewage system	53.6	30.72
Percentage of households with public water supply in the premises	71.98	36.22
Percentage of homes disposing of garbage through a garbage collection vehicle	76.97	69
Source: INEC. 2010 Census		

Percentage of household with a computer available at home	14.11%
Percentage of households using gas for cooking	92.28
Percentage of households using electricity for cooking	0.22%
Percentage of households in overcrowded conditions	22.06%
Source: INEC. 2010 Census	

According to estimations, the basic utilities deficit is 32.7%, showing low levels of access to electricity, drinking water supply, and sanitation.

11. Average household income

Seventy per cent of the population is recorded in the informal and self-employment sector, while between 68% and 73% of the economically active population has no access to permanent employment. While the national per capita income in 2010 was US $ 1,759, the provincial average only reached the US $ 670 figure.

The city and its vulnerability to climate change

Located right in front of the Pacific Ocean, in the Equatorial zone, the urban areas of the Esmeraldas canton lie between the final stretch and the estuary of the Esmeraldas river in between the Northern-Eastern area and a range of hills in the South and South-West. The geographical and astronomical location of the canton (by the Ocean and in the Equatorial zone), defines the presence of hydro-meteorological events having a heavy impact on the local and regional climate. This in turn, when combined with geographical and topographical components existing in its setting (between hills and a river-estuary) explains the risky situations the Esmeraldas city is exposed to, conditioning its socio-economic life.

On account of its geographic and astronomical location, the city of Esmeraldas is subject to meteorological events resulting from a combination of factors, such as: i) the confluence of the cold Humboldt and the warm El Niño currents, flowing from the Southern and Northern zones of the continent respectively, and the location of the city in the convection area where both currents mix. The arrival of the warm El Niño currents is beneficial to the Northern coast of Ecuador because of the rainfall those currents usually generate in the otherwise dry coastal area. This current, travelling from the North, pushes the cold Humboldt current flowing from the South, drying up the coastal areas; Ii) These cold and warm currents determine the occurrence of El Niño and La Niña phenomena, the former generating humid and extremely humid climate conditions, and the latter bringing dry and extremely dry climate conditions, both of them having significant global impacts; and iii) As the last climate factor derived from the Esmeraldas astronomical location, the impact of the intertropical convergence area determines the presence of accelerated evaporation processes, and the occurrence of high-humidity loaded clouds, with resulting convective storms and torrential rains.

Hydro-meteorological factors mentioned above have made the Esmeraldas canton and the province into a meteorological extremes area, with torrential downpours (typically between January and May), and drought (usually over August and September).

On the other hand, the geographic and topographic characteristics of the Esmeraldas city (right by an ocean and having a river and estuary on one side and mountains on the other), define the powerful bearing that these hydro-meteorological characteristics have on the city and the later ensuing social vulnerability and risk situation. This could be briefly explained as follows:

I) The city´s most important location component is the presence of the final course and estuary of the Esmeraldas River which, in turn, a few kilometres back, is fed by the River Teaone[6] waters, a fact signalling the presence of a wide riverbed, islands and adjacent lowlands. Due to specific socioeconomic reasons, this natural setup is a feature becoming into a social vulnerability and

[6] Fourteen local micro-basins make up the water system of the Esmeraldas and Teaone rivers recording a low and zero water volumes over the dry season, and substantial rainfall volumes over the rainy season.

risk issue since poor families and immigrants have been living in these areas for several decades, deeming them to be an affordable place to settle down. Being the end-result of land invasions and because they are flood-prone areas, these lands are among the cheapest in the city. Furthermore, in some cases luring people from most centrally located lands, attracting a large population estimated to be 5,000 families at least, who have so far settled in these areas prone to flood risks;

II) On the other hand, flanking the city on its South-West side, there is a chain of hills, the elevation of which does not exceed 300 metres vis-à-vis the city´s altitude, showing high risk scenarios notwithstanding. The geological composition of this topographic formation is made up of disintegrating clays with small stone material segments, a fact determining the occurrence of landslides of diverse sizes in some areas, putting at risk a large population settled on the hills´ slopes. Like the lowlands along the river, slope lands are also economically affordable because they were originally obtained through invasion, a large number of them lacking property titles and basic utilities. On account of the natural and socioeconomic conditions prevailing in the area, landslides occurring in this mountain area of the city are of a geological origin (weathered, cracked material), morphological origin (slope erosion), physical origin (long-lasting precipitations) and anthropogenic origin (excavation, mining, deforestation) (Montaño 2011). According to estimates, a population between 2000 and 5000 families has settled in this area.

These climate issues signalling the occurrence of heavy rainfalls, and the added city´s topographical characteristics (lowlands along the river bed, and slopes flanking the city), and socioeconomic conditions fostering settlement of a large population in these areas, have generated a widespread social vulnerability, a worrisome problem not only for people living there, but also for the local municipality, and government-attached risk planning and management entities. An estimation has been made that 30% of the urban population of Esmeraldas is settled in areas showing high and very high floods and landslides risks impacts (GAD-E 2012)[7]

Meteorological, geophysical and socio-economic considerations as above shall allow us to graphically appreciate that the city of Esmeraldas is an urban area particularly showing a high sensitiveness to climate change impacts. This natural and social framework is determinant vis-à-vis the prevailing situation and the attitude that both, city inhabitants and authorities have vis-à-vis climate change impacts. Most relevant stakeholders in the city have been interviewed for this Report (See **Annex 3.- Listing of people and public officers interviewed**), below.

Risk Management Policy and Legislation in Ecuador

Risk management policymaking and regulations are based upon a notion aimed at "improving the quality of life of the population"[8], which is one of the programmatic axes of both, the National Plan

[7] DAG-E (Municipal Decentralized Autonomous Government, Esmeraldas Canton) Development and Territorial Arrangement Plan 2012 - 2022

[8] See: Objective No.3, in NGLP.

for Good Living (NPGL), and a comprehensive safety warranty[9] for the country inhabitants: One of the overriding duties of the Ecuadorian State. The Constitutional risk management[10] and climate change mitigation[11] regulations respond to these two principles underpinning the public administration around management of climate change-related natural and anthropogenic events.

Based on policy-making and legislation principles as stated above, a regulatory risk management system has been constructed which is embodied in official documents as below:

- National Development Plan for "Good Living" - 2013-2017.
- The Political Constitution of the Republic of Ecuador.
- Public and State Security Act.
- Regulation to the Public Security and State Act.
- Organic Territorial Arrangement, Autonomies and Decentralization Code (OTAADC).
- Organic Planning and Public Finance Code (OPPFC).
- Organic National Public Procurement System Act.

This policy and legislation aggregate has been the origin of an institutional framework basically consisting of a national entity (the Risk Management Secretariat), provincial and regional entities are attached to throughout the country. Moreover, as an operational mechanism, plans are under way to setting up specific operational instances for each territory, which are operational only in risk situations. These are the Emergency Operations Committees (EOCs) which, bearing in mind the geographical scope of the potential impact of the threat detected, or damages in the event of a disaster, EOCs could have a national, provincial or cantonal coverage.

An EOC is an instance for inter-institutional coordination, the key duties of which are as follows:

a) Drafting up and approving the Risk Reduction Agenda (RRA) in the territory under its responsibility, implementing the RRA, and being accountable for its achievements.

b) Coordinating public and private entities efforts within their territorial scope during emergencies and disasters.

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[9] Seer: Article 3, Numeral 8, Political Constitution of the Republic of Ecuador (CRE)

[10] See: Article 389, Numeral -CRE: “The State shall protect individuals, communities and nature from the adverse impacts of natural or man-made disasters by means of risk prevention, disaster mitigation, recovery and improvement of social, economic and environmental conditions, with an aim to minimising vulnerability conditions”.

[11] See: Art. 414-CRE. “The State shall undertake appropriate and cross-cutting measures to mitigate climate change, by curtailing Greenhouse Gas emissions, deforestation and air pollution, and taking measures addressing the conservation of forests and vegetation, and the protection of populations at risk”.

c) Leading actions being implemented over the recovery phase.

d) Deciding upon matters that the EOC members submit to the Committee.

Members of the Cantonal Emergency Operations Committee

1. Mayor (Natural Chairman of the Cantonal EOC)

2. Cantonal Political Leader

3. Representatives of State secretariats present in the canton

4. Municipal Risk Management Unit, and Municipal Public Utility Companies Representative

5. Risk Management Secretariat and Heads of relief agencies (Fire BriADGe, Red Cross, Traffic Commission) delegate

6. Disabled peoples´ organisations in the canton delegate

7. Armed Forces (present in the canton) delegate

8. National Police delegate

9. Neighbourhood Boards canton representative

10. Technical panels coordinators

11. Other members at the discretion of the cantonal EOC

Parallel to the EOC, which is the public operating instance, there is the Risk Management Committee (RMC) which is made up by internal operational institutional (public and private) instances for targeted emergencies.

Vulnerability and Risk Reduction Project (CVRRP)

The CVRRP project is a joint initiative of the Ministries of the Environment of Ecuador (EME) and Chile (MMCh), and the Bank for Latin American Development (CAF). This project was originated on the fact that the Latin American region is the most urbanized region in the world, with 80% of its population living in cities, and 111 million people living in informal settlements and in poverty-in-inequality conditions, a situation making a substantial number of these people highly vulnerable to disasters. Most of this urban population is located in coastal areas, in places enduring the adverse impacts of climate change.

Bearing in mind this situation, the CVRRP is making a proposal for work to get under way to abating vulnerability to floods and landslides in three coastal cities in the region, one of which is Esmeraldas[12]. As the cheer size of climate change impacts escalate, the city of Esmeraldas will be

[12] Antofagasta and Taltal in Chile are the other two cities referred to.

becoming increasingly more sensitive to vulnerable situations such as those being highlighted in this paper, and which will put at risk both, the city and department inhabitants, and private infrastructure.

II. STAKEHOLDERS AND THEIR CONCERNS

The Stakeholder Review is a methodological tool allowing to single out the concerns that should be borne in mind at the time a programme, project, or policy is designed, executed, or enforced. Each stakeholder responds to a different two-basic type typology: public officers and citizens. The former could be planning, regulatory, and control institutions, executing or promoting works. The second type of stakeholder includes those being affected / benefited by the project, such as lobbyists, observers, private entities, communities, Civil Society Organisations (CCOs), citizens, among others.

As described above, the CVRRP is addressed to the reduction of two of the vulnerabilities detected in the city of Esmeraldas: landslides or mass earth movements, and flood risks. Two specific types of stakeholders are involved: public officials and risk management experts, and people being impaired by these two risks. Table 2 shows all stakeholders vis-à-vis the CVRRP, both at local, provincial and national level. These stakeholders who are attached to the geographical and functional area[13]of influence of the CVRRP, correspond to the following types:

1. Public entities:

a. National management and control bodies
b. Local Management Entities
2. Neighbourhood organisations
3. Civil society organisations

All entities and people having a particular interest in the CVRRP, as shown in Table 2 below, can be attached to any of the two types above. Key stakeholders will then be identified, i.e., those who are essential to the different project stages, with which the project executors should set up dialogue mechanisms, enter into agreements, and coordinate activities.

[13] "Functional Stakeholders", are those that, because of their institutional investiture (legal competence or public attribution), have a bearing on the project, even without being located in the project´s execution area, and even without having a particular interest in the project.

Table 2. Stakeholders Aggregate vis-à-vis the CVRRP

STAKEHOLDER	AUTHORITY – OBJECTIVES – KEY CONCERNS	LEGAL BASIS
PUBLIC MANAGEMENT AND CONTROL ENTITIES		
RMS	Risk Management Secretariat: Building up and leading the National Decentralized Risk Management System to ensure the protection of individuals and communities against the adverse impacts of natural or anthropic-origin disasters, on the basis of actions such as policymaking and generation of strategies and standards fostering targeted capacity-building to identifying, surveying, preventing and mitigating risks so as to face up to and manage disaster events. Further on, to recovering and rebuilding the social, economic and environmental conditions likely to be impaired by eventual emergencies or disasters.	The Political Constitution of Ecuador, and the Citizen Security Act
MEE	Ministry of the Environment: The governing body responsible for Environmental management, monitoring of watershed and protected areas. Through the Climate Change Under-secretariat, the Ministry has the authority to leading mitigation and adaptation efforts in the country to addressing climate change.	Environmental Management Act
MTPW	Ministry of Transport and Public Works: Execution of road and port works. The MTPW is the body coordinating the technical working group in charge of infrastructure and rehabilitation of the Emergency Operations Committee (EOC).	Roads Act
NWS	National Water Secretariat (NWS for its acronym in Spanish): leading the comprehensive and integrated management of the water resource throughout the national territory, on the basis of policy, standards, monitoring, and decentralized management to generating an efficient use and harnessing of the water resource.	Water Act
NMHI	National Meteorology and Hydrology Institute: Responsible for keeping the climatological and hydrological database updated, alerting on adverse hydro-meteorological phenomena, supplying weather, climate and the environment data, breaking down data being collected by hydro-meteorological monitoring stations.	NMHI Creation Act Citizen Security Law
ONI	Oceanographic Navy Institute: Oceanographic, climate research; monitoring of seawater surges for navigation safety; compilation and creation of the national nautical chart.	Executive Decree No. 642, issued on

		18 July 1972.
LOCAL AND PROVINCIAL GOVERNMENT ENTITIES		
Provincial ADG	In coordination with the regional government, executing public Works in watersheds and micro-basins. Environmental Management at provincial level	Article 47, OTAADC[14] Article 263, Constitution
Municipal ADG	Exercising control over land use and harnessing Provision of public utilities: drinking water, sewerage, sewage treatment. • Marking off, regulating, authorising and monitoring the use of seashores, riverbanks and riverbeds, lakes and lagoons • Safeguarding and ensuring an effective access of people to the use of sea beaches, river banks, lakes and lagoons. • Regulating, authorizing and controlling the exploitation of arid and stony materials present in riverbeds, lakes, sea beaches and quarries.	Article 264, Constitution
Fire BriADGe in Esmeraldas	Managing Urban emergencies, fires in particular.	OTAADC
CIVIL SOCIETY ORGANISATIONS		
Red Cross	Health emergency care	N / A
PCUE	Pontifical Catholic University of Ecuador (Esmeraldas Campus) Main concern: Higher education	N / A
STAKEHOLDER	**AUTHORITY – OBJECTIVES – KEY CONCERNS**	**LEGAL BASIS**
CAF	Bank for Latin American Development. Key concern: Funding of Development Projects	**N / A**

NEIGHBOURHOOD ORGANISATIONS

NEIGHBOURHOOD	LOCATION	ORGANISATION
Diógenes Mera (also known as Cruzeiro)	Located in the low-lying areas in the city, subject to flood impact. Recording sewage reflux problems.	A factual neighbourhood Board is in place. A youth integration group is in place carrying out social and sports activities, and cooperating in the cleaning and recovery of community areas, such as a sports fields. They also seek to undertaking

[14] OTAADC, Organic Territorial Arrangement, Autonomy and Decentralisation Code

		activities to disrupt youth gangs by engaging them in sports activities.
20 de noviembre	This neighbourhood was affected by a landslide in January 2016, destroying 38 houses.	There is a de facto neighbourhood Board the main purpose of which is to up-keeping community harmony. The January 2016 landslide made the Board to become operational, thus holding talks with Municipality authorities and the Provincial Council for support.
Unión y Progreso (La Guacharaca)	A landslide was recorded in this neighbourhood 20 years ago. Works to keep it in check included a concrete and mesh coating.	This is one of the oldest population settlements in the area, making it well-known for its greater social cohesion. The neighbourhood Board made a decision to up-keeping the natural vegetation on the hill slopes in order for any future landslides in the sector to be prevented.
Cocoy	The slope soils around this neighbourhood are unstable and rocky. A stone and sand mining operation is underway in the area. The April 2016 earthquake originated a small landslide, with no house damages recorded.	There is a de facto neighbourhood Board, working mainly for improvements in the area. Further, there is an informal women organisation concerned with preventing crime in their community. The location of the neighbourhood far away from the city centre, makes its people vulnerable to robberies and mugging.
13 de abril	Located in the upper area of the city, soils show characteristics similar to those of the November 20 neighbourhood.	There is no neighbourhood Board in operation
Chone Alto	Located in the upper area of the city, on soils characterized by their instability. No large landslides have been recorded in the	There is no neighbourhood Board; instead, one man living there hold a *de facto*

	area.	leadership which, when necessary, exerts it on behalf of people living in the sector.
El Arenal	Located in the lower area of the city, showing flood-related problems only in extreme situations.	There is no neighbourhood Board in place. A folk group has been formed.
Sector La Propicia 1 and 2	Located by the river banks, experiencing flood problems in extreme situations.	Sewerage problems from occasional discharges originating in nearby PETROECUADOR facilities.
Sector las 50 Casas	High city areas, close to an estuary flowing into the Esmeraldas river.	There is no neighbourhood Board in place
Pianguapi Island	Inner area in the island, lowland and prone to flood.	There is no neighbourhood Board in place
1.Vargas Torres Island: 2.Cordero Crespo Neighbourhood 3.12 de mayo neighbourhood 4.20 de noviembre neighbourhood 5.29 de agosto neighbourhood	All of these neighbourhoods are flood-prone areas in heavy rainy seasons in the upper reaches of the basins and micro-basins of the Esmeraldas and Teaone rivers. Also, over the high tide and flood season, heavy floods are generated, reaching 2M high waves. Flood events of this size have been recorded every ten years or so.	There are no consolidated neighbourhood Boards in place, but groups assuming a *de facto* leadership as may be required to making complaints to public bodies, or interacting with authorities.

Source: Field Work

Stakeholders' Insights and Concerns

In overall, the three organisational types and two subordinate types being identified in the CVRRP geographical and operational area of implementation do not share a similar insight vis-à-vis a need to monitoring climate change impacts; however, this is not the case regarding specific administrative and technical measures for this goal to be achieved. The aggregate of stakeholders identified as regards the CVRRP, as already mentioned, is made up as follows:

1. Public entities:
   a. National management and control entities
   b. Local Management Entities

2. Neighbourhood organisations
3. Civil society organisations

Bearing in mind the nature of activities the CVRRP is intended to undertake, and funding sources, there is no objection to the Project´s execution. Taking into consideration that this is an initiative being funded by international cooperation with non-reimbursable funds, all stakeholders have expressly or tacitly stated their full agreement with this project since it addresses specific problems the Esmeraldas city is facing up to, such as climate change impacts and risks, as well as social vulnerability to those impacts, and pre-existing conditions having a bearing on several local neighbourhoods and communities. Furthermore, a city-specific public policy conceptual design is still lacking to address climate change impacts readiness and mitigation. The CVRRP would play a key role in this endeavour towards public policymaking on this subject around which all stakeholders involved are articulated.

Beyond these understandable local concerns, no opposition likely to escalate to stressing or conflicting situations shall be generated by the CVRRP. Obviously, disagreements could arise over the project´s implementation phase, but they are unlikely to occur with respect to the reason behind the project implementation itself, but rather, regarding the way in which institutional interactions are established and prevention and mitigation actions and community participation are addressed.

The Standpoint of Neighbourhood Stakeholders

The local community likely to endure risks, emergencies and disasters as a result of hydro-meteorological events is made up by people enduring different poverty levels; a large number of people are migrants from rural areas in the same province, Manabí, and even from the Southern coastal areas of Colombia. That is to say, they are groups of individuals facing up to socio-economic vulnerability who have settled in low-priced, or freely-accessed places at risk, deemed as areas susceptible of invasion or irregular settlement. Their economic vulnerability prevents them from having access to any places other than those they are living in and, therefore, any attempt to displace or relocate them would become into a traumatic event if no proper assistant is provided to them beforehand.

Visits were made to two different locations in the city: an area next to a row of hills stretching from a beach sector known as Las Palmas into the mainland parallel to the city; and to the flood area at the edge of the Esmeraldas river bed and estuary. In the first sector, occasional landslides have been recorded on the hill slopes, while the second sector is subject to flood events. Specific emergencies were sustained in both sectors in January 2016 resulting from heavy rain throughout the region, clogging the river bed and triggering instability in a place known as the Gatazo Hill (Neighbourhood 20 de noviembre, El Oro Street). No casualties were recorded because landslides were small-scal.

As stated by the local community and, in particular, by people in the area enduring climate change impacts, they are unaware of the problematic they are living in. Sometimes, people only learn of climate-related risks the moment an emergency situation is triggered; some other times, people

naturally coexist with risk. This is the case of floods deemed as a normal natural event, since a sort of social resilience vis-à-vis floods has become ingrained in people making them to face up to these impacts with a sort of resignation to misfortune.

A manifest disconnection exists between neighbourhood and community areas and public administration processes focused on risk management, which, in broad terms, are a relatively new and often underestimated institutional perspective country-wise[15]. Furthermore, the institutional framework has yet to construct a public image of the aggregate of political, administrative and operational measures making up risk management, a fact adding to the population assuming risk management more as assistance to the population in case of a climate impact rather than as a comprehensive set of both, State and citizen rights and obligations.

In the absence of an integrative notion of what risk management entails, the social stance towards the State (in this case, the Municipality) is one of distrust, since the perception is that the risk management-focused discourse is only a justification for the public administration not meeting people needs, displacing them from the area, or not facing an already existing problem, such as the landslides in the 20 de Noviembre neighbourhood, which at the moment of its occurrence (year 2016) had already destroyed 38 houses[16] and was still active at the time this paper was drafted up.

As an outcome of the two factors mentioned signalling that the State is still to construct a comprehensive imaginary of risk management and that the public assumes it only from a welfare and philanthropic point of view, there are also expectations and even community demands that could not be met by public institutions, as shown in areas affected by floods. According to people living in these areas, smaller-size floods occur at least once a year, without causing permanent damages or impacts on the lower sectors of the Pianguapi and Vargas Torres islands and riverbanks close to the City (The Potosí sector). Heavy flood is recorded once over a five-year time range, reaching a 60cm rise, damaging a large number of houses. Every 20 years, heavy flood, reaching a 2M rise with a heavy impact on all houses in the islands and areas bordering the river is recorded. Notwithstanding the time estimate people make about the occurrence of these events, the most serious of them occur when high tide at sea and heavy precipitations in the upper and middle sectors of the Esmeraldas river mix basin together. Thus, floods generating emergencies and disasters could occur even within a shorter time lapse than that popular perception indicates.

Beyond the direct impact on movable property and even the homes of people affected by climate change impacts, emergencies unleash a series of non-visible problems having a direct bearing on residents and generating friction with disaster relief agencies. For example, many people living in an area at risk do not evacuate their homes despite the imminence of an emergency because of the security problems their assets and property are exposed to if people are not present. Reports of robberies and looting of homes or, at least, fears that this may happen are common. This

[15] Notwithstanding, the April 2016 earthquake shall greatly change citizen insight vis-a-vis risk management activities and institutionality.

[16] At the time the last visit was made over field work being done for this Report, three additional houses were being destroyed by the advancing landslide recorded in the area.

perception, justified or not, could lead to fatalities in the event of a disaster and people do not comply with the authorities' request for evacuation. This means that the sociological perceptions or realities of vulnerable populations should also be integrated into emergency readiness measures, besides making arrangements to addressing the adverse event itself[17]. Likewise, these perceptions are linked to gender inequality situations, since single mothers find it more difficult to evacuate their homes because of the uncertainty they are left with of not being able to meeting the needs of their children in makeshift places. This will be further discussed below.

Another subjective aspect likely triggering emergency situations that cannot be properly addressed is the perception about the occurrence of floods “demanding evacuation”. The rationale is that whenever heavy rains, high tide, and tidal waves occur, an evacuation process is mandatory. Notwithstanding, whenever heavy rainfall in the upper and middle parts of the Esmeraldas and Teaone river basins becomes apparent which may even go unnoticed in the lowlands where the city is located, could also cause sudden flood and even materials´ dragging. A firefighter was killed when he was trying to rescue someone in a flood event previous to that recorded in January 2016. Bearing in mind the perception people have of natural disasters, emergency entities should have a perspective that is based on remote warning systems allowing those entities to learning in advance about a threat of an adverse event, regardless of the subjective appreciations of people in the area.

The perceptions people have likely distorting risk management measures are also present in a problem-solving situation. An example of this is how some people in the Vargas Torres Island found a way to tackle with flood events in the area: According to some people, a retaining wall should be built in a sector in the island marking the point where the Esmeraldas river is split into two branches, while for others it would be necessary to making a filling in the sector most impaired by flood events, so that whenever the river level should rise, this sector would not get flooded. Both works would require a large investment by the municipality, without a certainty whether the wall or the filling would really solve the problem.

Another issue to be highlighted vis-à-vis local perception is the vulnerability people are faced with. Due to a lack of flood maps showing the areas likely to be prone to flood, the only way to find out whether or not a sector is flood-prone is through people´s own experience. This makes that vulnerability sectors likely to remain inactive for long periods of time to be invisible, thus becoming a source of risk under some circumstances. Versions have been collected about old dry riverbanks or river branches which have not been flooded since old times recollections in social memory. Since these areas are not considered as a potential hazard, people settle in them, building up their homes and other facilities without keeping risk situations in mind. Most people living in these areas argue that "no one has warned them" that the areas they have settled in are at risk. Further, this is intertwined with possible cases of speculation with lands resulting from invasions which are sold to

[17] A similar situation was recorded in New Orleans, when thousands of people living in areas being affected by the Katrina Hurricane did not evacuate the city despite the pressing call made by local authorities. In most of these instances, the evacuation order was disregarded and people stayed home to collect the social security check that was expected to arrive over the following days. An evacuation of the family without financial resources was not deemed realistic by poor settlers of the city (see: Real 2007).

families who long for a place to build their homes, and who are unaware whether the place is safe to live in.

Subjectivity as a factor of vulnerability to risk situations is also present in landslide areas, while people living in them take their own security measures on the basis of social memory, on the advisability of building their homes on cheap land, on a perception of security being generated by other houses already built on the site, on "without nothing happening," and, in general, on their own calculations about what can and cannot be done to face up to an ongoing socioeconomic risk, i.e., lacking a home of their own. These considerations inevitably turn against themselves and the authorities when an emergency situation occurs. Precisely in the area sustaining the latest landslide people living there argued that neither the Municipality nor any other authority informed them it was a risk area. Two of the residents who lost their homes due to the landslide stated that even their houses were granted building permits, and their property payments were up to date. Built in 2013, the two three-floor houses built in concrete were practically new (by 2016). The other 38 houses were destroyed and totally buried by the landslide because they were built right on the mountain slope where the landslide took place. This, as shown below, signals to an administrative fault by municipality authorities who, fourteen years ago had been given warning this place was prone to landslides, and specific preventive measures were suggested at the time, including a strict ban on the presence of settlements and construction of buildings. (EME 2002)

Authorities addressed this situation by merely providing assistance, while an inter-institutional coordination and, above all, a solution strategy, were non-existent. People were well aware that between the Municipality and the Provincial Council "there was a two-way road", i.e., two different ways of weighing a solution, or how an emergency should be dealt with. The point of view of people living there was that the earth released by the landslide should have been removed, a work undertaken just to show off some response action rather than to actually solve the problem. Earth released would have required thousands of tow-lorry loads to evacuate, a nearly impossible task given the Municipality financial constraints. Further, removing the material would undermine the natural consolidation of the hill resulting from the detachment of material not having enough grip in the lower area. This would accelerate the occurrence of a new earth sliding front. However, despite the dangers the task involved, people feel optimistic whenever they watch a tractor and some of the municipality's dump trucks working in what seems to be a useless task.

To further feeding people confusion, a few days later, according to residents interviewed, the Risk Management Secretariat arrived to take down the names of people who lost their homes. People thought of this as the start of some compensation or assistance process in the face of misfortune and, even more, as a chance to working with the rest of people living in the area who, although not yet impaired by the landslide, could also lose their homes. Notwithstanding the danger people continue to be exposed to, no procedure has been triggered to definitely address the situation.

Here again, a lack of a specific public policy for these areas signals the attitude of the population to their vulnerability status and to local authorities. The soil instability in the hills adjacent to the city of Esmeraldas is a fact people have been aware of for at least two decades, when landslides were recorded in the Wínchele river watershed, (sector locally knows as St. George) in February 1998

(Montaño 2011), leading to the breakdown of the Trans-Ecuadorian Pipeline and starting a daunting fire[18].

In 2002, the EME recommended the Esmeraldas Municipality a series of technical, regulatory and social measures to avoid emergency situations in vulnerable areas in the hills and neighbourhoods in the city, including the 20 de noviembre and JR Coronel neighbourhoods, an area known as "the landfill." These measures include a protection screen on hills slopes to keep wind and water erosion in check; relocating houses built on slopes edges to a mid-slope area or at the foot of the hill, because they are exposed to serious damage; and prohibition of new housing development in the area. Nevertheless, new population settlements spread up over the next two decades, including the 20 of noviembre sector where, in January 2016, fourteen years after prevention measures were suggested to the Municipality, a new landslide was recorded, destroying at least 40 houses, most of them built after the time the Municipality was warned to stop house building projects in the area.

The point should be highlighted that in some other inhabited areas in the hillsides (Cocoy, Union, Progreso, and Guacharaca Neighbourhoods, for example), people living there discern that landslides are linked to the loss of the slopes vegetation cover, so they have made a decision to keep the area in good condition. They are aware that some people, "to enlarging their backyards" have dig out the slope to have a flatter surface for family use and eventually build additional rooms. This, however, adds to hill slopes weakening. This community agency shows a clear concern to actively participate in monitoring the main threat these neighbourhoods are faced with.

For obvious reasons, a mandatory question in this survey was how to assess the implementation of a specific project to reducing vulnerability to landslides and floods and to fostering an adaptation culture vis-à-vis adverse climate change impacts. In all cases, the answer to this question is affirmative; however, there is also a perception that people not only appreciate that a project of this type is executed, but the fact that international organisations are funding it generates expectation and high credibility vis-à-vis the outcomes the project is expected to achieve. In both, landslides and floods areas, the news about this project reaches the population only three months after the last most serious events in the city were recorded over the last decade. This series of events have given rise to a people´s perception of continuity vis-à-vis measures or help assurances they have been given by State agencies.

As a complement to criteria drawn from interviews, Table 3 shows the specific points of concern that have been consistently stated by people living in the area being surveyed. These statements are incorporated verbatim so as to keep the significance they entail.

[18] The landslide and subsequent fire caused 2 dead people, 30 people seriously injured, and 624 homeless people.

Table 3. Worrisome Issues for Vulnerable Communities

→ Mitigation works should be undertaken to deal with risks existing in the province.
→ Coherent and strong policymaking is required. Authorities should address policymaking as an ongoing endeavour.
→ Authorities do not address mitigation as seriously as they should. They only talk about risks occurring on an annual basis.
→ There is a time loss at ECU911 decision-making, when it comes to verification, and the support of the other institutions is sought after.
→ None of the institutions in operation are prepared to face up to adverse risks. They are too slow to react to them, and the assistance they provide takes a rather long time to reach people in need.
→ Risk plans are eagerly drawn up by authorities in their offices, but those authorities neither execute them, nor implement them.
→ Political rivalries between the municipality and the prefecture are common place.
→Versions abound that the former mayor had declared the high hill sector as a risk area, while technicians now say that the risk strip is located downhill.
→ No one cares to know if there is a risk area. Authorities make decisions only when a catastrophe is a real fact.
→ Public offices in Esmeraldas work individually.
→ The authorities are still to submit any mitigation or prevention measures to deal with the overflow of an Emerald river branch.
→ Each institution works individually: everyone doing what he / she thinks is right.

While it is true that the concern shown by vulnerable communities may in some cases be excessive or even inaccurate, their concern nevertheless shows what these vulnerable groups think, observe or perceive of the situation in which they are involved. Moreover, this concern shows the worry that can only arise from the involvement (and consequent interest) people have regarding a problem, as this case shows: landslides and floods. The way how people react is, therefore, legitimate.

The Outlook of Public Entities

Public officers representing seven public entities working on risk management were interviewed over the field work carried out for this report. Their views consistently show risk management as a state administration-attached activity already anchored on the set of duties government institutions are accountable for. Interviews dealt with significant disaster events at local and national level, such as the Gatazo hill landslide, flood events in shantytowns on the Esmeralda River islands, banks, and estuary on 25 / 26 January 2016, and the April 16, 2016 earthquake. These events triggered government institutions awareness and their support to the victims, as well as endeavours for situations of this sort to be avoided.

As in some other public administration areas, and despite efforts to cross-managing risk, adequate articulation between different public entities in this area is still lacking, since it only occurs when emergency events calling for the activation of the Emergency Operations Committee (EOC) become evident. The EOC is an organisation that only gets into operation in an emergency situation, and

over the time required to attend to the victims and undertake the initial recovery tasks. Here, public entities should get involved in the so-called "Technical Boards". Once the emergency is over, there is scant coordination between entities to address management of risk areas and support vulnerable communities. Likewise, there is also no interaction with communities either affected or impaired by emergencies; however, some meaningful efforts have been made for vulnerable and risky areas in the city to be identified. According to evidence arising from interviews, adverse impacts adaptation and mitigation-focused strategies, plans and conceptual documents have been drafted up since 2010, together with the installation of early warning equipment, for which cooperation has been forthcoming from international entities, mainly GIZ, UN-HABITAT, DIPECHO and UNDP.

Notwithstanding these meaningful endeavours focused on risk management planning, a conceptual and administrative continuity with previous strategies and initiatives is still lacking: i.e., actions to diagnose, prevent and manage landslides-linked risks. Specific risk management approaches are present in the city (EME 2002, UNDP 2005) not showing any implementation or follow-up by government officials in charge. This could be explained by the paradigm shift generated with the approval in 2008 of a new conceptual and regulatory risk management framework[19], which unwillingly moved officials to look only at the work they would do from that year on.

Article 389 of the Constitution marked a landmark stage in public administration: risk management was for the first time understood as both, a crosscutting duty of the State and, implicitly, a citizen right. The second paragraph of this paper sets forth that risk management will be a regular activity, a part to all State levels and institutions, to be implemented through risk management units in all public and private institutions. This set of operational units constitutes the "decentralized national risk management system", under the aegis of the Risk Management Secretariat, which replaced the Civil Defence Office: a national entity attached to the Ministry of Defence that, having a less conceptual projection and devoid of an adequate Regulatory framework, was responsible for assistance work in disasters and emergencies up to year 2008 when the new conceptual framework came into being and, shortly after, the Risk Management Secretariat was set up. The paradigm shift recorded vis-à-vis this matter is basically a reflexion that disasters are not accidental events, but are due to natural, social and individual causal situations determining the vulnerability of a person or a community to a natural, or anthropogenic threat. Likewise, the temporality notion was replaced by a risk management on-going notion.

The implementation of the new conceptual and institutional scenario for emergencies and risks management in both, Esmeraldas and the country as a whole, is attached to the Risk Management Secretariat and, when an emergency arises, to the EOC. This has meant that in this new risk management stage, plans disregard previous initiatives such as those in place to prevent landslides, which for over a decade predicted what would happen on Gatazo hill, and made specific action suggestions (EME 2002, UNDP 2005). This situation is an outcome of an unconscious consideration that whatever risk management measures had been designed previous to the current management paradigm, they were wrongly proposed.

[19] This new conceptual framework was stipulated by the Republic Constitution, enacted in 2008.

To complement public officials´ perceptions, it is worth reviewing the statements made by some of the people interviewed for this report (Table 4). These admissions evidence the problems all paradigm transitions have, making it necessary that a new risk management outline currently operational in the country is consolidated in a harmonious inter-institutional exercise.

Table 4. Public Officers´ Self-criticism

→We are not prepared to face large-size adverse problems. → The EOC should be neutral vis-à-vis decision-making so as to be able to provide timely assistance to people affected. → Political rivalries are apparent within the EOC. → No in-depth analyses of environmental problems affecting the city have been conducted. → There is neither abidance nor a way to demand abidance by the prohibition for people to settle down in areas at risk;

Finally, a key issue arising out of interviews with public entities representatives working on, or linked to risk management -which goes beyond what is merely perceptual or subjective- is the scarce availability of resources allowing for plans and programmes drawn up to be implemented. Consistently, resources are needed to carry out and implement management plans and climate change prevention measures. The most important plan that has been implemented so far is the tsunami and flood risks-focused early warning system, equipped with two sirens strategically located in the city (one in the Provincial Council building and the other one in the Panecillo Hill), the activation of which can only be done by the city Mayor!

Within this perception context, the implementation of a specific landslides and floods vulnerability reduction project -further intended to bolster an adaptation to adverse climate change impacts culture- generates an obvious appeal in all sectors. A project of this type allows risk management-linked entities to having a tangible possibility to carrying out actions for which a budget is non-existent. But more important is the fact that actions as planned shall be implemented having the risk management philosophy as the component underlying interventions likely to be performed, and not those attached to a conventional, dissociated from a social dynamic, public work.

Characterization of Stakeholders Identified

On the basis of the review above, considerations are spelled out below for each stakeholder identified (Table 5).

Table 5. Analytical Description of Stakeholders

STAKEHOLDER	CHARACTERISATION
RMS	• Responsible for management of emergencies and disasters of all kinds, including those due to climate change impacts. • Positive stance to any initiative seeking to reduce vulnerabilities.
EME	• Responsible for national environmental management and policymaking. • Specific national leadership is attached to the EME to address climate change-focused policy, and regulatory and operational matters. • Fostering initiatives around local empowerment vis-à-vis management of climate change impacts. • Direct interest in participation in climate change-focused initiatives.
Provincial ADG	• Some of its duties are Provincial environmental and watersheds management. • Its highest-ranking ombudsman is the Chairperson to the provincial EOC. • An environmental management unit is attached to it to deal with climate change issues. • Empowered with a regulatory capacity around issues dealing with environmental management and prevention, mitigation and adaptation to climate change impacts. • In favour of initiatives to reduce climate change impacts at provincial level. • Directly concerned in interventions focused on climate change initiatives.
Municipal ADG	• Responsible for the provision of public utilities, urban planning, and public works in this setting. • Its highest-ranking Ombudsperson is the Chairperson to the cantonal EOC. • Empowered with a regulatory capacity around issues dealing with urban planning and compliance with higher regulatory policy addressing environmental management and prevention, mitigation and adaptation to climate change impacts. • An environmental department and a climate change unit are attached to it. • Favourable to initiatives to reduce climate change impacts at the cantonal level. • Directly concerned in interventions focused on climate change initiatives
NWS	• Responsible for the water resource administration within the geographical demarcations established for the purpose.

NMHI	• It aims at meteorological and hydrological research at the national level
NOI	• It is involved in meteorological research in marine-coastal areas.
RED CROSS	• International humanitarian institution providing assistance in emergencies and disasters.
EFB	• A local entity providing direct assistance to emergencies of all kinds, as well as support in cantonal and provincial level emergencies and disasters.
PWM	• Technical organisation the key duties of which are planning and execution of road works.
PCUEE	• Educational institution with a concern for conventional university education and practical training
CAF	• International development bank with funding capacity in environmental and climate change issues. • Specialized environment and climate change departments. • Directly concerned in promoting and / or investing in initiatives focused on the reduction and management of climate change vulnerabilities. Ecuador is a member country of CAF.
Vulnerable Neighbourhoods	• Both low-lying neighbourhoods and those located on hillsides show a generic vulnerability to climate change and vulnerabilities specific to geological, and river-related aspects of their location. • These neighbourhoods welcome any initiative in any way linked to their own concerns.
20 de Noviembre and LVT Island Neighbourhood	• Urban communities experiencing severe impacts by a combination of geological-fluvial and meteorological risks; • Climate changes pose a greater threat to these communities; • A higher incidence of hydro-meteorological threats would make it difficult or impossible for these human groups to recover from these threats' impact. • Highly interested in getting involved in initiatives seeking to abate or neutralize the problematics they have to face.

Table 5 above briefly shows how these different stakeholders are prejudiced vis-à-vis the scope of the CVRRP. Some of these stakeholders have a concern linking them to this project, while some others have only a circumstantial connection. For example, for the Cantonal DAG, management of climate change impacts originates both from DAG´s own urban-related skills as from the way DAG addresses emergencies within the area under its jurisdiction. In the opposite side, as far as MPO is concerned, the climate change issue is merely a referential, since although it has an impact on works this entity executes, this fact is not the only reason for the works that it implements to be undertaken bearing in mind the different types of natural or anthropogenic threats likely having an impact on them.

Identification of Key Stakeholders

As already mentioned, stakeholders are those people, social groups and institutions that are invested or legitimated to undertaking, formulating or executing a programme, policy or project, or having a positive or negative stance upon them. Depending upon the political, and socio-economic influence stakeholders have, this legitimation arises out of the impact it may have on his interests, or those of the competence the State has conferred upon those stakeholders to control, regulate or execute certain socioeconomic or technical activities.

Table 2 below shows the aggregate of stakeholders in place vis-à-vis the CVRRP. Notwithstanding the concern or expectation that all these stakeholders could have regarding the project, not all of these stakeholders are to be counted on with at the different project stages: either to establishing coordination links, or to entering into agreements favourable to the project viability. This is why key CVRRP stakeholders should be identified.

Notwithstanding the importance that many stakeholders may have to a particular project, only a few of them can be considered as key stakeholders: these being those the involvement of which is desirable, indispensable and / or compulsory to achieve the Project objectives. These stakeholders have the legitimacy, capacity or means to decide upon and bearing on all or some of the Project stages. Key stakeholders in this paper were identified on the basis of parameters detailed in Table 6 below.

TABLE 6. Identification of Key Stakeholders

Importance	Rationale	Key Stakeholders
Vulnerable groups or individuals bearing the impact of climate change impacts (or already affected by those impacts).	The State is accountable for the prevention and mitigation of disasters and emergencies, and should provide assistance to people enduring them.	Entities the duties of which revolve around risk and environmental management, and urban development.
Public entities with duties, attributions or powers vis-à-vis the CVRRP objective.	Attributions and powers in public law should be exercised, and are mandatory.	Entities the duties of which revolve around risk and environmental management, and urban development.
Entities with funding or technical advice capacity within the scope of the Project or programme.	The Law, or stakeholders´ own goals allows them access to technical and financial resources to executing works within the scope of the project´s management.	National or international entities having a concern or competences insofar climate change is concerned.

Stakeholders identified according to Table 6 are not homogenous insofar the CVRRP is concerned, since their motivation to intervene in the different project stages varies according to economic, political, or legal reasons, as explained below.

The rationale for a group to be interested in a project is based on three factors: Authority, Concern and Standing, as defined as follows:

- **Authority**: The formal (official) or informal (socio-economic) bearing that a stakeholder has regarding the project to be executed, or the geographical or operational functional settings linked to that project. This denomination refers to the ability stakeholders have to legitimately having a significant bearing on the project.
- **Concern**: The degree and type of gain or loss expectations, or adjustment to regulatory protocols, that a stakeholder has regarding the execution or implementation of a project or activity.
- **Standing**: The attitude stakeholders have toward the project, based on their own authority or concern, or on their own perceptions and expectations.

Table 7 below shows how the three factors behind each stakeholder motivation in a project are expressed in weighting levels. These levels are indicative for action over the project socialization stage, or of project-related agreements being entered into.

Table 7.- Key Stakeholders Authority, Concern, and Standing

VARIABLES		**LEVEL**	
Authority	High	Medium	Low
Concern	High	Indifferent	Low
Standing	Favourable	Indifferent	Adverse

Once methodological classifications are undertaken, an identification is made in sections below to setting apart the concerns stakeholders have about the CVRRP. This identification has been made on the basis of insights of stakeholders as recorded in interviews, and on a review of institutional assignments and duties, signalling to a tacit concern by these stakeholders.

Key Stakeholders in Project (CVRRP)

Table 6 above shows how to determine the bearing a stakeholder can have for a project to be deemed as a key undertaking. Briefly, this bearing stems from the project´s impending importance, from the competences around the project objective or its impacts, and from an ability for the direct support that could be expected from them as regards the problematics the project may entail. In Table 5 above “Analytical Description of Stakeholders, a listing is made of the competences, duties, and institutional or community concerns making up key points of concern vis-à-vis the CVRRP.

Taking the aggregate of stakeholders shown in Table 2 as a baseline, and bearing in mind the scope of the attributions or involvement each stakeholders has with regard to a need to abating and

managing vulnerabilities to climate change, a conclusion has been reached that the responsibility and concern each stakeholder has is different. While everyone has an implicit concern in being a part to a climate change initiative, not everyone can have the same commitment with the CVRRP warranting their involvement. This means that, in some cases, the stakeholders´ involvement with this initiative should be in line with the type of backup they can provide. Therefore, a conclusion can be reached that the CVRRP key stakeholders are entities and social groups as follows: the Barrio 20 de Noviembre, and Luis Vargas Torres Island neighbourhoods; EME; Provincial and Cantonal ADGs; and CAF.

Concerning the two urban communities chosen as key stakeholders for project intervention, the severity of the impact of heavy rainfall as a sign of climate change impact is considered. In the first case, these communities are located in a sector sustaining serious damage by a landslide in January 2016 caused by heavy rainfall throughout the region, and triggering the instability of a particular sector of these hills, known as Gatazo Hill (November 20 neighbourhood, El Oro Street). The landslide in this sector has been slow-moving, thus causing no casualties.

Troublesome conditions in this area call for a CVRRP intervention within a comprehensive outlook, that is, the inclusion of grey infrastructure that would be applied to stabilising the slopes, thus avoiding vulnerability to eventual heavier rainfall; establishment of green infrastructure to foster a vegetation cover on slopes; and undertaking social activities to strengthening up social resilience of the population settled in the lower sectors of the slopes. Likewise, backup should be provided to local authorities on regulatory matters and public policy, in order for settlements in risk areas to be kept in check.

Another sector the CVRRP could be making a contribution to the canton is that located in the eastern section of the Simón Plata Torres road, an area recording heavy rainfall conditions leading to drainage waters not being adequately discharged in the estuary, reflowing back into houses drains and streets sewerage systems. The project intervention in this particular case would also be through the application of existing technological solutions for problems of this sort.

The global characteristic of climate change, and the latter´s impact on populations all over the world, and the nature of objectives sought after through the CVRRP, which do not entail calling off public works or socio-economic activity, have not allowed for detractors of this initiative to be identified. There is a likelihood that detractors will emerge in the future to oppose any measures undertaken as a result of the project, such as the enactment of an ordinance forbidding settlements in certain areas in the city, or the relocation of residents already living in danger-prone areas. In this case, stakeholders who today support the project could be against it in the future; however, that will be the outcome of situations that are not part to the express or tacit CVRRP objective, but rather, secondary technical outputs or considerations already corresponding to some other initiatives (regulatory power attached to the municipal or provincial ADG, for example), which do not involve the project for which this stakeholders review is being performed.

Based on remarks above and taking into account the concern that stakeholders identified have regarding the main activity that the CVRRP is intent on carrying out, Table 8 below shows the stakeholders´ level of authority, concern, and standing.

Insofar public entities are concerned, the willingness to decisively intervene in an activity becomes into a regulatory mandate institutions have vis-à-vis a particular issue and, in the case of private and community entities, the real or perceived urgency to solving an affectation, or an interest in securing a benefit. That is to say, in all cases, the point is to making a profit, a gain, that can legitimately be obtained from participating in a project or initiative in which one or more objectives (interests) that entities, civil society organisations or communities to which stakeholders identified are involved.

Table 8. Stakeholders Concerns and Standing

VARIABLES	**AUTHORITY**	**CONCERN**	**STANDING**
STAKEHOLDERS	High Medium Low	High Indifferent Low	Pro Indifferent Against
MEE	X	X	X
Provincial DAG	X	X	X
Municipal DAG	X	X	X
Neighbourhoods	X	X	X
CAF	X	X	X
FB Esmeraldas	X	X	X
MPW	X	X	X
Red Cross	X	X	X
NWS	X	X	X
PCUE	X	X	X

III. STRATEGIC DECISIONS AND THE CVRRP MANAGEMENT

The review of the stakeholders' perceptions about how administration is performed for risk management, allows to understand the options for insertion of the CVRRP into the city´s institutional and social framework. This review shows that this project has a good institutional and social standing favourable to its implementation. However, some aspects cropped up through interviews made over fieldwork, showing a lack of understanding over the risk management administrative scope. These issues should be addressed so as to avoid that the project impact is reduced or distorted, and, besides, a direct intervention on these issues should be eventually made.

A Definition of Alliances

The review mentioned in previous sections shows that of the aggregate of stakeholders identified around the CVRRP objectives, only the EME, Provincial DAG, Municipal DAG, 20 de noviembre, and Isla Luis Vargas Torres neighbourhoods, and CAF should be deemed as strategic stakeholders, with whom this project should enter into a mandatory requirement to achieving its objectives. These stakeholders have a real capacity to significantly alter the project execution, its results, and / or its sustainability; therefore, direct interaction mechanisms should be incorporated to ensuring the proactive involvement of these stakeholders. The proper articulation of the latter will not only improve the project outcomes but, above all, buttress local risk management, which in itself should be deemed as a significant achievement of this initiative.

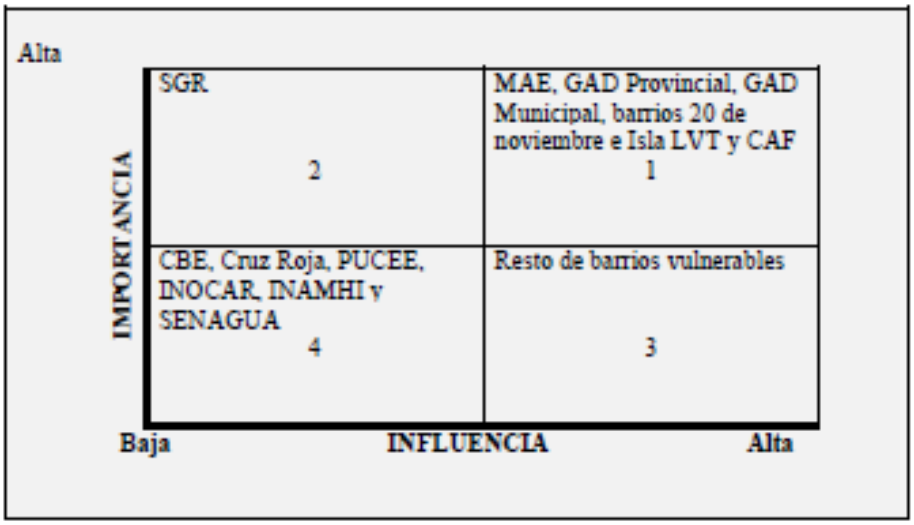
All other institutional stakeholders identified have a minimal or no bearing at all on the CVRRP, so their importance to this initiative is latent. There could be a need for these stakeholders to get into action over the execution of the project so as to ensuring access to certain specific objectives sprouting out from the institutional roles these stakeholders play, such as: capacity-building (RMS, EFB, Red Cross, PCUEE) (PWM), climate, and water resources data requirements (NOI, NMHI and NWS).

Although vulnerable neighbourhoods in the city in which no activity shall be carried out will not be directly involved in the project, they are nevertheless important to achieving the objectives the project seeks. The problems affecting them should be borne in mind, so as to prevent that an upsurge of those problems may give rise to negative or even critical perceptions about risk management in general. Although it is true that an initiative such as this CVRRP is not expected to performing a monitoring exercise of this type, and in keeping with its activities in others sectors of the city, it is desirable to do so.

Therefore, together with the strategic value each stakeholder has for the project, Table 9 incorporates a matrix with suggestions of the type of approach to each stakeholder, according to their bearing and influence. This matrix allows for an understanding of the real worth that entities and communities making up the aggregate of stakeholders in their field of action have for the project.

Table 9. Attitude of and Cooperation with Stakeholders Model

Tabla 9.- Modelo de Actitud y Cooperación con los actores



Matrix in Table 9 shows a reference scheme suggesting the institutional performance that the CVRRP should have over its execution phase. This scheme shows possible interrelationships to be established which are based on each stakeholder´s nature and concerns, and according to priorities as follows:

1. EME.- Provincial ADG, 20 de noviembre and LVT Island, and CAF.- This box shows key stakeholders, those having high bearing and influence. The project should enter into working relationships, and keep a good coordination with these stakeholders;
2. RMS.- The project should ensure that its activities shall not impair this stakeholder ´s concerns;
3. All other vulnerable neighbourhoods.- These stakeholders should be monitored on an ongoing basis since they could be a source of risk on account of the volatility social groups are often affected with due to problems that may surpass their ability for endurance. Likewise, gender mainstreaming issues should also be monitored at all times both, in social communities to be intervened, and everywhere else.
4. EFB, Red Cross, PCUEE, NOI, INAMHY and NWS.- These are low priority stakeholders. Nevertheless, they could participate in the project when specific needs so require.

Problems to be addressed

Once the importance of stakeholders vis-à-vis the CVRRP has been established, some issues should be singled out and addressed within the project scope. Particular problems arising over the field work and which could be approached by the project on the basis of its components, results and products according to its schedule, shall be addressed in this section.

The institutional framework or city-focused risk management rests upon a documentary base that in general terms signals the institutional perspective as regards this issue. Key documents are: Climate

Change Plan (ADG-E 2015), Risk and Disaster Management Strategy (ADG-E 2012), and Development and Territorial Arrangement Plans 2012-2022 (ADG-E s / f), all of them having a cantonal scope of action.

Buttressing the the consolidation of a local risk management policy and administration

While a comprehensive risk management plan for the canton urban area is non-existent, specific risk surveys have indeed been undertaken, such as those for the Gatazo Hill areas (EME 2002, UNDP 2005). This fact, however, has not been mentioned in interviews with public officials despite that one of those surveys predicted one decade earlier what was really going to happen ten years later, listing as well a series of specific prevention proposals to deal with the risks and the disaster that, in the end, became into a reality. This points to the sheer lack of coordination between different local administration tenures acting on a temporary basis, and confirms city dwellers´ perception about an institutional lack of coordination among management entities and, therefore, a lack of a unified strategy vis-à-vis public opinion.

The WEM document (**2002**) suggested specific preventive technical, regulatory and social measures which, to this date, were never either taken into consideration, or implemented, and leading, fourteen years later, to the risk scenario that was foreseen in that survey:

> "Landslides on the L1 profile slope will be rotational with faulty surfaces to a depth between 10m, and 12m and over 30m in length. Whereas for the opposite steep slopes, where the L2 and L3 profiles were evaluated, they show an immediate potential fault located at 4m or 6m depth. But with a long rainy season, and some triggering agent such as an earthquake, the fault surface could reach up to 20m deep."

On the other hand, UNDP (2005) did a great job in disaster preparedness and local risk management, as shown in the Revegetation of the Slopes of the City of Esmeraldas Project with the Esmeraldas Municipality involvement, and specifically addressed to: (i) stabilizing the city's urban slopes; (ii) reducing erosion and recovering soils in four urban micro-catchments; and (iii) Territorial enforcement of the Cantonal Development Plan; establishment of green areas to protect the city from oil refining and urban transport activities-generated pollution. However, an awareness (or knowledge) of these initiatives was not evident at any of the city entities accountable for risk management, the Municipality included.

This institutional weakness points to a dispersion of initiatives, a lack of continuity in risk management undertakings, and an absence of an institutional memory allowing for experiences to be recorded, and for knowledge and lessons from previous risk situations to be learned. This undermines a proactive capacity to face up to adverse situations beforehand and to implementing comprehensive risk management plans, with a preventive, mitigation, training and social resilience approach. This situation point to the need for local risk management policymaking to be fostered by the Municipality, the Representative of which should chair the cantonal Emergency Operations Committee (EOC).

The EOC incorporates all public entities linked to risk management, health care, infrastructure development, as well as emergency relief bodies. This Committee get into operation only in disaster and emergency situations with a provincial or cantonal scope. In case of emergencies surpassing a canton jurisdiction, requiring the activation of the EOC, this Committee will be chaired by the local prefect or the Provincial Council representative and, in the event that the emergency is concentrated in a single canton, the Committee shall be chaired by the Mayor.

Over the last few years, the EOC in particular, and the risk management system in general, have made significant inroads in adopting management notions and emergency prevention and attention mechanisms with a comprehensive focus. However, this concept is still to reaching out to the common citizen, and neither has it succeeded in constructing a comprehensive implementation of risk management-focused activities. A comprehensive imagery of risk management has not yet been constructed in which citizens do not only assume this from the point of view of care and philanthropy, but as an activity similar to any work or service addressing citizen needs.

This situation could be tackled with on the basis of component SC 1.4 (Emergency response), as set forth in the CVRRP Results Framework, strengthening up mechanisms to deal with mudslides and floods; and SC 2.1, on strengthening local governments Capacity.

Incorporating Gender Mainstreaming into Risk Management

Similar to some other situations arising out from social relations and prevailing socioeconomic patterns, gender inequality is one of the factors determining children and women vulnerability, and aggravating the impacts of disasters on these population groups. This particular issue is usually absent in risk management plans, and it is usual for these to provide "generic" operating mechanisms which are based on the existing situation, conditions and needs of men. This pattern for response actions to be formulated is not absent in the city's risk management plans.

Surveys conducted in several countries show that women vulnerability is often more acute than that of men, not only because of economic, social and even psychological reasons, but also because they are more exposed to the impacts of emergencies and disasters because of pregnancy, child care, their responsibility to provide food to the family, among other factors. These situations making women even more vulnerable than other people living under the same socioeconomic conditions are present in the city of Esmeraldas, where women are mostly the only ones caring for their families, lacking an employment and living in places where social insecurity is prevalent, such as areas affected by floods, recording the presence of youth gangs and incidence of common delinquency. As highlighted in the community perceptions survey focused on risk management measures addressing flood emergencies requiring the evacuation from areas affected, many families, in particular single-parent families headed by a woman are afraid to evacuate due to two recurring fears: the loss of their belongings because of pillage likely to occur when homes are momentarily left alone over the evacuation process, and their fear to stay places not providing security for them and their children. These two factors were highlighted over the last large flood events recorded in January 2016.

The vulnerability of Afro-descendant women is only an expression of a more far-reaching vulnerability, as shown in situations such as those below:

- High school dropout rates among Afro-descendant women
- High number of early pregnancies (Esmeraldas underage women are the youngest mothers in Ecuador).
- Decrease and debasing of women in vis-à-vis their involvement in organisational processes
- Domestic violence against Afro-descendant women
- Labour discrimination against Afro-descendant women
- Higher internal and external migration of Afro-descendant women
- Few incentive opportunities for entrepreneurship endeavours involving women (CCOSCA 2004)

Bearing in mind this state of affairs, the gender mainstreaming approach should be borne in mind in risk planning exercises in order to understand the specific situations in which women and children require differentiated measures to prevent or mitigate risks within the city, canton, and province framework. Failure to implement this approach would keep women invisible at all levels. The importance of taking into account pregnant or nursing women, and children, bearing in mind their need for food and water and even toys to alleviate their anguish, were recorded over the havoc created by the April 2016 earthquake in Manabí, which also had a huge impact on the Esmeraldas city and province.

A deep look into the gender differentiated impact is a still pending task in efforts to preventing and mitigating climate change impacts, so that such concerns should be tackled with in actions fostered by the CVRRP. This could be a part to the SC 2.1 component of the CVRRP Outputs Framework, which is focused on local governments capacity-building; as well as the SC component 2.1 regarding local capacity-building.

Specific interventions in risk-prevalent places

Bearing in mind the large number of expectations arising out over several years of omissions and incomplete interventions, and the urgency being entailed in the situation prevalent in the Noviembre 20 district, priority should be attached to interventions in this place. Therefore, a suggestion is made for the CVRRP to get involved in this city sector as part of the SC 1.2 component of the Outputs Framework, concerning implementation of infrastructure measures to reduce vulnerability to floods, landslides and mudslides.

On the other hand, dissemination mechanisms should be fostered to widely spread the community´s risk perceptions and experiences should be fostered so that the community itself becomes the origin of the message and its instrument for dissemination. The natural oral storytelling, corporal expression and musicality skills common to Afro-descendant people, who are predominant in Esmeraldas in general and in vulnerable areas in particular, could be implemented for this purpose. Component SC 2.1, addressing capacity-building of local residents could be applied. By conveying the prevention or adaptation to climate change impacts message on local cultural codes themselves, the vulnerable population will become more aware of the risks they are subject to.

CONCLUSIONS

The review and mapping of stakeholders in areas being impaired by adverse climate change impacts as described in this report, has identified an aggregate of 25 governmental, non-governmental, and community stakeholders, all of them having different risk management-focused concerns, several institutional objectives and perspectives, and a distinctive interest about the areas sustaining climate change impacts in the city of Esmeraldas.

This report shows that prospects of success of the "Vulnerability Risk Reduction Project" (CVRRP), would be linked to the local planning entities and the national environmental authority. This review also suggests that communities that have already experienced emergencies would be the most interested in getting involved in relevant specific activities.

Organisations identified as key stakeholders in this review are: CAF, EME, Provincial DAG, Municipal DAG, as well as the Noviembre 20, and Luis Vargas Torres Island neighbourhoods where emergencies have already occurred, such as landslides and floods, respectively. The importance and bearing these stakeholders have locally would greatly assist in carrying out the different technical, social and regulatory activities being foreseen in the CVRRP, thus the maximum efficiency could be achieved through compliance of all objectives, and use of available resources. While the RMS is a highly important entity in terms of risk management at national level, it shows a low bearing on the specific issue of vulnerability reduction and adaptation to the adverse impact of climate change. Likewise, due to its operational scope, this entity is less able to deal with specific risk areas, to which local entities are more closely related. Other entities and communities identified, such as EFB, PWM, Red Cross, NWS, NOI and PCUEE, are organisations having a low profile and a low bearing in the CVRRP operating areas, since their institutional objectives are too specific and little or Indirectly linked to management of climate change impacts. However, these entities could intervene in specific aspects in the project, whenever data are required concerning the activities making up their institutional objective.

Finally, the neighbourhoods vulnerable to landslides and floods in the city, the impairment of which is impending or has already been dealt with, stand as a low importance social area, considered from an outlook to undertaking preventive actions; nevertheless, these areas are indeed highly influential. Bearing in mind the vulnerability they are subject to, these groups have a legal right to making complaints, voicing their opinions, and demanding actions to deal with the problems afflicting them. This could, at some point, be a source of problems or distortions vis-à-vis the activities being implemented by the CVRRP. Therefore, a suggestion is made herein to closely monitoring the problems these people are facing up to.

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ANNEXES

1.- Relevant Methodology
2.- Basic questionnaires used in interviews
3.- Listing of people and public officers interviewed

ANNEX 1. METHODOLOGY

REDUCTION OF CLIMATE VULNERABILITIES AND FLOOD RISKS IN URBAN AND SEMI URBAN COASTAL AREAS IN ECUADOR AND CHILE

Esmeraldas Project – Ecuador

Methodology to Drafting up a Stakeholders Map

Contents

Methodology to Drafting up a Stakeholders Map

INTRODUCTION

DEFINITION, RELEVANCE, AND OBJECTIVES OF THE STAKEHOLDERS REVIEW

The stakeholder review is a methodological tool allowing for qualitative data to be collected to determine the concerns that should be taken into account for a programme, policy or project to be designed or implemented. Within this framework, a stakeholder is considered to be a person or institution having some relevance vis-à-vis the scope of a programme, policy or project intended to be developed, or implemented in a given community. Likewise, those people or social groups the lives of which will be significantly influenced by these activities are deemed to be stakeholders.

While appertaining to different typologies, there are two key types of stakeholders: public and private. The former can belong to the regulatory type (public institutions setting forth regulations to be abode by to carry out an activity or project), or developers (executors of a project): those stakeholders under the impact, influence or an activity, pressure groups, observers, among others. Then, stakeholders are also those people, social groups and institutions empowered or legitimized to implementing, positively or negatively influencing a programme, policy or project, or to determine it as regards regulations in force. Such a legitimation originates in the socio-economic influence those stakeholders have, the way how their interests may be affected, or the authority the State has granted them to regulating or undertaking a project or activity.

The significance of a stakeholders´ review lies in the data collected through that review to identify perceptions for or against a project, current or potential conflicts around them, and local needs to be addressed. Based on these data, strategic alliances can originate enabling for achievement of the different stakeholders´ goals, allowing for access to groups or individuals influenced or negatively affected by the project, with information and messages that are relevant to address a situation; and, if necessary, entering into dialogical processes in cases of conflicts, stressing situations, or confrontational dynamics likely to crop up as a direct or indirect effect of a policymaking or a project execution. In short, data collected from a stakeholder´ review is key to enable policy decision-makers to making adjustments to a programme or public policy vis-à-vis a better acceptance and social enforcement of that programme of public policy.

On the other hand, this tool makes it possible for the social, economic and political setting in which the programme is inserted to be understood, thus allowing to setting forth priorities, and looking into trends. This understanding is achieved through the perception each stakeholder has of the subject. This perspective enhances the exercise since it allows to become aware of issues which otherwise could not be grasped, because of their subjectivity or informality. Decisions can be made that are based on this approach to a specific problem, or suitable tools could be created to address the situation.

Stakeholders mapping is included in this review, on the basis of which not only a listing of the different stakeholders involved in an initiative can be drafted down, but also information can be collected about their scope of action, the reason or objectives involved in stakeholder involvement in a process or socio-economic dynamics, their perceptions or expectations, among some other issues allowing to understand their positioning vis-à-vis a programme, policy or project. Generally speaking, a stakeholders mapping is a first step in ensuring a proper civil society involvement in participatory actions (workshops, meetings, seminars, etc.), not only ensuring the number but also the representativeness of individuals or groups (associations, foundations, grassroots organisations, government institutions, etc.) that are invited to participate.

The use of a stakeholder mapping, also called sociogramme, helps represent the social reality to be intervened, understand it in its complexity, and design intervention strategies on the basis of elements other than common sense or the sole opinion of a qualified source. Using the social map is key to the design and execution of any project, as well as to the negotiation / joint construction of the activity schedule to be implemented.

In short, the review and mapping of stakeholders should allow project developers to properly interact with the different stakeholders involved, establish relationships to be taken into account, and provide relevant stakeholders with a sound understanding of the importance the project to be executed has, and the role those stakeholders shall play, or their rights in force vis-à-vis that process.

METHODOLOGY

The process to be implemented to conduct the stakeholders review suggested is shown below. While the process has a logical sequence, some of its stages could be replicated for additional relevant data to be recorded.

Design of Data Review Tools

Three variables are used in the stakeholders´ review: i) Standing; ii) Authority; and iii) Concern. The Standing, Authority and Concern recorded for each stakeholders is mainly based on the perceptions of the MPAs managers and some users.

Definitions of these three variables are as follows:

- ***Standing***. The stakeholder´s attitude vis-à-vis the project: favourable (pro), against, or indifferent.

- ***Authority***. The formal (official) or informal (socio-economic) bearing that the stakeholder has vis-à-vis the project to be executed, or about the geographical or functional areas originating therefrom. That is, civil, private or community entities (CSOs, associations, communes, etc.) are identified here; Individuals (teachers, priests, leaders), who have a significant bearing on the project execution area; entities that, due to their geographical scope of action (decentralized autonomous governments

(DAGs) or functional entities (SENPLADES, Ministry of the Environment, etc.), who may have a bearing on the project.

The Authority rating can be high, medium or low.

- ***Concern***. The type of gain or loss expectation, or adjustment to regulatory protocols a stakeholder has regarding the execution or implementation of a project or activity.

The concern rating can be high, indifferent or low.

Stakeholders will be classified according to categories as follows:

- *Government Stakeholders*. Attached to local, section and / or central government entities.
- *Non-Governmental Stakeholders*. Attached to grassroots organisations, private sector, productive sector, foundations, universities, funding agencies, etc.
- *Local civil society stakeholders (CSSs)*. Stakeholders having a local influence.
- *Regional / Provincial Civilian Stakeholders*. Stakeholders whose scope of action is regional or provincial.
- *National civilian stakeholders*. Stakeholders having a national influence, although they may be international in origin, such as the case of Civil Society Organisations to which funding has been allocated, or international organisations or treaties the goals of which are common to the subject.

Depending upon the review fine-tuning needs, stakeholders could also be ranked into the following categories:

- Primary stakeholders are those groups directly involved in the problem or project to be reviewed taking their specific problematics into account (institutional, personal, community).
- Secondary stakeholders are representative groups of affected communities, political pressure organisations involved in the solution of socio-environmental problems; or people having some territorial competence in the subject matter area in which some of these problems crop up.
- Backup stakeholders are civil or governmental organisations that, due to their grasp about some technical expertise or management of projects and social activities, have a specific knowledge as regards some environmental problems.

Identification of Stakeholders

Identification of interested parties, and the different groups, organisations and individuals having some influence, interacting, or regulating activities in the project execution area, or regarding the subject the project is concerned with. This identification will be made on the basis of legal and bibliographic revisions and interviews with key local sources.

Identification of stakeholders will be carried out through office work (regulatory and bibliographic revision) and field work (visits to vulnerable sectors in the city and interviews with their inhabitants). Insofar possible, focal meetings with local authorities and leaders will be scheduled, or independent interviews shall be held with public officials and local people. Interviews performed were semi-structured, and included a participatory observation exercise[20].

Stakeholders Description and Mapping

The description of stakeholders is an evaluative explanation of the reason why an individual or a social, civil or public organisation has been included in the exercise. The institutional characteristics, purpose or objectives shall be spelled out here and, depending upon the case, so will be the competence attached to these stakeholders.

Furthermore, the stakeholder mapping tool will allow for a graphical representation of individuals, organisations and institutions involved in the project execution process.

Upon this stage, two graphics will be designed: A Authority and Concern matrix; and an Authority and Standing Matrix. These matrices will allow to learn the Authority and Bearing weight vis-à-vis decision-making regarding the project, concern and standing vis-à-vis the project.

[20] Esta es una herramienta metodológica muy utilizada en la investigación social, que consiste en la apreciación de primera mano de las condiciones, realidades y circunstancias locales y/o de los stakeholderes sociales. Ver: Bernard 2001.

ANNEX 2.- Key guidelines to conducting interviews

Basic questionnaires applied to interviews conducted over fieldwork for the preparation of this report are shown below. They were addressed to people who have been impaired, and likely to be impaired by climate change impacts, as well as to public officials involved in hydro-meteorological management and risk management at the national, provincial and cantonal levels. Interviews lasted between 45 and 60 minutes each.

People interviewed were chosen by the work team members who authored this report, and based on the identification of stakeholders sustaining the impact of climate change-related events, and their involvement with risk management and prevention, mitigation and adaptation to adverse climate change impacts.

A.- Interviews with people living in the area

Respondent Name (optional) _____
Role in the entity / community _____
Date _____
Place _____

1. What are the main problems your community is facing up to, which are originated in natural events?

a. Are there any specific Community actions in place to solve them?
b. What organisations or individuals are implementing these actions?

2. How do you think these problems could be addressed?

3. What do you know about both, climate change, and the impact it has on your community?

4. What public or non-governmental entities have you and your community been involved with concerning the landslides or floods having an impact on your community?

5. Do you consider the information disseminated regarding environmental problems and risk management to be sufficient?

6. How do you think your worries about these problems could be solved?

7. What kind of actions would you expect the (national, provincial, local) State to carry out to ensure that you and your community have the right awareness about participation and prevention-mitigation of impacts resulting from climate change-linked natural events?

B.- Interviews with government officials

Interviewed name _____
Duty/ Entity _____
Date _____
Place _____

1. What are the most pressing climate change-related problems being recorded in the city of Esmeraldas?
   a. Are there specific actions in place to addressing them?
   b. What organisations or individuals are implementing these actions?

2. What kind of actions could public entities undertake in the national, provincial and local settings so that the community has the proper awareness, participation and prevention-mitigation knowledge about climate change-originating impacts?

3. How would you rate your entity´s coordination with other entities in the public sector regarding climate change-related issues?

4. How would you rate your interagency coordination within the framework of EOC's working groups?

5. How is your organisation's interaction with communities impaired by climate change-derived problems?

Annex 3.- Listing of people and public officers interviewed

INTERVIEWS WITH STAKEHOLDERS

NAME	ENTITY/ SECTOR	DATE	REMARKS
1. Engineer ROBERTO GÁMEZ	MINISTRY OF PUBLIC WORKS – PROVINCIAL	06/05/2016	Provincial Director
2. Engineer EDGARDO PRADO	PROVINCIAL DAG	06/05/2016	Director, Irrigation & Drainage Department
3. ENGINEER ÁLVARO RAMÍREZ	PROVINCIAL DAG	06/05/2016	Technician, Irrigation and Drainage Department
4. ENGINEER PEDRO VERA	PROVINCIAL DAG	06/05/2016	Technician, Irrigation and Drainage Department
5. ENGINEER JANINO CARBACHE LUCAS	PROVINCIAL DAG	06/05/2016	Director, Environmental Department, in charge of the Godzilla Plan
6. ENGINEER IVÁN SÁNCHEZ	PROVINCIAL DAG	06/05/2016	Technician, Environmental Department, in charge of the Climate Change Unit
7. ENGINEER RENATO TAMBACO	ESMERALDAS MUNICIPALITY	06/05/2016	Director, Environmental Management and Risk Directorate
8. ENGINEER LUIS MOREIRA CERVERA	ESMERALDAS MUNICIPALITY	06/05/2016	Director, Municipal Public Works Department

9. Mr. RAUL BONE	RED CROSS ESMERALDAS	06/05/2016	Manager, Red Cross Bureau in Esmeraldas
10. COLONEL JOSÉ VIVERO BOLAÑOS	FIRE BRIADGE, ESMERALDAS	06/05/2016	Commander, Fire Brigade Esmeraldas
11. Mr. VINICIO OJEDA, B.A.	FIRE BRIADGE, ESMERALDAS	06 y 07/05/2016	Journalist and Public Relations Officer, Fire Brigade
12. Mr. ELVIS BASTIDAS	NOI ESMERALDAS	06/05/2016	Meteorologist and Oceanographic Tehnician
13. Mr. JOSÉ MAFFARE	DIOGENES MERA Neighbourhood	07/05/2016	Head, Nighbourhood Committee. Community affected by 25 January 2016 flood
14. MR. MAURICIO PEREA	DIOGENES MERA Neighbourhood	07/05/2016	Settler, affected by 25 January flood
15. MR. VICTOR AYOVÍ	20 DE NOVIEMBRE Neighbourhood	07/05/2016	Head, Neighbourhood Committee. The neighbourhood is under warning call due to the 26 January 2016 landslides
16. MR. EDGAR LARA BAUTISTA	20 DE NOVIEMBRE Neighbourhood	07/05/2016	Lost his home during the February 2016 landslide
17. MR. MAURICIO QUIÑONEZ	20 DE NOVIEMBRE NEIGHBOURHOOD	07/05/2016	Settler affected by the Hill landslide. His house was badly damaged by the February 2016 landslide

18. MR. GARY CONZALES PALACIO	20 DE NOVIEMBRE Neighbourhood	07/05/2016	Settler living under warning call due to the hill landslide in February 2016
19. Mrs. HILDA PALACIO COROZO	20 DE NOVIEMBRE Neighbourhood	07/05/2016	A settler. She lives in constant fear because of the hill slide in February 2016
20. MR. JIMMY QUIÑONES	UNIÓN Y PROGRESO (LA GUACHARACA) Neighbourhood	07/05/2016	Neighbourhood Board Chairman. The community was affected by the Gatazo Hill landslide ten years ago (2006).
21. Mr. HARRY GOLLES KLINGER	UNIÓN Y PROGRESO (LA GUACHARACA) Neighbourhood	07/05/2016	Settler affected by the Gatazo Hill landslide ten years ago (2006).
22. MR. DAVID VALENCIA	UNIÓN Y PROGRESO (LA GUACHARACA) Neighbourhood	07/05/2016	Settler affected by the Gatazo Hill landslide ten years ago (2006).
23. MR. PATRICIO ORTÍZ CAICEDO	UNIÓN Y PROGRESO (LA GUACHARACA) Neighbourhood	07/05/2016	Settler affected by the Gatazo Hill landslide ten years ago (2006).
24. MR. ARSECIO PRECIADO CUERO	UNIÓN Y PROGRESO (LA GUACHARACA) Neighbourhood	07/05/2016	Settler affected by the Gatazo Hill landslide ten years ago (2006).
25. MR. CRISTIAN MOLIDA CERVANTE	COCOY Neighbourhood	07/05/2016	Neighbourhood Board Chairman. Settler frightened by the 25 January 2016

			first landslide. His home is right at the foot of the hill
26. Mrs. DAISE CERVANTE	COCOY Neighbourhood	07/05/2016	Settler frightened by the 25 January 2016 first landslide. Her home is right at the foot of the hill
27. MR. MIGUEL MOLINA CERVANTE	COCOY Neighbourhood	07/05/2016	Settler frightened by the 25 January 2016 first landslide. His home is right at the foot of the hill
28. MRS. EMILY PEREA	COCOY Neighbourhood	07/05/2016	Settler frightened by the 25 January 2016 first landslide. Her home is right at the foot of the hill
29. ENGINEER MILTON MEZA	PONTIFICAL CATHOLIC UNIVERSITY OF ECUADOR. ESMERALDAS CAMPUS	09/05/2016	Teacher. Risks subject Area
30. ENGINEER BETO ESTUPIÑAN TORO	RISK MANAGEMENT SECRETARIAT	09/05/2016	In charge of the risk management office. Former head, environmental and risk management during former municipality administration
31. COMMANDER. JORGE BASANTE GARCÍA	RISK MANAGEMENT SECRETARIAT	09/05/2016	General Coordinator, Zone 1
32. MRS. KATERINE LEMOS	13 DE ABRIL NEIGHBOURHOOD	10/05/2016	Settler in area damaged by

			landslide 15 years ago
33. MR. JEFFERSON CABEZ	13 DE ABRIL NEIGHBOURHOOD	10/05/2016	Settler in area impaired by landslide 15 years ago
34. MR. JULIO CABEZ	13 DE ABRIL NEIGHBOURHOOD	10/05/2016	Settler in area impaired by landslide 15 years ago
35. MRS. ANA TAFUR	CHONE ALTO NEIGHBOURHOOD	10/05/2016	settler in area impaired by erosion and flood in rainy seasons
36. MR. PUBLIO TAFUR	CHONE ALTO NEIGHBOURHOOD	10/05/2016	Settler in area impaired by erosion and flood in rainy seasons
37. MRS. SIRLEY ARAUJO	EL ARENAL NEIGHBOURHOOD	10/05/2016	settler in area impaired by flood due to recurrent rainfall
38. MRS. MARITZA GONGORA	EL ARENAL NEIGHBOURHOOD	10/05/2016	settler in area impaired by flood due to recurrent rainfall in the lower hillside area
39. MRS. MARLENE CUERO	LA PROPICIA 1 & 2 NEIGHBOURHOOD	10/05/2016	settler in area prone to flood due to overflow of the Esmeraldas and Teaone River caused by tidal waves
40. MRS. LUCIA CASTILLO	LA PROPICIA 1 & 2 NEIGHBOURHOOD	10/05/2016	settler in area prone to flood due to overflow of the Esmeraldas and Teaone River caused

			by tidal waves
41. MR. DARIO ORTÍZ MANSABA	LAS 50 CASA NEIGHBOURHOOD	11/05/2016	Settler enduring flood every single year due to overflow of the Teaone River
42. MRS. INES BONE CHICHANDE	LAS 50 CASA NEIGHBOURHOOD	11/05/2016	Settler enduring flood every single year due to overflow of the Teaone River
43. MR. EDUARDO VALENCIA GUSTAVINO	LAS 50 CASA NEIGHBOURHOOD	11/05/2016	Settler enduring flood every single year due to overflow of the Teaone River
44. MR. LUIS ARROYO ABAD	LAS 50 CASA NEIGHBOURHOOD	11/05/2016	Settler enduring flood every single year caused by overflow of the Teaone River
45. MR. ANTONIO CHEME	PIANGUAPI ISLAND	11/05/2016	Chairman. Affected by recurring damages caused by flood due to heavy rainfall
46. MR. A MARÍA PRECIADO	PIANGUAPI ISLAND	11/05/2016	Settler affected by recurring damages caused by flood due to heavy rainfall, and tidal waves
47. MR. HENRRY CANCHINGRE	PIANGUAPI ISLAND	11/05/2016	Settler affected by recurring damages caused by flood due to heavy rainfall, and tidal waves
48. MR. JAIRON PROAÑO	ISLA PIANGUAPI	11/05/2016	Settler affected by recurring damages caused by flood due

			to heavy rainfall, and tidal waves
49. MR. RICARDO CHEME	VARGAS TORRES ISLAND, CORDERO CRESPO NEIGHBOURHOOD	11/05/2016	Chairman. Neighbourhood Board. Affected by yearly flood caused by Esmeraldas River overflow
50. MRS. BEATRIZ PRECIADO BAZAN	VARGAS TORRES – ISLAND, CORDERO CRESPO NEIGHBOURHOOD	11/05/2016	Settler enduring yearly flood caused by Esmeraldas River overflow. On 25 January 2016, the highest ever overflow was recorded
51. MR. FRANCISCO SOLIS PRECIADO	VARGAS TORRES – ISLAND, CORDERO CRESPO NEIGHBOURHOOD	11/05/2016	Settler enduring yearly flood caused by Esmeraldas River overflow. On 25 January 2016, the highest ever overflow was recorded of a river branch
52. Mr. EDSON BONE LASSO	VARGAS TORRES – ISLAND, 12 DE MAYO NEIGHBOURHOOD	11/05/2016	Chairman. Neighbourhood Board. Enduring yearly flood caused by Esmeraldas River overflow
53. MRS. BRIGIDA VALENCIA CASTILLO	VARGAS TORRES – ISLAND, 12 DE MAYO NEIGHBOURHOOD	11/05/2016	Settler. Impaired by yearly flood caused by Esmeralda River overflow
54. MR. FRIXÓN ORDOÑEZ TENORIO	VARGAS TORRES ISLAND - 20 DE NOVIEMBRE	11/05/2016	Chairman. Neighbourhood Board. Impaired by

NEIGHBOURHOOD

yearly flood caused by yearly river overflow

Annex 10. Comparison of selected indexes between Chile and Ecuador.

Index	Chile			Ecuador		
	Value	Year	Source	Value	Year	Source
Country population	17.402.630	2012	Instituto Nacional de Estadísticas (INE)	14.483.499	2010	INEC (2011)
Human Development Index	0.832 [very high human development]	2014	UNDP (2015)	0.732 [high human development]	2014	UNDP (2015)
HDI rank	42	2014	UNDP (2015)	88	2014	UNDP (2015)
Life expectancy at birth (years)	79.63	2005-2010	UNDESA[1]	74.57	2005-2010	UNDESA
Adult literacy rate (% ages 15 and older)	97.3	2015	INE	93.2	2010	INEC (2010)
Mean years of schooling (years)	10.8	2013	CASEN[2]	9.04	2010	INEC (2010)
Gross domestic product (GDP) per capita (USD)	22,316	2015	World Bank	11,388	2015	World Bank
Poverty (% population)	14.4	2013	World Bank	22.5	2014	World Bank
OECD´s Social Institutions and Gender Index (SIGI)	Not assessed	-	OECD	0.0422 [low level of gender discrimination in social institutions]	2014	OECD[3]
Global Gender Gap Index[4]	0.698 [ranks 73 out of 145 countries]	2015	WEF (2015)	0.738 [ranks 33 out of 145 countries]	2015	WEF (2015)
Percentage of urban population	81.24	1980	UN-HABITAT (2012)	46.96	1980	UN-HABITAT (2012)
	89.00	2010		66.95[5]	2010	

[1] United Nations, Department of Economic and Social Affairs (UNDESA), Population Division (2015). World Population Prospects: The 2015 Revision, custom data acquired via website.
[2] http://www.ministeriodesarrollosocial.gob.cl/resultados-encuesta-casen-2013/
[3] http://www.genderindex.org
[4] 0.00 = inequality / 1.00 = equality.
[5] According to the national statistics 62.8% was urban population in 2010 (INEC, 2011a).

Annex 11. Existing designs quebrada Bonilla (Chile)

REPUBLIC OF CHILE
MINISTRY OF PUBLIC WORKS
HYDRAULIC WORKS MANAGEMENT

FINAL DESIGN OF ALLUVIAL POWER DISSIPATION SYSTEMS AND ALLUVIAL PATHS IN THE CITY OF ANTOFAGASTA

EXECUTIVE SUMMARY

BONILLA RAVINE

2000

In collaboration with:
ELECTROWATT ENGINEERING (CHILE) S.A.
AC CONSULTANT ENGINEERS LTD

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Scientific Terminology Source http://www.bioone.org/doi/abs/10.1659/mrd.0876

EXECUTIVE SUMMARY

BONILLA RAVINE

1. Background

The city of Antofagasta is located along a narrow coastal plain on the Western Coastal mountain range, at about 1,800M above sea level, stretching over an approximate 40km - 80km width area.

The city´s Eastern sector is settled over material ejection cones resulting from rocks weathering and wind-dragged materials. A fact that should also be borne in mind is the discharge of urban and industrial waste materials into riverbeds, and the extraction of materials in quarries, leading to a concomitant instability of mountain slopes.

The Antofagasta ravines have been commonly used as landfills, as are the Cármen and Cadena Salt quarries showing the highest accumulation of waste. Nevertheless, the fact should not be ruled out that all other ravines could also be used as landfills in the future, while the quarries mentioned are gradually becoming into even larger landfills piling up substantial volumes of debris of all sorts.

A series of meetings have been held over time with the Antofagasta Municipality authorities to tackle this situation. Accordingly, a decision was made that the Municipality authorities would see to it that all wastes should be removed from ravines, since local authorities were exclusively competent and accountable for their proper disposal.

Bearing in mind these particular characteristic, whenever low-volume heavy rainfall is present, several unusual events have been generated in the past, the main characteristics of which being the conveyance downstream of large amounts of debris material in the shape of alluvial flow. The loss of human life, and substantial material damages have been the main outcomes of these alluvial events. The huge energy and destructive power of highly concentrated solid-waste flows reaching urban areas have brought to light a need for engineering-based solutions allowing to keeping these massive waste flows in check in areas close to basins headwaters, or curtailing their impact by diverting them to more open areas so they are spread out without causing victims or material damage.

2. Project Rationale and Objective

The city of Antofagasta is deemed as the fastest growing development hotspot located in the Northern area of the country, and resulting from a progress boom the region has

witnessed as the outcome of the exploitation of large mining deposits in the territory. A swift urban growth devoid of any proper urban planning, and leading to the exploitation of large mining deposits has been recorded, resulting in a higher number of people being exposed to alluvial risks.

Climate conditions prevailing in Region II and the steep relief of the Coastal Range are the reason why ravines flowing into the Antofagasta sector are so sensitive to meteorological events, such as heavy rainfall bringing about alluvial-type silting; thus, the Antofagasta area is very prone to alluvial events being caused by heavy rainfall phenomena.

Large-scale alluvia have been generated after heavy rainfall, having a substantial impact and bringing about huge disasters in the city, with serious human losses and material damages. As a result of the last recent alluvium, dating back to 18 June 1991, a decision was made by the government for the Antofagasta city to be declared a catastrophe area.

The sheer size and high speed an alluvial downpour reaches as its gets close to the Antofagasta city makes it essential for surveys to be conducted and special prevention and / or protection structures to be built up to face up to any future events of this sort. Bearing this in mind, the Hydraulic Works Directorate issued a Call for Proposals to undertaking the "Alluvial Energy Dissipation Systems, and the Final Design of Alluvial Tracks in the City of Antofagasta".

This project is born out of a need to both, solve risk situations Antofagasta is being faced with, due to the city´s geomorphological condition, and decide upon the design of works that should be undertaken to avoiding and / or dissipating heavy rainfall-caused flooding, entrainment of solid material originating in an alluvial phenomenon, absorbing and evacuating alluvial flows, so as to eliminating or reducing flooding risks that the population and existing infrastructure in the city of Antofagasta are exposed to.

This project intends to putting forwards definitive and detailed engineering solutions to avoid and / or dissipate alluvial downpours, to catch or decant solid wastes, and evacuate flows, eliminating or reducing as much as possible the risks the population and existing infrastructure in the city of Antofagasta are exposed to.

3. Project Location

Located in the II Antofagasta Region, right in front of the Antofagasta city, the project´s subject matter are fifteen ravines (including the Bonilla ravine) flowing through the city up to their discharge into the sea.

4. Economic Assessment of Project Works and Size

An Economic Assessment of the project involved a decision on the size of works to be undertaken in each one of the ravines included in the Survey.

4.1. Valuation of Works

Private costs linked to execution of works for the economic rate of return of 50 and 100 years' periods were established on the pricing base recorded in the EWI-DGA (1995) Survey. For a definition of social costs, values stated therein were amended using the methodology suggested by MIDEPLAN.

4.2. Methodology

The methodology used for the Economic Assessment was based on an idea to assimilating the project-derived economic benefits to the avoided expected damage. This method assumes that the execution of project-related works shall avoid damages due to floods over the return period with which these works were designed. Therefore, the project Expected Annual Benefit corresponds to the difference between damages generated in situations with a project (future situation) and without a project (current situation).

Accordingly, benefits obtained through the project execution are directly dependent upon alluvial flows occurring from year to year, and damages curves should be defined vis-à-vis the period of return. The twenty-five year floods would not result in alluvial flows, therefore, they correspond to events recording no alluvial damages. Data allowed to obtain damage curves for the different floods likely to occurring in the Antofagasta ravines as regards a situation with a project and without a project.

The problem how to estimate future benefits, when there is no data available about the flows size or the sequence of flows likely to occur in the future, was solved by means of a calculation of the mathematical expectation of damages with and without project. These values are obtained on the basis of the damage-probability relations of exceedance, multiplying each probability increase, associated with each flood level, by the amount of related damages. The sum of these products corresponds to the amount of annual damages expected with and without project. The difference between both is the Expected Annual Benefit.

Disbursements or costs correspond to the investments necessary for project materialization, as well as to those investments aimed at works maintenance throughout the project lifetime being considered.

Investments for project materialization include costs involved in execution of works along the ravines. As explained above, through the preliminary dimensioning done for 50 and 100 years return period, the amounts of initial investments required for the materialization of works were determined. Access to this information allows for information on the cost and benefits flows over different periods of time which, when considered over an appropriate evaluation horizon, make up the basis to determining the project's profitability. This profitability was obtained from economic indicators such as: Net Present Value (NPV), Internal Rate of Return (IRR) and the NPV / INVESTMENT ratio. This analysis was performed bearing in mind both, private and social prices.

For the latter case, market prices were converted to social prices in accordance with MIDEPLAN recommendations. This transformation is based on conversion factors for manpower price and currency, and the application of a social discount rate.

On the basis of economic indicators obtained for different periods of return, the optimal solution in economic terms was defined, which corresponds to design conditions allowing to maximize the project´s profitability.

4.3 Alternatives Profitability, and Selection of an Optimal Solution

As mentioned above, an evaluation was made of the profitability of solution alternatives being suggested for alluvial control in the Antofagasta ravines. This evaluation was made on the basis of Economic indicators such as the Net Present Value (NPV) and the Internal Rate of Return (IRR). As a horizon of evaluation, a period of 30 years and a 12% discount were adopted from 1997 onwards, as recommended by MIDEPLAN.

The annual cost for maintenance of works was calculated as the equivalent of a fraction of the initial investment, considering a 0.5% value.

¨Profitability was evaluated taking into account 3, 5 and 10 years' deadlines to complete the investment or Total materialization of works, given the substantial amount of investment involved. Likewise, considering the uncertainty of the assessment of intangible type damages, a sensitivity analysis was performed with amounts equivalent to 6% and 12% of the total damage assessed.

Likewise, a sensitivity analysis was conducted considering ± 15% variations in Investment costs.

Results obtained in the Economic Assessment allowed to appreciate that the economic optimum ranges between a 50 to 100 years return period, and a verification was made that the optimal NPV is close to 60 years for the Social assessment of the project, and

about 50 years for its private assessment. Therefore, and considering the relative uncertainty involved in evaluating the magnitudes of the event depending upon the period of return (which somehow tend to be overestimated), it was advisable to adopting T = 50 years as a design return period.

The overall Economic Assessment of the project is included in Volume I in the Final Report.

5. Topographical Survey

Fieldwork undertaken over the time this Survey was under way included a detailed 1:200 scale topographic survey, including both the main ravine bed and all its tributaries, considering lengths shown in Table 5.1. In each case, transversal profiles were drafted up of the ravine bed, with an average 25 m spacing.

Table 5.1 Lengths of Sections Considered in Topographical Surveys of Ravines

Ravine	Ravine Bed Sector	Length (m)
BONILLA	NORTH	1.860
	SOUTH	2.450

For each section, this survey considered closed polygonal sections which were linked to the UTM coordinate planimetric system and to the IGM altimetric system. Further, a PR'S network was installed on the basis of concrete monoliths which were located with a highest spacing of 500 m between each other. Based on data collected *in situ*, 1: 200 scale drawings were made with contour lines every 0.5 m. This data was complemented with transversal and longitudinal profiles of ravine beds.

6. Soil Mechanics

The Soil Mechanics Report was drafted up to collecting background sub-soil data required to design the Alluvial energy dissipation works which are being scheduled to be located in the Bonilla Ravine, in the city of Antofagasta.

The Bonilla Ravine is located in the northern – centre side of Antofagasta, more specifically in the Northern area of the Salar del Carmen Ravine. Lengths as summarized in table below have been considered for the survey conducted on this ravine:

Table 6.1 - Lengths and number of wells per channel sector

Ravine	Channel Sector	Length (m)	Number of Wells
BONILLA	Northern	1.860	19
	South – Main Channel	2.050	23
	South – Tributary 1	200	3
	South – Tributary 2	200	2

Well 1 in Northern Bonilla is the same well 1 in Southern Bonilla, Main Channel, i.e., BON-1 = BOS-1, therefore, in Northern Bonilla there are a total of 19 wells, while in Bonilla South there are a total of 28 wells.

The subsoil was probed through drilling of 3 m depth wells, or drilling down to the rock in the event that the latter could be detected before reaching the expected depth. Since wells containing cemented material were also detected, showing substantial resistance to both, manual excavation and backhoe excavators, these wells were deepened as far as possible down to a 3 m depth or, failing that, intermediate wells which did not reach the specified depth, were complemented with some other wells so that the presence of cementing in the area could be established. Exploration wells were located every 100 m.

A detailed stratigraphy of all wells was performed and representative soil samples were extracted which were subjected to classification tests (granulometry and Atterberg limits), specific gravity, natural moisture, natural density, highest, minimum density, and soluble salts.

7. Geological Report

Some general conclusions reached by the Geological Survey undertaken for this project are spelled out below, pertaining both to the Bonilla ravine and to all other ravines involved in the project. Also, some conclusions directly concerning the Bonilla Ravine are included herein.

- The andesites[1], Porphiritic andesites[2] and sandstones present in *La Negra* Formation show a NS to N10º E heading and 35ºW to 50ºW slopes. Hard and little weathered

[1] **Andesite** is an extrusive rock intermediate in composition between rhyolite and basalt https://flexiblelearning.auckland.ac.nz/rocks.../andesite.html

[2] It is a volcanic rock, similar to diorite but fine-grained. www.ucl.ac.uk/museums-static/digitalegypt/stone/porphyry.html

rock, low to moderate fracturing degree. quartz – Feldspar dykes, syncline folds and faults have an impact on Andesites.

- Sandstones and Tertiary age coquinas are distributed along different horizons inside the terraces.

- Quaternary age alluvial sediments making up good to poor selection terraces are distributed along different horizons.

- The sedimentary material is composed of silt, fine to coarse sand, gravel and angular to rounded rock fragments (blocks and boulders), which are found along the ravines, hills slopes, mudflows (Alluvia) and on terraces.

- Mining is undertaken of aggregates in ancient and current terraces sedimentary, colluvial materials, and in the ravines. Unchecked mining has led to instability of terraces and sedimentary levels located higher up the hills.

- Weathering of rocks in high hill sectors release colluvial material into ravines.

- Ravines have become into actual landfills accumulating large volumes of wastes of different sorts whenever a large alluvium would occur. This waste could be easily removed by increasing the mud stream volume.

8. Technical Project Characteristics

8.1. Design criteria

The design of alluvial Control works incorporated as a key goal to abating the destructive impact debris flows have: i.e., keeping the highest possible flood volume in check, subject to current space constraints in ravines beds. These works shall reach a goal to reducing the volumetric concentration of solids from alluvial flows into the city, at the same time weakening its peak flow, speed and drag capacity in ravine beds. A 15% highest solids concentration at ravines exit was set up (access to the urban sector), so that the impact of ravine flows through the city would be similar to that of rainwater, thus making its evacuation easier.

The scope set by the MOP to this survey only considered a survey of tracks of ravines located upstream of the urban boundary. Solutions were preliminarily formulated on a cartographic scale base of 1: 5,000 obtained through an aerial photogrammetric survey of the ravines in year 1992.

8.2 Specific Design Features

Solutions were proposed consisting of the construction of transversal containment barriers, excavation of decantation wells, or containment-decantation works. These works were considered to be implemented over a stage series in ravine channels showing a likelihood for a higher volume of sediments.

A computational model was used to dimensioning the alluvial Control works, allowing for an assessment of the hydrological response of each basin when alluvial Control works are incorporated, along the channels making up the corresponding drainage network.

9. Description of the Alluvial Energy Dissipation Systems´ Works

9.1. Hydraulic Works Design

For the hydraulic design of alluvial control works planned for the ravine Bonilla, the volume of debris to be retained in the different ravine tributaries was determined, in order to avoid the occurrence of alluvial floods showing an up-to-fifty years return period. Based on results obtained, a proposal was submitted to drilling a number of decantation wells in the ravine tributaries. Also, for (North and South) tributaries, slope containment walls were considered.

9.1.1. General Basin Characteristics

The Bonilla Ravine is composed of a North and a South tributary which, together, make up a 6,7 km^2 area at a point defined by the confluence of both tributaries, upstream of the access to the urban sector.

Figure 1 shows the location of the Bonilla ravine in the survey area.

Table 9.1 shows values areas in each sub-basin, and the length of channels in areas being considered for execution of works.

Table 9.1. Contributing Areas by Bonilla Ravine Secondary watershed

Secondary Watershed	Area		Section Length
	(km2)	(%)	(m)
Northern Bonilla	3.4	50.7	1.554
Southern Bonilla	3.3	49.3	1.501
Total	6.7	100.0	3.055

FIGURE No. 1

9.1.2. Alluvial Monitoring Works Designs - Characteristics

Designs adopted involve the construction of decanter pool systems arranged in a series along the two tributaries of the Bonilla ravine, so that mudflows are contained upstream away from the entrance to the urban sector. Containment wells are to be drilled in the ravine bed, linked to all other wells by means of a concrete channel (connecting channel). To avoid the degradation of the ravine bed in the event that the drilling work does not reach the rocky stratum, digging works shall get under way to making a sort of a hollowing, and to protect the ravine bed through the arrangement of two layers of rocks.

The bottom of the connecting channel shall be constructed in a triangular shape, to as to ensuring that the ravine flow is channelled through the middle of this structure in order to prevent flows from being diverted to one side of the well, in particular when the latter is subject to the flow of floods smaller than those in the layout. The construction of a compacted filling embankment has been contemplated in designs, so as to allowing for the ravine to be closed down thus increasing the retention volume of wells.

Designs contemplate the construction of a compacted filling embankment, in order to close the ravine flow and thus increase the retention volume of wells.

Further, slope containment walls have been envisaged so as to avoiding their degradation and the upsurge of materials from the channel bed. These 3m height walls are made in reinforced concrete, and are provided with a central dumping site in order to channel the flow. In addition, downstream of each wall, the placement of a protective casting has been considered together with a preliminary excavation, in order to avoid the degradation of the ravine bed around the foundations of each structure.

Figure 2 shows the location and layout of the different tributaries making up The Bonilla ravine. Figure 3 shows a typical layout of the works being suggested. Table 9.2 shows the number of wells likely to be built up, the volume of debris those tributaries retain, and the number of slope containment walls being considered.

Table 9.2. Decanting wells and Containment Walls of Hills by Tributary

Sub-basin	No. of Wells	Retained Volume (m^3)	Gravitational Containment Walls
Northern Bonilla	7	41.959	31
Southern Bonilla	7	82.300	5
Total	14	124.269	36

FIGURE No. 2

FIGURE No. 3

9.1.3. Flows and Volumetric Concentrations

Table 9.3. shows highest flows and both, liquid and detritus flooding volumes for both, the Northern and Southern tributaries respectively. Considering Northern and Southern tributaries flows concentrations of 50% and 55% respectively, a highest detrital flow of 16.2m^3 /sec is obtained.

Tabla 9.3. Flood and Volumes in a Swollen River

Sub-Basin	Highest Flow (m^3/s)		Volume (m^3/s	
	Liquid	Detrital	Liquid	Detrital
Northern Bonilla	3.9	7.8	33.515	67.030
Southern Bonilla	3.9	8.4	32.411	72.024
Basin Total	7.7	16.2	65.928	139.054

Table 9.4 shows the concentration and design flows obtained for the various ravine streams, and the total ravine tributary flow. The point should be stressed that values shown for the ravine tributary were calculated after modelling the flood flow through decanting wells.

Tabla 9.4. Design Flows

Sub-Basin	Volume Concentration (%)	Flow (m^3/s)	
		Liquid	Detrital
Northern Bonilla	50	3,9	7.8
Southern Bonilla	55	3.8	8.4
Ravine Tributary	15	3.9	4.6

Figure 4 shows the tributary, and tributary hydrographs of this ravine.

FIGURA No. 4 PÁGINA RE-13 en PDF NO EXISTE EN PDF

9.2 Structural Design of Works

The structural calculation of flow Control works and energy dissipation of events such as Alluvial avalanche with solid entrainment was conducted in accordance with the "Structural Design Records" of this project, the properties and Parameters related to the geology of the Bonilla ravine soil, and its tributaries. These calculations are supported by Soil Mechanics reports prepared for this particular purpose, and some other particular considerations.

9.3. Particular Technical Specifications

In order for the execution of works to be carried out in accordance with the Project, a document entitled Technical Specifications has been drawn up singling out the Standards, Regulations, Materials, Construction Methods, and some other documents ruling the construction of the works.

10. Bonilla Ravine Budget

Table 10.1 includes the official budget for Bonilla Ravine works.

Tabla 10.1. Official Works Budget
(Price Baseline: March 1998)

Description	Budget $	Budget $ (VAT included)
Northern Tributary	1.210.136.495	1.427.961.064
Southern Tributary	1.048.315.353	1.237.012.117
Partial Addition	**2.258.451.848**	**2.664.973.181**
Setting up of Works	29.991.184	35.389.597
Access Roads	20.000.000	23.600.000
Environmental Management Measures	22.584.518	26.649.732
Overhead Costs, Profits and Incidental expenses	932.411.020	1.100.245.004
Grand Total	**3.263.438.571**	**3.850.857.513**

11. EXECUTION SCHEDULE

Works to be executed at the Bonilla ravine shall be implemented on a stage-by-stage basis, and are expected to be executed from the downstream to the upstream areas in each tributary in which works have been scheduled. Activities as follows have been considered for execution in the order they are stated:

-Hiring of Contractor
- Setting up of Works and Access Paths
- Works in Northern Tributary
- Works in Southern Tributary

A time estimate for execution of works has been fixed at 24 months. Sketches below show a Gantt letter enclosing a schedule for the Bonilla Ravine works.

12. Legal Issues

Expropriations likely to be required insofar project-related works are concerned shall not be enforceable insofar properties affected by the project are State-owned, no settlers are located nearby the project site, and / or people requiring protection and / or resettlement on account of the environmental impact of works as envisaged.

13. Environmental Impact Assessment

The environmental impact assessment of the execution and operation of works in the Bonilla ravine, has shown that the project´s potential impact is low and is confined to each project stage issues as follows:

Execution Stage:

Social Setting:

- Minor inconvenience to the local population due to an increase in particulate matter in the atmosphere if prevailing winds change their course towards the city of Antofagasta.
- Minor inconvenience to the local population due to an increase in noise pressure levels being caused by moving machinery.
- higher local employment rates

Natural Setting: Landscape

- Changes in current landscape´s morphology in project and dumpsites areas.

Operation stage:

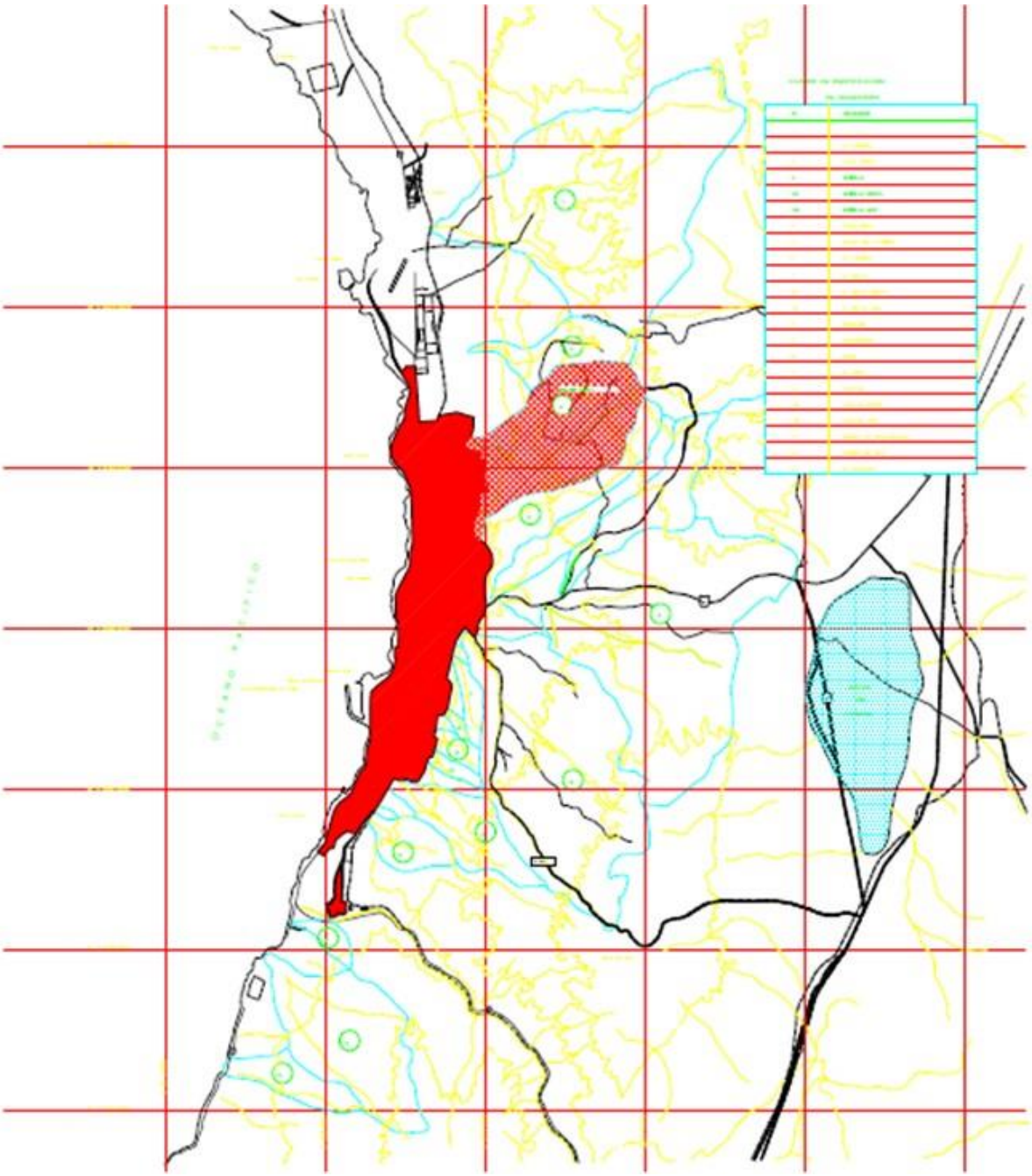
Social Setting:

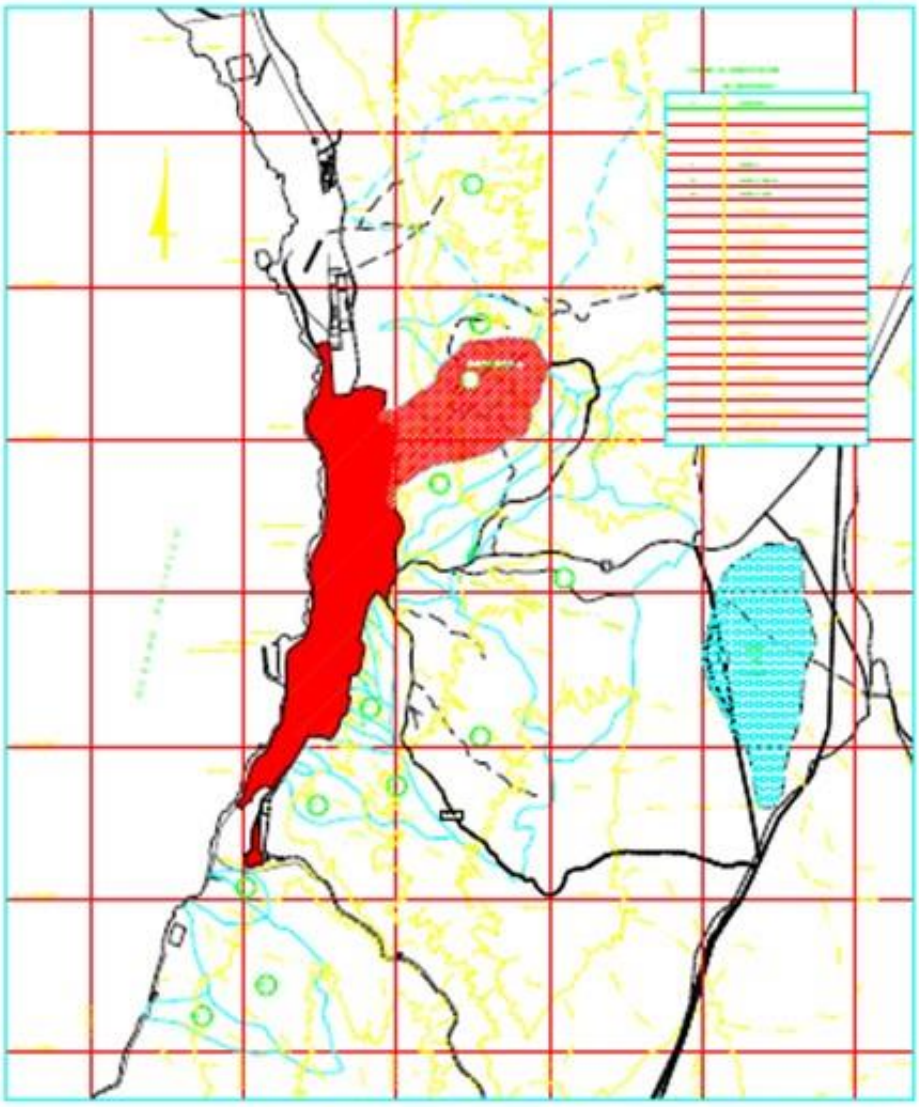
- Safety in monitoring of alluvial floods.
- Higher local employment rates.

Natural environment: Landscape

- - Presence of alluvial dissipation works on the Bonilla Ravine tributaries bed.

Mitigation measures are referred to the use of good Construction practices vis-à-vis GHG emissions, handling of waste materials, management of loans, and the protection of the biotic and cultural environment.





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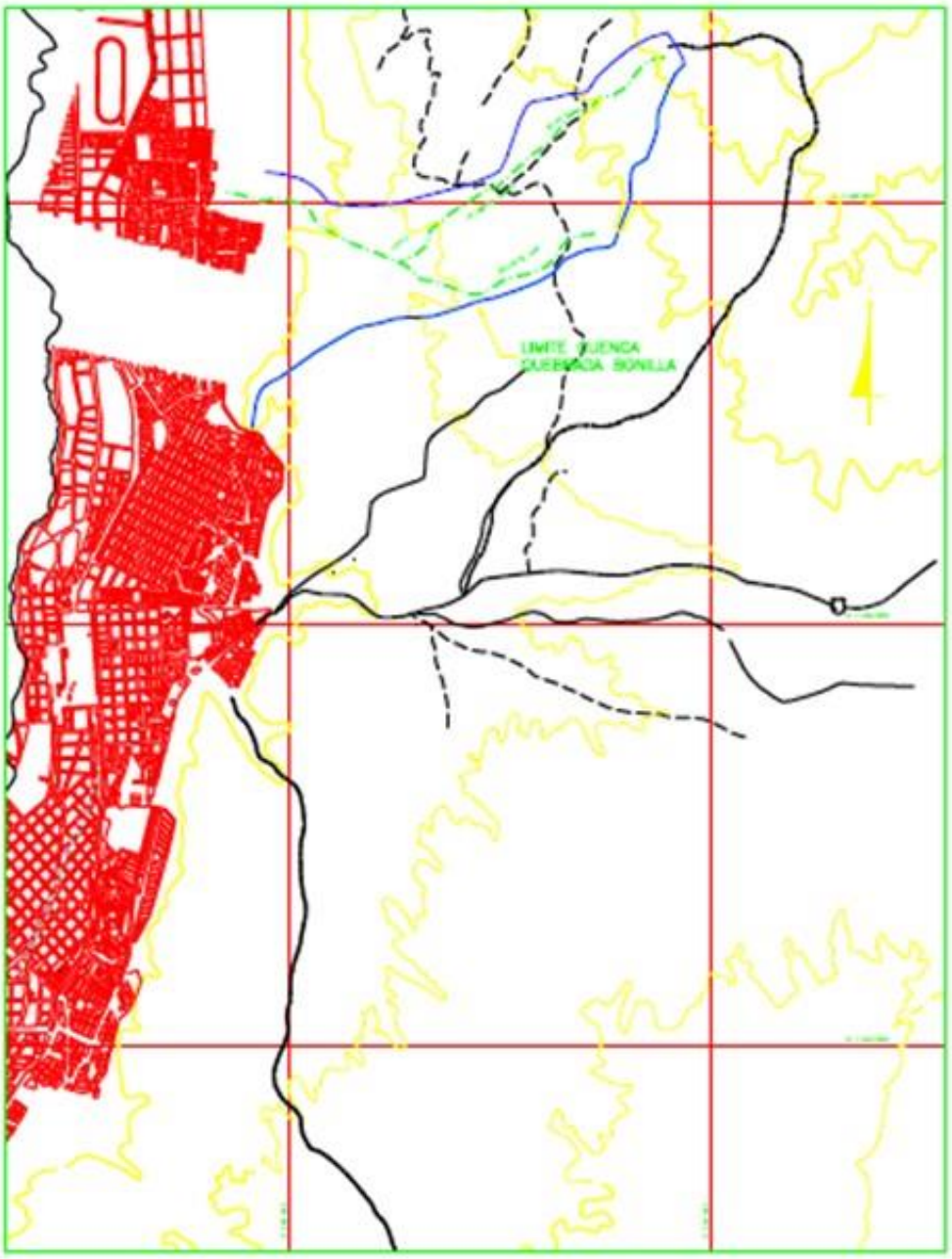

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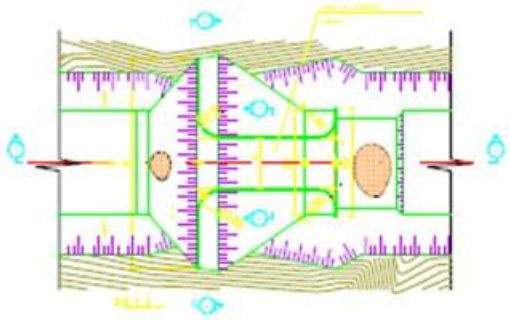

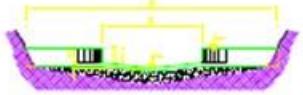

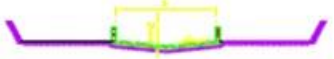

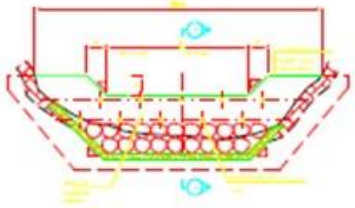

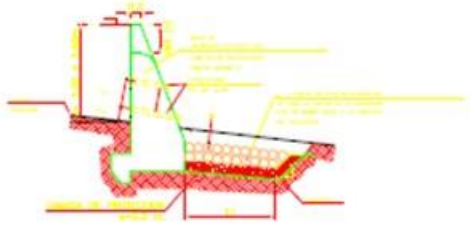

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ESQUEMA TIPO
BARRERA TERMINAL
Y MURO GRAVITACIONAL

3

SURVEY

STABILITY OF GATAZO HILLS SLOPES

ESMERALDAS CITY

EXECUTIVE SUMMARY

TRICONSUL CIA. LTDA.

Esmeraldas, Ecuador, September 2008

AUTHOR
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October 2008

1.- EXECUTIVE SUMMARY

1.1 A stability survey was conducted of four geological failures recently recorded in El Gatazo Hill slopes, in Esmeraldas, Ecuador. A proposal for these slopes to be stabilized is shown below.

1.2.- A summary of the topography, hydraulic, geological and geotechnical works, surveys findings and proposals for solution is shown below, together with a social assessment undertaken to determine the impact these landslides had on people settled in the lower side of the Hill.

1.3.- Mechanical solutions to address this type of hill slope problems involve stabilizing them by means of changes in their original geometry reducing the upper soil volume; solutions that in this case avoid groundwater movement, and mechanical solutions preventing the movement of the soil by using containment structures such as anchors.

2.- LOCATION AND CHARACTERISTICS OF LANDSLIDES

2.1.- The characteristics of landslides located within the topographic map of the city of Esmeraldas are shown together with a reference to the universal geographical coordinates system. Table below refers to this nomenclature.

a. Table below shows the geographic location coordinates of the survey area:

GEOGRAPHIC LOCATION

LATITUDE	LENGTH
M	**M**
104735 N	649658 E

Four landslides have been identified in the survey area, and table below shows geometric characteristics:

GEOMETRIC CHARACTERISTICS

Landslide m	Height m	Length m	Width m	Hill descent degrees	Loose Earth Mass Before M3	Current
A	40	140	70	33^{p}	99.000	13.677
B	35	80	40	24^{O}	37.000	4.257
C	20	100	50	12^{p}	48.000	8.695
F	16	80	50	12^{p}	14.000	7.300

TOTAL	198.000	33.931

2.2.- Landslides area is located in the Gatazo Hill slopes, La Guacharaca neighbourhood, in Esmeraldas, at an elevation of approximately 230M above sea level (masl) and the lower part of the Hill is located at an average 130M above sea level.

3. WORK SCOPE

3.1.- Topography, geology, geophysics, hydraulics and geo-technics related field work was undertaken at each site. Field and laboratory data results were processed to carry out the stability survey, to establish safety factors, and to decide upon the most appropriate, economical and safe solutions.

3.2.- The topography survey involved drawing up a sketch of the area in question to identifying the characteristics of landslides such as escarpments, borders, boundaries, geological failures, so as to determining dimensions, area and volume of the soil mass detached by the landslide. The surveyed topography was overlaid on the topographic map of the city of Esmeraldas, drawn up by INGECONSULT company for the Municipality of Esmeraldas, and a definition was then made of the slopes geometry before and after the landslides, thus allowing to learning how the hill slopes behave vis-à-vis alterations in their water contents.

3.3.- **Geology and geophysics** techniques applied were intended to determine the characteristics of the subsoil strata in the area, and to complement the geotechnical survey on the basis of field observation and electrical resistivity probes, ten of which were undertaken: six in the upper part of the affected area; 2 in the lower part of the same area; and 2 outside the area, in the Western sector where the antennas were reinstalled.

3.4.- On the basis of topographic surveys, **the hydraulics** of the site surveyed the characteristics of the basins, their flows and possible discharges, as well as the depth of the filtering strata.

3.5.- Geotechnical techniques were undertaken to schedule eight mechanical probes so as to determine the physical and mechanical characteristics of the soils in the subsoil of the upper stratum, and to induce the most probable parametre in the slopes behaviour. Six of these probes were located at the top, and two at the bottom of the Hill.

3.6.- Field and laboratory results were used to estimate soil parametres under normal working conditions and under critical conditions so that, using Bishop stability survey methods, in the presence of circular failure surfaces, critical safety factors could be determined and, if required, the containment force so as to achieving a higher than 1.5 safety factor.

3.7.- Hydraulic conditions were determined and a ditches and sub-drains system was designed to superficially up-keeping the conditions of soils from sustaining water effects.

3.8.- On the basis of design data collected, work volume were calculated according to items and specifications in Handbook MOP-001 - F – 2002.

3.9.- A social survey was conducted of all families settled in the lower part of the area impaired, and based on interviews, income level data, and dwelling conditions, their level of affectation was measured, and a recommendation was made for relocation of 106 households.

4.- SOILS STRATIGRAPHY

4.1.- In the upper part of the hill, an upper stratum is present in the surveyed depth which is a MH type, light brown loose soil, with a number of strokes in the standard penetration test between N=3 and N=16; average liquid limit at 65%, and average plastic limit at 40%; average natural humidity 50% close to the plastic limit; the percentage of fines passing the No. 200 sieve is 75%. This layer is made up by the surface soil in which the failures and cracks are present.

4.2.- The lower stratum is a very hard soil, formed by two sub-strata, one formed by shales, siltstones, or sandstones, of a light brown and greenish coffee colour, MH type, and another underlying soil formed by a GW type conglomerate. The number of strokes in the standard penetration test increased from N = 20 to 50; plasticity limits values are close to LL = 65% and LP = 40%; natural moisture 55% and percentage through sieve No. 200 is similar to the material in the upper layer because they have the same origin. This stratum shows a very homogeneous formation; the two substrata share the same mineralogical characteristic, prone to oxidation and fragmentation, when they are exposed and are in contact with natural environmental conditions for a long time. This stratum, while also showing failures and cracks, is very stable.

4.3.-Surveys conducted in the lower part of the hill show a soil similar to the one defined for the upper sector, and from a 7M deep, a conglomerate type underlying soil appears similar to the soil on the Eastern hill front, in the quarries sector.

4.4.- On the basis of field and laboratory results of soil mechanics and geophysical surveys, an average level has been determined of the interface between the non-compact upper soil and the lower hard soil located under the two soil strata mentioned, which is made up by very hard tuffs of the shales, siltstones types settled on a very hard sandstones and conglomerate stratum.

5. LANDSLIDES CONDITIONS

5.1.- Landslides are all located at the top of the ridge, and are generated in the upper soil having a 20m and 25m thickness, according to mechanical and geophysical surveys undertaken.

5.2.- Two types of defined strata are present in the Esmeraldas area soils: An upper stratum made up of silty time schists resulting from the alteration of limolites and arcillolites and even sandstones; this stratum is very heterogeneous, with very weak and low-resistant mantles, and rests on another

stratum made of unaltered and very resistant materials. Failure surfaces are generated in the first stratum and on the upper part of the second stratum.

5.3.- General parametres recommended for stabilisation surveys are taken from retrospective surveys conducted in slopes in the province of Esmeraldas area, and are based upon the methodology brought forward by Engineer Francisco Abad and Engineer Francisco Ureña, from CEMOSA Co., at the 5th National Symposium on Unstable Slopes and Hills, held in Madrid, Spain, in 2001, a methodology basically correlating cohesion values and an internal friction angle to obtaining safety factors equal to 1, and called "intrinsic line".

5.4.- Parametres as follows were taken from the retrospection survey vis-à-vis the weak upper stratum on which the failures were caused. For the lower substrates values have been taken from the soil characterisation table below:

SOIL PARAMETRES FOR STABILITY TEST

PARAMETRES		**STRATA VALUES**		
		Higher	**Substratum 1**	**Substratum 2**
COHESION	C T/m2	5	40	40
FRICTION ANGLE	Φ (º)	8	15	1.8
NO SAT. UNIT WIEGHT	γ T/m3	1.6	1.8	1.8
SAT. UNIT WEIGHT	Γsat T/m3	1.7	1.9	2.0
SUCS CLASSIFICATION		MH	MH	GW

6.- STABILITY SURVEY

6.1.- On the basis of soil-related data, and the survey conducted on circular failure surfaces, the typical conditions of mechanical behaviour were determined using the Bishop method with the XSTABL V5 Programme.

6.2.- Once the soil parametres were defined, a survey was conducted in each landslide of its central profile considered as the most critical, and defined in the topographic survey as such.

6.3.- Bearing in mind the knowledge available about the topography prior to the occurrence of landslides, and the current topography resulting from the survey carried out in this assessment, we proceeded to determine the soil parametres in place when the slope failed, that is, the parametres making the safety factor equal to 1, using the Bishop method, with the XSTABL V5 Program: these parametres were revised to find out whether they were within the intervals of the retrospective survey of the Esmeraldas soils.

6.4- Six behavioural parametres were assessed in each of the four landslides with defined soil parametres, to inquire into the geometry prior to the occurrence of landslides. In the first state, the

safety factor was determined in conditions critical to the entire slope The second stage was to determine the failure conditions of the upper layer of the ridge generating the landslide.

6.5.- For the geometry after the landslides, the safety factor for the total height was determined in a third state; in a fourth state the safety factor was determined for the failed stratum.

6.6- For the current conditions, two final states were analysed: a fifth state determined the safety factor after correcting the slope geometries, for which slopes should be constructed with a maximum 1V:2H gradient, with a surface and underground drainage system.

6.7.- In a sixth state, a horizontal containment force was determined that should be provided by means of anchors, in order to reach a 0.25 increase in the safety factor achieved with the geometries change. Anchors should be installed with an inclination perpendicular to the slopes and should reach a length until reaching the lower layer where it will be extended at least 8M.

6.8.- The safety factor chosen for the survey was 1.5 bearing in mind the mountain collapse characteristics, the site location, social and economic impacts. However, in order to provide additional safety taking into account the risk to life, an additional 0.25 increase was made by providing an external force through anchorages.

6.9.- The water table was determined in surveys conducted below the sliding soils, i.e., the water affecting the failed slopes is only the water infiltrating over rainy conditions.

7.- HYDRAULICS

7.1.- Hydraulic conditions in the survey area were determined. Topographic data allowed for charts on which the altimetry survey of the site was drawn showing contour lines, the same ones that were used for the implementation of the different channels dug up, and design structures recommended for this purpose.

7.2.- Two areas have been hydraulically defined: an upper area measuring approximately 3.6Ha, and a second one along the middle slopes of the Gatazo Hill. The lower part of the hill is made up by La Guacharaca neighbourhood, and has two water channels flowing from above the Hill that will be used as drainage from high areas. These channels flow into a sewage system starting in two catchment areas, one of them, because of landslides, is affected both at the start and the first section of the pipeline.

7.3.- Surface flow rates have been calculated by rational methods and are included in Annexes. Two surveys have been conducted: one for the affected upper area, and the second one taking into account the whole hillside.

7.4.- To determine underground flows, a calculation has been made on the basis of the method proposed by Kevin Forrester document published by the ASCE Press, entitled: *Subsurface Drainage for Slope Stabilisation,* and separation of trenches.

7.5.- Drainage and sub-drainage systems have been designed as a set of surface ditches and drainage trenches formed by a drainage pipe within a filtering stone material core, covered with geotextiles and geo-membranes.

7.6.- Dimensioning of structures and drainage and sub-drainage works is shown in annexes, and has been made based on the needs to minimize the water impact on the slopes soils *in situ*.

8. OBSERVATIONAL RISK SURVEY

8.1.- The parametres of the retrospective survey show values similar to those bringing slopes to the Hill failure: this means that the conditions to which soils in sites surveyed have been subjected are critical, a fact which can be stressed by witnessing that in most slopes there are water flows showing that the runoff has been deficient by natural ways, this meaning that soils conditions will greatly improve if a sub-drains system is implemented.

8.2.- For the risk factor to be determined, the observation method described in *Manual for Zonification on Areas Susceptible to Rain-induced Slope Failure*, published by the Asian Technical Committee on Geo-technology for Natural Hazards has been used, that takes into account the slope height, the mountain inclination, topography, surface soil thickness, depth of water table, and geological failures levels, and attaches a 16 value to the highest risk and a 3 value to the minimum risk, according to the basic table shown in the annexes as well as to each slide table.

8.3.- Observational survey findings rate the slope risk at 100%.

9. FAILURE MECHANICS AND SOLUTION

9.1.- The failure mechanism has been established bearing in mind the hydraulic conditions prevailing in the area, and having a severe impact during the 1998 El Niño phenomenon, when a larger depth of the soil upper stratum was affected by the weather and heavy rainfall, altering the mechanical conditions by increasing the weight of the soil mass and decreasing the latter´s resistance, causing failures in several places in the city and the province. Later on, more failures were generated over the drought periods, because when the new strata in which the water contents increased under heavy rainfall conditions reduced their size, they were cracked, also losing resistance. These new cracks deeper than those in previous time became into a critical area since, as new rainy seasons arrived, they became a greater depth of infiltration weakening down a larger soil mass, and causing new landslides similar to those sustained in the Gatazo Hill.

9.2.- The survey area shows a very cracked failure area needing substantial work to close the cracks. This shall be done by creating water collection areas and stable slopes. These have been defined with a 1V: 2H slope, with 3M at least terraces or berms to allow for the displacement of work teams.

9.3.- Construction of a surface and underground drainage system has been arranged to ensure a fast water evacuation by means of the construction of coronation and of foot of slope gutters, as well as a drainage trenches system constructed down to a 4M depth connected to an external draining system

flowing into the city system for which a plan to rehabilitate the system has been jointly prepared with the Municipality of Esmeraldas.

9.4.- In addition, an anchors system has been designed on the lower slopes to increasing the slopes safety factor in some 0.25 additional points, considering risk sensitivity on account of a populated area located at the foot of the Hill.

10. TECHNICAL SPECIFICATIONS

10.1.- Working conditions are rather particular bearing in mind that working sites are located on the upper sector of a populated neighbourhood, so that thorough safety conditions should be in place to avoid damages in the lower sector.

10.2.- Technical specifications in designs are those stipulated in the General Specifications Manual for the Construction of Roads and Bridges MOP-001-F-2002.

10.3.- Two specifications have been defined in a special way for Stakeout and Anchors items.

10.4.- All materials should be disposed of at a place in the lower part of the city. Arrangements have been made in coordination with Esmeraldas Municipality authorities for debris to be placed in the Southern section of the road to the Montúfar military post, to be used as a landfill, allowing for a road leading to the lower part of La Chamera neighbourhood, crossing nearby the Esmeraldas Tennis Club. A 10Km travelling distance for evacuation of materials has been considered in the budget, together with maintenance of a 2KM access road to Gatazo Hill.

10.5.- Several safety standards have been borne in mind, and a budget has been estimated to meet environmental standards.

11.- METHODOLOGY, WORKLOAD, BUDGET AND TIMETABLE

11.1.- A methodology proposal was drafted up to setting forth activities' characteristics and to determine time and costs involved in unit prices and schedule.

11.2.- Based on MOP-001-F-2002 designs and specifications, the workload was split up into construction stages and systems, as shown in Annexes.

11.3.- Two budgets have been prepared: one addressing official CORPOECUADOR unit prices, updated as of July 2008, and including special unit prices, which are not included in the official list and are necessary on account of the project typology; and a second budget incorporating special prices in consideration of stringent working conditions vis-à-vis safety of workers and dwellings in the lower area, as well as a difficult access, thus, having two budgets is acceptable to the project real conditions; these unit prices have been updated as of September 2008. In both budgets, 22% indirect costs have been considered.

11.4.- Works costs have been estimated at $2,358,749.91 (Ecuatorian Currency), considering CORPOECUADOR official unit prices as of July 2008.

11.5.- The works costs considering actual working conditions have been calculated on the basis of CORPOECUADOR unit prices, corrected by a difficulty factor considering the project location and safety measures to be undertaken, with total costs of works amounting to $2,552,226.44, including the budget of works to be contracted by CORPOECUADOR and the works recommended to be executed on the basis of agreements to be entered into with the Municipality of Esmeraldas, such as sewerage works, and EE-4 items. And works contracted with the Luis Vargas Torres Technical University, such as revegetation of slopes, Item 206 (4), and reforestation, item EE-5, activities to be removed from the budget and from the work schedule, as stipulated.

11.6.- The scheduled time for work execution is 12 months: ten months for specific stabilisation works; and 2 additional months for works pursuant to agreement: sewage rehabilitation, revegetation, and reforestation.

12.- CONCLUSIONS AND RECOMMENDATIONS

12.1.- A conclusion can be reached on the basis of results that the whole slopes body has been stable before and after the landslides; and the lower stratum is not affected by changes in the water contents.

12.2.- The upper layer failed under conditions typical of the Esmeraldas soils, which show a 6.5 Tn / m2 cohesion, and $\phi = 8°$ internal friction angles; after the landslides, the slopes stabilized increasing the safety factor to values between 1.5 and 2, which is understandable if the consideration is taken into account that the occurrence of slides at the top caused the detachment of the slope from the top of the hill.

12.3.- Changes in the slope geometry and the installation of anchors in the lower front side will stabilize the slopes with a safety factor higher than 1.5, in all slopes.

12.4.- The resettlement of families as listed in the social survey is recommended in order to provide them with the highest security in the future.

12.5.-Stabilisation works should be carried out together with the relocation of 106 dwellings to minimize risks over execution of works.

12.6.- A recommendation is made that, for coordination of and responsibility for the works, two stages involved therein: revegetation and reforestation, are undertaken through an agreement with a specialized institution considering that the work is dependent upon several environmental conditions, the responsibility of which could be taken over by a non-for-profit institution.

12.7.- The rehabilitation of sewerage systems in the lower part of the Hill, which were obstructed by landslides, is an additional phase that should be carried out through a public institution. The point

should be borne in mind that procedures and implications with adjacent and complementary systems attached to other Public Utilities could be executed by the Municipality of Esmeraldas, and under their responsibility.

12.8.- The Environmental Impact Assessment contemplates that the intervened areas should be revegetated by placing MONTHhes with local seeds and soils existing in the site. The site´s organic vegetal soil collected at the time of clearing and the beginning of the soil cutting should be kept and taken care of over the execution of works, to be reused at the time works are under way on reconstructed slopes.

12.9.- The soil produced by the cutting should be placed along the new road sector on the way down to La Chamera neighbourhood, as arranged for by the Municipality of Esmeraldas.

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1. This assessment was made on the basis of the Japan Landslide Society recommendations, Fig 2.1 *Deslizamientosandestabilidad en taludes en zonas tropicales*, Jaime Suarez Díaz.

2. The Recognition Methodology, Chapter 4 of *Landslide Recognition,* Richard Dikau, Denys Brunsden was used.

3. The security factor was analysed on the basis on numeral 4.2 of *Landslides and their stabilisation*, Christian Veder.

4. The assessment concepts were taken from Chapter 4 of *Slope Stability and Stabilisation Methods*, Abramson, Lee, Sharma and Boyce.

5. The Assessment Method used was the Janub Method referring to XSTABL V5 non-circular surfaces programme, *Interactive Software Design Inc, Sunil Sharma*.

6. Soil parametre values for assessments were taken from the *Estudio de Parametrización de los Suelos para Análisis de Estabilidad de Taludes de la Zona Central de la Provincia de Esmeraldas* (Soil Parametreisation Study for Stability Analysis of Slopes of the Central Area of the Province of Esmeraldas) according to Abad and Ureña method, *V Simposio Nacional sobre TaludesandLaderas Inestables*, Madrid, Spain, November 2001.

7. The Screen system design was taken from Chapter 12 in *Foundation Engineering Handbook,* Hsai-Yang Fang, and Chapter 13 of *Foundation Engineering Handbook,* Winterkorn.

8. The moments and pressures calculation was taken from Chapter 10 *Geotechnical Engineering*, Joseph Spilogon.

9. The thrust coefficients for cohesive soils were taken from page 453 in *Foundation Engineering Handbook*, Hsai-Yang Fang.

10. The drainage trench system was taken from figure l 11.25 Chapter 11, *Foundation Engineering Handbook*, Hsai-Yang Fang.

11. Drainage trench calculations were made using the method presented by Kevin Forrester in ASCE Press publication, *Subsurface Drainage for Slope Stabilisation*, 2001.

12. The slope drainage graph un Figure 8, page 71-280 of *DM 7.01, NAVFAC* was used

13. The pile separation and anchoring calculations were performed in line with methods in *Manual Design for Permanent Ground AnchorageWalls*, by the Federal Highway Administration, U.S. Transportation Department, September 1998.

14. For anchoring estimates, concepts were applied as set forth in *Manual de Estabilidad de Taludes*, Teotecnia Vial, National Road Institute, Transportation Ministry, 1998.

15. Risk level was measured in accordance with budget in *Manual for zonification on areas susceptible to rain-induced slope failure*, Asian Technical Committee on Geotechnology for Natural Hazards, 1997.

A CONTINUACIÓN: VERSIÓN EN INGLÉS – PÁGINAS 175 – 185 EN EL DOCUMENTO ORIGINAL EN PDF

CORPECUADOR

ESMERALDAS DELEGATION

SURVEY

STABILITY OF GATAZO HILLS SLOPES

ESMERALDAS CITY

ANNEX

CONSTRUCTION METHODOLOGY

SPECIFICATIONS, BUDGET, POLYNOMIC FORMULA

AND WORKING SCHEDULE

TRICONSUL CIA. LTDA.

Esmeraldas, September 2008

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1.- CONSTRUCTION METHODOLOGY

1.1.- Calculating the budget and scheduling the work to be executed involve the design of a working system so as to allowing for a definition of activities-related characteristic, and advancing a construction methodology that can be subject to changes by the contracting party according to his / her criterion, equipment, technology and working schedule.

1.2.- This proposal addresses in the first place the revegetation and levelling in the area, execution of works in access roads and the removal of the vegetation layer in the work area, and the disposal of waste material to a temporary storage place for further reuse in revegetation works.

1.3.- Soil cutting and dislodgement works should be started later on to reconstructing the slopes, a work to be done in a top-to-bottom fashion, in order that the soil cutting and removal of the soil reduces the weight on the slopes, and the bottom floor is later removed. Appropriate equipment such as backhoes and dump trucks should be used.

1.4.- A drainage system should be subsequently built up, trying to ensure that excavation work does not destabilise the slopes, and construction is done by stretches of no more than 6M in length. This work should be done with specialized equipment, such as backhoes.

1.5.- The construction of the anchoring system should be scheduled to be done simultaneously with the work above, once the slopes have been reconstructed and it is possible to do the drilling and place the tensioners and the plates. This work should be carried out with specialized equipment such as a pneumatic or mechanical drilling machine; a support crane should be available to support the equipment and the transfer of materials and work elements. During the implementation of surveys, a monitoring system should be in place to ensure that the hard *lutitas* (shale) soil is being penetrated to at least a 8M depth.

1.6.- Subsequent to the placement of anchors and the construction of the drainage system, the construction of ditches and the external drainage system works shall be undertaken.

1.7.- Revegetation works scheduled to be carried out over the rainy season to ensure their efficiency should then be carried out and, to ensure their efficiency, a constant water system should be available for maintenance.

1.8.- Reforestation works should be simultaneously planned to be undertaken in the upper or lower slopes area. These works should be subject to a process and maintenance time to achieving the outcoMONTH expected.

1.9.- Mitigation and environmental monitoring plans should be taken into account throughout the construction works of stabilisation systems.

2.- SPECIFICATIONS

2.1.- Project specifications vis-à-vis the construction materials and modality of the project items will be those as spelled out in the **MOP 001 F 2002 Handbook**, according to the denomination of items in the quantities and budget listings.

2.2.- All matters related to legal and environmental provisions should be taken into account.

2.3.- Removal of excavation material wastes should be done in the south-west sector outside the place adjacent to the affected area in order to avoid adverse impacts on the slopes.

EE-1 Revision of project projections and levelling

Description.- This work involves the revision of the preliminary project projections and keeping them in place throughout the project, carrying out the revision of the entire project projections as the different activities are being carried out. All plans containing the profiles prior to the execution of the works should be prepared and submitted to the previous approval of the Inspection office, to carry out the monitoring of the guidelines, dimensions and slopes for a sound execution of works.

Work Procedure.- Milestones and stakes will be placed in the worksite and maintained for the proper verification, measurement and monitoring of the work at hand; and work measurements will be made for payment purposes.

Equipment required.- Duly calibrated theodolites, levels or full stations shall be used to ensure correct work results.

Measurement.- All works described in this section will be measured per M2 of the area, on a horizontal plane, according to the total amounts included in the contract.

Payment.- Amounts as stated shall be paid according to constant unit prices set forth in the contract, and including all personnel, materials and equipment necessary for the total execution of the item concerned.

EE-2 SLOPES FORMATION

Description.- This work involves all cuts that should be made in the slopes as required to obtain the geometry calculations as determined in drawings and according to the alignments and dimensions defined therein.

Working Procedure.- These cuts should be made from top to bottom, i.e., the slopes being a floor structure subject to failure, because the weight increases on the top or the weight is reduced on the bottom, works should be executed completing each slope horizontally before continuing in the next lower slope. The materials resulting from the cuts shall be immediately removed outside the work area, towards the lower part of the city, through the access road to the place as provided by the Inspector. The Municipality of Esmeraldas has authorized that these materials are placed in the Chamera lagoon sector.

Equipment required.- Excavators and dump trucks should be used to make cuts and to proceed to load and remove materials from the worksite.

Measurement.- The work described in this section will be measured by M^3 of all global amounts included in the contract; this measurement will be made of the difference of volume determined in planimetry and altimetry calculations of drawings made before and after the cuts were made.

Payment.- The determined amounts will be paid according to the constant unit prices set forth in the contract and include all personnel, materials, and equipment necessary for the total execution of the item, and the removal of materials to the place approved by the Works Inspection.

EE-3 STABILISATION ANCHORAGE - LENGTH 30M

Description.- The construction of a cylindrical excavation filled in with concrete, and having a tensioner guaranteeing at least 65Tn of external admissible tension, and 105Tn at the breakage point, and externally supported on a concrete plate, as described in drawings: f ' c = 280 kg /cm^2. The contractor shall supply an anchorage system guaranteeing the required tension. The anchorage should be arranged in the place shown in drawings, and in the inclination shown therein.

Working Procedure.- This procedure refers to executing a drilling of at least 15cm in diametre and 30M in length to guarantee to have drilled down to 8M in the hard, tobas type ground, described in the surveys and approved by the Inspector. A tensor system with a length similar to that of the sounding equipment will be inserted in the hole, and should guarantee the required tension, and the hole shall be filled with grout-type concrete of high expansive resistance down to the a 10M depth, and the filling shall be finished with f'c = 280 Kg /cm^2 concrete.

Equipment required.- Drilling shall be carried out with specialized equipment, such as mechanically or hydraulically driven drills with compressors; the holes will be filled by injection of mortars in lengths as shown; concrete slab will be constructed with concrete prepared in plant or *in situ*. The anchorage tension will be applied with a specialized mechanical or hydraulic equipment that measures the tension applied.

Measurement.- Works described in this section will be measured by complete unit according to global amounts as set forth in the contract.

Payment.- Amounts as set forth in the contract will be paid according to unit prices stipulated therein, and shall include all personnel, materials, and equipment necessary for the total execution of the item.

EE-4 REHABILITATION OF THE CITY SEWAGE SYSTEM

Description.- The rehabilitating of the City sewage system according to requirements and needs as set forth in the requirements as proposed.

EE-5 REFORESTED AREA, 1 NIN-TYPE TREE NIN (NEEN) EACH 9 M²

Description.- Reforestation of 6Ha of land: 3Ha at the top in the landslides area, and 3Ha at the bottom of this area. NIN-type trees will be planted, one per each $9M^2$, and one-year maintenance work shall be enforced.

Work Procedure.- Works should guarantee the indefinite existence of trees by means of sowing and maintenance techniques.

Equipment required.- The equipment needed to carry out soil preparation and planting of trees, ensuring the efficiency of the works to be executed.

Measurement .- Measurement will be made by Ha or partial of the area planted on an horizontal plane.

Payment.- Amounts as stipulated will be paid according to constant unit prices as stipulated in the contract, and will include all the personnel, materials, and equipment necessary for the total execution of the item.

EE-6 **WASTE PIT**

Description.- Construction of a waste disposal pit for construction materials and to be located outside the work area.

Working Procedure.- An excavation of at least $3M^3$, and a $1.5M^2$ area. In a stabilized ground site, a wooden light structure will be built on top of the waste disposal site, that can be removed when works are finished. A drawing of the intended waste disposal pit should be submitted to the Inspector's approval.

Measurement.- Measurement shall be fully completed, in accordance with the Inspector´s decision.

Payment.- Works described in this section will be measured by complete unit according to global amounts as set forth in the contract.

EE-7 BIODEGRADABLES

Description.- Collection of all non-natural materials existing in the work site prior to the start of construction work, and which should be evacuated outside the work area.

Measurement .- Measurement will be made in a completed overall fashion according to the Inspector´s decision.

Payment.- Works described in this section will be measured by complete unit according to global amounts as set forth in the contract.

EE-8 **LATRINES**

Description.- The construction of a pit for human organic materials to be located outside the work area.

Working Procedure.- An excavation of at least $3M^3$, and a $1.5M^2$ area. In a stabilized ground site, a wooden light structure will be built on top of the latrines, that can be removed when works are finished. A drawing of the intended latrines should be submitted to the Inspector's approval.

Measurement.- Measurement shall be fully completed, in accordance with the Inspector´s decision.

Payment.- Works described in this section will be measured by complete unit according to global amounts as set forth in the contract.

3.- BUDGETS

3.1.- CORPECUADOR UNIT PRICES - JULY 2008

CORPECUADOR - GATAZO HILL SLOPES STABILISATION WORKS					
Updated to July 2008					
Esmeraldas City					
Item Code	**Item Description**	**Unit**	**Number of units**	**Unit Cost**	**ITEM COST**
	1 INITIAL WORKS				
201-(1)	Camp & related works	Glb	1.00	9,402.400	9,402.40
	Access roads				
EE-1	Stakeout & Levelling	M2	12,000.00	0.217	2,600.52
308-2(1)	Finishing of existing basic work	M2	12,000.00	0.334	4,010.36
403-1	Sub-base Class 3 slope higher than 6%	M3	2,400.00	6.105	14,650.83
309-6(5)	Base, sub-base transport, crushed material, loan screening, & others D/L – 0 Km (D/L=O km)	m3-Km	24,000.00	0.208	4,992.00
307-3(1)	Gutter excavation	M3	3,200.00	1.520	4,864.00
	2 ESTABILISATION				
	Slope formation				
EE-1	Stakeout & Levelling	M2	36,495.00	0.217	7,908.83
302-1	Clearing, deforestation & cleaning	Ha	3.65	246.044	897.94
EE-2	Slope formation & clearing	M3	33,933.46	7.688	260,896.28
	Sub drains				
307-2(1)a	Excavation & filling for structures, with selected imported material	M3	8,456.00	5.287	44,706.87
606-1 (1a)	Sub-drains piping 150 mm	M	2,114.00	13.785	29,141.84
606-1 (1b)	Geo-membrane coating Table 822.2.1	M2	4,228.00	2.741	11,587.84
402-8	Geo-membrane coating Table	M2	4,228.00	4.145	17,523.95

(1)	402.8.1				
606-1(2)	Filtering Material	M3	2,114.00	7.499	15,853.43
	Slopes top gutters				
307-3(1)a	***Manual excavations for gutters, top gutters, drenches***	M3	2,114.00	4.913	10,386.79
402-8(1)	Geo-membrane coating Table 402.8.1	M2	5,580.96	4.145	23,131.62
503(2)	Class B Portland cement coating (180 Kg / cm2), for gutters	M3	311.18	117.220	36,476.40
	Slope protection				
206 (4)	Geo-synthetic blankets including seeds	M2	21,140.00	11.626	245,773.64
	Anchorage				
EE-3	Anchorage for stabilisation Average length. 25 m	U	645.00	1,292.151	833,437.13
	External drainage				
307-2(1)	Excavation & filling for drainage piping (I/T)	M3	8,456.00	5.287	44,706.87
606-1(1a)	Drainage piping 150 mm	M	2,114.00	13.785	29,141.84
307-3(2)a	Gutter excavation	M3	656.00	4.913	3,223.15
402-8(1)	Geo-membrane coating Table 402.8.1	m2	1,443.20	4.145	5,981.69
503(2)	Class B Structural Portland Cement (180 Kg / cm2), for gutters	m3	73.47	117.220	8,612.36
	3 REHABILITATION OF THE CITY SEWER SYSTEM				
EE-4	Uptake No. 1 & Lenghtening of Pipes	Glb	1.00	57,000.000	57,000.00
EE-4	Uptake No. 2	Glb	1.00	23,500.000	23,500.00
EE-4	Uptake No. 3 & Lenghtening of Pipes	Glb	1.00	87,000.000	87,000.00
	4 ENVIRONMENTAL MITIGATION				
220-(1)	Awareness-raising Talks	U	10.00	315.00	3,150.00
708-5(1)AEb	Warning Signage	Glb	25.00	109.80	2,745.00
708-5(1)AEb	Informational Signage	Glb	10.00	109.80	1,098.00
EE-5	Reforested area 3Ha type NIN trees (NEEN)	Ha	3.00	25,000.00	75,000.00
EE-6	Waste pit	Glb	1.00	2,500.00	2,500.00

EE-7	Biodegradables	Glb	1.00	10,000.00	10,000.00
EE-8	Latrine	Glb	1.00	1,500.00	1,500.00
				TOTAL DIRECT COSTS	1,933,401.57
				DIRECT INDIRECT COSTS 22	425,348.35
				TOTAL COST	2,358,749.91

3.2.- SPECIAL UNIT PRICES – SEPTEMBER 2008

CORPECUADOR.- GATAZO HILL SLOPES STABILISATION WORKS					
Updated to September 2008					
Esmeraldas City					
Item Code	**Item Description**	**Unit**	**Number of ítems for implementation**	**Unit Costs**	**ITEM VALUE**
	1 INITIAL WORKS				
201-(1)	Camp & related works	Glb	1.00	14,978.000	14,978.00
	Access roads				
EE-1	Stakeout & Levelling	M2	12,000.00	0.217	2,600.52
308-2(1)	Finishing of existing basic work	M2	12,000.00	0.952	11,429.52
403-1	Class 3 Sub-base slope greater than 6%	M3	2,400.00	14.148	33,954.96
309-6(5)	Transport of base, sub-base, crushed material, loan screening and otherss (D/L=O km)	m3-Km	24,000.00	0.326	7,824.00
307-3(1)	Gutter excavation	M3	3,200.00	3.039	9,724.80
	2 STABILISATION				
	Slope formation				
EE-1	Stakeout & Levelling	M2	36,495.00	0.217	7,908.83
302-1	Clearing, deforestation & cleaning	M2	36,495.00	0.559	20,400.71
EE-2	Slope formation & clearing	M3	33,933.46	7.688	260,896.28
	Sub drains				

307-2(1)a	Excavation & filling for structures, with selected imported material	M3	8,456.00	8.343	70,548.41
606-1 (1a)	Piping for subdrains 150 mm	M	2,114.00	13.785	29,141.84
606-1 (1b)	Geo-membrane coating Table 822.2.1	M2	4,228.00	2.741	11,587.84
402-8 (1)	Geo-membrane coating Table 402.8.1	M2	4,228.00	4.145	17,523.95
606-1(2)	Filtering Material	M3	2,114.00	13.881	29,343.87
	Slopes top gutters				
307-3(1)a	*Gutter excavation, Manual excavations for gutters, top gutters, drenches*	M3	2,114.00	5.896	12,464.14
402-8 (1)	Geo-membrane coating Table 402.8.1	M2	5,580.96	4.145	23,131.62
503(2)	Class B Structural Portland Cement (180 Kg / cm2), for gutters	M3	311.18	198.325	61,714.77
	Slope protection				
206 (4)	Geo-synthetic blankets including seeds	M2	21,140.00	11.626	245,773.64
	Anchorage				
EE-3	Anchorage for stabilisation Average length. 25 m	U	645.00	1,292.151	833,437.13
	External drainage				
307-2(1)	Excavation & filling Drainage piping (I/T)	M3	8,456.00	8.343	70,548.41
606-1 (1a)	Drainage piping 150 mm	M	2,114.00	13.785	29,141.84
307-3(2)a	Gutter excavation	M3	656.00	5.896	3,867.78
402-8 (1)	Geo-membrane Coating Table 402.8.1	m2	1,443.20	4.145	5,981.69
503(2)	TClass B Structural Portland Cement (180 Kg / cm2), for gutters	m3	73.47	198.325	14,571.33
	3 REHABILITATION OF THE CITY SEWER SYSTEM				
EE-4	Uptake No. 1 & Lenghtening of Pipes	Glb	1.00	57,000.000	57,000.00
EE-4	Uptake No. 2	Glb	1.00	23,500.000	23,500.00
EE-4	Uptake No. 3 & Lenghtening	Glb	1.00	87,000.000	87,000.00

	of Pipes				
	4 ENVIRONMENTAL MITIGATION				
220-(1)	Awareness-raising Talks	U	10.00	315.00	3,150.00
708-5(1)AEb	Warning Signage	Glb	25.00	109.80	2,745.00
708-5(1)AEb	Informational Signage	Glb	10.00	109.80	1,098.00
EE-5	Reforested area 3Ha type NIN trees (NEEN)	Ha	3.00	25,000.00	75,000.00
EE-6	Waste pit	Glb	1.00	2,500.00	2,500.00
EE-7	Biodegradables	Glb	1.00	10,000.00	10,000.00
EE-8	Latrine	Glb	1.00	1,500.00	1,500.00
				TOTAL DIRECT COSTS	2,091,988.88
				DIRECT INDIRECT COSTS 22%	460,237.55
				TOTAL COST	2,552,226.44

A CONTINUACIÓN:

PÁGINAS 196 – 261 EN EL DOCUMENTO ORIGINAL EN PDF

ENVIRONMENTAL IMPACT ASSESSMENT

STABILITY SURVEY OF THE GATAZO HILL SLOPES

GUACHARACA SECTOR - CITY OF ESMERALDAS

1. INTRODUCTION

The city of Esmeraldas sustains very strong anthropic activities in its surrounding hills, with environmental degradation being an outcome of a swift growth rate, a high soil fragility, and a poor or almost null capacity for self-recovery.

The current status of the Gatazo Hill, and the Guacharaca sector in particular is characterized by strong degradation processes and landslides, among which are excavation for latrines and housing

construction, extraction of stone material, civil engineering works to open roads on the top of the Hills, and infrastructure works for communication antennas, water reservoirs, farming activities, cattle raising, grassland burning, drainage ditches, heavy machinery and vehicles vibrations, natural causes, and others.

Today, environmental quality is understood not only as a development component, but as a forward-looking economic activities factor, and a driver of an enhanced quality of life of citizens.

CORPECUADOR has brought forward environmental policy seeking the recovery, improvement and capitalisation of the Guacharaca sector (Gatazo Hill) involving high-risk areas for people whose hoMONTH are located at the foot and centre areas of the Hills, as well as in natural drainage areas along these Slopes.

Within the environmental categorisation of projects, the project we are referring to in this paper is considered to belong to the B category, likely having a moderate bearing on the environment with substantial environmental impacts. Adverse environmental impacts have well-known solutions. This project indeed requires an environmental impact assessment and audits to determine conformities vis-à-vis environmental quality.

2. ASSESSMENT OBJECTIVES

2.1 OVERALL OBJECTIVES

• Determining current environmental conditions in the Guacharaca (Gatazo Hill) sector.

• Foreseeing possible environmental impacts resulting from activities the Engineering Project is envisaging, activities seeking to environmentally revaluing the Gatazo Hill area to meeting expectations of the population, and activities in their setting.

• Drafting up a Management Plan incorporating programme and sub-programme together with their environmental mitigation measures.

2.2. PARTICULAR OBJECTIVES

• Project description

• Description of the setting where the project will be executed

• Identification of environmental impacts in the area where the project will be executed.

• Drafting up the Environmental Management Plan.

3. SCOPE

The *Ex-Ante* Environmental Impact Assessment will cover activities over the project execution, and how those activities shall be having a direct and indirect impact on the environment at the physical, biotic, socioeconomic and cultural levels.

A characterisation shall be made of the baseline of the area where the environmental remediation and protection project is intended to be executed. Environmental impacts likely to be generated by the project execution shall be identified and assessed vis-à-vis their environmental component or variable.

Presentation of the Management Plan to ensure that all activities are incorporated by measures to prevent, minimize, and mitigate the negative impacts likely to be generated by the project activities. Those activities should be compatible with environmental management practices pursuant to Ecuadorian regulations.

4.1 LEGAL FRAMEWORK

The *Ex-Ante* Environmental Impact Assessment was undertaken in abidance with Legal Regulations in force, as follows:

4.1. NATIONAL REGULATIONS

Core aspects in environmental legislation in force in the Republic of Ecuador make up Constitutional regulations assigning duties, rights and responsibilities to the Ecuadorian State and its inhabitants. Thus, and in accordance with this Legal Framework, the defence of the country´s natural and cultural heritage and the protection of the environment, are two of the overriding duties of the State.

Pursuant to the National Constitution, **Article 14 (Right to a Healthy Environment**) "***The right of the population to live in a healthy and ecologically balanced environment is acknowledged, warranting sustainability and Good living, sumak kawsay.***

> **Agreements: Ecuador Constitution (ECons)**: 66 Num. 27; 391 // **General Environmental Law (*LGAmb)***: 1; 2; 7

The preservation of the environment, conservation of ecosystems, biodiversity and the integrity of the country's genetic heritage, the prevention of environmental damage, and the recovery of degraded natural areas is hereby declared to be of public interest.

Agreements: ConsE: 396; 397; 399 // - ***LGAmb***: 5

The Constitution stipulates the State obligation to recognize this right. The practical outcome of Constitutional principles quoted above is that the *State shall protect the right of the people to live in a healthy and ecologically balanced environment warranting sustainable development. The Constitution shall ensure that this right is not impaired, and shall warrant the preservation of nature and good living*." This State obligation is abode by through the declaration of public interest of activities as follows:

1. The preservation of the environment, the conservation of ecosystems, biodiversity and the integrity of the country's genetic heritage.

2. The prevention of environmental pollution, the recovery of degraded natural areas, the sustainable management of natural resources, and the requirements that public and private activities shall abide by.

National Regulatory Framework in force:

• Political Constitution of Ecuador

• Environmental Management Law. Law No. RO 245, enacted on July 30, 1999

• Secondary Environmental Legislation Unified Wording (TULAS, for its acronym in Spanish), including the Single Environmental Management System (SUMA, for its acronym in Spanish).

4.2. LOCAL REGULATIONS

• Municipal Ordinance

5. METHODOLOGY

Both, drafting up of environmental surveys, and their implementation, and the preparation of this EIA were carried out in accordance with the Terms of Reference (TORs) put forward by CORPECUADOR in their civil engineering surveys.

For the preparation of the *Ex Ante* EIA, primary and secondary sources data were used. Drafting up of the baseline involved each one of the abiotic, biotic, socioeconomic and cultural components.

The *ex-ante* EIA is complemented with supporting photographic, cartographic, and other supporting annexes.

GENERAL OUTLINE TO DRADFTING UP ENVIRONMENTAL SURVEYS

ENVIRONMENTAL SURVEYS TRANSPORT, CONSTRUCCION OF CIVIL WORKS
BASELINE CHARACTERISATION (Baseline)
IMPACTS ASSESSMENT
ENVIRONMENTLA MANAGEMENT PLAN

5.1. DELIMITING THE PROJECT´S AREA OF INFLUENCE

For access to a particular assessment framework and further data to be collected vis-à-vis environmental impact assessments, two areas were identified likely to be impaired by project activities: 1. The direct impacts scenario (local area); and 2. An area in which impacts could be sustained in some other sectors (indirect impacts, micro regional area), and some other facilities in the area.

The definition of the project´s area of influence also takes into account that this area is directly related to that area being currently affected by landslides, as well as to some other sectors close to the work site such as: facilities, road and urban infrastructure, the Esmeraldas river flowing through the Eastern sector of the project's operations site, and some other sectors.

5.1.1. Direct Area of influence

When cutting operations are under way on the slope top, the area where soil is being removed, and the houses located at the foot and near the slope, are prone to the direct impact of the project in the Guacharaca sector (Gatazo Hill).

5.1.2. Indirect Area of influence

All those areas where materials are moved out to, possibly in the Chamera sector, hoMONTH close to the Esmeraldas river in the Potosí sector, and the Esmeraldas river in the same sector. The impact will be less strong than in the direct influencer area, and people settled farthest from the Guacharaca working area (Gatazo Hill) will possibly be affected by dust, noise and vibrations.

5.2. BASELINE

A survey was conducted of the environmental components of the overall impact area, together with particular features of the direct influence area. These features are detailed below:

5.2.1. Physical Component

Relevant components were characterized both concerning the general area of influence and the direct area of influence. For the general area of influence (both direct and indirect) components as follows are described: Geology, Geomorphology, Land Use, Climatology, General Hydrology, and Landscape. Secondary information was used to describe these components.

5.2.1.1. Geology

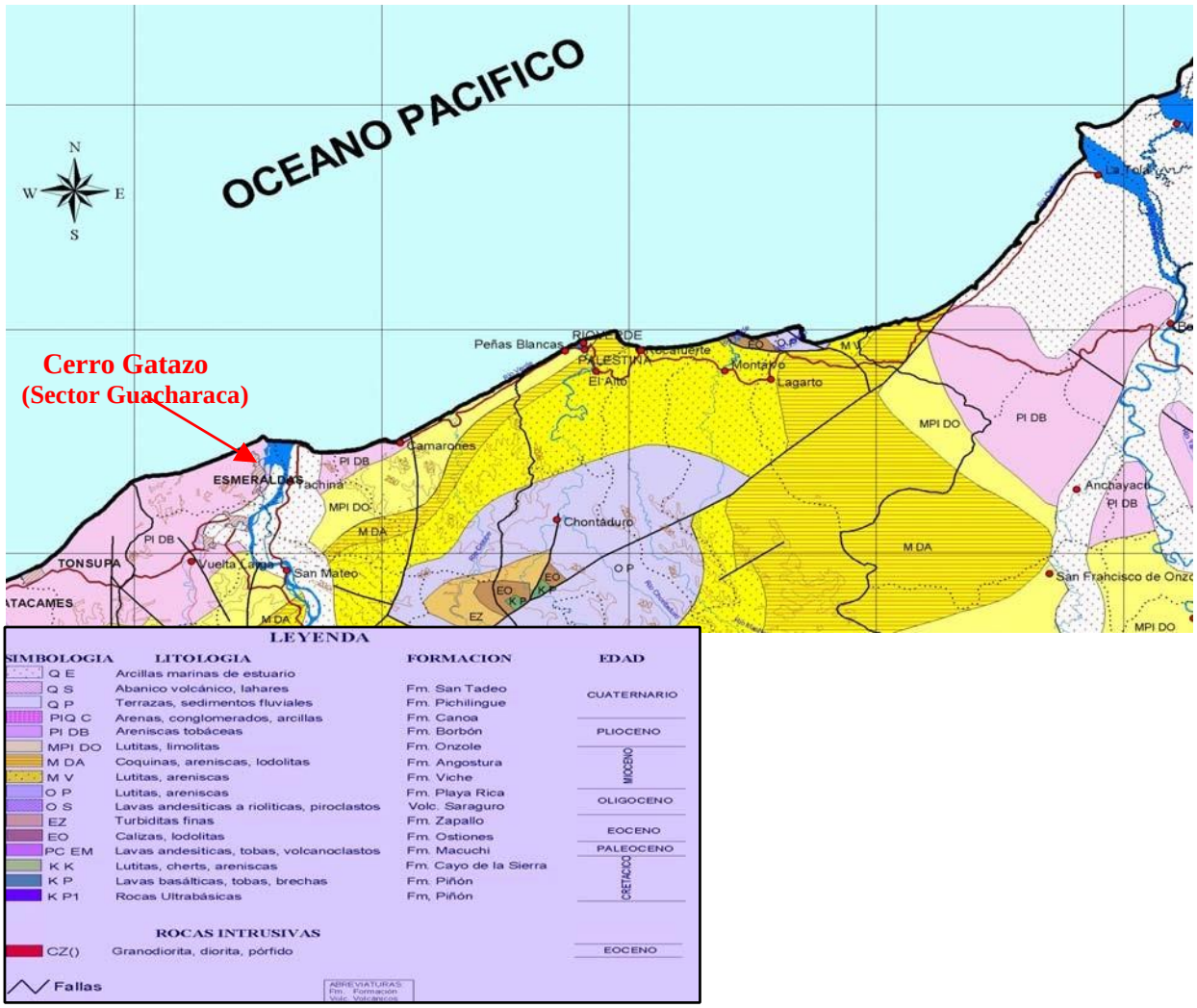
Within the survey area, lithologies are sedimentary, deposited and consolidated in an underwater environment, at the end of the Tertiary Period.

GATAZO HILL PROJECT AREA GEOLOGY ((Guacharaca)

MAPA PÁGINA 201 DOCUMENTO PDF

Gatazo Hill

(Sector Guacharaca)



Regional geology

A series of units are present within the extended survey area, such as the following:

Sandstone, limonites and conglomerates unit; fine-grained sandstone unit; sludge unit; conglomerate unit; boulder unit; silt-sandy materials to silty-loam unit; and recent alluvial deposits unit.

According to the geological survey carried out by TRICONSUL CIA. LTDA., In September 2008, and insofar Regional Geology is concerned, Esmeraldas city and its surroundings are located along a coastal strip of the Ecuadorian Coast, showing geological characteristics of a tectonic rise originating on account of the bearing of an inner wall of the oceanic fossa, both characteristics are in turn the outcome of the subduction of the Nazca oceanic plate below the South American continental plate. This situation gives the region in general and the site in particular the characteristics of a very dynamic area from a tectonic point of view.

Gatazo Hill and other high relief areas surrounding the city of Esmeraldas are formed by Pliocene-age rocks known as a whole as the *Onzole Formation,* which were formed from sedimentary deposits in a deep continental platform marine environment, and which soon were raised by the tectonic movements of the lithospheric plates.

In particular, the Gatazo hill is a high relief area, more than 260M height, located to the North of the Tiaone River confluence with the Esmeraldas River, and remains as the highest hill in the city, bearing up against the river erosion, making access through the South and into the city difficult over many years, until the access route through El Cabezón site was enlarged by means of large cuts into clay rocks in the eastern slopes of the hill Gatazo, which at the time caused serious s instability conditions along this route.

Local Geology

Stratigraphy

The entire Gatazo hill is formed by Pliocene Age´s Onzole formation rocks. The stratigraphic section of concern to this survey begins at a topographic platform located at approximately 100masl in the Northern part of the hill. At 120 masl at the NE end of the hill, an artificial widening of this platform is apparent resulting from the exploitation of a large quarry known as Gatazo quarry.

At the base of the sedimentary sequence there are a number of clusters and subordinate sandstones, the total thickness of which reaches 50M at their widest part. While compact, these rocks show a low cementation degree, and a weathering degree allowing for their removal with a mechanical shovel, except for some more consolidated sectors remaining in a "balls" shape after quarrying activities are carried out.

In their lower third, conglomerates are "dense flows" type, showing a coarse sandy matrix and grain heterogeneity with many angular rocks fragments; these conglomerates with grain-growing granulometry are present in some places, a fact confirming their similar origin in dense flows, and allows for them to be classified as "redeposited conglomerates" as defined by Walter; i.e., they are formed by gravels modelled in a fluvial environment that were carried down to great sea depths by means of high-density *turbiditical flows*. Towards the middle and upper part of these conglomerates clusters are found well-rounded clasts of andesitic and rhyolitic volcanic rocks, of varying sizes: from a few centimetres to 1dm. The occasional presence of marine fossils in these gravels (reported by a quarry worker) confirms that they were deposited in a marine environment.

These conglomerates are also found in some other sites, such as quarries or mines located to the South of the antennas in the Battalion Montúfar Mine, Southern side, and more towards the Southeast in the Cabaret Mine.

Friable sands, or sands, that are intercalated in the conglomerates are thick-to-very thick granulometry deposits, and they form lenticular channels of up to 1M thickness.

On top of the conglomerates, intercalations of *tobaceas* arcillolites and grey sands are found in decimetrics thicknesses which have been detected in geo-electrical probes with the generic name of *tuffs* due to their high competence and porosity. Their thickness is variable, reaching average values between 40M and 50M.

Overlying the tuffs are well-rolled white creamy to white clayey arcillolites gradating towards clays in the most superficial part by the weathering effect, as can be seen in geotechnical perforations mentioned in subtitle below, and representing the rocks making up most of the Gatazo Hill top.

5.2.1.2. Geomorphology

Stretching along some other coastal foothills, the Esmeraldas and Muisne basins appear as isolated depressions. They share many similarities:

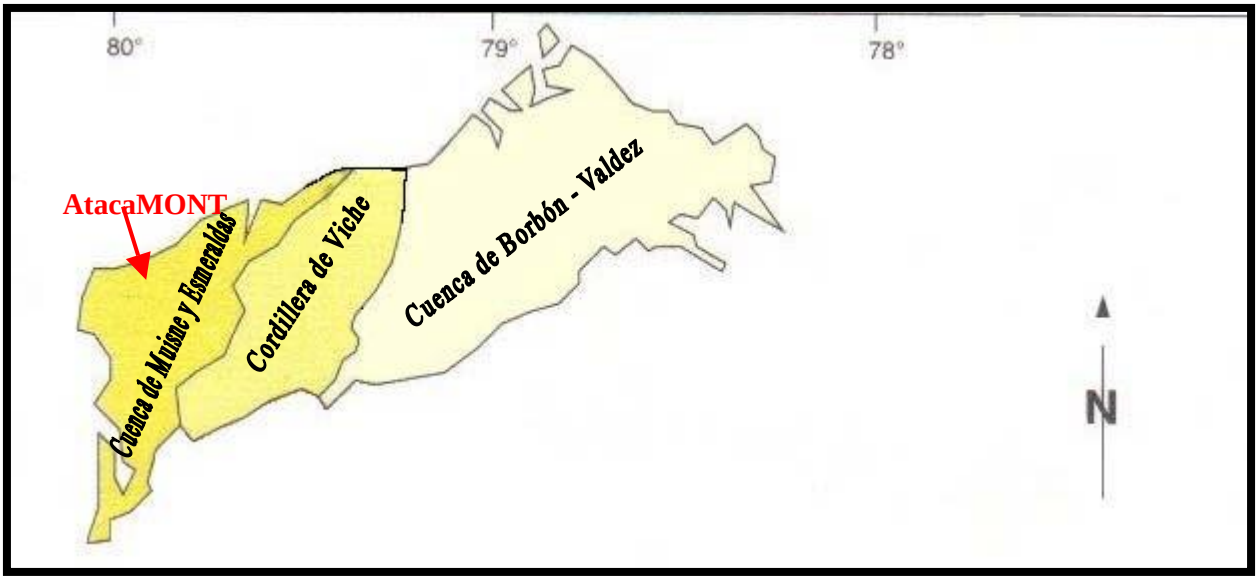
• Altitudes are always low, generally less than 100masl and gradually decreasing towards the shores.

• Reliefs are smooth-patterned, with small and medium-sized homogeneous convex-concave hills with moderate slopes.

• They are established on a substrate identical to that of above-mentioned reliefs: limonites and sandy clays, with some locally sandy intercalations.

The landscapes characteristics are presented as low hills, showing the basic brown, clayey soils of the Esmeraldas – AtacaMONTH basin.

GRÁFICA PÁGINA 205 DOCUMENTO ORIGINAL EN PDF



Muime & Esmeraldas Basin

Viche Mountain Range

Borbón – Valdez Basin

The Esmeraldas-AtacaMONTH basin has the shape of a 40Km almond from East to West, along a 15Km line from North to South, bounded on the West by the Atacama, and to the East by the Esmeraldas River valley cliffs.

The basin modelling is made up of low and middle height hills, at 10-150M altitudes, reaching the highest 200 masl along the sea edge to the West of Esmeraldas. The slopes, with a median close to 40% slope, are convex with a concave basal part.

Under climate conditions with a well-defined dry season, moderately deep clayey alterations are developed, while soils, with a moisture regime, are clayey brown. The accumulation of calcium carbonate, in the form of fine mycelia, is frequent in contact with the alteration horizon. This landscape also includes quite extensive valleys, a complex of sandy to silty terraces at the mouth of the Esmeraldas and the Teaone Rivers.

5.2.1.3. Soil Use

Soil in the Gatazo Hill, Guacharaca sector, is used in pastures crops, mining (rolling stone), native forest remnants, several subsistence crops, housing building of all types. This area is considered a marginal sector of Esmeraldas city.

5.2.1.4. Soils

Underdeveloped due to permanent washing and erosion, soils do not exceed 0.5m thick. Expansive clays are the most common in these formations, their expansion reaching 30% or 40% with respect to dry soil volume.

5.2.1.5. Climatology

The climate in the Esmeraldas Province is directly influenced by the Trade winds system, ocean currents, and El Niño phenomenon. The region is located in the "Equatorial Low Pressure Belt" between 30º N and 20º S latitudes, in the Intertropical Convergence Area(ITCZ), and is characterized by the presence of air coming from the hemispheres, giving rise to atmospheric perturbations areas. Climate can be considered as Tropical Monsoon and Tropical Humid Climate.

According to several climate-related surveys conclusions, the Ecuadorian coastal region is influenced by the presence of large masses of air and water, the displacements of which determine the region´s climate characteristics. When present in front of the Ecuadorian coast, the water and air masses generate heavy rainfall over the January to March period. But, as these masses of water and air move towards the North of the country, the dry season begins, running until November and December. Also, the influence of the Humboldt Current is accentuated, so that this current is responsible for relatively low temperatures prevailing in the region, low rainfall, and higher cloudiness from June to November.

The well-known El Niño Phenomenon brings about wide climate fluctuations, which can be described as an anomalous oceanographic condition in which the surface warms up, low salinity water moves towards the Southern region displacing the cooler waters having a relatively high salinity. This climate anomaly is sometime accompanied by similar sudden changes with the strength and direction of the wind, and it is associated with heavier rainfall in the coastal area generating substantial material losses having a severe impact on the region´s economy sectors and, in particular, on road infrastructure and hills sustaining large landslides.

Wind

The local wind speed mean is 5.08m/ s, showing little variability, because the region is located in the migration area of the Intertropical Convergence Area (ITCA) .....

TEXTO INCOMPLETO.. NT PÁGINA 205 EN EL ORIGINAL EN ESPAÑOL EN PDF

LOS TEXTOS EN LA PÁGINA SIGUIENTE (206) NO TIENEN ILACIÓN CON EL CONTENIDO DE QUE TRATA EL ACÁPITE ANTERIOR *WIND*

NO SE TRADUCEN NI SE INCORPORAN AL TEXTO EN INGLÉS

EL TEXTO EN INGLÉS CONTINÚA CON: 5.2.1.10. Hydrology, a continuación

5.2.1.10. Hydrology

The movements of air masses and marine currents of water in the Pacific Ocean determine the climate characteristics of the area and, consequently, the rainfall regime in the project´s area of influence.

Overall, during the December - June period, these masses move in a Southward fashion, showing strong rainfall which is characteristic of the humid season and, as these masses return in a Northward direction, the dry season begins, usually extending from July to November.

Mass movements are one of the most frequent phenomena linked with high-intensity precipitation which, in a short time, saturate the residual soil and weathered rock layers and, consequently, drastically modify the precarious stability conditions of many natural slopes and hillsides, so that the next heavy rains can trigger a gravitational movement of the different unstable areas **…… TEXTO INCOMPLETO (NT)**

The well-known "El Niño" Phenomenon brings about wide climate fluctuations, which can be described as an anomalous oceanographic condition in which the ocean surface warms, low salinity water moves towards the southern region, displacing the Humboldt Stream cold waters towards the Galapagos Province which shows a relatively high salinity. This climate anomaly is sometime accompanied by similar changes having the wind strength and direction, and is associated with heavier rainfall in the coastal area, generating substantial losses of materials having an adverse impact on the various economy sectors in the Region and in particular on road infrastructure.

The calculation of flow rates for the survey area was done through the rational method, i.e., for a total basin area of 3.65Ha: a flat area in the basin: 2Ha, and a sloping area in the basin: 1.65Ha. The maximum rainfall volume are found in the Hydrology survey of the area of influence.

The cyclical phenomenon of El Niño is deemed as one of the natural events having the strongest socio-economic and environmental impact in Ecuador. Areas at greatest risk are the low-lying area, with a very low to flat relief; the low alluvial terraces, and areas where the water table levels are very high, easily flooding even though having a permeable soil.

Mass Movements

Mass movements are one of the most frequent phenomena associated with high-intensity precipitation which, in a short time, saturate the residual soil and weathered rock layers, thus drastically changing the precarious stability conditions of many natural slopes, as well as the Gatazo Hill slopes, so that further heavy rains can trigger a gravitational movement of the different unstable areas in the Gatazo Hill, Gguacharaca neighbourhood, and several other sectors.

FOTOGRAFÍAS PÁGINA 208 TEXTO EN PDF

Source: Esmeraldas Civil Defence. Landslides, Las Palmas area, Gatazo Hill (1998).

Source: Civil Defence, Esmeraldas. Landslides, El Gatazo, Guacharaca Neighbourhood

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5.2.1.11. Short air characterisation

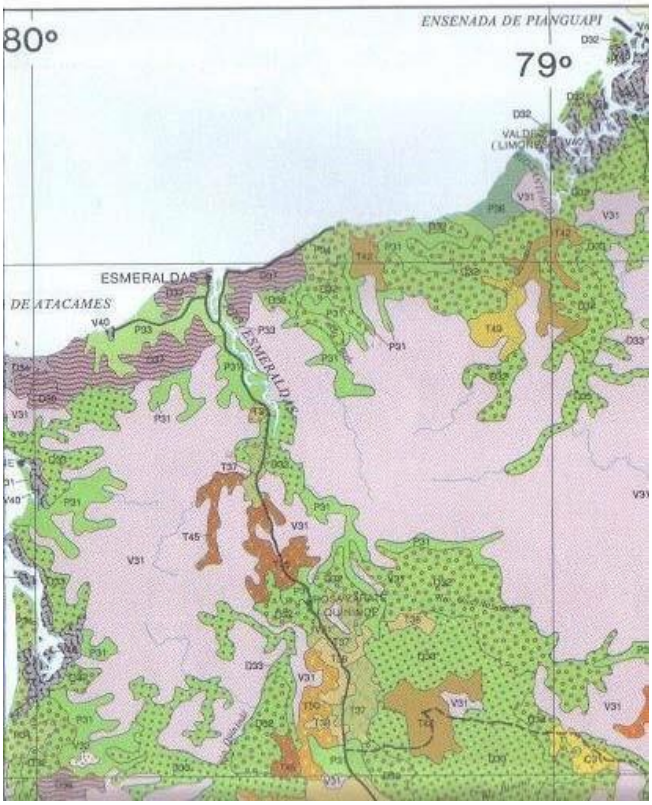
While no work has been undertaken within the project area on particulate matter and atmospheric pollution, we can consider that the air at 200masl, with winds coming in from the sea is undergoing a permanent renovation, so we can consider it to be of good quality. There is a likelihood for some pollution levels to be apparent because of traffic and ground movements in stone quarries, but these pollution levels are swiftly diluted by the presence of winds.

5.2.2. Biotic Component

5.2.2.1. Life Area:

According to Leslie R: Holdridge and Cañadas, a survey area has been identified on the Ecological Map of Ecuador as ***a very dry tropical forest (bmsT) life area*.**

The vegetative cover of this formation is as follows:



FUENTE: IGM

P23 = Pastures & cor

U37 = Pastures, some crops, relict forests

GRÁFICO PÁGINA 209 DOCUMENTO ORIGINAL EN PDF

Source: IGM

Cierra textos gráfico

According to Sierra (1999) the vegetation consists in lowland dry thicket

GRÁFICO PÁGINA 210 TEXTO ORIGINAL EN PDF

VEGETATION TYPES IN CONTINENTAL ECUADOR

Source: **CIFOP**: Pichincha Forest Engineers School in Ecuador

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5.2.2.2. Biodiversity

Forest Structure

a. Horizontal.- Highly intervened mixed and irregular secondary forest, no management of any kind has been implemented; very thick coverage in gallery sectors and at the hill top, showing lower density, a highly impacted area with pasture cover.

b. Vertical. - Three strata can be singled out in some areas with dense, lower, middle and higher cover due to little intervention. The forest as a whole has high impact anthropic sectors (vis-à-vis the primary forest).

Description of vegetative associations

The forest vegetation is characterized by the heterogeneity of the tree species, herbaceous epiphytes, shrubs, etc. This species variability in this life area and different habitats is due to human intervention with plants introduced to gather food. Notwithstanding the properties of the tropical forest, these vegetative associations correspond to secondary forests´ remnant forests, which are located mainly in gullies or drainages, while high-density forests grow in the Gatazo Hill, Guacharaca sector and the stone mine.

TABLE. 10-YEAR METEOROLOGICAL OBSERVATIONS RECORD

Source: Esmeraldas Station (INOCAR)

Latitude: 0º 59 '45' 'N
Length: 0º 79º 07 '' W
Height: 4 masl
Period: 1995 – 2004

AÑOS	Environment Temperature (ºC)	Maximum Temperature (ºC)	Minimum Temperature (ºC)	Relative Humidity (%)	Heliophony (horas)	Wind Speed (m/s)	Precipitation (mm)
2004	26.23	32.4	21.45	83.00	117.88	4.667	71.70
2003	26.00	31.4	21.88	83.00	115.92	4.750	77.96
2002	26.26	32.1	22.16	83.42	124.58	5.000	99.30
2001	25.61	31.5	21.93	82.58	131.30	5.417	27.417
2000	25,99	31.5	21.83	82.13	114.93	4.917	53.64
1999	25.54	31.6	21.70	83.46	123.51	5.667	101.82
1998	26.57	32.5	22.24	82.42	121.71	5.500	189.44
1997	26.56	32.5	22.03	81.67	144.-13	4.750	139.82
1996	20.40	31.3	22.00	82.33	127.23	5.000	40.41
1995	26.07	31.1	21.90	81.25	105.93	4.417	61.96
∑	255.23	317.9	219.12	825.26	1227.12	50.085	863.47
Yearly Media	**25.523**	**31.79**	**21.912**	**82.53**	**122.712**	**5.009**	**86.35**

Source: Esmeraldas Station (INOCAR) **Layout: Eng. Alfredo Arévalo Tello M.Sc**

Average Wind Direction: S – SW –S

5.2.1.6. General Hydrography

The Esmeraldas River is the main water source, with a 21,166 km2 drainage area, main channel length 325Km, annual water deficit 100 mm, yield l / s 50.50, average flow generated m3 / s 1,069.5, average flow available m3 / S 1,021.30. The Esmeraldas River carries large amounts of sediment, silt and sand, solid waste (wood). pH is 7.5; raw water hardness is 26. 50 ppm according to laboratory tests. Water is loaded with pathogens (coliforms, fungi, etc.).

The Teaone River flows reach $60M^3$, and its sub-basin is located in the region where the Slopes Stabilisation project is scheduled to be executed. The river flows into the Esmeraldas River basin. The Teaone River, with tributaries on the right bank, the Huele River, and drainage into the Teaone River, the Tabiazo River on the left bank, and drainage into the Teaone River. Hydromorphy: None. Flooding in the project area: None. Drainage: Moderately well drained.

5.2.1.7. Landscape (Characterisation)

The identification of landscape units is a very useful tool to achieving a sustainable management of the territory. An in-depth knowledge of the area is secured, and a zoning according to its biophysical characteristics is obtained, with the relevant benefit of focusing development on those characteristics, besides the possibility of restoring the most significant visual impacts.

To begin with: human settlements have been and are being done in high-risk areas, have no environmental management and are generally located in areas degraded by human activities. Further, those settlements also contribute to the degradation of the environment.

HoMONTH built in areas corresponding to the Esmeraldas River channel

HoMONTH built along the hill slopes on unstable soils

Having a quality landscape is a goal ingrained in any treatment to recover a degraded space, without forgetting the fact that most of the perception is made by sight.

Human activities throughout the Gatazo (La Guacharaca) area show general morphology alteration, or significant relief forms, loss or change in native vegetation, incorporation of visual elements (antennae), obliteration of harmony, accumulation of solid waste, significant changes in the landscape singularity, changes in Nature, introduction of geometric forms as substitution of nature´s own shapes for lines, production of punctual wounds (quarry), while human dwellings are set up on a very fragile soil.

Landslides occur in many low and middle height hills with altitudes close to 100 -266.75masl near the antennas location and the sea edge, in the western area of Esmeraldas. Areas close to the sea in

Balao show steep slopes, erosion due to runoff and landslides is one of the most dangerous event in these soils. The spoilage of the landscape aesthetics is a most serious concern.

Exclusively, for the direct influence area:

5.2.1.8. Land topography

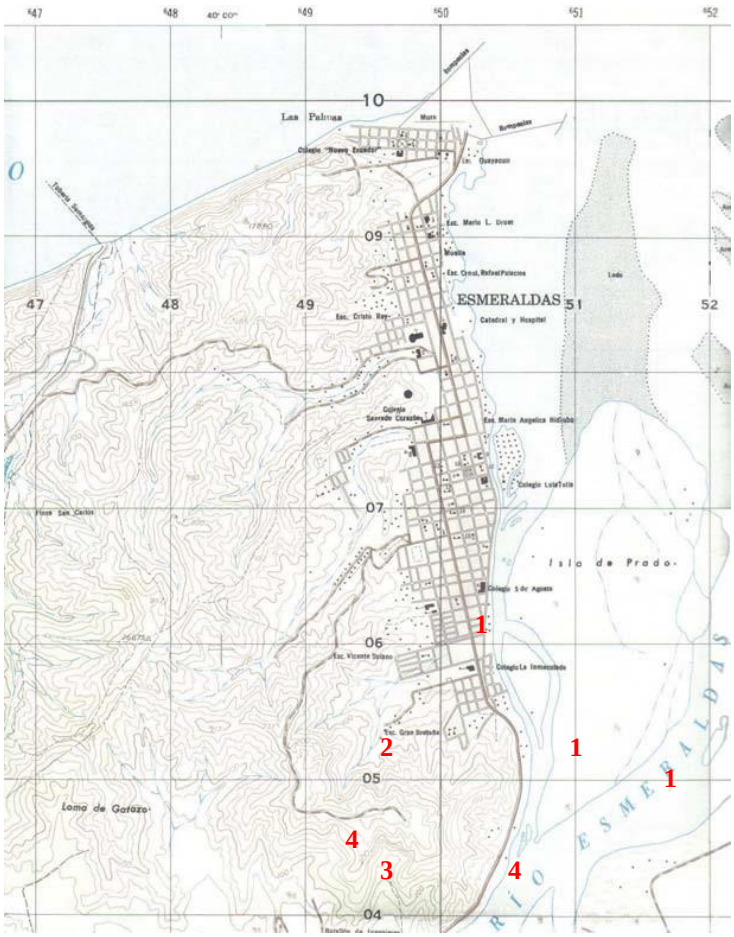
A terrain showing steep slopes and an irregular shape. The landslides area corresponds to a Gatazo Hill sector in La Guacharaca neighbourhood, in the city of Esmeraldas, located at an approximately 230masl elevation, and the lower section is located at an average 130masl elevation. Its slopes are a high-risk area due to its instability; the contour lines are at 20M, the highest altitude in the area is 266.75masl.

Slopes impaired by landslides have descents averaging 40º to 45º; the largest landslide located in the West has left a batter with a slope higher than 65º.

In the surroundings of the Guacharaca sector, from the top of the Gatazo hill to the bottom, a large number of drains (gullies) of different sizes are present, some of them used for house building purposes.

Failures are apparent in all sector in the Gatazo Hill, which are causing landslides processes, three of them already under way.

SLOPES STABILITY



SLOPES AS RECORDED IN THE AREA

1	Stable areas, flat and undulating surfaces, with smooth slopes of less than 12%
2	Average stability area, with dominant slopes ranging between 12 and 70%
3	Unstable areas, consisting of hills with medium to high gradients, moderately dissected, generally rectilinear slopes, with dominant slopes higher than 40%
4	Very unstable areas, where the high and very high heterogeneous hills and very dissected slopes are rectilinear with slopes having a 100% likelihood for the occurrence of landslides.

5.2.1.9. Physical soil characteristics

Clayey, gravelly, dry, vertics and calcareous soil. Soils of this kind show a high degree of pedogenic development, with an organic mineral horizon (A1) on the surface. **(¿TEXTO INCOMPLETO?)**

5.2.2.3. Floristic inventory:

FLORA

Table. Some flora species in Gatazo Hill La Guacharaca Neighbourhood

FAMILY	SCIENTIFIC NAME	*COMMON NAME*
ANACARDIACEAE	*Spondias mombin* ***L.***	Obo de monte
	Spondias purpurea L.	Obo coMONTHtible
	Magnifera muricata L.	Mango
ANNONACEAE	*Annona muricata L.*	Guanábana
BOGNONTACEAE	*Tabebuia chrisantha (Jacq.) G, Nicholson*	Guayacán de costa
	Crescentia cujete L.	Mate
	Tecoma castanifolia (D.Don Melch.	Muyuyo de montaña
BOMBACACEAE	*Ochorma pyramidale (Cav. Ex Lam) Urb.*	Balsa
	Pseudobombax millei ***(Standl.) A. Robins***	Beldaco
	Momordica charantia L.	Achochilla
	Croton fraseri ***Müll. Arg***	Chala
GRAMINAE	*Panicum MAXIMUM*	Saboya
	Paspolum fasciculatum	Grama
	Paspolum notatm	Grama
BORAGINACEAE	*Corda alliodora (R.&P) Open Laurel*	Laurel
	Cordia lutea, Lam.	Moyuyo
	Cordia hebeclada I.M. Johnst.	Guacharaco
ASTERACEAE	*Vermonymthura patens (Kunth) H. Rob.*	Chilca
CONVOLVULACEAE	*Menimia qauinquefolia (L.) Halier F.*	Batatilla
FLACOURTIACEAE	*Muntingia calabura L.*	Nigüito
MALVACEAE	*Sida acuta Burm.*	Escobilla
	Sida rombifolia L.	Escobilla
MISOSACEAE	*Leucaena leucocephala (Lam) de Wit.*	Leucaena
	Mimosa pigra L.	Uña de gato
MORACEASE	*Ficus máxima*	Higuerpin de montaña
	Coussapoa sp.	Matapalo
PIPERACEAE	*Piper aduncum*	Cordoncillo
	Photomorphes peltata	Santa María
STERCULIACEAE	*Guazuma ulmifolia, Lam-*	Guázimo

Most Wildlife species have been obliterated from the area due to urban development. Some of these species are:

Reptiles: Mata caballo (*Boa constrictor*), Equis (*Bothrops atrox*), Verrugosa (*Lachesis muta*), Coral (*Oxyrhopus petola*), Coral (*Micrurus sp*), Mialo (L*eptophis ahaetllu bocourti*), Platanera (*Imatodes inornatus*), Pudridora (*Amphisbaena fuliginosa*), Lagartija (*Stenocercus sp*), Iguana (*Iguana iguana*), **Birds**: Pigeons: Paloma tierrera (*Columbina talpacoti*), Garrapatero (*Crotophaga Ani*). **Mammals:** Opossum, Fox (*Didelphys marsupials*), Rat (*Rattas saltos*),

¿INCOMPLETO? NT

5.2.3. Socioeconomic Component:

General area of influence

The Esmeraldas province is located in the farthest Northern-Western side of Ecuador, being the most Northern region in the country, and stretching over a 15,216Km2 area.

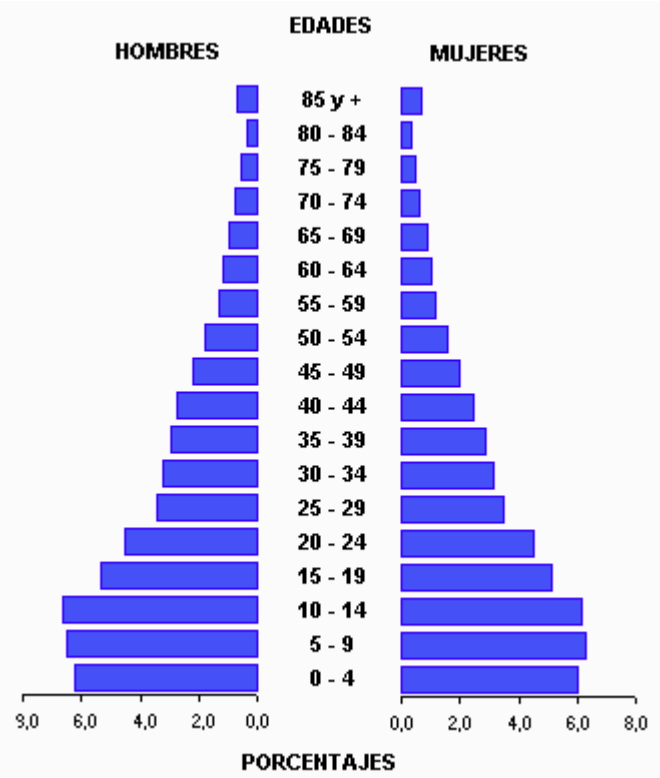
Population

***SOURCE*:** INEC (National Statistics and Censuses Institute), National Population and Housing Census 2001 - 2002

Table and chart below show population and housing surveys in the Esmeraldas province, according to the 2001 Census final figures.

ECUADOR AND ESMERALDAS PROVINCE POPULATION (1950-2001 CENSUS)			
YEAR	**ECUADOR**	**ESMERALDAS**	**%**
1950	3.202.754	75.407	2.4
1962	4.564.080	124.881	2.7
1974	6.521.710	203.151	3.1
1982	8.138.974	306.777	3.1
1990	9.697.979	306.777	3.2
2001	12.156.608	385.223	3.2
Percentage figures (%) show the province population share vis-a-vis the country as a whole			

POPULATION PYRAMID 2001 CENSUS



Men Ages Women

Percentages

ESMERALDAS: EVOLUTION OF THE URBAN AND RURAL POPULATION 1960 – 2001 Census						
Population	**1950**	**1962**	**1974**	**1982**	**1990**	**2001**
Percentage (%)						
Urban	20	32	36	48	44	41
Rural	80	68	64	52	26	59

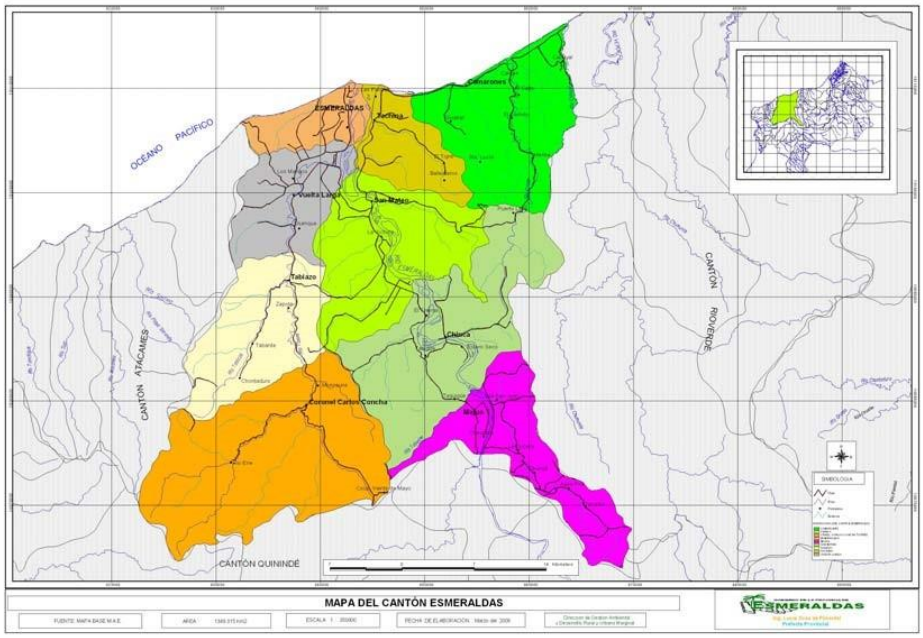
The annual growth rate of the city of Esmeraldas is 7.78%. Population: 135,145 inhabitants.

Socioeconomic survey of population impaired by landslides in the Gatazo´s La Guacharaca sector

A survey of the social and economic level, and the bearing of impacts on families living in the Unión and Progreso Alto Sectors (La Guacharaca), at the foot of the Gatazo Hill, can be found in Sociologist José-Luis Yagual report.

Political-administrative division

Esmeraldas is the provincial capital, located at the mouth of the Esmeraldas River. The Esmeraldas canton´s territory is made up of five urban parishes and eight rural parishes as shown in rural parishes map below.



5.3. PROJECT DESCRIPTION

5.3.1. *Project Location*

MARCAR LAS ZONAS DE RIESGO EN ROJO

Source: IGM Chart

Table below shows the geographic co-ordinates location of the survey area:

Geographic Location:

PROJECT CO-ORDINATES (Probe Points)

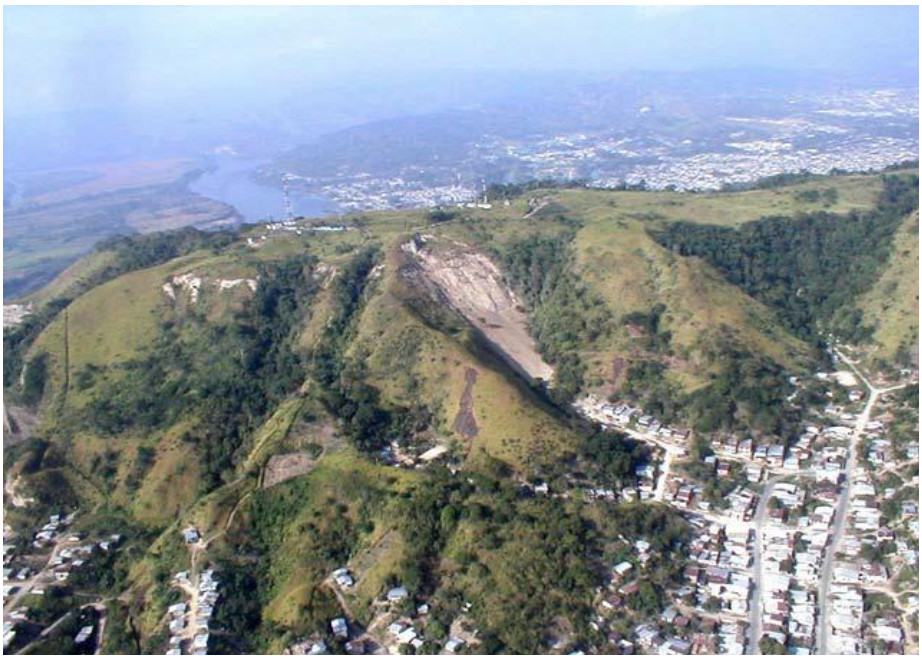
SITE	NORTH	EAST
Gatazo (antennae) Guacharaca Sector Probe points	104769 104735 104742 104773 104810	17 649571 17 649658 17 649736 17 649666 17649662

Four landslides have been recorded in the (specific) survey area. Table below shows their geometric characteristics:

GEOMETRIC CHARACTERISTICS

Landslide	Height M	Length M	Width m	Slope Degrees (*)	Mobilised mass m^3 Previous	Current
A	40	140	70	33	99.000	13.677
B	35	80	40	24	37.000	4,257
C	20	100	50	12	48.000	8.697
D	16	80	50	12	14.000	7.300
TOTAL					**198.000**	**33.931**

The area landslides are recorded in belongs to the Gatazo hill sector in the Guacharaca neighbourhood, Esmeraldas city, at an elevation of approximately 230 masl and the lower landslide section is on average at 130 m.a.s.l.



MARCAR EN ROJO LAS SEÑALES

5.3.2. Project Rationale

The substantial environmental degradation process of Gatazo Hill throughout the territory surrounding the city of Esmeraldas is an aftermath of a swift-pace growth, a high environmental fragility, and a low capacity for self-recovery.

The threat the Gatazo Hill is posing with its unstable slopes and permanent rotational type landslides represents a serious risk to the life and health of the city inhabitants the hoMONTH of which are located at the foot of the hill. The location of some 111 hoMONTH makes them prone to affectation, and families should be urgently evacuated to a safe place.

The recovery of the Guacharaca sector in the Gatazo Hill, Esmeraldas city, intends the environmental revaluation of the area to meet the expectations of the population and activities undertaken in the surrounding area. An outdoor leisure area for the population is an idea that should be made into a reality throughout the rehabilitated area and the area adjacent to the project.

This demand for service should be addressed by the City of Esmeraldas, taking advantage of investments scheduled to be made, and projecting a basic design towards the ecological use of this sector, together with a potential for self-financing for its sustainability, and the creation of work sources.

5.3.3. Construction Methodology

This Environmental Impacts Assessment will be carried out in accordance with the construction methodology put forward by TRICONSUL, which can be modified by the developer according to his / her criteria, equipment, technology and working schedule.

Activities as below have been scheduled to be initially implemented:

- Camp construction and operation, once stakeout and levelling have been implemented, and execution of works in the access roads.

- Removal of the vegetal layer in the work area, its disposal in a temporary storage place for reuse in revegetation works.

- Cutting and dislodgement work should be done for slope reconfiguration, and should follow a top-to-bottom fashion, so that the soil cutting and removal will decrease the weight on the slopes and, then, the slopes soil at the bottom is removed. This work should be done with suitable equipment, such as backhoes and dump trucks.

- The drainage system should then be constructed, trying to avoid the excavation work from destabilizing the slopes. The system should be built up in stretches of no more than 6m length. Specialized equipment such as backhoes should be used.

- Construction of the anchoring system should be scheduled to be inserted into the previous works, once the slopes have been reshaped and probes have been undertaken and tensioners and plates have been set up. This work should be carried out with specialized equipment such as a pneumatic or mechanical drilling machine, equipment support crane, and moving of materials and work elements. A monitoring system should be in place at the time surveys are being conducted to ensure that the hard shale soil is drilled down to a at least 8M depth.

- Once anchors and the drainage system have been set up in place, the ditches and the external drainage system construction work should be undertaken.

- Revegetation works should be scheduled to be carried out in the rainy season to ensure their efficiency, or a constant water system should be available for maintenance.

- Reforestation works should be planned to be simultaneously implemented in the upper and lower areas, and a maintenance process and timing schedule should be in place.

- Mitigation and environmental monitoring plans should be taken into account during all construction work on stabilisation systems.

5.3.3.1. Specifications

Project specifications regarding materials and project items´ construction modality will be those as spelled out in the **MOP 001 F 2002 Handbook**, according to the denomination of items in the quantities listing and the budget.

Each and every issue related to legal and environmental provisions should be taken into account.

The excavation material should be disposed of at the site designated by the Municipality.

- INITIAL WORKS

Camp building and operation

201-01. *Description*.- These are provisional constructions and related works that the Contractor should carry out to provide for accommodation and comfort for the implementation of work activities by technical and administrative Staff (Contractor´s, Audit´s and workers´ in general).

201-02. *Working Procedure*.- In overall, camps should be provided with sanitary facilities as required, according to Public Health regulations in force, and contractual requirements.

201-02.1. *Location*.- The design and location of camps and their facilities should be such as to not polluting surface waters or underground drinking water sources and should in any case be previously approved by the Inspector.

In no case should camp and facilities be located within ecologically sensitive areas, in protected or endangered biotic species (flora and wildlife) habitats, in places with a high water table, or risks due to instability of soils, and others.

201-02.2. *Installation*.- Land clearing, landfills, and vegetation removal in the area should be avoided as much as possible. Camp buildings may be of the fixed, removable or mobile type at the Contractor's option, unless a particular type is specified in environmental specifications.

201-02.3. *Operation*.- Camps should meet sanitary, hygienic, recreational and safety requirements; thus, suitable systems for water supply, waste disposal, lighting, fire extinguishing equipment, medical service and / or nursing (in line with their greater or lesser distance to populated centres), library, entertainment sites and means, informational and precaution accidents and fire signalling.

201-02.4. *Dismantling and environmental recovery*.- When camps are erected, areas on which they were settled down, as well as the natural drainage systems, should be restored according to conditions in the place prior to their installation and occupation.

The Contractor shall be required to remove all signs of occupation of the place, such as scrap, debris, fencing, electrical and sanitary installations, structures and their respective foundations, pedestrian and vehicular roads, parking lots, etc. All wells should be filled up, and the soil should be decomposed so as to restore the vegetation cover.

Access roads

202-01. *Description*.- These are temporary roads constructed to move personnel to workplaces, for transit of vehicles and the Contractor´s and Inspector´s machinery to the work fronts, materials and supplies sources, or to other sites within the worksite, endeavouring for these tasks to be implemented with a limited budget and with restrictions in the clearing, earth movement, and affectation to natural watercourses.

202-02. *Working procedures*.- Access roads will be built with suitable equipment and materials, and the prior approval of the Inspector, who should approve overall construction details.

Slope, layout, drainage, and tread layer characteristics suitable for normal transit of equipment and construction vehicles should be in place. Its layout should conform to the natural terrain contours so as to minimize cuts and embankments. The width of access roads shall be the minimum required (4.5M), as well as the curvature radii (15M), with a maximum 15% longitudinal gradient, in order to provide safety conditions and the lesser possible impact on the environment. Drainage of these accesses will be a key aspect to be taken into account in the layout and construction, as this depends on road stability; sewers entrances and exits should be properly protected, as the Inspector may request.

The Contractor shall be solely responsible for maintaining these accesses in a good transitability and safety condition over the duration of the construction of road works. The relevant day and night signalling shall be put in place in order to safeguard traffic safety, with a particular concern for detours and maximum traffic speed (40km / h).

EE-1 Staking out and Levelling

Description.- This work involves the revision of the preliminary project stakeout references, and keeping them in place throughout the project, to carry out the entire project stakeout as the different activities are being carried out. All plans including the profiles should be drawn up prior to the execution of the works, and should be previously approved by the Inspector. The alignments, dimensions and slopes should be monitored for a sound execution of works.

Working Procedure.- The milestones and stakes shall be placed and kept on site for verification. All works will be measured and monitored on the basis of these milestones and stakes, and the work measurements for payments will be made.

Equipment required.- Totally calibrated theodolites, levels or stations will be used to ensure proper work results.

Measurement.-All works described in this section will be measured per each area square metre, on a horizontal plane, in accordance with global amounts included in the contract.

Payment.- Amounts as determined will be paid according to constant unit prices stipulated in the contract and include all materials, equipment and personnel necessary for a comprehensive execution of the item.

• STABILISATION

EE-2 SLOPES FORMATION

Description.- This work involves all cuts in slopes necessary to obtain the geometries as determined in drawings in line with alignments and dimensions defined therein.

Working procedure.- Cuts should be made from top to bottom, i.e., being the slopes a floor structure subject to failure, because the weight is increased at the top, or weight is lost at the bottom, works

should be executed by completing each slope in an horizontal way before continuing in the next lower slope. The materials resulting from the cuts should be immediately disposed of outside the work area, in the lower part of the city, by the access path to the place arranged by the Inspector. The Municipality of Esmeraldas has authorized disposal of this material in the Chamera Lagoon sector.

Equipment required.- Excavators and dump trucks should be used for cuts to be made, and to load waste materials *in situ* for further disposal.

Measurement.- Works described in this section will be measured by m^3 of all global amounts as set forth in the contract. Measurement will be made of volume difference as determined in planimetry and altimetry parametres in drawings made before and after the cuts were made.

Payment.- Amounts as agreed upon will be paid according to unit prices as set forth in the contract, and they include all materials, equipment and personnel necessary for the total execution of the item, and the removal of the materials to the place approved by the Inspection.

EE-3. STABILISATION ANCHORAGE - LENGTH 30m

Description.- Construction of a concrete-filled cylindrical excavation with a tensioner warranting at least 65Tn admissible external voltage and a 105Tn breakage, and externally supported on a concrete plate, as described in drawings, f 'c = 280 kg /cm^2. The contractor will provide an anchorage system warranting the required tension. The anchorage should be arranged in the place shown in the drawings and at the inclination shown therein.

Working procedure.- Performing a 15cm diametre and 30M length drilling at least that ensures that 8M has been drilled down the hard ground type tobas described in surveys and approved by the Inspector. A tensor system with a length similar to that of the probe will be placed in the hole warranting the required tension and the 10M metres deeper will be filled with grout-type concrete of high expansive resistance and finished up with f' c = 280 Kg /cm^2 concrete.

Equipment required.- Probes are performed with specialized equipment, mechanically or hydraulically driven drills with compressors. Holes will be filled by mortars injection in lengths shown. The concrete slab will be constructed with concrete prepared in plant or *in situ*. The anchorage tension will be applied with a specialized mechanical or hydraulic equipment, measuring the tension applied.

Measurement.- Works described in this section will be measured by complete unit according to global amounts included in the contract.

Payment.- Relevant amounts will be paid according to unit prices stipulated in the contract, and include all materials, equipment and personnel necessary for the total execution of the item.

EE-4. REHABILITATION OF THE CITY SEWER SYSTEM

Description.- The rehabilitating of the City sewage system according to the requirements and needs as set forth in requirements.

EE-5 REFORESTATION AREA, 1 NIN TYPE TREE (NEEN) EACH 9m²

Description.- Reforestation of 6Ha of land: 3Ha at the top of the landslides location, and 3Ha at the bottom of this area. NIN-type trees will be planted, one per each 9 square metres, and one-year maintenance should be ensured.

Working procedure.- The work should warrant the indefinite existence of the trees by means of shade maintenance techniques.

Equipment required.- The equipment required should be that needed for soil preparation and planting of trees, warranting the efficiency of works to be executed.

Measurement.- This shall be made by Hectare, or a partial measurement of the area sown on an horizontal plane.

Payment.- Amounts determined will be paid according to unit prices stipulated in the contract and include all materials, equipment and personnel necessary for the total execution of the item.

EE-6 WASTE DUMPING SITE

Description.- The construction of a waste dumping site for construction materials, and should be located outside the work area.

Working procedure.- A 3M at least, and a 1.5M^2 area will be dug out in a stabilized area in the ground, and over the excavation a light wooden structure will be built up that can be removed at the end of the works. The construction drawings should be submitted to the Inspector's approval.

Measurement.- Measurement shall be thoroughly completed, in accordance with the Inspection decision.

Payment.- Works described in this section will be measured by complete unit according to the global amounts included in the contract.

EE-7 BIODEGRADABLES

Description.- The collection of all natural materials present in the worksite prior to the beginning of the construction, and that should be removed outside the work area.

Measurement.- Measurement shall be thoroughly completed, in accordance with the Inspection decision.

Payment.- Works described in this section will be measured by complete unit according to the global amounts included in the contract.

EE-8 LATRINES

Description .- Construction of a pit for human organic materials to be located outside the work area.

Working Procedure.- An excavation of at least 3 m3, and an area of 1.5 m2, in a stabilized area of the ground a light wooden structure will be built hat can be removed at the end of the works. This construction should be submitted to the Inspector's approval.

Measurement.- Measurement shall be thoroughly completed, in accordance with the Inspection decision.

Payment.- Works described in this section will be measured by complete unit according to the global amounts included in the contract.

5.3.3.2. **Budget**

CORPOECUADOR UNIT PRICES

CORPECUADOR.- GATAZO HILL SLOPES STABILISATION					
Updated to September 2008					
Esmeraldas City					
Item code	**Item Description**	**Unit**	**Quantity**	**Unit Costs**	**ITEM VALUE**
	1 INITIAL WORKS				
201-(1)	Camp & related works	Glb	1.00	14,978.000	14,978.00
	Access roads				
EE-1	Stakeout & Levelling	M2	12,000.00	0.217	2,600.52
308-2(1)	Finishing of existing basic work	M2	12,000.00	0.952	11,429.52
403-1	Sub base Class 3 slope higher than 6%	M3	2,400.00	14.148	33,954.96
309-6(5)	Base, sub-base transport, crushed material, loan screening, & others D/L (D/L=O km)	m3-Km	24,000.00	0.326	7,824.00
307-3(1)	Gutter excavation	M3	3,200.00	3.039	9,724.80
	2 STABILISATION				

	Slope formation				
EE-1	Stakeout & Levelling	M2	36,495.00	0.217	7,908.83
302-1	Clearing, deforestation & cleaning	M2	36,495.00	0.559	20,400.71
EE-2	Slope formation & clearing	M3	33,933.46	7.688	260,896.28
	Sub drains				
307-2(1)a	Excavation & filling for structures, with selected imported material	M3	8,456.00	8.343	70,548.41
606-1 (1a)	Piping for subdrains 150 mm	M	2,114.00	13.785	29,141.84
606-1 (1b)	Geo-membrane coating Table 822.2.1	M2	4,228.00	2.741	11,587.84
402-8 (1)	Geo-membrane coating Table 402.8.1	M2	4,228.00	4.145	17,523.95
606-1(2)	Filtering Material	M3	2,114.00	13.881	29,343.87
	Slopes top gutters				
307-3(1) a	Gutter excavation, manual excavations for gutters, top gutters, drenches	M3	2,114.00	5.896	12,464.14
402-8 (1)	Geo-membrane coating Table 402.8.1	M2	5,580.96	4.145	23,131.62
503(2)	Class B Structural Portland Cement (180 Kg / cm2), for gutters	M3	311.18	198.325	61,714.77
	Slope protection				
206 (4)	Geo-synthetic blankets including seeds	M2	21,140.00	11.626	245,773.64
	Anchorage				
EE-3	Anchorage for stabilisation Average length. 25 m	U	645.00	1,292.151	833,437.13
	External drainage				
307-2(1)	Excavation & filling Drainage piping (I/T)	M3	8,456.00	8.343	70,548.41
606-1 (1a)	Drainage piping 150 mm	M	2,114.00	13.785	29,141.84
307-3(2) a	Gutter excavation	M3	656.00	5.896	3,867.78
402-8 (1)	Geo-membrane coating Table 402.8.1	m2	1,443.20	4.145	5,981.69
503(2)	Class B Structural Portland Cement (180 Kg / cm2), for gutters	m3	73.47	198.325	14,571.33
	3 REHABILITATION OF THE CITY SEWER SYSTEM				

EE-4	Uptake No. 1 & Lenghtening of Pipes	Glb	1.00	57,000.000	57,000.00
EE-4	Uptake No. 2	Glb	1.00	23,500.000	23,500.00
EE-4	Uptake No. 3 & Lenghtening of Pipes	Glb	1.00	87,000.000	87,000.00
	4 ENVIRONMENTAL MITIGATION				
220-(1)	Awareness-raising Talks	U	10.00	315.00	3,150.00
708-5(1)AEb	Warning Signage	Glb	25.00	109.80	2,745.00
708-5(1)AEb	Informational Signage	Glb	10.00	109.80	1,098.00
EE-5	Reforested area 3Ha type NIN trees (NEEN)	Ha	3.00	25,000.00	75,000.00
EE-6	Waste pit	Glb	1.00	2,500.00	2,500.00
EE-7	Biodegradables	Glb	1.00	10,000.00	10,000.00
EE-8	Latrine	Glb	1.00	1,500.00	1,500.00
				TOTAL DIRECT COSTS	2,091,988.88
				DIRECT INDIRECT COSTS 22%	460,237.55
				TOTAL COST	2,552,226.44

5.3.3.3. Schedule with CORPECUADOR prices

The time for the execution of the work in the schedule is 12 months: Ten months for the specific stabilisation works, and two additional months for works pursuant to contractual terms for sewerage rehabilitation and revegetation and reforestation.

CORPOECUADOR – STABILISATION OF GATAZO HILL SLOPES
RATED TIMELINE

Number	Item Description	Unit	Amount	Unit Price	Total Price	EXECUTION TIME 12 M MONTHS			
						MONTH 1	MONTH 2	MONTH 3	MONTH
	1 INITIAL WORKS								
201-(1)	Camp & related works	Glb	1.00	11,470.93	11,470.93	100.00%			
						11470.93			
	Access roads								
EE-1	Stakeout & Levelling	M2	12,000.00	0.26	3,172.63	100.00%			
						3172.63			
308-2(1)	Finishing of existing basic work	M2	12,000.00	0.41	4,892.64	100.00%			
						4892.64			
403-1	Class 3 sub-base,higher than 6% slope	M3	2,400.00	7.45	17,874.01	30.00%	70.00%		
						5362.20	12511.81		
309-6(5)	Base, sub-base transport, crushed material, loan screening, & others D/L (D/L=O km)	m3-Km	24,000.00	0.25	6,090.24	30.00%	70.00%		
						1827.07	4263.17		
307-3(1)	Gutter excavation	M3	3,200.00	1.85	5,934.08		100.00%		
							5934.08		
	2 TABILISATION								
	Slope formation								
EE-1	Stakeout & Levelling	M2	36,495.00	0.26	9,648.77			20.00%	20.00%
								1929.75	1929.75
302-1	Clearing, deforestation & cleaning	Ha	3.65	300.17	1,095.48			50.00%	50.00%
								547.74	547.74
EE-2	Slope formation & clearing	M3	33,933.46	9.38	318,293.46			10.00%	15.00%
								31829.35	47744.02
	Sub drains								
307-2(1)a	Excavation & filling for structures; with selected imported material	M3	8,456.00	6.45	54,542.38				
606-1	Piping for	M	2,114.00	16.82	35,553.05				

(1a)	subdrains 150 mm								
606-1 (1b)	Geo-membrane coating Table 822.2.1	M2	4,228.00	3.34	14,137.17				
402-8 (1)	Geo-membrane coating Table 402.8.1	M2	4,228.00	5.06	21,379.22				
606-1(2)	Filtering Material	M3	2,114.00	9.15	19,341.19				
	Slopes top gutters								
307-3(1) a	Hand-made Gutter excavation, top gutters & channelling	M3	2,114.00	5.99	12,671.88				10.00% 1267.19
402-8 (1)	Geo-membrane coating Table 402.8.1	M2	5,580.96	5.06	28,220.58				 0.00
503(2)	TClass B Structural Portland Cement (180 Kg / cm2), for gutters	M3	311.18	143.01	44,501.20				 0.00
	Slope protection								
206 (4)	Geo-synthetic blankets including seeds	M2	21,140.00	14.18	299,843.84				 0.00
	Anchorage								
EE-3	Anchorage for stabilisation Average length. 25 m	U	645.00	1,576.42	1,016,793.30				10.00% 101679.3
	External drainage								
307-2(1)	Excavation & filling Drainage piping (I/T)	M3	8,456.00	6.45	54,542.38				10.00% 5454.24
606-1 (1a)	Drainage piping 150 mm	M	2,114.00	16.82	35,553.05				10.00% 3555.30
307-	Gutter excavation	M3	656.00	5.99	3,932.24				

3(2) a									
402-8 (1)	Geo-membrane coating Table 402.8.1	m2	1,443.20	5.06	7,297.66				
503(2)	TClass B Structural Portland Cement (180 Kg / cm2), for gutters	m3	73.47	143.01	10,507.08				
	3 REHABILITATION OF THE CITY´ SEWER SYSTEM								
EE-4	Uptake No. 1 & Lenghtening of Pipes	Glb	1.00	69,540.00	69,540.00				
EE-4	Uptake No. 2	Glb	1.00	28,670.00	28,670.00				
EE-4	Uptake No. 3 & Lenghtening of Pipes	Glb	1.00	106,140.00	106,140.00				
	4 ENVIRONMENTAL MITIGATION								
220-(1)	Awareness-raising Talks	U	10.00	384.30	3,843.00	10.00% 384.30	10.00% 384.30	10.00% 384.30	10.00% 384.30
08-5(1)AE	Informational Signage	Glb	25.00	133.96	3,348.90	100.00% 3348.90			

EE-5	Reforested Area 3 Ha tyoe NN trees (NEEN)	Ha	3.00	25,000.00	75,000.00
EE-6	Waste Pit	Glb	1.00	2,500.00	2,500.00
EE-7	Biodegradables	Glb	1.00	10,000.00	10,000.00
EE-8	Latrine	Glb	1.00	1,500.00	1,500.00
				TOTAL DIRECT COSTS	2,091,988.88
				DIRECT INDIRECT COSTS 22%	460,237.55
				TOTAL COST	2,552,226.44

EXECUTION SCHEDULE - 12 MONTHS

MONTH 6	MONTH 7	MONTH 8	MONTH 9	MONTH 10	MONTH 11	MONTH 12

20.00%	20.00%					
1929.75	1929.75					
15.00%	15.00%	15.00%	15.00%			
47744.02	47744.02	47744.02	47744.02			

20.00%	20.00%	20.00%	20.00%	20.00%		
10908.48	10908.48	10908.48	10908.48	10908.48		
20.00%	20.00%	20.00%	20.00%	20.00%		
7110.61	7110.61	7110.61	7110.61	7110.61		
20.00%	20.00%	20.00%	20.00%	20.00%		
2827.43	2827.43	2827.43	2827.43	2827.43		
20.00%	20.00%	20.00%	20.00%	20.00%		
4275.84	4275.84	4275.84	4275.84	4275.84		
20.00%	20.00%	20.00%	20.00%	20.00%		
3868.24	3868.24	3868.24	3868.24	3868.24		

25.00%	25.00%	25.00%				
3167.97	3167.97	3167.97				
15.00%	25.00%	25.00%	25.00%			
4233.09	7055.14	7055.14	7055.14			
15.00%	25.00%	25.00%	25.00%			
6675.18	11125.30	11125.30	11125.30			

10.00%	10.00%	10.00%	10.00%	20.00%	25.00%	15.00%
29984.38	29984.38	29984.38	29984.38	59968.77	74960.96	44976.58

15.00%	15.00%	15.00%	15.00%	15.00%		
152518.99	152518.99	152518.99	152518.99	152518.99	0.00	0.00

15.00%	30.00%	30.00%				
8181.36	16362.72	16362.72				
15.00%	30.00%	30.00%				
5332.96	10665.91	10665.91				
25.00%	30.00%	30.00%				
983.06	1179.67	1179.67				
25.00%	30.00%	30.00%				
1824.41	2189.30	2189.30				
25.00%	30.00%	30.00%				
2626.77	3152.12	3152.12				

25.00%	25.00%	25.00%	25.00%			
17385.00	17385.00	17385.00	17385.00			
		25.00%	25.00%	25.00%	25.00%	
		7167.50	7167.50	7167.50	7167.50	
			25.00%	25.00%	25.00%	25.00%
			26535.00	26535.00	26535.00	26535.00

10.00%	10.00%	10.00%	10.00%	10.00%		
384.30	384.30	384.30	384.30	384.30		

FLOWCHART – PROJECT PROCESSES

INITIAL WORKS

INITIAL WORKS	
Construction of camp site and related works	Provisional constructions, provision of accommodation and storage
Access roads	Provisional roads, vehicle and machinery transit
Mobilisation of personnel and machinery	Public mobilisation
ESTABILISATION (slope formation)	
Clearing, logging, and cleaning	
Slope formation and dislodgement	Cuts on slope, and soil removal
Drainage	Inside and outside the Gatazo Hill (Guacharaca sector)
Slopes protection	Revegetation and reforestation
Anchorage	A cylindrical construction filled in in concrete, 65Tn tensor
Rehabilitation of city sewer system	Rehabilitation sewer system for drainage in the area
Signalling	Horizontal and vertical signalling. Signs are being constructed
Implementation of Environmental Management Plan (**Mitigation**)	Verification of compliance with mitigation programme

5.3.3.4. Activities envisaged in project execution

With regard to changes to the physical, biological, landscape and socio-economic settings likely to be generated as an aftermath of project activities, activities envisaged are related to issues as follows:

A1.- Camp construction and related works

A2.- Access roads

A3.- Mobilisation of Personnel and machinery

A4.- Forest clearing and cleaning

A5.- Slope formation and removal

A6.- Drains

A7.- Protection of slopes

A8.- Anchors

A9.- Rehabilitation of sewerage in the city (Gatazo area)

A10.- Signage

A CONTINUACIÓN Numeración errónea en el original en español en PDF

6. ENVIRONMENTAL ASSESSMENT

6.1. *Methodology for Identification and Assessment of Environmental Impacts (EIAs)*

The methodological framework allowing for identification of interactions between environmental components and activities being envisaged in this project sets forth a direct "cause-effect" relationship, which is articulated in Leopold (1970)´s Double Entry Matrix, for which steps as below will be spelled out:

1. Environmental factors related to the project will be identified on the basis of the following table:

CUADRO EN PÁGINA 233 DEL ORIGINAL EN ESPAÑOL EN PDF

Environmental Factors

Environmental Component	Environmental Sub-component	Environmental Factor	Definition
Physical	Air Soil Water	Air quality Sound level Soil quality Surface water Underground water	Presence in air of substances altering air quality Impaired by noises originating in project´s own activities egradation of soil quality due to project activities Changes in surface water quality Changes in underground water quality
Biotic	Flora	Vegetative cover Crops Special ecosystems	Changes in vegetative cover in the area changes in crops due to project execution

			hanges in special ecosystems due to project execution
	Wildlife	Ictiowildlife	changes in ictiofauna in the project execution area
		Heterowildlife	isappearance of heterofauna n the project execution area
		Microwildlife	disappreance of microfauna thriving in the area
		Macrowildlife	sappearance of macrowfauna thriving in the area
		Bird Life	Disappearance of birds´ food sources, refuge sites, reproduction sites, and birds life
Socio-economic	Perceptual medium	Sighsts and Landscape Archaeology	Landscape alterations lodifications in archaeological remains in the area
	Use of resources	Water supply	Water consumption over Project execution Works
		Electricity	Demand for electrical power
	Human	Welfare	hanges in welfare conditions of people living close to the area
		Health	Changes in health of people living in the area
		Security	Risks project workers are exposed to
		Employment	Generation of project-related work sources

2.The impacts qualitative assessment rates the size and bearing of the impact identified, by means of criteria as follows:

- **Impact Type**: Negative (-) Positive (+)
- **Bearing**: High (3), Medium (2), Low (1)
- **Magnitude**: High (3), Medium (2) and Low (1)
- **Duration**: Temporal (T) and Permanent (P)
- **Geographic area**: Local (L) and Regional (R)
- **Reversibility**: Reversible (R) and Irreversible (I)

7. IDENTIFICATION OF IMPACTS

Impacts likely to be generated in each environmental component on account of activities being carried out over the remediation work are identified in this section.

The interaction matrix is a two-dimension checklist. **Rows**: environmental factors or components. **Columns**: work tasks, intersection impact cause – effect relation.

MATRIZ EN PÁGINA 234 DEL ORIGINAL EN PDF

MATRIX FOR IDENTIFICATION OF IMPACTS, CAUSE - EFFECT,
ACTIVITIES FOR STABILISATION OF THE GATAZO HILL SLOPES
LA GUACHARACA SECTOR

ACCIONES / FACTORES AMBIENTALES			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	POSITIVOS	NEGATIVOS
FÍSICO	Aire:	Calidad del aire	X	X	X	X	X		X				1	5
		Nivel sonoro	X	X	X	X	X			X				6
	Suelo:	Calidad del suelo		X		X	X	X	X				1	4
		Erosión	X	X		X	X	X	X				1	5
	Agua:	Aguas superficiales		X		X	X		X		X		2	3
		Aguas subterráneas												
BIOTICO	Flora:	Cubierta vegetal	X	X		X	X		X				1	4
		Cultivos				X	X		X				1	2
		Ecosistemas especiales												
		Itiofauna									X			1
	Fauna:	Heterofauna												
		Microfauna	X	X			X	X	X				1	4
		Macrofauna							X				1	
		Avifauna	X	X	X	X	X		X				1	4
SOCIOECONÓMICO	Medio Perceptual:	Vistas y paisajes	X	X		X	X	X	X				1	5
		Arqueología												
	Uso de recursos:	Abastecimiento. de agua	X										1	
		Energía eléctrica	X										1	
	Humano:	Bienestar							X				1	
		Salud							X		X		2	
		Seguridad							X	X		X	3	
		Empleo	X	X	X	X	X	X	X	X	X	X	10	
TOTAL													29	43

TEXTOS EN INGLÉS

GATAZO SECTOR LA GUACHARACA

ACTIONS

POSITIVE

NEGATIVE

PHYSICAL

Air:

Air Quality

Sound level

Soil:

Soil quality

Erosion

Water:

Surface water

Groundwater

BIOTIC

Wildlife:

Heterowildlife

Microwildlife

Birds

SOCIO-ECONOMIC

Perceptual Medium

Sights and Landscapes

Archaeology

Use of resources:

Water supply

Electricity

Human:

Welfare

Health

Security

Employment

SOCIOECONOMIC

Human:

TOTAL

Close Matrix

Identification of project impacts: **29 positive impacts and 43 negative impacts**

A1.- Construction of camp and related works

A2.- Access roads

A3.- Personnel and machinery transportation

A4.- Forest clearing and cleaning

A5.- Slope formation and removal

A6.- Drains

A7.- Slopes Protection

A8.- Anchorage

A9.- Sewer Rehabilitation

A10.- Signalling

7.1. Qualitative Appraisal of Environmental impacts

IMPACT ASSESSMENT MATRIX, CAUSE – EFFECT

FACTORES AMBIENTALES / ACCIONES			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	POSITIVOS	NEGATIVOS	AGREGACIÓN DE IMPACTOS
ÍSICO	Aire:	Calidad del aire	-1 / 1	-1 / 1	-1 / 1	-1 / 2	-2 / 3		2 / 2				1	5	7
		Nivel sonoro	-1 / 1	-1 / 1	-1 / 1	-1 / 2	-2 / 2			-1 / 1				6	10
	Suelo:	Calidad del suelo		-1 / 1		-1 / 1	-1 / 1	-1 / 1	2 / 2				1	4	0
		Erosión	-1 / 1	-1 / 1		-2 / 2	-2 / 2	-1 / 1	2 / 2				1	5	7
	Agua:	Aguas superficiales		-1 / 1		-1 / 2	-2 / 2		2 / 2		1 / 1		2	3	2
		Aguas subterráneas													
BIOTICO	Flora:	Cubierta vegetal	-1 / 1	-1 / 1		-2 / 2	-2 / 2		2 / 3				1	4	4
		Cultivos				-1 / 1	-1 / 1		2 / 2				1	2	2
		Ecosistemas especiales													
		Itiofauna									-1 / 1			1	1
	Fauna:	Heterofauna													
		Microfauna	-1 / 1	-1 / 1			-1 / 1	-1 / 1	2 / 2				1	4	0
		Macrofauna							1 / 1				1		1
		Avifauna	-1 / 1	-1 / 1		-1 / 2	-1 / 2		2 / 2				1	4	2
SOCIOECONÓMICO	Medio Perceptual:	Vistas y paisajes	-1 / 1	-1 / 1		-2 / 2	-2 / 3	-1 / 1	2 / 3				1	5	7
		Arqueología													
	Uso de recursos:	Abastecimiento. de agua	1 / 1										1		1
		Energía eléctrica	1 / 1										1		1
	Humano:	Bienestar							2 / 3				1		6
		Salud							1 / 2		1 / 1		2		3
		Seguridad							2 / 2	1 / 2		1 / 2	3		8
		Empleo	1 / 1	1 / 1	1 / 1	1 / 2	1 / 2	1 / 1	2 / 2	1 / 1	1 / 1	1 / 1	10		15
AFECTACIÓN POSITIVA			3	1	1	1	1	1	14	2	3	2	29		
AFECTACIÓN NEGATIVA			7	9	2	9	10	4		1	1			43	
AGREGACIÓN DE IMPACTOS			4	8	1	20	31	3	61	0	0	3			-3

ENGLISH

ACTIONS

ENVIRONMENTAL FACTORS

POSITIVE

NEGATIVES

IMPACT AGGREGATION

PHYSICAL

Air

Air quality

Sound level

Soil:

Soil quality

Erosion

Water:

Surface water

Groundwater

BIOTIC

Flora

Vegetable cover

Crops

Special Ecosystems

Itiowildlife

Wildlife:

Heterowildlife

Microwildlife

Macrowildlife

Birdlife

SOCIOECONOMIC

Perceptual medium:

Sights and Landscapes

Archaeology

Use of resources:

Water supply

Electric power

Human:

Welfare

Health

Security

Employment

POSITIVE AFFECTIONATION

NEGATIVE AFFECTION

AGGREGATION OF IMPACTS

A1.- Construction of camp and related works

A2.- Access roads

A3.- Personal mobilisation and machinery

A4.- Forest clearing and cleaning

A5.- Slope formation and removal

A6.- Drains

A7.- Slopes Protection

A8.- Anchorage

A9.- Sewer Rehabilitation

A10.- Signalling

MATRIX – POTENTIAL IMPACTS

PÁGINAS 236ª Y 237 EN BLANCO EN EL ORIGINAL EN ESPAÑOL EN PDF

8. ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) is the final stage of this survey and has been drawn up on the basis of findings having a significant bearing: it is a set of standards and measures intended to prevent, mitigate, foresee, monitor or minimize adverse environmental and socio-cultural impacts, likely to be generated over Project execution.

The EMP is the final outcome of this assessment process, and addresses prevention, mitigation, compensation, and other measures that should be undertaken by the Contractor, so as to abide by the Ecuadorian Environmental Legal Framework, and in particular by the General Specifications for Construction of Roads and Bridges, as set forth by the Ministry of Public Works Resolution MOP - 001 - F Quito 2000.

MEASURE 1

Prevention

Surveillance of the mitigation process (Environmental education)

SECTION 105. PUBLIC AND COMMUNITY PARTICIPATION

General provisions for construction of roads and bridges MOP - 001 - F Quito 2000

105 - 01. Description.-

During construction, operation / maintenance, and concession processes, constrains may arise between the Contractors and those involved in the project, such as landowners whose properties are close to the road, the community, non-governmental organisations (NGOs), local authorities, and others. It is advisable for the builder to enter into a friendly relationship with social stakeholders as mentioned above, in order for socio-environmental conflicts to be avoided that may jeopardise the works´ objective.

105 - 02. Community Involvement Actions.-

Actions should be undertaken by the Contractor so as to preventing any social disturbance at work:

1) Keeping stakeholders, the community and local authorities in the area of influence of works abreast of the characteristics involved therein (new constructions, rehabilitation, maintenance, concession); the different activities to be implemented, and the negative

and positive impacts to be generated. This information should be disseminated in a clear, precise and up-to-date fashion.

2) Informing the community and local authorities about hazardous situations likely to arise over works execution. If sensible situations should crop up, relevant information will be conveyed to the authorities by the Inspection Director.

3) Periodic communication mechanisms should be established with main stakeholders, in order to up-keeping an ongoing coordination of social and community issues encompassing road works.

4) Instructing Contractor´s representatives, technical personnel and workers on the procedures and appropriate behavioural ways to deal with landowners, occupants of lands close to the worksite and others, in order to reaching an acceptable demeanour of communities toward the project and, above all, counting on their support and collaboration.

5) Having respect for private property, for which the Contractor should request the proper authorisation from owners or administrators in case of temporarily entering into those properties, keeping them duly informed of the purpose of the work to be performed.

6) Strictly using the space and time as agreed upon with the Inspector, in order to avoid discomfort to people living close to the worksite.

7) Delimiting by wire fences expropriated areas, and those areas for road works, trying to cause the least possible damage to neighbours.

SECTION 220 ENVIRONMENTAL EDUCATION AND AWARENESS

220-01. Description.- This section entails the execution by the Contractor of a number of activities the end goal of which is to strengthen up knowledge and respect for the natural heritage, and the involvement of people living in the area and who will benefit from the work.

These activities shall be directed towards two focal points of work under way: a) the population directly involved with the work, and all other social stakeholders who are located within the area of influence; and b) the technical staff and workers who are in permanent contact with the work and the environmental setting in the area.

The project execution process should get under way fifteen (15) days before the start of works and should be carried on an ongoing basis until the completion of the project execution.

220-02. ***Working Procedure***.- If in the particular environmental specifications no mention is made of this item, the Inspector will require the Contractor to comply with this section, and the latter will plan and submit to the Inspector for consideration the work contents, schedule and execution methodologies for approval.

Minimum tasks the Contractor should perform should be as below:

220-02.1. Awareness-raising Talks.-

These will be focused on people living in neighbouring towns and along the road, who are directly or indirectly related to the objective of the road work.

These talks will involve project-related subjects and the affectation they will be on the environment, such as:

• The environmental setting surrounding the work and the latter´s close interrelation with people living in the area;

• Main environmental impacts of the works and relevant mitigation measures;

• Social and environmental benefits that road construction / rehabilitation will be bringing about;

How to keep the worksite in good condition upon the completion of activities. This issue shall be dealt with by professionals having a strong background on management of natural resources, community development, and social communication.

SECTION 711

MEASURE 2

ENVIRONMENTAL SIGNALLING

711-01. Description.- The installation of an adequate signage addressing subjects dealing with prevention and monitoring of human activities in order to avoid environmental impairment in work areas.

711-02. Working Procedure.- Before the preliminary work gets under way *in situ*, the Contractor shall implement an appropriate environmental labelling addressing i) informational, ii) preventive and iii) restrictions-related issues.

Informational signs should warn workers, visitors and the population close to the worksite on the execution of road works.

Precautionary signs shall aim to warn road workers and users about potential hazards in work areas, and indicate the restrictions or prohibitions that may arise, in particular those regarding circulation speed limits.

These restriction signals will indicate actions forbidden so as to not to cause adverse environmental impacts.

The particular subject for each label type, as well as the material and location, will be included in specific environmental specifications or, according to the Inspector's criteria, if applicable.

This type of labelling will include making and placing signs in accordance with the work drawings, or Inspector provisions.

In case it is deemed advisable and subject to prior approval by the Inspection, signs with artificial lighting will be placed in danger areas.

Except for cases in which the Inspection considers it inappropriate, these signs will be made in treated wood, with a low relief wordings and drawings.

711-03. Measurement.- All signs should have the same measurement and paid per unit at prices specified in the contract.

711-04. Payment.- These prices and payments will amount to the total compensation for the construction and placement of signs; payments will include labour, materials, tools, equipment and operations related to signs installation on site.

MEASURE 3

Dust Control (wetting)

SECTION 205

DUST CONTROL

205-01. Description.- In line with Inspector´s suggestions, this work will involve the application of substances to keeping in check dust emissions originating in the work construction, or road traffic going through the project site, detours and accesses.

Dust control will be done by using water or chemical stabilizers such as wetting agents, hygroscopic salts, and surface crusting agents such as sodium chloride and calcium chloride. The material used, the places treated, and the application frequency should be approved by the Inspector.

-205-02. Work Procedures.- If water is used for dust removal it should be evenly distributed by cisterns equipped with a pressure sprinkler system. The equipment used should be approved by the Inspector. The spraying rate will be between 0.90 and 3.5 litres per square metre, according to Inspector instructions also addressing the application frequency. When dust control is done with vehicles, the maximum application speed will be 5 km / h.

205-03. Measurement.- The amount to be paid for this work are the thousands of litres of water being used for application, and verified by the Inspector.

205-04. Payment.- Amounts payable according to guidelines in the previous item will be paid for at prices as stated in the contract for items listed below.

No additional payment will be made to the Contractor for the hour-based dust control application.

205- (1) Water for dust control ..... Thousands of Litres

MEASURE 4

Monitoring of construction and clearing materials removal

CHAPTER 300

EARTH MOVEMENTS

SECTION 301. PRELIMINARY OPERATIONS

301.1. Overview

301-1.01. Description.- This work will involve the disposal and removal of obstacles, walls, pavements, miscellaneous concrete constructions, bridges, and the clearing of vegetation. In short, this Section refers to all preliminary work required to allow for movement of land and the construction of road structures, pursuant to the Contract, according to these Specifications, as set forth in additional contractual documents, and as indicated by the Inspector.

This work will further include the cleaning and clearing of waste materials, except for those the Contractor intends to harness at his / her convenience, instead of transporting road excavation materials to be used on the road platform, and sites marked for the lower base and tread layer materials.

301-2. Removal of sundry obstacles

301-2.01. Description.- The total or partial removal of obstacles such as buildings, houses and other constructions, abandoned roads and detours, strips and devices for traffic monitoring, fences and roadways, sewers and other drainage systems, except for those obstacles that should be removed in accordance with contractual terms. Further, filling of resulting trenches, pits and holes, as well as the proper disposal of materials removed as described below, should also be included.

SECTION 302. SCRAPING, DEFORESTATION, AND CLEANING

302-1.01. Description.- Clearing the ground as required to carry out the work contracted in accordance with these Specifications and other contractual documents. In areas shown in drawings or as indicated by the Inspector, all trees, shrubs, logs, live fences, bushes and any other vegetation will be removed together with stumps and leaf litter. Also included in this heading is the removal of the soil layer down to a depth shown in drawings or as indicated by the Inspector; as well as the disposal, to the Inspector´ satisfaction, of all materials resulting from the clearing, deforestation and cleaning operation.

These works will include all places, quarries and mines within and adjacent to the road area shown in drawings, or indicated by the Inspector, as designated or optional sources of construction materials. They shall also include the removal of miscellaneous obstacles, as stipulated in subsection 301-2, if the items annotated in that Section are not included in the contract.

This work will also contemplate the preservation -avoiding any damage or spoilage- of the vegetation, plantations, and objects that should be preserved.

302-1.02. Work Procedures.- Clearing, deforestation and cleaning shall be done through efficient, manual and mechanical means, including soil cleaning, felling, pealing and any other efficient procedures that the Inspector considers satisfactory. Usually, this work will be done within the working site boundaries and up to a 10M distance outside the structures on the outer slopes lines. In any case, the Contractor will be paid only for the works carried out within the clearing, deforestation and cleaning boundaries as shown in drawings, or as indicated by the Inspector.

When the contract provides for the conservation and disposal of the soil layer in planting areas, this material will be stored in sites approved by the Inspector, until it is incorporated into the new work, and all transport, storage and disposal of this material will be paid in accordance with provisions in Sections 206 and 207 pursuant to these Specifications.

In excavation areas or embankments having a less than 2M height, all trunks, stumps, roots, vegetation in general, and material deemed as inadequate by the Inspector, shall be removed and disposed of, and if contractual documents so require, those materials should be removed and stored for later use on the topsoil layer.

In areas to be covered by embankments higher than 2M, tree cutting can be done so that the cut is made at a height of no more than 20cm. over the natural terrain surface; shrubs and weeds will be thoroughly removed, and the grass should be at ground level. Trees should be completely removed in places on which structures or sub-drains, piles, anchors, staggered excavation for landfill, removal of soil layer, or removal of unsuitable material are to be set up.

In areas to be covered by embankments and where vegetation, non-usable material, stumps or roots have to be removed, the resulting surface will be levelled and compacted once those materials have been removed. Filling and compaction shall be carried out in accordance with subsection 305-1.

Tree cutting, or deforestation along areas for gutters, channel rectifications, or waterbeds, will be carried out until the depth required has been reached for excavations in these surfaces as envisaged in drawings.

In areas beyond the construction site boundaries and within the limits shown in drawings for clearing, deforestation and cleaning, tree trunks will be cut at ground level, and in no case shall they be left at a height of more than 30cm. Removal of shrubs or other vegetation other than trees will not be required in these areas.

All these works should be done in such a way as to not impairing vegetation, constructions, buildings, public services, etc., existing in adjoining areas. In this regard, provisions in

subsection 102-3 "Legal Relations and General Responsibilities" in these Specifications shall be abode by.

No land removal may be undertaken in any part of the project site until the Clearing, deforestation and cleaning works in areas in that sector have been thoroughly completed in a manner satisfactory to the Inspector, and in accordance with the approved work schedule.

302-1.03. Disposal of materials removed.- All non-usable materials resulting from the Clearing, deforestation and cleaning works, will be removed and discharged in places shown in drawings, or on those places as the Contractor indicates, and subject to the Inspector´s approval. No discharges of debris or rubble will be allowed in places within the right-of-way area, where they would be visible from the finished road, unless they are buried or placed in such a way that they do not spoil the landscape. Neither will the materials removed be allowed to burn.

Any material the recovery of which is foreseen in contractual documents, or required by the Inspector, will be stored for further use, pursuant to contractual stipulations and the Inspector instructions.

Any wood harnessed within the boundaries stipulated for the Clearing, deforestation and cleaning, will be property of the Work and for the latter use within the worksite, and any surplus will be stored in the nearest Ministry of Public Works warehouses (MOP, for its acronym in Spanish).

302-1.04. Measurement.- The amount to be paid for clearing, deforestation and cleaning shall be the area in hectares, as measured at the worksite, in its horizontal projection of orderly and acceptably executed works, including lending areas, quarries and mines within the road area and the work sources harnessed outside that area, which are shown in drawings as designated or optional sources to the Contractor.

302-1.05. Payment.- The amount set forth as shown in item above shall be paid at the contractual unit price for the item shown below, and should be stated in the contract.

This price and payment shall constitute the total compensation for the elimination, removal, disposal and transportation of all materials resulting from the Clearing, deforestation, and cleaning, as well as all labour, equipment, tools, materials and related operations required to executing the Works as set forth in this Section, including the removal and disposal of sundry obstacles, whenever the contract does not stipulate payment for such work.

When the contract does not clearly stipulate these Clearing, deforestation, and cleaning activities, this work shall be deemed as required and shall be paid for at the same contractual prices as those for the excavation and filling works.

MEASURE 5

Transportation of materials and movement of machinery

SECTION 234

224-01. Description.- All precautions and measures are included that the Contractor should undertake in order to avoid causing the minimum discomfort to human health and to the environment surrounding the worksite.

224-02. Working Procedure.- During the construction, rehabilitation or concession of roads, and particularly in connection with soil movements that have to be carried out to comply with the work design conditions over the extraction, loading, transport or placement of materials stages, these tasks should be prevented from producing air pollution by dust particles, and the Contractor shall take all necessary precautions to avoid this occurrence, for example, by watering the affected area.

The Contractor shall take all necessary precautions to prevent the discharge of material during transportation, such as having access to covering tarpaulins, sealed containers or others. The Inspector may order the removal of trucks not abiding by this provision.

Transportation of materials to the worksite, whether or not they are owned by the Contractor, should be scheduled and adapted in such a way as to avoid any damage to public and private roads, constructions, crops and any other public or private property. This work schedule should be submitted to the Inspector for its knowledge and approval.

When public roads or paths should be used for transport purposes, the Contractor should ensure that vehicles do not exceed the maximum authorized axle weights.

The Contractor shall avoid compaction of soils due to an unnecessary machinery traffic, in particular in areas that are no part to the basic road works infrastructure. The Inspector may order that those areas are recovered that have been unnecessarily used for traffic purposes, at the Contractor's expense and cost.

Any material that is found out of place due to carelessness in transportation, such as concrete, rocks, vegetation detritus, etc., will be disposed of by the Contractor and at his / her own expense and cost. In case this is not done, the Inspection may order the removal of the material to third parties, at the Cpntractor´s expense and cost.

224-03. Measurement and Payment.- The works that should be executed as set forth in this section, and bearing in mind these works´ nature, will not be directly paid; rather, those works will be included in contractual items.

MEASURE 6

Industrial safety and occupational health

SECTION 213

213-01. Description.- Industrial safety is the set of prevention and monitoring standards that the Contractor should implement in each of the Contractor´s work fronts and facilities in order to avoid the occurrence of work risks and accidents. This is known as Occupational Health.

213-02. Work Procedure.- The Contractor shall be obliged to adopt industrial safety measures as required in work fronts, and to issue and implement programme aiming to achieving a sound physical and mental health of all its personnel, pursuant to regulations in force as enacted by The Ecuadorian Institute for Social Security (IESS, for its acronym in Spanish).

As minimum requirements for compliance with these requirements, due consideration should be attached to wording below:

• The Contractor should implement the necessary facilities in worksites warranting a healthy recreation of personnel at the worksite, and at the same time ensuring the minimum comfort conditions.

• The first aid area should include at least one medical doctor and one medical assistant, in addition to the basic equipment and implements to cover medical emergency care.

• For work hazards to be minimised, the Contractor shall provide his or her personnel with basic clothing such as protective helmets, waterproof clothing, rubber-tipped steel boots, dust masks, and other implements recommended by the country's industrial safety laws in force.

Communities-addressed Procedure

In the case of accidents resulting in damage to infrastructure, or risks to the well-being or health of the community, preliminary response guidelines should be established that are aimed at ensuring that monitoring measures are implemented, as well as ensuring community participation in the protection of their own safety and well-being. Some of these measures are shown below.

Designating a community monitoring group for surveillance of environmental abidance, and a community leader to contact the construction company management and Inspector.

Collaborating in the cleaning of contaminated soil and water, as well as in reforestation activities.

MEASURE 7

Recovery and collection of the vegetation layer

SECTION 208

208-01. Description.- Recovery of the vegetation layer is understood as activities involving the removal of surface layers of natural soil, material which is not suitable to the construction site, of soils in places where some other works shall be carried out that are connected to road works, such as camps, machinery yards, warehouses, etc., that, once completed, road works should be restarted.

The collection refers to the accumulation and maintenance in good conditions of the removed vegetal layer for later use on intervened areas.

208-02. Working Procedure.- The removal and collection of the vegetal layer will be carried out in all areas to be excavated or refilled, mainly in work fronts, such as camps, road platform, dumps, yards for operation and maintenance of machinery , slope cutting, etc.

In areas to be recovered, both the hauling and removal of organic soils, and the use of fertilizers should be authorized by the Inspection.

The collection of these organic soils can be done with a dozer blade tractor, front loader tractors, and dumpers, (soil thickness between 15 and 30cm). This mixed vegetation and soil material will be collected in areas shown in particular environmental specifications, or authorized by the Inspector, and single stows not higher than two metres should be made.

If possible, the time the organic material will be kept in storage areas should not exceed two months, in order to avoid decomposition of the material itself. This time could be altered subject to prior approval of the Inspection, for which the Contractor will request this authorisation in writing, explaining the construction, environmental and technical reasons for this change.

Once organic soils have been removed and reused, the site on which the reservoirs were located should be recovered by ploughing or raking the soil, according to the Inspector instructions in order to allow for soil oxygenation, and facilitating natural succession and recovery.

The Contractor may request the Inspector not to comply with this provision when excavation or canopy areas show original surfaces with less than 10cm organic soil layers in places such

as steep slopes hills, sites with rocky outcrops and, in general, in places where the site characteristics prevent collection works, or where there is no material for removal.

208-03. Measurement.- Material excavated volume shall be measured to allow for removal of the vegetal layer taking the cubic metre as a measuring unit.

208-04. Payment.- The vegetal layer recovery and collection works are not directly paid for since they are included in contractual clearing, felling and cleaning items (Numeral 302-1.01 of Specifications MOP-001-F-2000).

SECTION 217

Prevention and monitoring of noise and vibrations

217-01. Description.- Noise is any undesirable sound and, just like vibrations, if proper prevention and monitoring measures are not implemented, both, noise and vibrations sources could have a substantial and adverse bearing on the health of workers and operators.

217-02. Working Procedure.- The noise and vibration levels generated in work fronts should be monitored to avoid disturbing human and wildlife populations in the worksite surrounding area.

Machinery and equipment the operation of which generates high noise levels (above 75 dB) should be moved from worksites to workshops to be repaired, and returned to work once they meet noise permissible levels, and assurance is given that construction activities those machinery and equipment are intended to perform are within noise ranges pursuant to the Pollution and Prevention Monitoring Law – noise-related Regulation.

If the Inspector ascertains the generation of noise and / or vibrations in particular work areas, the Contractor should be notified for the necessary corrective measures to be undertaken, thus avoiding discomfort and conflicts.

Noise and / or vibrations monitoring may require the Contractor to perform any of the following actions:

- Reducing the cause by use of exhaust silencers for vehicles, machinery or heavy equipment and shock absorbers to mitigate vibrations.

- Isolating the noise transmission source by means of the installation of closed premises, and of machinery maintenance workshops lined up with sound absorbing material.

- Monitoring and elimination of unnecessary audible signals, such as sirens and whistles.

- Absorption or attenuation of noise between the transmitting source and the receiver through barriers or screens.

217-03. Measurement and Payment.- Works that should be performed under this Section will not be measured or paid for, since it is the Contractor´s responsibility to keeping equipment and machinery in good working condition.

MEASURE 8

Landscape integration

SECTION 223

223-01. Description.- The landscape conditioning plays a role as an integrating element between the road work and the surrounding environment.

This environmental component includes a little-disturbed environment in the global vision that road users have and their total integration to a little-disturbed environment.

223-02. Work Procedure.- It is in the construction phase itself where most appropriate measures should be applied by the Contractor to perform tasks aimed at environmental rehabilitation and their integration with the landscape.

Landscape works should be executed at the same time as road works, thus warranting a cost reduction by hiring the same operators and the same machinery.

Except that no mention is made of this issue in particular environmental specifications, and in order to address it, the Contractor shall submit to the Inspector for consideration a landscape integration programme that shall at least incorporate the following tasks to be executed:

- Undertaking land movement operations which are adapted to the natural terrain.

- Formation and stabilisation of Hills with slopes suitable for their subsequent revegetation treatment. Rounding of the edges of cut and filling slopes.

- Formation of fillings and embankments with due concern for the natural terrain shapes.

- Concern for the natural drainage system, avoiding the disposal of materials in natural water courses.

- Monitoring the accumulation of waste materials in sites not intended for this purpose.
- On-going maintenance and cleaning of areas producing large debris and construction waste volume.

Sites to be considered and requiring enhanced landscape and visual attention will be those materials´ exploitation areas, road slopes, areas occupied by temporary facilities, and areas for deposit of surplus construction materials.

223-03. Measurement and Payment.- Works that should be performed for the purposes of this section, and bearing in mind their nature, will not be paid for directly, but instead considered in contract items.

MEASURE 9

Reforestation and enhancement of the road and slopes (Revegetation)

SECTION 207

207-1.01. Description.- This work will involve planting of trees, shrubs, vines and flowerbeds within a lateral area of the road, islands, dividing girdle and any other area (Revegetation in slopes) shown in drawings, in order to embellishing the roadway and integrating it into the natural setting nearby.

207-1.02. Work procedures

207-1.02.1. Preparation of areas for planting.- Areas to be planted with trees and other ornamental plants will be delimited in the drawings, as well as the spacing or location of individual plants.

Before transplantation, holes should be excavated down to the specified depth; then, a 15cm thick layer of vegetable soil will be placed at the bottom, unless the soil characteristics are such that the Inspector considers that it will be enough to crumble the existing soil to form the plant bed. The vegetable soil or other soil in the bed and the soil with which the hole is filled shall be mixed with an organic or a chemical fertilizer of the type and in the quantity specified in contractual documents. The holes´ dimensions will be appropriate for the plants that will be sown in them, so that their roots are at a minimum 15cm distance from the two sides and the bottom of the hole.

Plantation areas should be cleared of any weeds growing over the time between clearing and cleaning, and the transportation of trees, shrubs or flowerbeds.

207-1.02.2. Trasplantation.- Trees and shrubs transplantation should be done once basic work in a certain section has been finished, or as ordered by the Inspector. Planting work should preferably be done in moist soil and over the rainy season. If this is not feasible, the soil should be moistened before transplanting, as instructed by the Inspector.

At least two weeks before the transplant, the Contractor shall advise the Inspector to inspect the nursery from which the plants will be extracted and approve plants species and quality. According to plant varieties concerned, they shall be removed with a shovel, and wrapped in cardboard, or transported with bare roots, and protected with moss or straw; In both cases the roots should remain in good condition until the plant has been planted.

Before the plants are collected for transportation, they should be pruned and trimmed to reduce damage due to spoilage, and the loss of water by evaporation. Precautions will be taken to avoid any physical damage during transportation. No more plants will be brought to the area than can be planted in one day. During transplantation or immediately afterwards, the plants will be watered and adequate moisture will be maintained on successive days by irrigation as necessary, according to the Inspector.

Plantation areas should be cleared of any weeds that have grown during the interval between clearing and cleaning and transport of trees, shrubs or flower beds.

207-1.02.3.Irrigation.- Once the plants have taken root, only one weekly irrigation would be required, even in temperate and arid areas; according to local climate, soil and rainfall conditions, the Inspector will recommend the frequency and amount of water to be applied in order to keep the soil moist in the root system area of the plants until they have settled in the new place.

Irrigation will be done carefully to avoid soil erosion and not cause damage to the plants, but at the same time allowing for full saturation of the soil next to the plants.

207-1.02.4.- Plant Care.- The Contractor is obliged to care for and maintain in a satisfactory state of development the areas planted, including trees, shrubs and plants individually, providing irrigation, pruning and everything thatis required.

All plants that, for any reason, are poorly developed or have not satisfactorily grown up, shall be replaced at the Contractor's cost with live and healthy plants, sown in accordance with original specifications, in the same class of plants, quantity and size.

207-1.03. Measurement.- Live plants and normal plants that have been planted in accordance with contractual stipulations shall be measured for payment purposes.

MEASURE 10

SECTION 206 - ROAD AND SLOPES PROTECTION

206.1.01. Overview.- This section will include all works required to protect the newly constructed road, as well as to preserve and improve the landscape within the roadside area.

206.1.02. Erosion Prevention

206.1.02.1 Description.- The preparation of slopes and other areas to be planted, the incorporation of plant soil and the sowing or planting in areas shown in drawings, or pinpointed by the Inspector, in order to prevent erosion in sections in the platform and in slopes, further using Geo-synthetic Blankets for erosion control.

The coating material should be made of coconut fibre, straw fibre, sown with polyester yarn in a black polypropylene interlacing, and stabilized against ultraviolet rays. Specifications and characteristics that erosion monitoring blankets should comply with are shown in Table 206.1.1.

The seeds species (planted area) or seedlings (planted area) to be used will be stipulated in particular environmental specifications and should be fast-growth and easy-regeneration plants, to minimize erosion processes.

206.1.02.2. Work procedure

206.1.02.2.1. Preparation of areas for protection.- Erosion prevention works should be undertaken once the basic work has been finished in the respective section.

206-01.1. Sown area.- This work consists in sowing plants in sites susceptible to erosion and environmental recovery, such as lateral road slopes, dumps, areas previously used for camps, workshops, warehouses, plants for materials production, and others in which the soil is bare and it is necessary to protect it with a vegetal layer before installing the geo-synthetic blankets.

206-01.1.1. Work procedure

206-01. 1. 1. 1. Analysis and preparation of areas to be treated.- Works to prevent erosion and to recover cleared sites should be undertaken once the basic work in the respective road section has been finished.

The Contractor should take into account the preliminary work as below, prior to planting: (i) providing good drainage; (ii) decompressing the soil where the vegetation will be established to allow for proper rooting development; (iii) removing toxic elements; Iv) increasing supply

of essential growth nutrients (fertilisation); and v) integrating terrain morphology into the surrounding landscape.

The soil can be decomposed by means of scarification, subsoiling and ripening. If the scarification method is used, the treatment depth will be between 10 and 35cm; the depth for ripping and subsoiling is between 35 and 75essential cm.

All areas for sowing, after decompression, shall provide a reasonably firm but fragile bed with a minimum 15cm depth of on flat ground, and 10cm on slope ground. Areas should also be free of weeds, larger than 5cm diametre stones, debris and rubble.

206-01. 1. 1. 2. Fertilisation.- Fertilisation or edaphic improvements are essential to soil preparation and can be done through inputs of organic matter, organic fertilisation (prepared vegetable soil, humus, fungi residues, household wastes, and fertilizers) or by inorganic fertilizers (mineral complexes such as ammonium nitrate, urea, ammonium sulphate and phosphoric acid or ammonium phosphate).

In areas showing instability and erosion risk, organic products should be applied that are evenly distributed, according to drawings requirements and Inspector instructions. Organic and inorganic fertilizers should be evenly spread over the sowing area, with a between 6kg and 8kg per hectare density, using suitable mechanical equipment or manual procedures, in accordance with the Contractor's proposal, and the Inspector´s approval.

206-01. 1. 1. 3. Sowing. The Contractor shall proceed as stipulated in particular environmental specifications or, depending on the land slope, will suggest to the Inspector that the planting id done according to the following methods: a) in (<15 °) rows; B) releasing seeds by throwing them by over the soil, and covering them with earth (<20 °); C) hydro-sowing; D) aerial; other.

206-01.2. Planted area.- Providing, delivering and planting trees, shrubs, vines and ground covering plants of the type and size shown on drawings or in particular environmental specifications. Plantation sites will be those identified in drawings, particular environmental specifications, or according to the Inspector provisions.

The location of trees and shrubs required will be shown in drawings or indicated by the Inspector.

206-01.2.1. Work Procedure.- This work will be done by the Contractor over the time shown in particular environmental specifications, or as the Inspector decides upon. In no way should this work be carried out in icy terrains, or areas showing a high saturation degree.

The Contractor shall notify the Inspector in writing, and at least 15 days in advance, of the delivery of nursery plants, or plants from the collection source. All plant materials should be

available for inspection at nurseries or supply sources before the plants are ready for planting. Transportation, provisional storage and maintenance costs shall be borne by the Contractor until final planting.

Prior to digging holes, the ground should be free of grass, weeds, roots and all materials deemed as unsuitable for filling purposes. Plants should be sown in holes by thrusting them heavily into the holes and to the same or lower level than that at which they were cultivated in nurseries; hole filling with the plant inside will be done with a topsoil, black soil or peat humus mixture.

Fertilisation will be done as shown in the particular environmental specifications or using organic fertilizers as stipulated in the section dealing with the planted area in this document. The use of compost (wood chips, sawdust or marsh moss) is recommended and the application rate will be 5Kg / m^3: this compost should be added within 24 hours after planting.

Dead plants or plants in poor shape should be removed from the worksite and replaced by some other good quality, sanitation and size plants, which should be delivered to the Inspector's consideration and approval.

206-01.3. Turfing or ditching.- The preparation of the place for turfing, ditching, to carry and to place the perennial grass in places shown in drawings or determined by the Inspector.

206-01.3.1. Working Procedure.- Turfing operations will be done at appropriate time, pursuant to these particular environmental specifications, or when the Inspector so authorizes in writing.

The Contractor shall notify the Inspector three days in advance, before beginning to cut the 30cm by 30cm squares grass sections, in order to avoid deterioration of the grass growing base. The area from which grass sections will be extracted should be approved by the Inspector, before starting the signalling and cutting of those grass sections.

Prior to delivery of grass sections, the lawn areas should be aligned and levelled; soil should be removed by scarifying with discs or crawler, in such a way as to loosen the soil to the depth shown in the particular environmental specifications or as indicated by the Inspector. Once the soil has been scarified, the fertilizer, time or other material will be applied to sustenance nutrients.

The grass sections should be placed on the prepared ground for 24 hours after cutting, except when those grass sections need to be stored in (moistened) stacks or piles, with grass surfaces against each other, and the root surfaces piled up in the same fashion, for a time not to exceed 5 days.

Prior to manual placement of solid grass sections, bed areas should be clear of debris, rubbish, etc. and fully moistened. Implantation in flat areas will be done by placing grass sections in an edge to edge fashion; when the area to be covered with grass section shows a 2:1 or greater slope, grass section units should be staked after they have been manually tamped and the stakes should remain at the same level as the lawn seating surface.

Areas covered with grass sections should be moistened while they are being put in place, and the Contractor will have to keep them moist until they are revised, and the work is approved by the Inspector. Pruning will be done by the Contractor at his / her own cost until the final reception of the work.

206-02. Irrigation.- The Contractor shall protect and take care of grass areas sown and planted at his / her own cost, keeping them wet, repairing or replenishing areas not showing a satisfactory growth, until the final reception of the work.

Irrigation should be done by tanker trucks or other approved equipment allowing for pressure irrigation with hoses or sprinklers. Water will be evenly distributed without causing erosion; water will be frequently applied and in quantities approved by the Inspector.

206-03. Measurement.- Work carried out in accordance with requirements in this section shall be measured as follows:

The areas effectively planted and covered with grass, according to contractual specification in documents, will be measured in square metres of the surface area. For the planted area, measurement and corresponding payment shall be made according to the number of trees, shrubs and vines of specified sizes and varieties planted and delivered in accordance with the particular environmental specifications or with the Inspector's report. Only planting, forage and living and healthy plants will be acceptable at the time of the final inspection. Payment made on the basis of this measurement will include hay or straw that is required as a moisture retainer.

The soil and organic fertilizer required will be measured in cubic metres. Payment made on the basis of this measurement for the plant land shall include any temporary storage and other handling of the material as necessary.

Chemical fertilizers, time and seeds used according to contractual requirements, shall be measured in kilogramme.

Water used to irrigate areas treated with vegetation cover, in addition to trees and shrubs, will not be measured for payment. Costs involved in water supply will be covered by Item 204-A (1) and the water application cost will be offset by payments made by the various erosion prevention items.

206-04. Payment.- Quantities and units defined in numeral above will be paid at contractual prices for the designated items, as stated in the contract.

These prices and payment will constitute the total compensation for erosion prevention work, including supply of materials, labour, tools, equipment and related operations required for execution of works as described, as well as for maintenance of trees, shrubs, vines, areas planted and turfed until the final reception of these works.

Payment Item and Designation	**Measurement Unit**
206 (1) Area sown	Square metre
206 (2) Planted area (Trees and shrubs)	Unit
206 (3) Turfed area (grass)	Square metre
206 (4) Geo-synthetic blankets	Square metres
206 (5) Hydro Sowing	Square Metres
206 (6) Vegetable Reinforcement Geo-grid	Square Metres

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PHOTOGRAPHIC ANNEX

PHOTO. Showing remnants of degraded secondary forest and grasslands in project area

PHOTO. House destroyed by sliding impact near the antennas location

FOTOCultivo en lugar inapropiado

PHOTO 1. Crops in unsuitable places

PHOTO 2. High-risk area sustaining a huge rotational mass landslide

PHOTO. Abandoned house fearing dangerous ground fault condition

PHOTO. The project area can be used to set up a sighting place as a life quality improvement factor.

Annex 13. Alternative approaches considered but not adopted in the project.

Barrier	Project action	Alternative approaches considered but not adopted
1. Protection works do not incorporate the climate change variable	Update Antofagasta´s stormwater management plan incorporating the climate change factor (output 1.1) to guide future investments to cope with foreseeable stronger and more frequent coastal storms. Prepare green infrastructure plan for Esmeraldas (output 1.2) to protect the city from flooding and landslides caused by the foreseeable increase in rainfall associated with stronger and more frequent El Niño. Update protection infrastructure designs and constructions incorporating the climate change factor for quebrada Bonilla and cerro Gataso (output 2.1) and cerro Gataso (output 2.2) to reduce vulnerability of local population and develop methodology and experience for mainstreaming the climate factor in infrastructure works.	There is no alternative to the use of grey infrastructure to protect the cities from stronger and more frequent weather events. In Antofagasta and Taltal, the use of green infrastructure was considered and discarded because desert conditions make impractical the use of vegetation. At first it was thought that mainstreaming the climate change factor into protection works could be done working directly with the municipalities. This was discarded for Chile, because infrastructure and water management is administered by MOP, who prepare and implement regional plans. The current Antofagasta´s plan cover the period 2012 – 2021 (MOP, 2012). Influencing the existing plan was not feasible, therefore it was decided to update Antofagasta´s stormwater management plan to incorporate the climate change factor. This is a compulsory instrument for cities with more than 50,000 inhabitants, which outlines the means and infrastructure required to channel stormwater and prevent damages to people and property. In Esmeraldas, it was seen that a combination of grey and green infrastructure could be used to adapt to the impacts of a future scenario of stronger and more frequent rainfall. Actions to address flooding and landslides were analysed. However, addressing flooding was discarded because it would require a level of investment far beyond the scope of the present project. The city drainage system is obsolete and only cover about 50% of the urban area. In addition, people have settled in low flood-prone areas that easily inundate when the Esmeraldas and Teaone rivers overflow due to heavy rain. The required adaptation solution will be to upgrade the city´s drainage system considering the expected climate-related increase in rainfall. In contrast, there were (i) previous experience on the use of vegetation to stabilise the slopes of cerro Gataso (MAE, 2002; PNUD, 2005), and (ii) fully developed engineering designs for infrastructure to stabilise hillsides and drain stormwater (Annex 12). The designs need to be updated and incorporate climate change considerations (e.g., stronger and more frequent El Niño), but this can be easily done.

Barrier	Project action	Alternative approaches considered but not adopted
		The construction works in quebrada Bonilla (Antofagasta) and cerro Gataso (Esmeraldas) were chosen because (i) they were urgently needed, and (ii) there were engineering designs that could be updated to include the climate factor.
2. Early warning systems have limited information to alert people at risk with sufficient time to evacuate.	Increase capacity to forecast hydrometeorological hazards and strengthen early warning systems. Install meteorological radars and meteorological stations in Antofagasta and Esmeraldas (outputs 3.1 and 3.2). Expand public warning systems in Antofagasta and Taltal to alert and evacuate the local population in case of mudflows (output 4.1). Prepare and implement a pilot community-based flood warning system in Luis Vargas Torres Island (Esmeraldas) (output 4.2), prepare climate-adjusted flood and landslide risk maps for the city and signal the evacuation routes and safe areas (output 4.3)	At first it was considered that strengthening climate monitoring with automatic weather station could be sufficient to improve the forecasts. However, it was analysed that the weather stations this will not provide information with sufficient time to alert the local population in case of emergency. In Antofagasta and Taltal, coastal storms develop very fast and once rain falls, the window of opportunity to alert people is one hour or less. The same occurs in Esmeraldas, where flooding is mostly associated with heavy rainfall upriver. Doppler weather radars were chosen because they provide information on precipitation movement and intensity. This will be the first weather radar in Chile. INAMHI´ experience with Quito´s weather radars was useful to assess the viability of this project element and will serve during project execution.
3. Limited capacity to address informal occupation of land in high risk areas.	Raise awareness of local population about the danger of setting on high-risk areas through the implementation of communication and education strategies (output 6.1) and an initiative to invigorate cultural memory (output 6.2).	At first, it was considered to directly address the issue of land tenure in informal settlements in risk areas. It was thought that the project could contribute to strengthen municipal regulations and assist to motivate that people relocate to safe areas. However, it was found that informal land use was a long-standing issue with very complex root causes. In Chile, despite sustained major work from public and private organizations, the problem still persists. Therefore, this approach was considered inviable because the present project would not be able to have a real impact. It was decided that the communication and education strategies include messages and actions to raise awareness about settling in hazard areas.
4. Local technical staff with limited capacities to mainstream climate change adaptation and disaster risk reduction.	Develop and implement an online course on risk-based adaptation in coastal cities for local governments´ officers (output 5.1).	At first, it was considered to use traditional in-person training. However, this was very costly and it seemed difficult to sustain it after project closure. The use of on-line training was chosen because (i) there is local experience and capacity to prepare and execute it, (ii) this kind of training is now widespread in LAC, (iii) it more cost-effective, (iv) it allows for diverse participation of professionals from the region, and (v) allows for self-paced learning. The limitations of self-paced only online training (e.g., inability to ask specific questions, no interaction with peers) were considered, and a blended approach was chosen. This is, a combination of

Barrier	Project action	Alternative approaches considered but not adopted
		self-paced materials / activities with online sessions to interact with trainers and other course participants.
5. Local population not fully aware of climate-related risks.	Develop and implement communication and education strategies (output 6.1) and an initiative to invigorate cultural memory (output 6.2).	At first, only public communication and education strategies were considered to raise awareness and engage local groups into climate change adaptation. However, it was seen that there was a need of a social process to maintain a living memory of past events and to pass lessons to the new generations. Chile´s experience with the Japanese narrators´ methodology was analysed and found to be too formal and structured. Therefore, it was decided to use the basic concepts to build a culturally-appropriate initiative that gets rooted in local groups to be sustained on the long term.
	Collective learning through communities of practice (transversal to all project outcomes).	At first, task-specific workgroups were considered to allow for team work. However, it was analysed that workgroups have a narrow scope and usually tend to focus on accomplishing a certain task. Workgroups do not necessarily contribute to a learning environment. Communities of practice (Lave & Wenger, 1991; Wenger, 1998; Wenger et al., 2002) were selected because they allow for collective knowledge creation and learning, collaborative processes and social networking. Communities of practice have limitations (Robert, 2006; Konig, 2013) and need to be cultivated and nurtured (Cambridge et al., 2005), but were considered a better choice.

Annex 14. Environmental and Social Management Plan (ESMP).

Project description summary

This is a regional project whose purpose is to generate experience and knowledge to advance Disaster Risk Reduction (DRR) adaptation in coastal cities of Latin America and the Caribbean (LAC). The governments of Chile and Ecuador will implement specific actions in three[1] small coastal cities (less than 500,000 inhabitants), that face adaptation challenges that are common across the region. Antofagasta and Taltal are vulnerable to mudflows caused by flash floods, and Esmeraldas is vulnerable to flooding and landslides.

The project objective is to reduce vulnerability to climate-related floods, mudflows and landslides in three coastal cities by mainstreaming a risk-based approach to adaptation, building collaboration and networking, and developing a culture of adaptation. The project strategy has five key elements:

a. Develop experience on how to build better to withstand climate- related hazards. This includes (i) updating the designs of Antofagasta´s stormwater plan and the protection works for quebrada Bonilla, and Esmeraldas´ construction works to stabilize cerro Gataso, and (ii) building the public works in quebrada Bonilla and cerro Gataso. These actions will facilitate learning on incorporating the climate variable into protection works. In addition, a green infrastructure plan will be prepared for Esmeraldas, and a first element will be implemented in cerro Gataso to complement grey infrastructure.

b. Enhance disaster preparedness by (i) using a weather radar (Esmeraldas) and a storm detection system (Antofagasta) and an increased number of meteorological stations to anticipate risk situations and gain time to alert the local population, and (ii) strengthen involvement of local groups, including installing sirens to alert of danger, publicize evacuation maps, and establish public emergency drills to promote rapid and effective response to floods and mudflows.

c. Prepare an on-line regional training course on risk-based adaptation for municipal officers of coastal cities. This will contribute to strengthen local capabilities and empower municipal officers to mainstream DRR at the local level.

d. Increase awareness and empower local communities through public communication and education strategies and develop a narrators' initiative to strengthen cultural memory for climate-related DRR.

e. Share lessons by systematically document, exchange and disseminate experience and learning within each country, between both countries and with other coastal cities of LAC.

To achieve the project´s objective and purpose, a group of protect and accommodate adaptation measures will be implemented, including:

Adaptation measures to protect the people and infrastructure of the built environment

[1] Antofagasta (ca., 320 thousand inhabitants) and Taltal (ca., 10 thousand inhabitants) in Chile, and Esmeraldas (ca., 161 thousand inhabitants) in Ecuador.

1. Construction of structural measures to protect local population of Antofagasta and Esmeraldas from climate-related mudflows and landslides, respectively. The construction of climate proof infrastructure will serve to gain experience on incorporating long-term climate predictions into protection works´ design and construction; this experience will be useful in both countries and the region.
2. Use green infrastructure to complement the structural measures to address landslides in Esmeraldas

Adaptation measures to accommodate to the new climate conditions

3. Incorporate long-term climate predictions into the design and construction of structural and non-structural protection works. This includes:
    a. Preparation of guidelines to incorporate the climate variable into mudflow and landslide protection works,
    b. To update Antofagasta´s stormwater management plan, and
    c. To prepare Esmeralda´s green infrastructure plan.
4. Improve climate monitoring and early warning and evacuation systems in the three cities.
5. Develop a knowledge framework (community of practices, training course, on-line platform) to strengthen capacities to prepare and implement risk-based adaptation measures and to disseminate lessons and best practice in the region.
6. Raise awareness of local population and maintain cultural memory of climate-related disasters and risks.

The above-mentioned adaptation measures will contribute to mainstream risk-based adaptation in the three cities. All the adaptation measures will be sustainable in the long-term through active participation of local governments (e.g., municipal governments, Antofagasta Regional Government, Esmeraldas provincial government) and local stakeholders. The project´s lessons and best practice will be documented and disseminated to serve for application in other coastal cities of the region.

Project components

The project is organised into three components and seven outcomes:

1. Priority Actions to increase resilience	Outcome 1. Enhanced plans and green infrastructure reduces vulnerability to floods, landslides and mudflows in two coastal cities	1.1. Stormwater management plan for Antofagasta	Chile
		1.2. Green infrastructure plan for Esmeraldas	Ecuador
	Outcome 2. Reduced vulnerability to floods,	2.1. Mudflow control infrastructure in Antofagasta	Chile

	landslides and mudflows in two coastal cities	2.2. Landslide mitigation works in Esmeraldas	Ecuador
	Outcome 3. Improved climate monitoring and means to alert the local population	3.1. Weather radar in Esmeraldas and a storm detection system in Antofagasta	Chile and Ecuador
		3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas	Chile and Ecuador
	Outcome 4. Improved means to respond to floods, landslides and mudflows	4.1. Enhanced public warning system in Antofagasta and Taltal	Chile
		4.2. Pilot flood warning system in Esmeraldas	Ecuador
		4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	Chile and Ecuador
2. Strengthen capacities for adaptation.	Outcome 5. Local governments with improved capacity to design and implement adaptation measures	5.1. Course on risk-based adaptation in coastal cities	Chile and Ecuador
	Outcome 6. Local population and government personnel with increased awareness of climate-related risks (floods, landslides, mudflows)	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	Chile and Ecuador
		6.2. Narrators´ initiative initiated	Chile and Ecuador
3. ICTs and partnership between coastal cities in Latin America .	Outcome 7. Lessons and best practice on reducing vulnerability to climate related flooding, landslides and mudflows in coastal cities have been shared in the region.	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice.	Chile and Ecuador
		7.2. Lessons and best practice documented and disseminated.	Chile and Ecuador

Preparation of the Environmental and Social Management Plan

The Adaptation Fund´s Environmental and Social Policy (ESP) (AF, 2013) aim to avoid unnecessary environmental and social harms because of AF-funded projects and programmes. The ESP requires that the projects are screened for risks against the AF´s 15 principles of environmental and social safeguarding, and categorised accordingly to the level of potential negative impacts. Projects that present environmental and social risks must undergo a risk/impact assessment, and prepare an Environmental and Social Management Plan (ESMP). The ESMP establish the measures to be taken to mitigate or avoid adverse environmental and social risks and impacts.

The methodology applied to ensure compliance of the present project with the ESP is described in the following sections. The key background documents use are AF (2013), AF (2016) and AF (2016a).

Screening

The ESP requires that all projects be screened for their environmental and social impacts (i.e., the potential to cause environmental or social harm), that those impacts be identified, and that the proposed project be categorized according to the level of its potential environmental and social impacts. Three categories have been established by the AF:

- Category A. Projects likely to have significant adverse environmental or social impacts.
- Category B. Projects with potential adverse impacts that are less adverse than Category A projects/programmes, because for example they are fewer in number, smaller in scale, less widespread, reversible or easily mitigated.
- Category C. Projects with no adverse environmental or social impacts.

The ESP establishes that the screening process shall seek to identify potential environmental and social impacts and risks, taking into consideration the 15 Adaptation Fund's environmental and social principles (Table 1). The screening process verifies compliance with the 15 environmental and social principles; no further assessment actions are required for principles that are not applicable. The AF guidance document (AF, 2016) indicates that three principles always apply: principle 1 compliance with the law, principle 4 human rights, and principle 6 core labour rights.

Table 1. The 15 environmental and social principles of the Adaptation Fund.

1. Compliance with the Law
2. Access and equity
3. Marginalized and vulnerable groups
4. Human rights
5. Gender equity and women´s empowerment
6. Core labour rights
7. Indigenous peoples
8. Involuntary resettlement
9. Protection of natural habitats
10. Conservation of biological diversity
11. Climate change
12. Pollution prevention and resource efficiency
13. Public health
14. Physical and Cultural Heritage
15. Lands and Soil Conservation

Environmental and Social Assessment

The ESP indicates that for all projects/programmes that have the potential to cause environmental or social harm (i.e., category A and B projects), the implementing entity shall prepare an environmental and social assessment that identifies any environmental or social risks, including any potential risks associated with the Adaptation Fund's environmental and social principles that have been triggered during the screening process. The assessment shall:

(i) consider all potential direct, indirect, transboundary, and cumulative impacts and risks that could result from the proposed project;

(ii) assess alternatives to the project; and

(iii) assess possible measures to avoid, minimize, or mitigate environmental and social risks of the proposed project.

Environmental and Social Management Plan

The AF Guidance indicate that risks and/or impacts that are identified and determined as unavoidable in the assessment process should be captured in an environmental and social management plan (ESMP).

The ESMP should describe the risk mitigation measures that will be taken to ensure consistency with the ESP Principles and applicable host country laws and regulations.

Results of the screening and environmental and social assessment

Screening

The results of screening the 15 environmental and social principles are summarised in Table 2 and Table 3.

Table 2. Summary of the screening of the 15 environmental and social principles.

Checklist of environmental and social principles	**No further assessment required for compliance**	**Potential impacts and risks – further assessment and management required for compliance**
Compliance with the Law	No risk or adverse impacts. The project is in compliance with domestic and international law	Construction works in Antofagasta and Esmeraldas will have to obtain the

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		corresponding environmental permits[2].
Access and Equity	No risk or adverse impacts. The project intervention will contribute to protect the inhabitants of three coastal cities from climate-related risk. The project will not impede / limit access to essential services and rights. Communication and public awareness activities will be open to everyone.	Ensure that local population and stakeholders are adequately informed and engaged in project actions.
Marginalized and Vulnerable Groups	No risk or adverse impacts to marginalized and vulnerable groups. The project intervention will contribute to protect the lives and possessions of any vulnerable group present in the area of work[3].	Ensure that families living in informal neighbourhoods in risk areas are adequately informed and engaged in project actions, special female-led households.
Human Rights	No risk or adverse impacts. Both countries are parties of the core human rights treaties. The project intervention does not imply any sort of violation of human rights.	
Gender Equity and Women's Empowerment	No risk or adverse impacts. The project interventions in early warning and protection will defend all persons. Also, communication and public awareness activities will reach all the population.	Ensure that project actions (i.e., outputs 4.1 to 7.2) area gender, age and cultural sensitive, and consider special needs of persons with disabilities.

[2] The Project workplan and budget include this requirement. In Chile, MOP will submit the environmental impact statement to the Environmental Evaluation Service (SEA) for approval (this has already been done for exiting mudflows control infrastructure). In Ecuador, GADE will submit information to MAE to obtain and environmental registry.
[3] The most vulnerable groups are families that live in informal neighbourhoods on risk areas.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Core Labour Rights	No risk or adverse impacts. The project intervention has no implication with the four fundamental principles and rights at work[4].	
Indigenous Peoples	No risk or adverse impacts. The project intervention will not affect indigenous groups or territories. Indigenous population in Antofagasta and Taltal is minimal. In Esmeraldas, the majority of the population is afro-Ecuadorian.	
Involuntary Resettlement	No risk or adverse impacts. The project intervention does not imply involuntary resettlement. Construction works will be done in unpopulated gorges and hillsides.	
Protection of Natural Habitats	No risk or adverse impacts. The project will not intervene in protected areas or high value conservation areas.	In Esmeraldas, ensure that mangroves and the existing protected area[5] are considered in the green infrastructure plan (output 1.2).
Conservation of Biological Diversity	Low risk in Esmeraldas. Vegetation will be used in Esmeraldas for slope stabilization in cerro Gataso. The priority will be to use native species. However, there is an option to use vetiver[6] a non-native grass widely used	Report the species used for slope stabilization in Esmeraldas. Invasive species will not be used.

[4] i.e., child labour, discrimination at work, forced or compulsory labour, and freedom of association.

[5] Wildlife Refuge Mangroves of Esmeraldas. This protected area encompasses the remnant mangroves of the city; it has an area of 242 ha of which ca., 37% are mangroves and tropical dry scrubland.

[6] One of the plants under consideration is vetiver (*Chrysopogon zizanioides*), a perennial grass from India. This plant is non-invasive (Joy, 2009), and has already been used in Esmeraldas (PNUD, 2005). Vetiver is extensively used for slope stabilizations (Truong et al., 2008).

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
	worldwide for slope stabilization. There is no risk in Chile.	
Climate Change	No risk or adverse impacts. The project will not increase greenhouse gas emissions or the main drivers of climate change indicated in principle 11.	
Pollution Prevention and Resource Efficiency	No risk or adverse impacts. The project does not imply major use of energy or the production of wastes and pollutants. Emissions and residues during construction works will be managed.	Ensure that residues and waste from construction works are properly managed.
Public Health	No risk or adverse impacts. The project does not imply negative impacts on public health.	
Physical and Cultural Heritage	No risk or adverse impacts. The project will not intervene in cultural / archaeological sites or sites with unique natural values. On the contrary the narrators´ initiative will build on traditions (e.g., marimba, tales) to potentiate cultural memory of climate-related disasters.	
Lands and Soil Conservation	No risk or adverse impacts. The project does not imply soil conversion or degradation. The areas affected by construction works are no productive lands nor high value conservation sites. In Esmeraldas, vegetation will be used to cover barren land to prevent erosion and landslides.	

Table 3. Summary of the screening of the 15 environmental and social principles by project outcome.

Environmental and social principles	Outcome						
	1	2	3	4	5	6	7
Compliance with the Law		x					
Access and Equity	x	x		x	x	x	x
Marginalized and Vulnerable Groups	x	x		x		x	x
Human Rights							
Gender Equity and Women's Empowerment				x	x	x	x
Core Labour Rights							
Indigenous Peoples							
Involuntary Resettlement							
Protection of Natural Habitats	x						
Conservation of Biological Diversity		x					
Climate Change							
Pollution Prevention and Resource Efficiency		x					
Public Health							
Physical and Cultural Heritage							
Lands and Soil Conservation							

Environmental and Social Assessment

The purpose of this section is to identify and assess the potential environmental and social impacts and risks that could occur during the project's implementation. The project was assessed using CAF´s methodology and instruments, which includes verification of compliance with its nine environmental and social safeguards (CAF, 2016), which have equivalencies with AF´s environmental and social principles. The results of the analysis are presented in the Environmental and Social Report (IAS), which is included in Annex 15. In addition, there was a detailed identification of potential impacts and risks for each of the 14 project outputs, considering the 15 environmental and social principles, and with emphasis on the seven principles applicable to the project (Table 2 and Table 3). The results are presented in Table 4.

As a result of this analysis, potential minor environmental and social impacts and risks associated to the implementation of some activities were identified.

The seven environmental and social principles that require attention during project implementation are:

Principle 1. Compliance with the Law

Principle 2. Access and equity

Principle 3. Marginalized and vulnerable groups

Principle 5. Gender equity and women´s empowerment

Principle 7. Indigenous peoples

Principle 8. Involuntary resettlement

Principle 9. Protection of natural habitats

Principle 10. Conservation of biological diversity

Principle 12. Pollution prevention and resource efficiency

Principle 14. Physical and cultural heritage

The principles on (i) access and equity, (ii) marginalized and vulnerable groups, and (iii) gender equity and women´s empowerment have to be considered in most of the outcomes to ensure that key groups are adequately informed and involved. It will be necessary that key actions like early warning systems, communication strategies and the narrator´s initiative are inclusive, gender and age sensitive, and consider the needs of persons with disabilities.

In Chile, the construction works in quebrada Bonilla (output 2.1) will require an Environmental Qualification Resolution. In Ecuador, the works in cerro Gataso (output 2.2), and the installation and operation of the weather radar and the meteorological stations (outputs 3.1 and 3.2) will require an Environmental Registry. In addition to the mandatory environmental requirements, CAF has set pre-conditions (see Table 5).

In Chile, the environmental regulatory framework[7] requires an Environmental Impact Study[8] (EIA), for projects with high-level impacts, and an Environmental

[7] Chile´s environmental regulatory framework is based on the Environmental Law (Law 19,300) amended by Law 20,417 of 2010, and Supreme Decree 40/2012 of 2012 (regulation for the environmental impact assessment system). Article 10 of Law 19,300 list the types of activities that will be subject to the environmental impact evaluation system. Two types of environmental permits exist: Environmental Impact Study and Environmental Impact Declaration.

[8] An EIA applies to projects that may generate high-level impacts; article 11 of Law 19,300 establishes that a project with any of the following characteristics has to present an EIA:

a. Risk to the health of the population, due to the quantity and quality of effluent, emissions and waste.
b. Significant adverse effects on the quantity and quality of renewable natural resources, including soil, water and air.
c. Resettlement of human communities, or significant alteration of the systems of life and customs of human groups.
d. Location at or near populations, resources and protected areas, priority conservation sites, protected wetlands, glaciers, that may be affected, as well as the environmental value of the territory in which it is intended to deploy.
e. Significant change in terms of magnitude or duration, of the scenic or tourism value of an area.
f. Alteration of monuments, sites with anthropological, archaeological, historical value and, in general, belonging to the cultural heritage.

Impact Declaration[9] (DIA) for other projects. These documents are submitted to the national environmental impact evaluation system (SEIA) and are subject to public consultation[10].

In the present case, the existing designs for the protection works in quebrada Bonilla already include the DIA. However, because the designs will be updated to incorporate the climate variable, the DIA will be updated. Therefore, MOP will prepare and submit the updated DIA to the SEA. SEA will conduct the review process, which is managed online, and issue an Environmental Qualification Resolution (RCA). For a DIA, the review process takes ca., 60 working days and has no cost. Existing mudflow protection works presented DIAs and obtained RCAs. The cost of preparing the DIA is included in the project budget (see budget note 14).

In Ecuador, the environmental regulatory framework[11] requires an Environmental Licence[12] for projects with high-level impacts, and an Environmental Registry[13] for other projects. The construction of cerro Gataso´s protection works (output 2.2) and the installation and operation of the weather radar and the meteorological stations (outputs 3.1 and 3.2) will require an Environmental Registry. The process to obtain the Environmental Registry is managed online (suia.ambiente.gob.ec), and consists on completing an online formulary and paying a fee of ca., USD180; the permit is issued automatically.

For the construction works in cerro Gataso, GADE will obtain the corresponding environmental registry. For the weather radar and meteorological stations, GADPE will obtain the corresponding environmental registries. CAF has requested more stringent measures and will require the preparation of environmental impact assessments and the implementation of environmental management plans for these three project elements.

Categorization

The project execution may generate few and minor potential environmental and social impacts and risks that should be reversible and easy to avoid or mitigate. Therefore, the project is categorized as Category B, according to the categories established in the ESP.

[9] Projects included in the categories of article 10 of Law 19,300, but which do not have the characteristics listed in article 11 of the same law, must present a DIA.
[10] The Environmental Evaluation Service (SEA) has established guidelines to conduct the public consultation process (SEA, 2013).
[11] Ecuador´s environmental regulatory framework is based on the Environmental Management Law (Law 37 of 1999, coded in 2004), the environmental impact evaluation system (Ministerial Agreement 061 of 2015) and complementary regulations. Article 14 of Ministerial Agreement 061 established two types of environmental permits: (i) Environmental Registry, and (ii) Environmental Licence. There is an online catalogue which list the projects, works and activities that require an environmental permit and the corresponding permit type (article 22 of Ministerial Agreement 061).
[12] Article 25 of Ministerial Agreement 061 indicates that the Environmental Licence is issued to projects, works and activities with medium or high environmental impact and risk. To obtain an Environmental Licence, an Environmental Impact Assessment (EIA) must be submitted, and the review process is subject to public consultation.
[13] Article 24 of Ministerial Agreement 061 indicates that the Environmental Registry is issued to projects, works and activities with low environmental impact and risk.

Environmental and social management plan

This plan consists of two programs that will be implemented during project execution:

1. Environmental prevention and mitigation program, in which specific measures are established to prevent, correct and/or mitigate adverse environmental impacts and risks. This program includes the grievance mechanism for the project.
2. Monitoring, assessment and oversight program, in which the implementation arrangements for monitoring and evaluation (M&E) of the compliance with mitigation measures and grievance mechanism is defined.

The development of these two programs is presented in the following sections.

Table 4. Screening matrix to verify compliance with the Adaptation Fund´s Environmental and Social Policy.

Environmental and social principles that always apply.

Risks identified.

Risk level: low, medium high

Environmental and social principles[14]	Project outputs					
	1.1. Stormwater management plan for Antofagasta	1.2. Green infrastructure plan for Esmeraldas	2.1. Mudflow control infrastructure in Antofagasta	2.2. Landslide mitigation works in Esmeraldas	3.1. Weather radar in Esmeraldas and a storm detection system in Antofagasta	3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas
1. Compliance with the Law	No risk. The stormwater management plan will be prepared under the guidance and oversight of MOP, the competent authority	No risk. The plan will be prepared under the guidance and oversight of GADE, the competent authority	Requires environmental permit. Risk (low): Inadequate implementation of mandatory environmental and social management measures required by the national authority and CAF.	Requires environmental permit. Risk (low): Inadequate implementation of mandatory environmental and social management measures required by the national authority and CAF.	No risk. The radar and the storm detection system will be purchased and installed under the guidance and oversight of DMC (Chile) and INAMHI (Ecuador), the competent authorities. In Ecuador, an environmental registry will be required. Potential risk of impact on site and access route	No risk. The meteorological stations will be purchased and installed under the guidance and oversight of DMC (Chile) and INAMHI (Ecuador), the competent authorities In Ecuador, an environmental registry will be required. Potential risk of impact on site and access route

[14] As listed in section B of the Environmental and Social Policy (AF, 2013).

Environmental and social principles[14]	Project outputs					
	1.1. Stormwater management plan for Antofagasta	1.2. Green infrastructure plan for Esmeraldas	2.1. Mudflow control infrastructure in Antofagasta	2.2. Landslide mitigation works in Esmeraldas	3.1. Weather radar in Esmeraldas and a storm detection system in Antofagasta	3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas
					if located on a pristine area.	if located on a pristine area.
2. Access and equity	Risk (low): population of Antofagasta not adequately informed of the proposed stormwater management plan.	Risk (low): population of Esmeraldas not adequately informed of the proposed green infrastructure plan.	Risk (low): population of quebrada Bonilla not adequately informed of the mudflow control infrastructure.	Risk (low): population of cerro Gataso not adequately informed of the landslide mitigation works	No risk.	No risk.
3. Marginalized and vulnerable groups	Risk (low): population of Antofagasta living in campamentos not adequately informed of the proposed stormwater management plan.	Risk (low): population of Esmeraldas living in informal neighbourhoods on risk areas not adequately informed of the proposed green infrastructure plan.	Risk (low): population of campamentos along quebrada Bonilla not adequately informed of the mudflow control infrastructure.	Risk (low): population of informal neighbourhoods on the hillsides of cerro Gataso not adequately informed of the landslide mitigation works	No risk.	No risk.
4. Human rights	No specific issues concerning human rights were identified that could be exacerbated by the project intervention.	No specific issues concerning human rights were identified that could be exacerbated by the project intervention.	No specific issues concerning human rights were identified that could be exacerbated by the project intervention.	No specific issues concerning human rights were identified that could be exacerbated by the project intervention.	No specific issues concerning human rights were identified that could be exacerbated by the project intervention.	No specific issues concerning human rights were identified that could be exacerbated by the project intervention.
5. Gender equity and women´s empowerment	No specific factors will impede or limit women´s participation.	No specific factors will impede or limit women´s participation.	No specific factors will impede or limit women´s participation.	No specific factors will impede or limit women´s participation.	No specific factors will impede or limit women´s participation.	No specific factors will impede or limit women´s participation.

Environmental and social principles[14]	Project outputs					
	1.1. Stormwater management plan for Antofagasta	1.2. Green infrastructure plan for Esmeraldas	2.1. Mudflow control infrastructure in Antofagasta	2.2. Landslide mitigation works in Esmeraldas	3.1. Weather radar in Esmeraldas and a storm detection system in Antofagasta	3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas
6. Core labour rights	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.
7. Indigenous peoples	The areas of intervention will not affect indigenous groups or territories	The areas of intervention will not affect indigenous groups or territories	The areas of intervention will not affect indigenous groups or territories	The areas of intervention will not affect indigenous groups or territories	The areas of intervention will not affect indigenous groups or territories	The areas of intervention will not affect indigenous groups or territories
8. Involuntary resettlement	The project intervention does not imply displacement of local population.	The project intervention does not imply displacement of local population.	The project intervention does not imply displacement of local population. The sites were construction works will be executed are barren, unpopulated and not used for economic or recreational activities.	Risk (low). The project intervention does not imply displacement of local population. However, the final design of the protection works will indicate if it will be necessary to relocate families at risk. The hillsides where construction works will be executed are unpopulated and not used for economic and recreational activities. The project will not affect the situation of informal neighbourhoods.	The project intervention does not imply displacement of local population.	The project intervention does not imply displacement of local population.

Environmental and social principles[14]	Project outputs					
	1.1. Stormwater management plan for Antofagasta	1.2. Green infrastructure plan for Esmeraldas	2.1. Mudflow control infrastructure in Antofagasta	2.2. Landslide mitigation works in Esmeraldas	3.1. Weather radar in Esmeraldas and a storm detection system in Antofagasta	3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas
9. Protection of natural habitats	The project intervention will not intervene in protected areas or high value conservation areas.	Risk (low). Do not consider the role of mangroves in the green infrastructure plan. There is a 242 ha protected are (Wildlife Refuge Mangroves of Esmeraldas) in the northern tip of Luis Vargas Torres Island.	The project intervention will not intervene in protected areas or high value conservation areas.	The project intervention will not intervene in protected areas or high value conservation areas.	The project intervention will not intervene in protected areas or high value conservation areas.	The project intervention will not intervene in protected areas or high value conservation areas.
10. Conservation of biological diversity	The project intervention will not intervene areas with high value biodiversity.	Risk (low). Introduction of invasive species to stabilise cerro Gataso´s hillsides.	The project intervention will not intervene areas with high value biodiversity.	The project intervention will not intervene areas with high value biodiversity.	The project intervention will not intervene areas with high value biodiversity.	The project intervention will not intervene areas with high value biodiversity.
11. Climate change	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.
12. Pollution prevention and resource efficiency	The project intervention will not use large quantities of energy, water or other natural resources.	The project intervention will not use large quantities of energy, water or other natural resources.	Risk (low). Pollution generated during construction works.	Risk (low). Pollution generated during construction works.	The project intervention will not use large quantities of energy, water or other natural resources.	The project intervention will not use large quantities of energy, water or other natural resources.

Environmental and social principles[14]	Project outputs					
	1.1. Stormwater management plan for Antofagasta	1.2. Green infrastructure plan for Esmeraldas	2.1. Mudflow control infrastructure in Antofagasta	2.2. Landslide mitigation works in Esmeraldas	3.1. Weather radar in Esmeraldas and a storm detection system in Antofagasta	3.2. Increased number of meteorological stations in Antofagasta, Taltal and Esmeraldas
13. Public health	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.
14. Physical and Cultural Heritage	The project intervention will not affect or intervene physical and cultural heritage.	The project intervention will not affect or intervene physical and cultural heritage.	The project intervention will not affect or intervene physical and cultural heritage.	Risk (low). The project intervention will not affect or intervene known sites with physical and cultural heritage. However, as a precaution, there have to be measures to act in case archaeological remains are found during construction works.	The project intervention will not affect or intervene physical and cultural heritage.	The project intervention will not affect or intervene physical and cultural heritage.
15. Lands and Soil Conservation	The project intervention will not intervene valuable land.	The project intervention will not intervene valuable land.	The project intervention will not intervene valuable land.	The project intervention will not intervene valuable land.	The project intervention will not intervene valuable land.	The project intervention will not intervene valuable land.

Environmental and social principles	Project outputs							
	4.1. Enhanced public warning system in Antofagasta and Taltal	4.2. Pilot flood warning system in Esmeraldas	4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	5.1. Course on risk-based adaptation in coastal cities	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	6.2. Narrators´ initiative initiated	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice	7.2. Lessons and best practice documented and disseminated
1. Compliance with the Law	No risk. The enhanced public warning system will be prepared under the guidance and oversight of ONEMI, the competent authority	No risk. The pilot will be prepared under the guidance and oversight of GADE, the competent authority	No risk. The evacuation maps and signals will be prepared under the guidance and oversight of ONEMI (Chile) and GADE (Ecuador), the competent authorities.	No risk. The course, both countries have agreed that the regional course will be prepared and executed by APC.	No risk. There are no legal requirements to comply.	No risk. There are no legal requirements to comply.	No risk. There are no legal requirements to comply.	No risk. There are no legal requirements to comply.
2. Access and equity	Risk (low): population of Antofagasta and Taltal not adequately informed of the warnings and response actions to be taken.	Risk (low): population of the pilot site (Luis Vargas Torres Island) not adequately informed of the warnings and response actions to be taken.	Risk (low): population of Antofagasta,Taltal and Esmeraldas of evacuation routes.	Risk (low): trainees with limited access to internet (difficulties to access the online course).	Risk (low): population of the three cities not adequately aware of climate-related risks (communication channels insufficient to address the	Risk (low): limited community involvement / interest in narrator´s actions to maintain cultural memory.	Risk (low): limited access to internet.	Risk (low): language barriers limit dissemination of key messages / lessons.

Environmental and social principles	Project outputs							
	4.1. Enhanced public warning system in Antofagasta and Taltal	4.2. Pilot flood warning system in Esmeraldas	4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	5.1. Course on risk-based adaptation in coastal cities	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	6.2. Narrators´ initiative initiated	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice	7.2. Lessons and best practice documented and disseminated
					intended audience)			
3. Marginalized and vulnerable groups	Risk (low): families living in informal neighbourhoods on risk areas not adequately informed and engaged in project actions.	Risk (low): families living in Luis Vargas Torres island not adequately informed and engaged in pilot flood warning system.	Risk (low): families living in informal neighbourhoods on risk areas not adequately informed and engaged in project actions.	No risk.	Risk (low): families living in informal neighbourhoods on risk areas not adequately informed and engaged in project actions.	Risk (low): families living in informal neighbourhoods on risk areas not adequately informed and engaged in project actions.	Risk (low): families living in informal neighbourhoods on risk areas with limited internet access[15].	Risk (low): families living in informal neighbourhoods on risk areas with limited internet access.
4. Human rights	No specific issues concerning human rights were identified that could be exacerbated by	No specific issues concerning human rights were identified that could be exacerbated by	No specific issues concerning human rights were identified that could be exacerbated by	No specific issues concerning human rights were identified that could be exacerbated by	No specific issues concerning human rights were identified that could be exacerbated by	No specific issues concerning human rights were identified that could be exacerbated by	No specific issues concerning human rights were identified that could be exacerbated by	No specific issues concerning human rights were identified that could be exacerbated by

[15] Internet access has limitations in both countries. The Internet Monitor of Harvard University (thenetmonitor.org) reports that in Ecuador, 35% of individuals use internet and 22% of households have internet access. In Chile, 61% of individuals use internet and 45% of households have internet access.

Environmental and social principles	Project outputs							
	4.1. Enhanced public warning system in Antofagasta and Taltal	4.2. Pilot flood warning system in Esmeraldas	4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	5.1. Course on risk-based adaptation in coastal cities	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	6.2. Narrators´ initiative initiated	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice	7.2. Lessons and best practice documented and disseminated
	the project intervention.	the project intervention.	the project intervention.	the project intervention.	the project intervention.	the project intervention.	the project intervention.	the project intervention.
5. Gender equity and women´s empowerment	Risk (low): the public warning systems are not gender and age sensitive and do not consider the needs of persons with disabilities.	Risk (low): the flood warning and response system is not gender and age sensitive and do not consider the needs of persons with disabilities.	Risk (low): the evacuation routes and signals are not gender and age sensitive and do not consider the needs of persons with disabilities.	Risk (low): the course contents, materials and channels not gender and age sensitive and do not consider the needs of persons with disabilities.	Risk (low): the communication channels and messages are not gender and age sensitive and do not consider the needs of persons with disabilities.	Risk (low): the narrators´ initiative actions are not gender, age and cultural sensitive and do not consider the needs of persons with disabilities.	Risk (low): electronic platform content is not gender, age and cultural sensitive	Risk (low): documents are not gender, age and cultural sensitive
6. Core labour rights	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.	The project intervention has no implication with the four fundamental principles and rights at work.
7. Indigenous peoples	The project actions will not affect indigenous	Risk (low). There are about 60 Chachi families	The project actions will not affect indigenous	The project actions will not affect indigenous	The project actions will not affect indigenous	The project actions will not affect indigenous	The project actions will not affect indigenous	The project actions will not affect indigenous

Environmental and social principles	Project outputs							
	4.1. Enhanced public warning system in Antofagasta and Taltal	4.2. Pilot flood warning system in Esmeraldas	4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	5.1. Course on risk-based adaptation in coastal cities	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	6.2. Narrators´ initiative initiated	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice	7.2. Lessons and best practice documented and disseminated
	groups or territories.	living the Luis Vargas Torres island.	groups or territories.	groups or territories.	groups or territories.	groups or territories.	groups or territories.	groups or territories.
8. Involuntary resettlement	The public warning systems do not imply displacement of local population.	The pilot flood warning system do not imply displacement of local population.	The installation of evacuation route maps and signals does not imply displacement of local population.	No risk	No risk	No risk	No risk	No risk
9. Protection of natural habitats	The public warning systems will not affect protected areas or high value conservation areas.	The pilot flood warning system will not affect protected areas or high value conservation areas.	The installation of evacuation route maps and signals will not affect protected areas or high value conservation areas.	No risk	No risk	No risk	No risk	No risk
10. Conservation of biological diversity	The project intervention will not intervene	The project intervention will not intervene	The project intervention will not intervene	No risk	No risk	No risk	No risk	No risk

Environmental and social principles	Project outputs							
	4.1. Enhanced public warning system in Antofagasta and Taltal	4.2. Pilot flood warning system in Esmeraldas	4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	5.1. Course on risk-based adaptation in coastal cities	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	6.2. Narrators´ initiative initiated	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice	7.2. Lessons and best practice documented and disseminated
	areas with high value biodiversity.	areas with high value biodiversity.	areas with high value biodiversity.					
11. Climate change								
12. Pollution prevention and resource efficiency	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.	No risk. The project intervention does not include activities with large greenhouse emissions.
13. Public health	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.	The project intervention does not imply negative impacts on public health.
14. Physical and Cultural Heritage	The project intervention will not affect or intervene physical	The project intervention will not affect or intervene physical	The project intervention will not affect or intervene physical	The project intervention will not affect or intervene physical	The project intervention will not affect or intervene physical	The project intervention will not affect or intervene physical	The project intervention will not affect or intervene physical	The project intervention will not affect or intervene physical

Environmental and social principles	Project outputs							
	4.1. Enhanced public warning system in Antofagasta and Taltal	4.2. Pilot flood warning system in Esmeraldas	4.3. Evacuation route maps and signals in Antofagasta, Taltal and Esmeraldas	5.1. Course on risk-based adaptation in coastal cities	6.1. Public communication and education strategies for Antofagasta, Taltal and Esmeraldas.	6.2. Narrators´ initiative initiated	7.1. Electronic platform to facilitate communication among stakeholders and dissemination of lessons and best practice	7.2. Lessons and best practice documented and disseminated
	and cultural heritage.	and cultural heritage.	and cultural heritage.	and cultural heritage.	and cultural heritage.	and cultural heritage.	and cultural heritage.	and cultural heritage.
15. Lands and Soil Conservation	The project intervention will not intervene valuable land.	The project intervention will not intervene valuable land.	The project intervention will not intervene valuable land.	No risk	No risk	No risk	No risk	No risk

Environmental and social prevention and mitigation program

Specific measures to prevent, correct and/or mitigate adverse environmental and social impacts and risks are presented in Table 5. Twenty mitigation measures have been outlined.

Grievance mechanism

In the present project, CAF will apply the grievances and complaints system used in CAF/GEF projects. This system is formed by two administrative entities (Ombudsperson and Grievance Management Committee) and one mechanism, to acknowledge, grievances, complaints, compensation and reparation claims. Its purpose is to allow to settle and give a proper solution to environmental or social controversies and claims likely to arise from the project.

The grievances and complaints system is explained in detail in section XII of CAF´s environmental and social safeguards for CAF/GEF projects manual[16] (CAF, 2015). The administrative instances to receive, respond and deal with complaints and grievances are: (i) the ombudsperson (i.e., CAF Corporate Controller), and (ii) the Grievances Management Committee (GMC). The GMC is formed by (i) the Executive Vice-President (who presides), (ii) the Corporate Human Capital Director, (iii) the Legal Director; (iv) the Corporate Credit and Risk Director.

The grievances and complaints mechanism is summarised in Figure 1. The process starts with the submission of a grievance/complaint) and continues with the consultation and verification of enforcement.

Before project start, the grievances and complaints system document -- i.e., section XII of CAF (2015) -- will be adjusted to the particular needs of the present project (e.g., contact information in Chile and Ecuador) and translated into Spanish. In CAF´s and the project´s websites there will be (i) a brief explanation of the grievances and complaints system, (ii) the contacts to file a grievance/complaint, and (iii) the grievances and complaints system document.

Monitoring, evaluation and oversight program

At project start, a “Manual of Social and Environmental Safeguards Implementation” will be developed to have protocols with specific indicators, means of verification and responsible for the implementation of the mitigation measures (Table 5). These protocols will be validated with the main partners involved in the project’s implementation. Additionally, a training workshop aimed to the members of the project unit and project partners will be carried out for the implementation of this manual. CAF will give technical support for the manual elaboration and the training workshop.

[16] The document can be downloaded from the following link: https://www.caf.com/media/2759391/d0-7_s_e_safeguards_manual_to_caf-gef_projects_may_2015_28.pdf

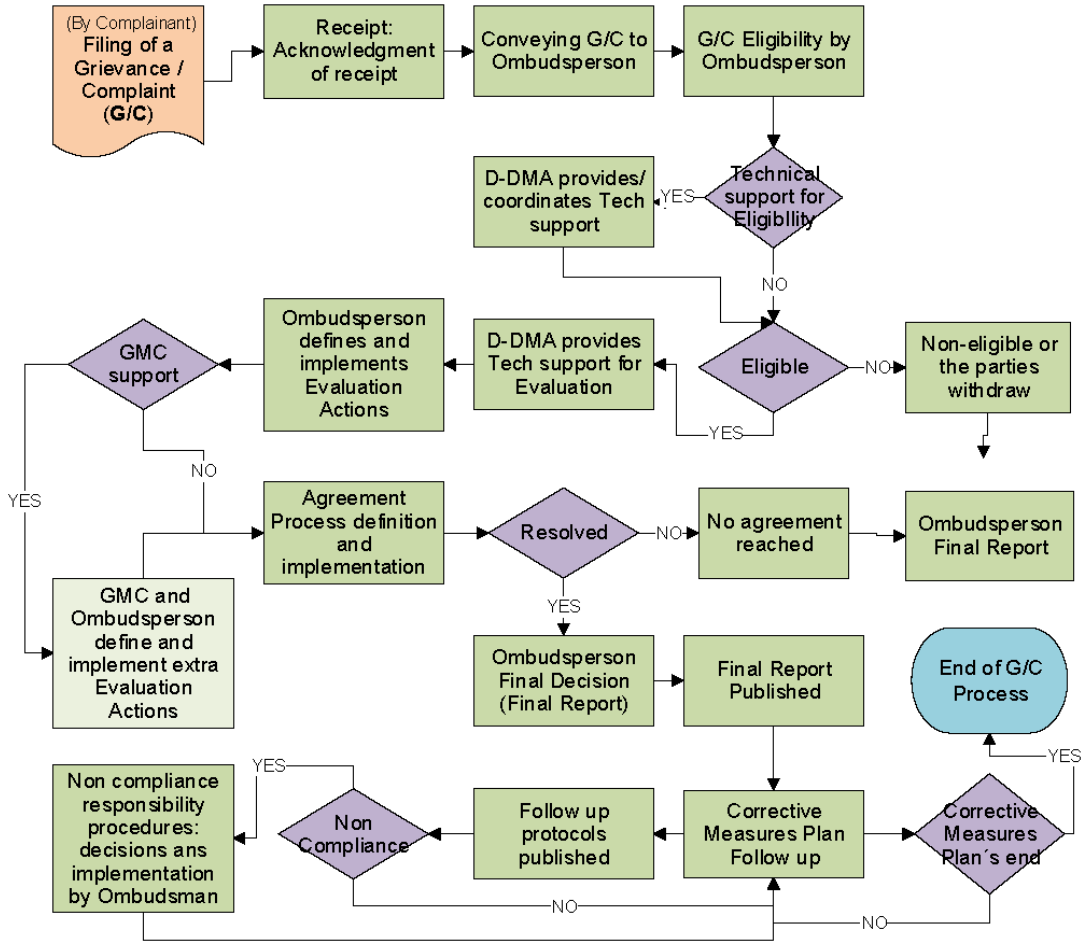


Figure 1. Grievances and complaints reception mechanism. G/C = Grievance/Complaint - GMC = Grievances Management Committee - D-DMA = Environmental and Climate Change Division Director

Table 5. Mitigation measures for management of environmental and social impacts and risks.

Environmental and Social Principle	Environmental or social risk	Mitigation measure
Principle 1. Compliance with the Law	In the construction of mudflow control infrastructure in Antofagasta (output 2.1) and landslide mitigation works in Esmeraldas (output 2.2), inadequate implementation of mandatory environmental and social management measures required by the national authorities and CAF.	Mitigation measure 1. MOP and GADE must comply with the following commitments established by CAF: In Chile 1. No later than 30 days after the conclusion of the reported quarter (Jan-Mar, Apr-Jun, Jul-Sep or Oct-Dec): Quarterly reports on the progress of the Environmental and Social Management Plan for Antofagasta. 2. In the event that during the term of the Contract, an event of extreme rainfall that results in alluvial or other processes that generate emergencies in any of the gorges with or without works, and no later than 90 days after the emergency is concluded: A report explaining the characteristics of the event, its consequences, the manner in which it was attended to and all relevant information according to the responsible entity. 3. Not later than thirty days after being signed: the Agreements for the proper functioning of the works with the communities or other third parties, which establishes the commitment not to dispose of any type of waste in the pools, which Have been built during the term of the Agreement. 4. Timely notification to CAF of any changes in the characteristics of the projects or in the environmental or social situations that occur during the term of the Agreement.

Environmental and Social Principle	Environmental or social risk	Mitigation measure
		In Ecuador: Conditions prior to the first disbursement: The Executing Agency will submit, to CAF's satisfaction: 1. The terms of reference (TDR) for the Elaboration of a Strategic Environmental Assessment on the intervention in Esmeraldas in the three components of the Project "Reducing climate vulnerability in urban and semi urban areas in cities in Latin America". 2. The TDRs for updating the EIA for the Study at the final design for the Stability of the Cerro Gatazo Slopes, and for the installations of meteorological stations and Doppler radar at the sites selected by INAMHI. Conditions at 120 days after the first disbursement: The Executing Agency will submit, to CAF's satisfaction: 3. The EIA for the final design of Stability of the Cerro Gatazo Slopes, and for the installations of meteorological stations and doppler radar in the sites selected by INAMHI. This EIA must contain all the information requested in the CAF Environmental and Social Safeguards: S01, S03, S06 and S07 that are activated for the present operation and which the Executing Agency declares to know. This final design should include a road safety audit of the design of the project to avoid unnecessary damage to pedestrians and light transportation vehicles of the residents of the area of influence of the Cerro Gatazo Slope Stabilization Project. The signage must be designed to contain the messages in both Spanish and the Cha'apalachi language of the Chachi.

Environmental and Social Principle	Environmental or social risk	Mitigation measure
		4. The final design for Stability of the Cerro Gatazo Slopes, and for the installations of meteorological stations and Doppler radar in the sites selected by INAMHI. Conditions at 180 days after the first disbursement: The executing agency will submit, to CAF's satisfaction: 5. The Strategic Environmental Assessment document on the intervention in Esmeraldas in the three components of the Project "Reducing climate vulnerability in urban and semi urban areas in Latin America" and its interaction with several projects that are happening in the city of Esmeraldas in Cerro Gatazo, in the Estuary of the Esmeraldas River and in its area of influence. Conditions during the disbursement period: The Executing Agency will submit to CAF's satisfaction: 6. Evidence that an external and independent environmental and social audit has been contracted for Component 1 of the Project, which submits quarterly reports. 7. The quarterly reports of the progress of the Environmental and Social Management Plan for the works of component 1 must report on the following aspects: A. Improvement of the signalling in the tracks of the area of direct influence of Cerro Gatazo during the works of stabilization of slopes, B. Monitoring of the compliance of the transport routes of debris (coming from Cerro Gatazo) to the site of final disposal approved,

Environmental and Social Principle	Environmental or social risk	Mitigation measure
		C. Implementation of the green infrastructure plan, specifically the revegetation and reforestation of Cerro Gatazo, once the tasks of remodeling of slopes and anchorage have been carried out. Among others that will be established in the Environmental and Social Management Plan requested. D. Social study incorporating the results of the consultation process, and a plan for the Chachi ethnic group in the project (in response to activation of Safeguard S06).
Principle 2. Access and equity	Population of Antofagasta not adequately informed of the proposed stormwater management plan (output 1.1)	Mitigation measure 2. MOP in coordination with the MdA will 1. Inform through public media (e.g., radio and newspaper interviews) of the initiation of the process to update Antofagasta´s stormwater management plan. 2. After the technical work is finished: (i) the draft document will be published in MOP and MdT websites for public consultation. This will include an executive summary for public use. (ii) the population will be informed through public media that the draft stormwater management plan is available for consultation. Interested parties will be able to submit comments or questions through the website. (iii) a public hearing will be held to present to the public the draft stormwater management plan, summarise the main comments and answer questions and comments. (iv) this process will be documented and published in the project´s website.

Environmental and Social Principle	Environmental or social risk	Mitigation measure
	Population of Esmeraldas not adequately informed of the proposed green infrastructure plan (output 1.2)	Mitigation measure 3. GADE will 1. Inform through public media (e.g., radio and newspaper interviews) of the initiation of the process to prepare the green infrastructure plan. 2. Implement a participatory process with key stakeholders. 3. The draft document will be published in GADE´s website for public consultation. This will include an executive summary for public use. 4. The population will be informed through public media that the draft green infrastructure plan is available for consultation. Interested parties will be able to submit comments or questions through the website. 5. A public hearing will be held to present to the public the draft green infrastructure plan, summarise the main comments and answer questions and comments. 6. The entire process will be documented and published in the project´s website.
	Population of quebrada Bonilla not adequately informed of the	Mitigation measure 4. MOP in coordination with the MdA will organise information meetings with the neighbourhood councils[17] of the area of influence of quebrada Bonilla. Meetings will be held before, during and

[17] Neighbourhood councils (Juntas de Vecinos in Spanish) are community organizations that represent the people that reside in a neighbourhood. Their purpose is to defend the rights of the neighbours and collaborate with the State and the municipality. The neighbourhood councils are regulated by Law 19,418 of 1997 and its subsequent updates and modifications. The municipalities of Antofagasta and Taltal maintain a registry of existing neighbourhood councils and other local organizations. See:
http://www.municipalidadantofagasta.cl/index.php?option=com_content&view=article&id=791&Itemid=534
http://municipalidadtaltal.cl/transparencia/_files/60/20140428-093523_organizaciones-sociales-de-taltal.pdf

Environmental and Social Principle	Environmental or social risk	Mitigation measure
	mudflow control infrastructure (output 2.1)	after completion of the construction works. This will be an element of the citizen participation plan requested by CAF (see mitigation measure 1).
	Population of cerro Gataso not adequately informed of the landslide mitigation works (output 2.2)	Mitigation measure 5. GADE will organise information meetings with the local organizations of the area of influence of cerro Gataso. Meetings will be held before, during and after completion of the construction works. This will be an element of the citizen participation plan requested by CAF (see mitigation measure 1).
	Local population not adequately informed of the warning and response actions to be taken (outputs 4.1, 4.2, 4.3)	Mitigation measure 6. The public communication and education strategies (output 6.1) will include specific actions to introduce the new warning systems and evacuation routes (e.g., sirens to alert to alert of mudflows).
	Trainees with limited access to internet (output 5.1)	Mitigation measure 7. The regional course will be developed with the option to download content for offline viewing. The course will use an offline content player to allow access to the training content without the need for continuous internet connectivity.
Principle 3. Marginalized and vulnerable groups	Population of Antofagasta living in campamentos not adequately informed of the proposed stormwater management plan.	Mitigation measure 8. MOP and MdA will ensure that the campamentos´ organizations are invited to the public hearing to present to the public the draft stormwater management plan (see mitigation measure 2). If needed, specific meeting will be organized within campamentos located

Environmental and Social Principle	Environmental or social risk	Mitigation measure
		on the main drainage channels. At project start, the list of campamentos will be revised and updated if needed[18].
	Population of Esmeraldas living in informal neighbourhoods on risk areas not adequately informed of the proposed green infrastructure plan.	Mitigation measure 9. GADE will ensure that the participatory process (see mitigation measure 3) actively involve the organizations that represent informal neighbourhoods. At project start, a list of organizations will be revised and updated if needed.
	Population of campamentos along quebrada Bonilla not adequately informed of the mudflow control infrastructure.	Mitigation measure 10. MOP will organise information meetings with the campamentos of the area of influence of quebrada Bonilla. Meetings will be held before, during and after completion of the construction works. This will be an element of the citizen participation plan requested by CAF (mitigation measure 1) and will complement the meetings with the neighbourhood councils (mitigation measure 4).
	Population of informal neighbourhoods on the hillsides of cerro Gataso not adequately informed of the landslide mitigation works.	Mitigation measure 11. GADE will ensure that the organizations that represent informal neighbourhoods and key community leaders participate in the information meetings about landslide mitigation works in cerro Gataso (mitigation measure 5). Meetings will be held before, during and after completion of the construction works. This will be an element of the citizen participation plan requested by CAF (mitigation measure 1).
	People living in informal neighbourhoods of risk areas	Mitigation measure 12. At project start, the project´s local adaptation specialists will establish direct contact with key groups and community

[18] The Regional Government of Antofagasta has registry of campamentos. In addition, Techo has an online database (see http://chile.techo.org/cis/monitor/).

Environmental and Social Principle	Environmental or social risk	Mitigation measure
	are not adequately informed and engaged in project actions.	leaders and will cultivate a collaborative environment and fluid communication channels. On each city, an advisory group will be formed and maintained. These groups will provide feedback and suggestions for the preparation and implementation of actions to inform and engage the groups living in informal neighbourhoods of risk areas.
	People from informal neighbourhoods may also have limited internet access, which in turn restrict their access to information posted in electronic sites.	Mitigation measure 13. Introduce community information boards in key sites to serve as a complementary communication channel to post relevant information like meetings and news. Concise guidelines on managing the boards will be prepared and local groups trained. The community information boards will serve to channel information from both the community and the project.
Principle 5. Gender equity and women´s empowerment	The communication contents are not gender and age sensitive and do not consider the needs of persons with disabilities.	Mitigation measure 14. At project start, communication guidelines will be prepared jointly with key partners (e.g., ONEMI, GADE) to ensure that language, means and forms are adequate to the project´s key target audiences. These guidelines will be based on national and international experience and published resources[19]. The guidelines will be applied by all project partners and reviewed annually.
Principle 7. Indigenous peoples	There are about 60 families living in the Luis Vargas Torres island	Mitigation measure 15. At project start, identify the location of the Chachi families and establish communication. Engage them in the process to develop and implement the pilot flood early warning alert system. Ensure that their needs are taken into account in the design of early warning and evacuation procedures.

[19] For example, CIDA (1995), UNISDR et al., (2009).

Environmental and Social Principle	Environmental or social risk	Mitigation measure
Principle 8. Involuntary resettlement	The final design of protection works in cerro Gataso will indicate if it will be necessary to relocate families at risk	Mitigation measure 16. If necessary, prepare intervention actions to relocate families at risk. GADE will be responsible to negotiate and reach agreement with the pertinent households.
Principle 9. Protection of natural habitats	Do not consider the role of mangroves in Esmeraldas´ green infrastructure plan (output 1.2)	Mitigation measure 17. The project team will take specific care to ensure that mangroves and the existing protected area[20] are considered in the green infrastructure plan. Communication and education strategies will include actions in support of the conservation of the protected area.
Principle 10. Conservation of biological diversity	Introduction of invasive species during slope stabilization (revegetation) in cerro Gataso (output 1.2)	Mitigation measure 18. The plant species to use to hold and consolidate the ground in cerro Gataso will be decided during project implementation. However, to prevent impacts, the selection criteria will include: a. Preference to use native species. b. If a non-native species is a best choice, no species listed on IUCN´s Global Invasive Species Database[21] could be used. Before execution, GADE will provide a written report indicating the list of plant species to be used for slope stabilization and the criteria used for their selection.

[20] Wildlife Refuge Mangroves of Esmeraldas. This protected area encompasses the remnant mangroves of the city; it has an area of 242 ha of which ca., 37% are mangroves and tropical dry scrubland.
[21] www.iucngisd.org

Environmental and Social Principle	Environmental or social risk	Mitigation measure
Principle 12. Pollution prevention and resource efficiency	Pollution generated during construction works not adequately managed.	Mitigation measure 19. MOP and GADE will ensure that all potential contaminants (e.g., residues and waste) from construction works are properly managed. Mitigation measure 1 (above) list conditions to be fulfilled.
Principle 14. Physical and cultural heritage	Finding archaeological remains during construction works	Mitigation measure 20. The environmental management plan must include provisions in case archaeological remains are found.

Operational arrangements

The main responsibilities of the key partners involved in the project's implementation for management of environmental and social impacts and risks are the following:

Project unit

1. Elaborate the "Manual of Social and Environmental Safeguards Implementation" and carry out the training workshop in coordination with CAF. The Project Manager, Lead Adaptation Specialist and Monitoring and Evaluation Specialist will be responsible of these tasks.
2. Implement the ESMP. The Adaptation Specialists will be responsible for implementing ESMP in the three cities. They will report to the Lead adaptation specialist, who will jointly with the Project Manager will prepare and send a report every six months to CAF about ESMP implementation.
3. Update the ESMP. During the preparation of the annual operating plans the Project Manager will be responsible to identifying and assessing potential environmental and social impacts and risks of all the activities planned for the year. The Project Manager will program mitigation measures accordingly, as well as the budget required for their implementation. Moreover, the Project Manager, in collaboration with the Lead Adaptation Specialist and the Monitoring and Evaluation Specialist, will be responsible for updating the ESMP annually or every time as necessary. For activities, which impacts and risks were not identified during the project´s design, the Project Manager should follow the procedure established in the corresponding section of the present document (page 38).
4. Undertake quarterly meetings with CAF for monitoring of implementation progress.

Project board

1. Receive biannual project management reports, including safeguards compliance.
2. Provide high-level technical and managerial guidance to the Project Unit.

CAF

1. Give technical support to the Project Unit for the elaboration of the "Manual of Social and Environmental Safeguards Implementation", as well as for the execution of the training workshop for its application.
2. Oversee compliance of conditions on the construction of mudflow control infrastructure in Antofagasta (output 2.1) and landslide mitigation works in Esmeraldas (output 2.2) (see Mitigation measure 1). This includes to give no-objection to the terms of reference of pertinent contracts.
3. Oversee the process of the ESMP updating and the programming of the mitigation measures in the annual operation plans.
4. Oversee the implementation of ESMP. CAF will conduct at least two

5. supervisions per year, in order to verify the implementation of the ESMP.
6. Send the supervision reports to the Project Board with the recommendations or corrective actions to be implemented by the project team.
7. Undertake quarterly meetings with the project unit for monitoring of implementation progress.
8. Receive and review the reports of ESMP implementation sent by the Project Manager and submit them biannually to the Adaptation Fund.

Financial arrangements

The budget necessary for ESMP implementation is included in each activity cost. Table 6 shows the section of the project where budget is included.

Table 6. Budget for safeguard´s implementation.

Activity	Section of the project where budget is included
Elaboration and approval of the manual of environmental and social safeguards implementation	Project execution costs (M&E)
Training workshop aimed to PC and local coordinators	Project execution costs (M&E)
Obtain environmental permits for construction of mudflow control infrastructure in Antofagasta (output 2.1) and landslide mitigation works, weather radar and meteorological stations in Esmeraldas (output 2.2)	Outputs 2.1 and 2.2
Implementation of the ESMP by Project Unit	Included in all project's activities and project execution costs (M&E)
Oversight of ESMP implementation by CAF	Project cycle management fee

Special procedure to manage impacts and risks unidentified during the project´s design

There is a possibility that adverse environmental and social impacts and risks that were not foreseen during the project design are identified during project implementation. In order to anticipate future issues, during the preparation of the annual operation plans, the Project Unit will identify potential environmental and social risks associated to each of the activities planned for the year and will program mitigation measures accordingly, as well as the budget required for their implementation. This analysis will be made applying the same methodology used in this project to identify impacts and risks of other activities and considering the environmental and social principles applicable to the present project (Table 5).

The Project Manager will be responsible for reporting CAF every six months, the progress made on implementing these measures. Additionally, during quarterly meetings organized to monitor the progress on annual operation plan implementation, the Project Manager will report any possible environmental or social risk that has arisen and was not previously identified during the preparation of the annual operation plan. The Project Manager will be responsible to update the ESMP every time unforeseen impacts and risks are identified. This will allow that timely and appropriate actions are taken to prevent any possible environmental or social damage.

CAF will designate an officer responsible to oversight the compliance of implementing the proposed provision in the annual operation plans. In the case of infrastructure works in Antofagasta and Esmeraldas, CAF and the Project Manager will closely coordinate to ensure compliance of the outlined conditions.

Implementation schedule

The schedule for the implementation of the ESMP is presented in Table 7.

Table 7. Implementation schedule for ESMP.

Activity	Year 1				Year 2				Year 3				Year 4				Year 5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Elaboration and approval of the manual of environmental and social safeguards implementation																				
Training on manual of environmental and social safeguards implementation																				
Implementation of the ESMP by the Project Unit																				
Oversight of ESMP implementation																				
Reporting of ESMP implementation																				

Description of the compliance with the AF' environmental and social principles

A brief overview of the project compliance with the expected outcomes of the 15 environmental and social principles is presented below[22]:

Principle 1: Compliance with the Law.

[22] The same text is included in the main body of the project document.

The only element of the project that will require a specific permit is the construction of protection works in quebrada Bonilla (Antofagasta) and cerro Gataso (Esmeraldas). As explained in section Environmental permits of the project document, the works in quebrada Bonilla will require and Environmental Qualification Resolution issued by SEA on the basis of an Environmental Impact Declaration. Also, in Ecuador, the works in cerro Gataso, the radar and the meteorological stations will require an Environmental Registry which is issued online after filling a formulary and paying a fee. According to the Chilean and Ecuadorian environmental regulations, both works are categorised as having low environmental and social impact.

To comply with national regulations MOP, GADE and GADPE will obtain the corresponding environmental permits. This will be done after the engineering designs have been updated to be climate resilient, and before initiation of construction (Annex 6). The cost of preparing the environmental studies is included in the project budget. CAF has stipulated more stringent conditions that are indicated in Annexes 14 and 15.

Principle 2. Access and Equity.

A stakeholder analysis was prepared for each city (Annexes 8 and 9). Key stakeholders were identified, as well as existing or potential conflicts that might affect project execution. The analyses found no evidence of opposition to the project proposal, or conflicts that could affect project execution. The most vulnerable groups are people living in hazard areas in campamentos in Antofagata and Taltal and informal settlements in Esmeraldas (see section **¡Error! No se encuentra el origen de la referencia.**). Project activities will not exacerbate their condition, nor impede / limit access to essential services and rights. On the contrary, project actions will contribute to reduce the risk of damages caused by extreme weather events. In addition, the public communication and education strategies and the narrators´ initiative will address all the population (independent of gender, age, race, ethnicity or nationality) and will be open to everyone who wish to contribute and participate. In Esmeraldas, the pilot community-based early warning system will be implemented together with the informal settlers who live in Luis Vargas Torres island. Leaders of these groups participated in the consultation process (Annex 4), contributed to design project actions and pledged to participate in the project[23]. Nonetheless, several mitigation measures have been included to ensure that the local population of the three cities is adequately informed and engaged into the project (see mitigation measures 2 to 7 in Table 5).

Principle 3. Marginalized and Vulnerable Groups.

The stakeholder analyses found that the most vulnerable groups are families that live in informal neighbourhoods on risk areas. Women are active in local organizations and there was no evidence of barriers that will impede or limit women´s participation in project activities. Project activities will not impact negatively these groups. On the contrary, project actions will contribute to reduce their exposure to impacts from extreme weather events.

Nonetheless, several mitigation measures have been included to ensure that the vulnerable groups of the three cities are adequately engaged into the project (see

[23] The organizations that have agreed to contribute are 12 de mayo, Cordero Crespo, 20 de noviembre, Pianguapi, 29 de agosto, and Habana.

mitigation measures 8 to 13 in Table 5). In addition, all communications will be gender, age and cultural sensitive and will consider the needs of persons with disabilities (mitigation measure 14).

Principle 4. Human Rights.

Both countries have ratified the core international human rights treaties. The US Department of State Country Reports on Human Rights Practices for 2015 indicate that principal human rights problems are:

- In Chile, harsh prison conditions; violence and discrimination against women, children, and lesbian, gay, bisexual, transgender and intersex (LGBTI) persons; and societal conflict and discrimination against indigenous populations
- In Ecuador, excessive force and isolated unlawful killings by security forces; arbitrary arrest and detention; and delays and denial of due process. Violence and discrimination against women, children, minority groups, and the lesbian, gay, bisexual, transgender, and intersex (LGBTI) community; trafficking in persons; and child labour persisted.

Despite the general context, in the areas of work no specific issues concerning human rights were identified that could be exacerbated by the project intervention.

Principle 5. Gender Equality and Women's Empowerment.

Both countries rank high in the Global Gender Gap Index. Chile has almost complete equality in educational attainment and health and survival, but major gaps in political empowerment and economic participation and opportunities (WEF, 2015). Ecuador almost complete equality in educational attainment and health and survival, and a high level in economic participation and opportunities, but a major gap in political empowerment (WEF, 2015). The stakeholder analyses found that there is strong women leadership in neighbourhood and local organizations in the three cities. The analyses did not find factors that will impede or limit women´s participation in project activities. The project will implement a set of actions in support of gender equality and women´s empowerment. In addition, communication guidelines will be prepared and implemented (mitigation measure 14) to ensure that all communication contents is gender and age sensitive.

Principle 6. Core Labour Rights.

Both countries have ratified the eight core labour conventions. The project intervention has no implication with the four fundamental principles and rights at work.

Principle 7. Indigenous Peoples.

ILO convention 169[24] is in force in both countries. In Antofagasta and Taltal, the indigenous population is very small. The 2002 Census found that, in Antofagasta and Taltal the indigenous population was, respectively, 1.8% and 1.0%. 4.7% of Antofagasta region´s populations were indigenous groups (INE, 2005). On the contrary, the majority of Esmeraldas´ population is afro-ecuadorian (52.1%). The project intervention will not affect indigenous groups or territories. The areas where construction works will be executed are not part of indigenous territories. The work in Luis Vargas Torres island (Esmeraldas) will be done with six neighbourhoods of local settlers (about 11% of the families that live in the island),

[24] i.e., Convention concerning Indigenous and Tribal Peoples in Independent Countries.

mostly afro-Ecuadorians. Because a group of Chachi families reside in the island, the evacuation map and its procedures (outputs 4.2 and 4.3), and the communication and education strategies (output 6.1) will take into account the needs of this indigenous group (mitigation measure 15 in Table 5).

Principle 8. Involuntary Resettlement.

The project intervention does not imply displacement of local population.

- In quebrada Bonilla (Antofagasta), the sites where construction works will be executed are barren, unpopulated and not used for economic or recreational activities.
- In cerro Gataso (Esmeraldas), the hillsides where construction works will be executed are also unpopulated and not used for economic or recreational activities. However, the final designs for the protection works will define if it will be necessary to relocate a few families for their protection. Mitigation measure 16 has been included in case it becomes necessary to relocate families at risk.
- In Luis Vargas Torres island, the project will not affect the situation of the existing informal neighbourhoods.

Principle 9. Protection of Natural Habitats.

The project will not intervene in protected areas or high value conservation areas.

- In quebrada Bonilla (Antofagasta), the sites where construction works will be executed are barren desert and does not contain the endemic high-value biodiversity present in certain areas of the Atacama Desert.
- In cerro Gataso (Esmeraldas), the hillsides where construction works will be executed are devoid of original vegetation. Some hillsides will be revegetated (output 1.1) and the project will encourage that these areas are declared protected forests.
- There is a small protected area in the northern tip of Luis Vargas Torres island. The Wildlife Refuge Mangroves of the Esmeraldas River Estuary was established in 2008. It covers 242 ha of water and land area; about 37% of this area is mangrove and tropical dry scrubland. The project will not intervene in this area. The community-based flooding early warning system will be implemented together with six neighbourhoods that are located on the south-west of the island. Nonetheless, the communication and education strategies will include actions to support the conservation of the protected area (output 6.1). In addition, the project will ensure that protected areas are part of the green infrastructure plan for Esmeraldas (output 1.2).

Nonetheless, mitigation measure 17, has been introduced to ensure that mangroves and the wildlife refuge area considered elements of Esmeraldas´ green infrastructure plan (output 1.2).

Principle 10. Conservation of Biological Diversity.

Both countries are parties of the Convention on Biological Diversity and have National Biodiversity Strategies. Ecuador is a party of the Cartagena Protocol; Chile is not a party of this protocol. The project will not intervene areas with high value biodiversity. However, in cerro Gataso, it will be needed to use plant species that area appropriate to stabilise the hillsides. As mentioned before, two recommended species are vetiver and huaje that are non-indigenous species;

huaje, despite being widely used in Ecuador, is considered an invasive species. To prevent negative impacts, mitigation measure 18 was introduced. It will require that the following criteria will be used as part of the selection process for plant species: (i) preference to native species, and (ii) If a non-native species is a best choice, no species listed on IUCN´s Global Invasive Species Database[25] could be used. CAF will require that GADE provide a report indicating the plant species to be used and the criteria used for their selection.

Principle 11. Climate Change.

The project does not include activities that involve a significant increase in emissions of greenhouse gases or other climate change stressors.

Principle 12. Pollution Prevention and Resource Efficiency.

The project does not include activities that will use large quantities of energy, water or other natural resources. Nor they will generate large quantities of residues, emissions and discharges. Nonetheless, as indicated before, CAF will require that building contractors implement stringent measures to prevent negative impacts during construction works (mitigation measures 1 and 19).

Principle 13. Public Health.

The project does not imply negative impacts on public health.

Principle 14. Physical and Cultural Heritage.

Both countries are parties of the World Heritage Convention. The project will not affect or intervene physical and cultural heritage. However, as a preventive measure, the environmental management plan for the construction works will include actions in case archaeological remains are found (mitigation measure 20).

Principle 15. Lands and Soil Conservation.

The project will not intervene valuable land. The areas affected by construction works are no productive lands nor high value conservation sites. In Esmeraldas, the project will contribute to reduce erosion and soil loss in cerro Gataso. There, vegetation grey infrastructure will be used to prevent erosion and landslides.

Consultation

During project preparation, there were inception and validation workshops, and stakeholder analysis in Antofagasta, Taltal and Esmeraldas. Following the request from the Adaptation Fund, there was additional consultation to local groups in the three cities.

Inception workshops

Before the inception workshops, MMA, MAE and the consultants in charge of the stakeholder analyses made a quick survey to identify local organizations and stakeholders to be invited. National and local entities and main stakeholders were invited by MMA in Chile and MAE in Ecuador.

The inception workshops were aimed to present the pre-concept, have feedback and initiate the project preparation process. In both workshops a roadmap was

[25] www.iucngisd.org

prepared, outlining the milestones to prepare the project proposal. The memoirs of the workshops (including list of participants) were distributed to all participants and are found in Annex 4.

The Antofagasta inception workshop was held on 4 May 2016. It included the stakeholders from Taltal; transportation was provided to bring the persons from Taltal to Antofagasta (a two-hour trip). Thirty-five people from Antofagasta and Taltal participated; 14 were females (40%). Participants included representatives of neighbourhood organizations, the two municipalities, and national entities (e.g., MOP, ONEMI, MINVU).

The Esmeraldas inception workshop was held on 16 May 2016. Twenty-eight people participated; three were females (10.7%). Participants included representatives of neighbourhood organizations, GADE, GADPE and national entities (e.g., INOCAR).

The inception workshops had the following elements:

a. Presentation of the project concept (as approved by the Adaptation Fund). Participants were introduced to the project concept and were able to provide comments and recommendations.
b. In group sessions, a participatory situation analysis was prepared. Participants identified key issues and suggested their root causes and constraints.
c. Using maps of the cities, participants located the most critical sites and analysed the situation on priority sites. The result was a preliminary list of intervention sites to be analysed afterwards.
d. Finally, participants analysed the proposed project elements (outcomes and outputs) and proposed adjustments and changes. For example, at this stage the idea of a weather radar for Esmeraldas was first discussed.

Stakeholder analyses

After the inception workshops, stakeholder analyses were prepared, covering each of the three cities (Annexes 8 and 9). In-depth interviews and focus groups were used to obtain perceptions, views and recommendations about the project proposal and its elements. These studies included a review of information on the social and economic situation of the cities and the identification of gender issues to be taken into account in the project.

The focus groups and in-depth interviews included (i) juntas de vecinos[26] (neighbourhood councils) and campamentos in risk areas of Antofagasta and Taltal, (ii) residents of flood-prone areas (riversides along Teaone and Esmeraldas rivers and Luis Vargas Torres island) and landslide risk areas in Esmeraldas, and (iii) civil society organizations. In the focus groups and in-depth interviews local groups were presented the project concept and asked to comment the proposed actions, as well as to suggest modifications. This allowed to assess the options to work with specific groups. The campamentos and

[26] Juntas de Vecinos are community organizations that represent the people that reside in a neighbourhood. Their purpose is to defend the rights of the neighbours and collaborate with the State and the municipality. The neighbourhood councils are regulated by Law 19,418 of 1997 and its subsequent updates and modifications. The municipalities maintain lists of the Juntas de Vecinos of their territory.

neighbourhood organizations of the main risk areas where the project will intervene[27], where visited and consulted.

In the focus groups and interviews with juntas de vecinos and campamentos in Antofagasta and Taltal, participants ranked high the proposed actions and provided recommendations that were incorporated into the project:

- Ensure that the education strategies include children (9 – 12 years old) and people that live in the risk areas.
- In alluvial risk areas, use means / media to facilitate that the local community identify and remember the risks[28].
- Campamentos are illegal settlements, therefore these groups have limited access and influence in the decisions of the local authorities (e.g., municipalities, ARG).
- Unlike local residents, the immigrants in campamentos are not familiar with the natural history of the area (e.g., former mudflows) nor are aware of the mudflow impacts. Also, they seem unwilling to move to safer areas.
- The municipality is perceived as the key entity to address mudflow emergencies.

In Esmeraldas, the focus groups and interviews included a range of barrios located on landslide and flood risk areas (Annex 9). There was support to the proposed actions and recommendations / comments that were incorporated into the project:

- The families that live in the risk areas have household and community vulnerability. They consider that cannot access / afford living in safer areas. Therefore, relocation will be traumatic, unless appropriate support is provided.
- There is limited comprehension of hydrometeorological hazards and the impacts from climate change.
- There is dissatisfaction with the emergency response from the municipality and pertinent public entities.
- Many households do not evacuate to guard their property. Pillage has been common in former emergencies. Measures need to be taken to safeguard the population and prevent looting of houses.
- Women, mostly in female-headed households, are concerned about the safety and security of their families in strange environments or improvised shelters.
- There are no maps that show the risk areas for floods and landslides, nor evacuation maps / procedures that indicate safe routes and shelters.
- Sirens and other related equipment must operate under extreme situations. Power failures are common during floods. Also, this equipment has to be protected from stealing and vandalism.

[27] In quebrada Bonilla (Antofagasta): campamentos Víctor Jara, Mujeres Unidas and Villa Esperanza. In cerro Gataso (Esmeraldas): barrio 20 de noviembre. In Isla Luis Vargas Torres: neighbourhood committees 12 de mayo, Cordero Crespo, 20 de noviembre, Pianguapi, 29 de agosto, and Habana.

[28] This recommendation motivated the action to install evacuation route maps in large format in high-transit areas (see page 36).

Validation workshops

The second round of consultation (validation workshops) focused on the analysis of the final project draft. These workshops served to confirm partner engagement and contributions. The Antofagasta workshop was held on 19 July 2016; like in the inception workshop, transportation was also arranged to bring the persons from Taltal to Antofagasta. The Esmeraldas workshop was held on 22 July 2016. The memoirs of the workshops (including list of participants) were distributed to all participants and are found in Annex 4.

Twenty-four people participated in the Antofagasta validation workshop; eleven people were females (45.8%). The key elements of the agenda were: (i) presentation of the draft PRODOC, (ii) presentation of the results of the stakeholder analysis, (iii) group work, and (iv) preparation of a roadmap to finalise the PRODOC. Two groups were formed, one analysed components 1 and 3, and the other components 2 and 3. The group work focused on reviewing the proposed outcomes, and present recommendations for adjustments and to solve pending issues.

Ten people participated in the Esmeraldas validation workshop. The only female present was CAF´ climate change officer. The key elements of the agenda were: (i) presentation of the draft PRODOC, (ii) group work, and (iii) preparation of a roadmap to finalise the PRODOC. Participants analysed the proposed outcomes and budget, and proposed recommendations for adjustments and to solve pending issues. Finally, contributions and participation of local organizations in the various project outcomes were confirmed. On this meeting, it was confirmed that six neighbourhoods of Luis Vargas Torres island and the barrio 20 de Noviembre will participate and contribute, respectively, to actions in the pilot flood warning system and the landslide mitigation in cerro Gataso.

Meetings of project partners

There were also in-person and virtual meetings with the project partners:

- In Chile, the project partners are MMA, MOP, DMC, ONEMI, the Municipality of Antofagasta, and the Municipality of Taltal. A meeting was organised with the Chilean Agency for International Cooperation for Development (AGCID) to obtain their input to the project proposal. AGCID is the National Implementing Entity (NIE) of the Adaptation Fund in Chile.
- In Ecuador, the project partners are MAE, the Municipality of Esmeraldas, GADPE and INAMHI.

Additional consultation to local groups

Five consultation meetings were organised with local groups during June and July of 2017. The purpose of the meetings was to have contributions and comments from local groups that might not have participated in the inception and validation workshops.

The meetings were organised in collaboration with MMA in Chile and MAE in Ecuador. The date, time and place were consulted with local groups to make sure that women and men could attend the meetings.

On each meeting, the project proposal was presented. Participants were provided with copies of the results framework (including budget allocations). Afterwards,

there was a plenary to answers questions and have initial comments. Later, there was group work to analyse the elements of the project proposal. Finally, there was a plenary where groups presented their results and there was an open discussion. The meetings were managed to ensure that women could openly express their ideas.

Meeting with Barrio 20 de Noviembre

The meeting was held on the afternoon of 23 June 2017, in the barrio´s community house. Thirty-eight people participated, including women and older people.

There was support to the proposed actions and recommendations / comments that have been incorporated into the project:

- Promote that the municipality take immediate action to advance the works in cerro Gataso (e.g., baseline studies). This will shorten the time for implementation of the protection works.
- Ensure that communication actions and warning alerts use the radio stations with most local audience.
- The evacuation plans must take into account the needs of people with disabilities.
- Make sure that there are secure meeting points and shelters to accommodate people during emergencies.
- To motivate women participation on risk training, include complementary activities that suit their interests.
- People live in risk areas because they have no means to move somewhere else.

Meeting in Luis Vargas Torres island

The meeting was held in the morning of 24 June 2017, in Leonidas Grueso George School. Forty-four people participated, including women, older persons and differently-abled people.

There was support to the proposed actions and recommendations / comments that have been incorporated into the project:

- Include mangrove forestation and reforestation within Esmeralda´s green infrastructure plan.
- Ensure that the people is alerted with sufficient time to evacuate or take protective measures.
- Establish local women´s groups to support emergency actions.
- Women can coordinate and support community activities.
- It is valuable to pass experience to the new generations.
- The sirens have to be guarded against vandalism and must operate under extreme conditions like electricity failure.
- During past floods, there were power outages and communication failures. Cell phones and text messages may not be available during emergency.
- The footbridges are in poor state. They are the main evacuation way to cross to the mainland.

Meetings in Antofagasta

There were two meetings in Antofagasta in juntas de vecinos located in the mudflow risk area of quebrada Bonilla.

The first meeting was held in the afternoon of 6 July 2017, in the community centre of the Junta de Vecinos Villa Irarrazabal. Twelve people participated, all neighbours were women.

There was support to the proposed actions and recommendations / comments that have been incorporated into the project:

- The use of a meteorological radar[29] is a good idea.
- Ensure that the sound of mudflow sirens is different from the existing tsunami sirens.
- Evacuation protocols must consider the needs of children, older persons and people with disabilities.
- People need to be trained how to correctly evacuate during mudflows.

The second meeting was held in the afternoon of 7 July 2017, in the community centre of the Junta de Vecinos Esperanza Nuestra. Twenty neighbours participated, 17 were women.

There was support to the proposed actions and recommendations / comments that have been incorporated into the project:

- People are not aware of climate change and its impacts.
- It is important to build the alluvial control infrastructure in quebrada Bonilla.
- Campamento dwellers are more vulnerable to mudflows because of their low-quality constructions.
- The narrators´ initiative is interesting. It will need to promote participation of children and older people.
- It is necessary to ensure the grant from the Adaptation Fund, and start the project in 2018.

Meeting in Taltal

The meeting was held in the morning of 7 July 2017, in the cultural centre of Taltal. Sixteen neighbours participated, including Taltal city mayor[30].

There was support to the proposed actions and recommendations / comments that have been incorporated into the project:

- It will be very valuable to have means to alert people with sufficient time to evacuate. The last mudflow was devastating, it ran through the city and isolated the population.
- The cost and effort of recovery and reparations is very high. The removal of debris from the retaining pools is still ongoing.
- Campamentos are vulnerable, but their informal condition limit public action.

[29] The change of a weather radar for a storm detection system was decided by MMA and DMC after the consultation to local groups.

[30] It is important to highlight that Taltal city mayor has personally participated in all meetings during the preparation of the presente project.

- The evacuation procedures must consider the needs of children, older citizens and people with disabilities.
- It is laudable to have included culture into the project. It is necessary to cultivate and develop cultural manifestations and to strengthen collective memory. It is advisable that communication actions and the narrators´ initiative foster participation of diverse local groups and artists.

Environmental and Social Report (ESR) "Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America"

Operation Name	Reducing climate vulnerability in urban and semi urban areas in cities in Latin America	
Country	Chile - Ecuador	
Assessment Date	16 - 19 May 2017	
Person Responsible for Operation	Carolina Cortés	
Executive / Assessment Consultants	José-Agustín Blanco and Mauricio Velásquez	
Direction of the Environment and Climate Change (DECC) Executive Responsible	Mauricio Velásquez (Ecuador) José Agustín Blanco (Chile)	
Coordinador UGAI - DECC	Edgar Salas	

Signature

Executive Summary

Coastal areas are highly exposed and vulnerable to the adverse effects of climate change and the impacts of climate change-originating disasters. Coastal populations are exposed to severe harm by flooding, coastal erosion, and salt intrusion resulting from a steady sea level rise. Neumann et al., (2015) and Hallegatte et al. (2013) estimated that economic losses due to flooding events in the 136 largest coastal cities in the world could increase from approximately USD 6 trillion / year in 2005, to USD 52 trillion / year by 2050. Climate change could further increase these losses in USD one trillion (Cai et al., 2014; Cai et al., 2015), besides increasing the number of stronger and more frequent coastal storms.

To reduce climate vulnerability in coastal cities, in particular floods, mudslides and mass movements-originating vulnerability, the Environment Ministries in Chile and Ecuador called on CAF, so that, as an Accredited Entity / Implementing Agency of the United Nations Climate Change Adaptation Fund (henceforth known as the AF), submits to the AF, the "Reducing climate vulnerability in urban and semi urban areas in Latin America" project, involving: a) construction of hydraulic works to minimising floods impacts on coastal cities sustaining chronic problems in this regard, b) capacity building of local governments and communities; and c) creation of communities of practice.

The aim this Regional Project is seeking to achieve is to bringing about lessons for an enhanced adaptive capacity in Latin America and the Caribbean. Accordingly, the Chile and Ecuador governments have agreed to collaborate and jointly implement a learning approach through action to address climate change adaptation concerns in coastal cities.

Thus, the city of Esmeraldas in Ecuador and the cities of Antofagasta and Taltal in Chile were chosen by the Ecuadorian and the Chilean governments respectively to be a part to this FA Operation, identified with Code (Project ID) LAC / RIE / DRR / 2015 / 1, and allocated a US $ 14,938,731 budget.

Bearing in mind the orographic and precipitation characteristics present in Northern Chile, in the presence of low volume and high intensity rains, the generation of extraordinary events has been recorded the main characteristic of which is the transportation of a substantial amount of materials in the shape of an alluvial flow.

Indeed, due to the climatic conditions prevailing in Region II, and the abrupt relief being shaped up by the Coastal Mountain Range, the ravine systems flowing into the Antofagasta and Taltal sector, show a great fragility vis-à-vis precipitation events bringing about alluvial-type sediment flows; thus, both Antofagasta and Taltal are highly prone to alluvia events as an outcome of rainfall phenomena.

The Gatazo Hill (260 metres above sea level (m.a.s.l.), located in the city of Esmeraldas, shows a geological faults mechanism activated by hydraulic conditions exacerbated by the aggressive impact of the 1998 El Niño phenomenon. Heavy rains recorded at the time affected a greater depth of the Hill´s top soil layer, disturbing mechanical conditions therein by increasing the wet soil mass weight and decreasing soil resistance. Later on, in times of drought, soil strata sustained deep cracking. The arrival of subsequent heavy rains brought about a greater infiltration depth, weakening a larger unstable soil mass that caused a large-scale landslide in 2005, affecting 475 people. In January 2016, rains again triggered another landslide, with substantial impacts on the population. Sixteen times in a row were cities flooded, and 2600 people were evacuated from their homes in Vargas Torres Island[1] located on the Teaone River banks.

In Ecuador, several critical issues have been identified that: a) definite and final Gatazo Hill slopes stabilization works still need to be actualized with the climate change scenarios; b) in Ecuador there is no need of a Environmental Licence. However, taking into account CAF´s

[1] Press Release on Luis Vargas Torres Island evacuation http://www.expreso.ec/actualidad/el-clima-destruye-viviendas-en-esmeraldas-YYGR_8846614

environmental and social safeguards and Adaptation Fund Principles, for this project after approving it, the executer will need to present the environmental and social surveys and environmental and social impact assessment; c) the high vulnerability of Luis Vargas Torres Island inhabitants due to floods caused by extreme rains; and d) the possibility for the S07 Population Resettlement Safeguard to be activated pursuant to the Gatazo Hill stabilization layout results.

The key critical issue vis-à-vis interventions in Chile is that related to maintenance of water pools (buffer reservoirs) over the time the system is not in operation, since the worst that could happen is that these pools are full at the time a major event occurs. On the other hand, each and every water pool should be cleaned up after each event, not just the last pool. If this work is not done on time, and is instead postponed, and in the meantime another event may occurs, the problem would be exacerbated, and its aftermath would be dire.

From an environmental and social perspective, the viability of this operation is warranted by the experience of implementing agencies in Chile and Ecuador, as verified *in situ* by CAF's Institutional Environmental Management Unit, over assessment missions, at which time visits were also made to similar works in similar settings in the Antofagasta (Chile) and Esmeraldas (Ecuador) regions, works which were found to be running smoothly.

The capacity and mystique of personnel attached to the Environmental Unit at the Public Works Ministry (MOP, for its acronym in Spanish) in Chile, the performance of contractors undertaking similar works visited, and the permanent presence of the environmental authority (Ministry of the Environment of Chile), which is a member of the Work team in its monitoring and control role, as a whole, exemplify what has been so far noticed, and allows to expect similar or better results vis-à-vis the projects within the framework of this Adaptation Fund Operation: Bonilla, In Antofagasta, and Cortaderas, in Taltal, Chile. In Ecuador, a very smooth coordination exists between the Ministry of the Environment and the Municipality of Esmeraldas as regards protection of mangrove areas, sea turtle nesting sites, as well as the monitoring and control role these institutions play in works carried out by the Municipality of Esmeraldas, such as the construction of retaining walls, breakwaters, rehabilitation and maintenance of rainwater drainage, among other works also signalling the technical capacity of local human resources and their experience, and the involvement of the local population in these works.

Notwithstanding CAF's compliance with the performance of implementing agencies, to ensure the environmental and social sustainability of the Project the DACC recommends that the Environmental and Social Conditions as set forth in the Agreement between CAF (as the

Adapting Fund´s Implementing Agency), and executing agencies in Chile and Ecuador are set down as follows:

FOR THE PROJECT IN CHILE

Conditions over the disbursement period:

The Executing Agency will submit, to CAF satisfaction:

1. Before one-hundred-and-eighty (180) days after signature of the Agreement: a report on the hydraulic verification of the design (re-calculation) of the Taltal System pools capacity, and verification that the last pool, that having the lower level, at least has the same capacity as the upstream pools, plus the intermediate input of the lateral tributaries.
2. No later than thirty (30) days after conclusion of the reported quarter (Jan-Mar, Apr-Jun, Jul-Sep or Oct-Dec): Quarterly Reports on the progress of the Environmental and Social Management Plan for Antofagasta Works, and actions scheduled in Taltal's work, vis-à-vis the community.
3. In the event that over the term of the Contract, extreme rainfall could occur that could become into alluvial or other processes generating emergencies in any of the ravines -with or without works being executed in the latter- and no later than ninety (90) days after the emergency is over: A report should be submitted explaining the characteristics of the event, its impacts, the manner in which the event was dealt with, and all relevant information, according to the responsible entity.
4. Not later than thirty days (30) after Minutes have been signed on Agreements reached with the communities, or other third parties for the proper functioning of the works, Minutes in which the commitment not to dispose of any type of waste in pools, which have been built over the term of the Agreement, has been clearly stated.
5. Timely notification to CAF of any changes in projects characteristics, or in environmental or social situations that may occur over the term of the Agreement.

FOR THE PROJECT IN ECUADOR

Conditions prior to the first disbursement:

The Executing Agency will submit, to CAF satisfaction:

1. The Terms of Reference (ToRs) for the drafting up of a Strategic Environmental Assessment on the intervention in Esmeraldas in the three components of "Reducing climate vulnerability in urban and semi urban areas in cities in Latin America" project.
2. ToRs for Updating the IAS for the final design of the Gatazo Hill Slopes Stability Survey, and for installation of meteorological stations and Doppler radars at sites selected by the National Meteorology and Hydrology Institute (INAMHI, for its acronym in Spanish).

Conditions at 120 days after first disbursement

The Executing Agency will submit, to CAF satisfaction:

1. The IAS for the final design for Gatazo Hill Slopes Stabilization, and for installation of meteorological stations and Doppler radars in sites selected by INAMHI. This IAS should include all information requested in CAF Environmental and Social Safeguards: S01, S03, S06 and S07 that are activated for this operation and which the Executing Agency declares to be aware of. This final design should include a road safety audit of the project design to avoid unnecessary damage to pedestrians and light transportation vehicles of people living in the area of influence of the Gatazo Hill Slope Stabilization Project. It is recommended that signage should be designed to include messages in both Spanish and the *Cha'apalachi* language of the Chachi Indigenous community.
2. The final design survey for the Gatazo Hill Slopes Stabilization, and for installation of meteorological stations and Doppler radars in sites selected by INAMHI.

Conditions at 180 days after first disbursement

The Executing Agency will submit, to CAF satisfaction:

1. The Strategic Environmental Assessment document dealing with the intervention in Esmeraldas, as set forth in the three components of Project "Reducing climate vulnerability in urban and semi urban areas in Latin America" and the latter´s interaction with several projects being currently executed in locations in Esmeraldas, i.e., the Gatazo Hill, the Esmeraldas River Estuary, and in its area of influence.

Conditions over the disbursement period:

The Executing Agency will submit, to CAF satisfaction:

1. Evidence that an external and independent environmental and social audit has been hired for Component 1 in the Project, incorporating the submission of quarterly reports.
2. Quarterly reports on Progress of the Environmental and Social Management Plan for works in component 1 should refer to issues as follows:

    a. Improvement of signalling in tracks in Gatazo Hill´s direct areas of influence over slopes stabilization works.
    b. Monitoring of compliance of debris transportation routes (originating in Gatazo Hill) to final disposal site approved.
    c. Implementation of the green infrastructure plan, and revegetation and reforestation of Gatazo Hill in particular, once slopes reconfiguration and anchorage works are completed. Additional works to be established in the Environmental and Social Management Plan requested should also be included in this plan.
    d. A social survey incorporating the consultation process results, and a specific plan for inclusion of the Chachi Indigenous People in the project (in line with enactment of safeguard S06).

3. Evidence that the Environmental Interpretation Capacity-building programme has been conducted to informing and providing capacity-building to local residents and visitors so they can work in tourism activities in the protected area (in line with enactment of safeguard S03). This capacity-building should be given in both Spanish and Chachi *ch'apalachi* language.

I. Description of Borrower, Executing Agency, and the Operation

To reduce climate vulnerability in coastal cities, specifically floods, mudslides and mass movements-related vulnerability, the Chile and Ecuador Ministries of the Environment called on CAF, as Accredited Entity / Implementing Agency, to submit to the United Nations Climate Change Adaptation Fund (hereinafter referred to as the FA), the "Reducing climate vulnerability in urban and semi urban areas in Latin America" project, involving: a) the construction of hydraulic works to minimize floods impacts on coastal cities showing chronic problems In this regard; b) capacity-building of local governments and communities; and c) creation of communities of practice.

The end-goal of this Regional Project is to generate lessons to increase adaptive capacity in Latin America and the Caribbean. For this goal to be achieved, the Chile and Ecuador governments have agreed to collaborate and jointly implement a learning approach through

action to address climate change adaptation in coastal cities.

Thus, the city of Esmeraldas in Ecuador, and the cities of Antofagasta and Taltal in Chile, were chosen by the respective national governments to be a part to this FA Operation, which is identified with Code (Project ID) LAC / RIE / DRR / 2015 / 1, and to which a US $14,938,731 budget has been allocated.

The Executing Agency in Chile is the Hydraulic Works Directorate attached to the Chilean Ministry of Public Works, which is responsible for executing the "Alluvial Energy Dissipation System within the scope of the Club Hípico, and the Bonilla and Farellones Ravines" project.

In the Antofagasta, Taltal and Tocopilla area in particular, similar works have been executed over more than eighty (80) years by the Ministry of Public Works in six ravines, and the Plan for Region II to which these cities belong - including Tocopilla – provides for another eight similar works, to reach a total of fourteen works.

In Ecuador, the Executing Agency is the Municipality of Esmeraldas, together with the Provincial Government of Esmeraldas. Terms of Reference are being drafted by the latter for a Survey to be hired that will allow for El Gatazo Hill slopes instability to be tackled with. The last mass movement in this Hill was recorded in April 2016. Meanwhile, the Provincial Government of Esmeraldas will undertake project-related work with INAMHI to install meteorological systems for storm detection and, together with the National Secretariat for Risk Management (SSRM), to set up early flooding warning systems, in particular on Vargas Torres Island.

The project submitted to the Adaptation Fund incorporates three components, as follows:

a. **Component 1:** proposing priority actions for infrastructure construction and installation of early warning equipment, and incorporation of Disaster Risk Reduction (DRR) criteria into local planning processes to increase resilience, such as: a) Storm water Management Plan, in Antofagasta; b) Drafting up a Green Infrastructure Plan, in Esmeraldas; c) Construction of infrastructure to monitoring mudflows, in Antofagasta[2]; c) Gatazo Hill Landslides Mitigation works, in Esmeraldas; e) Installation of meteorological radars, in Antofagasta and Esmeraldas; f) Installation of additional meteorological stations, in Antofagasta, Taltal (Chile) and Esmeraldas (Ecuador); and (g) installation of an Early Warning System in Luis Vargas Torres Island.

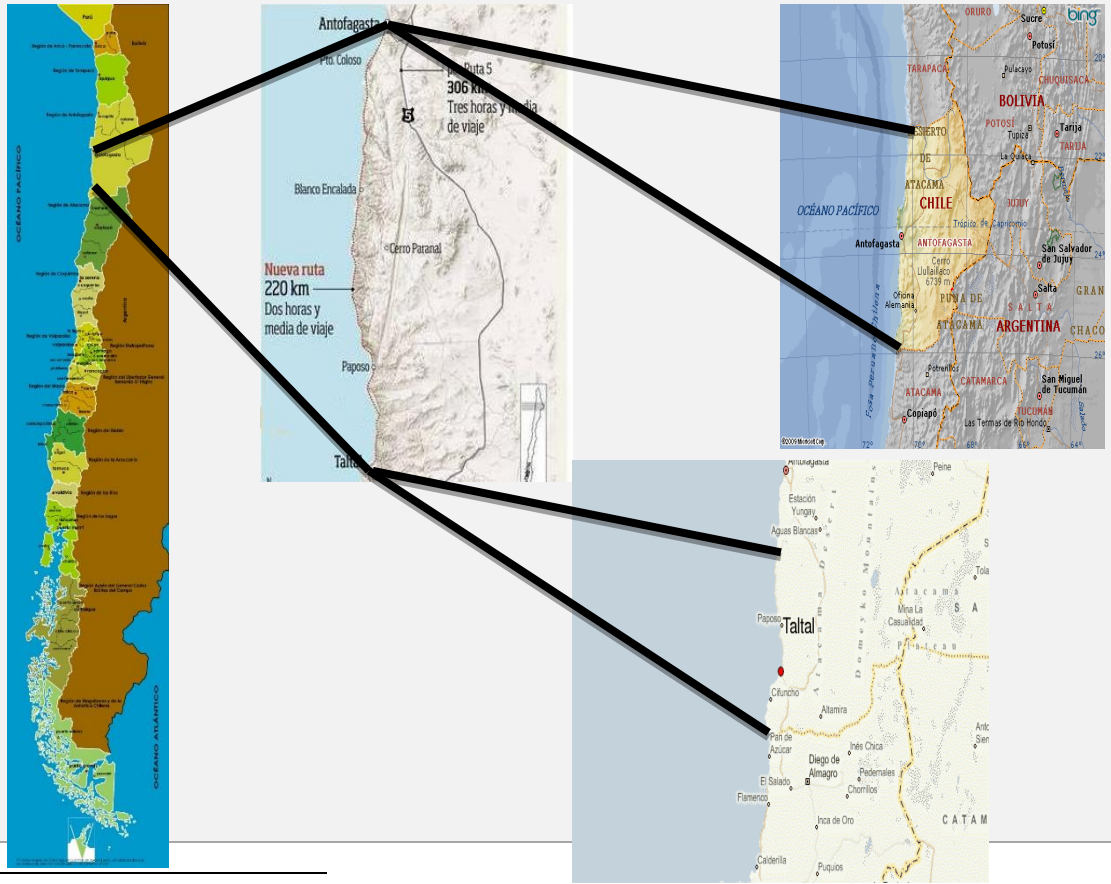
[2] Fourteen decanting pools and thirty-one gravitational retaining walls will be located in the Bonilla Ravine, in Antofagasta, as part of Component 1

b. **Component 2:** Strengthening up local governments´ and communities´ capacity (and improving relations and coordination among them) through: a) designing a risk-addressed adaptation course for municipal officials; b) Implementing education and communication strategies to enhance local knowledge, and build up a cultural memory; c) Implementing the Storytellers Initiative.

c. **Component 3:** Creating project communities of practice[3] and implementing (a) an electronic platform to facilitate interaction and cooperation among Project stakeholders, with some other stakeholders, and with people concerned in some other coastal cities; b) Publication and dissemination of good practices.

The area in which works will be carried out in Chile, is shown in Figure N ° 1, below:

Figure N° 1. Project Location



[3] Communities of Practice

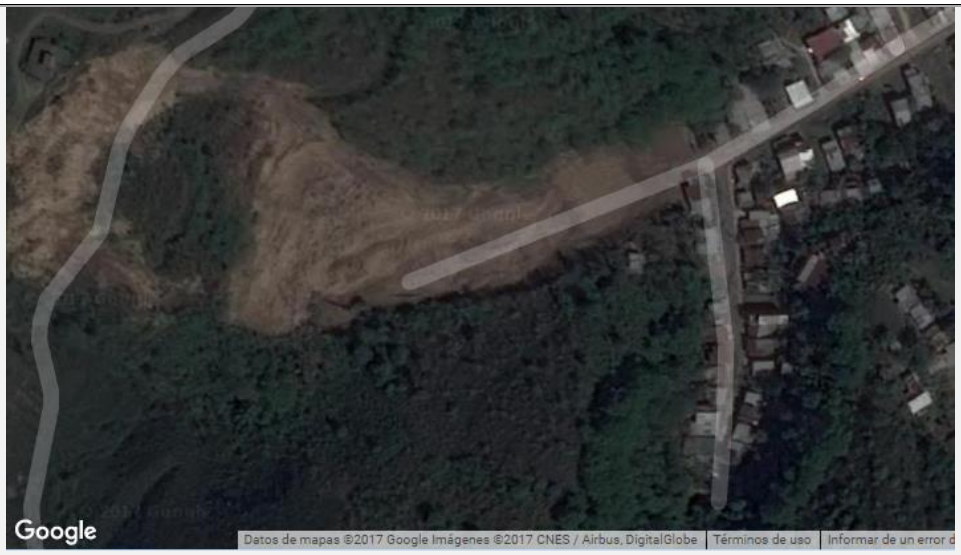
***Source*: J. Blanco elaboration, from Google images.**

In Ecuador, project interventions will be carried out in the city of Esmeraldas, capital of the coastal Esmeraldas province (Figure 2). The Gatazo Hill crosses through the city of Esmeraldas (260 m.a.s.l.): The Hill is a natural barrier to protect the city and one of the highest points being deemed as a safe area insofar tsunami risks are concerned (Figure 3).

The city is located on the Esmeraldas estuary Western bank, showing a coastal front with a sandy beach known as "Las Palmas"; a series of rather intervened sedimentary islands are found in the estuary, the Luis Vargas Torres Island being the most well-known of them. This island was informally inhabited, having no territorial arrangements for neighbourhoods known as "invasions". The island is linked to the river´s East bank, and to the city through bridges and a main road. There is a remnant mangrove ecosystem area, located in the Northern part of the island. This place was declared a protected area in 2008.

Figure N° 2 Location of the Esmeraldas City and the Luis Vargas Torres Island

Figure N° 3. Location of the Gatazo Hill and the 20 de Noviembre Neighbourhood



In Antofagasta, works in the Bonilla Ravine involve construction of 14 decantation pools, very similar to those of the Cortaderas de Taltal Ravine (Figure N ° 4), with a retention alluvial material capacity equivalent to 124,259 m^3.

Figure N° 4. Alluvial Works Cortaderas Ravine. Taltal

Stabilization of slopes is being envisaged for the Gatazo Hill area, by reshaping of these slopes, placement of anchors and improvement of the drainage system in the low basin. In addition, depending on the areas affected by the constructive tasks, reforestation activities should be undertaken.

II. A Description of environmental and social characteristics

The city of Antofagasta is located along a narrow coastal Range plain reaching, on average, a 1,800 m.a.s.l., and a width ranging from 40 to 80 Km.

The Eastern sector of the city has been historically settled on a place on which several watercourses are flowing, carrying debris produced by the weathering of rocks and the dragging of material by water and wind. Urban and industrial wastes are disposed of on river beds, as well as sediments resulting from the extraction of quarry materials, which, in addition, add instability conditions to the slopes.

In Antofagasta, over the construction of hydraulic works in the Salar del Carmen and La Cadena Ravines, their beds were used as garbage dumps. Although much progress has been made in raising awareness in neighbouring populations, in the future, all other ravines, and the Bonilla Ravine included, will also be used for this purpose, implying high costs to the Municipality of Antofagasta, since wastes in these sectors should be removed at the Municipality´s expense, to ensure the operability of works as required.

Bearing the orographic and precipitation characteristics of the area in mind, extraordinary events are generated at times of low volume and high intensity rains, the main features of which is the transportation of large amounts of material in the form of an alluvial flow.

In fact, due to climate conditions prevailing in Region II and the rugged terrain of the Coastal Range, the Ravines system flowing into the Antofagasta sector shows a substantial fragility vis-à-vis precipitation events bringing about alluvial type sediment dragging. That is, the Antofagasta area shows a high susceptibility to alluvial events in case of rainfall phenomena.

This is a key issue since the city of Antofagasta is the fastest growing development hotspot in the Northern region in the country, and, with the resulting and logical swift urban growth, without a suitable urban planning, the situation becomes into a higher number of people getting exposed to alluvial risk.

Suffice is to recall the extreme flood recorded on June 18, 1991, claiming human lives and

forcing the Government to declare the city of Antofagasta a catastrophe area.

The Bonilla Ravine Project is part to a Programme encompassing fourteen (14) ravines in the city of Antofagasta. All of these ravines flow into the Eastern part of the city, passing through it until they are discharged into the sea. Therefore, the project is also envisaging – using the urban road layout- the construction of open channels to drain the retained water surpluses in hydraulic works undertaken for that particular purpose, as well as the education, awareness-raising, and capacity-building of the people close to these works and channels.

In Taltal, the project focus was the Cortaderas Ravine, and it allowed for water storing capacity to be added to the dam system achieving a 338,000 m^3 retention volume, with an investment of some 8,606 million Chilean pesos (about US$13 MM), and works were built as follows: four settling pools and four barriers; a work very similar to that envisaged for the Bonilla Ravine, in Antofagasta.

In this already executed project, and within the framework of the Operation with the Adaptation Fund, education and awareness-raising activities shall be implemented with people living in areas close to the works, in order to make them aware of the fact that any foreign object or obstacle in the riverbed is a risk threatening their physical wellbeing and safety, as well as their assets and belongings near the watercourse. Likewise, people shall be trained in productive endeavours that are aligned with the goals intended by the works to be built.

Environmental, climate and orographic conditions are very similar to those prevailing in Antofagasta, and only people are settled nearby the works intended, and are settled close to the decantation pool and around the open channels through which water will be evacuated once the hydrological work is concluded. These channels, as in Antofagasta, are operational communication ways (streets and avenues).

From an environmental and social stance, problems in these works have only cropped up in interactions with neighbours living nearby who are, on the one hand, the largest beneficiaries of works but, on the other, the cause of the work´s largest problems due to people´s practice to dispose of their urban solid waste in the pools intended to retain water and alluvial material. As shown in Figure 4, these works are mostly being built in areas with no people around, except for the last pool located in a peri-urban area of the city.

On the other hand, the city of Esmeraldas is located in the Northern sector of the

Ecuadorian coast, shown two climate seasons: a rainy season locally known as Winter, running from January to April, and a dry season (Summer) running from May to December. The climate is highly influenced by oceanographic conditions, being this the reason why the El Niño Phenomenon (ENSO) has a very strong impact on weather conditions in the project´s area of influence in Ecuador.

The project´s area of influence shows quite humid conditions, and its annual precipitation is approximately 800 mm. The Esmeraldas River flows down through a Basin measuring 21,553 km²: the fourth largest basin in Ecuador. Main tributary rivers are the Guayllabamba and the Toachi, flowing from the Andes. A third tributary river is the Quininde , with a 300 m³/s flow rate, and a sediment discharge of approximately 13,000 t/day, mainly due to the strong deforestation and poor agricultural practices in its basin. The average annual discharge of the Esmeraldas River is 8.5 billion m³. While the River Teaone drains into a 504.89 km² basin, showing an average inter-annual discharge of 370 million m³.

The highest climate-related risk is flooding being caused by the Esmeraldas and Teaone rivers flows, and also landslides in the unstable hills. This exposure is exacerbated by the informal and illegal increasing occupation of riverbanks and estuarine sedimentation processes-originating islands, as well as invasions in the hills (Perrin et al., 1998). Despite this situation, planning work among the different municipal authorities is not optimal. Housing plans are in the making by the Ministry of Urban Development and Housing (MIDUVI) intended to building 160 housing units[4] in the Luis Vargas Torres and Roberto Luis Cervantes islands, in the Esmeraldas canton, despite the high exposure of these islands to flooding events in recent years.

a. Physical Environmental Factors

Antofagasta, Chile

The Antofagasta regions stretches over a latitudinal range going from a 20° 56' to a 26° 05' South latitude, and a longitudinal range, going from a 67° 00' West longitude to the Pacific Ocean. The Tropic of Capricorn crosses the region at the height of the Andres Sabella Gálvez National Airport, a few kilometres North of the city of Antofagasta. Taltal is about 250 km South of the city of Antofagasta (see Figure N ° 1).

[4] http://gobernacionesmeraldas.gob.ec/entrega-de-viviendas-en-la-isla-luis-vargas-torres/
http://www.habitatyvivienda.gob.ec/nuevos-proyectos-de-vivienda-se-construiran-en-esmeraldas/

The relief of the Second Region shares many similarities with those of Region I, to the North: Tarapacá. Only the coastal plains are wider and stretch over the Mejillones Peninsula area in particular; farther on, they are cut by the high mountain ranges of the Cordillera de la Costa, from which all the Ravines that the Chilean Government is intended on intervening to minimize alluvial impacts are located.

Heights of more than 2.000 m.a.s.l. are recorded in the area, such as the Vicuña Mackenna Hill, with 3.114 m.a.s.l. being the highest along the whole of the mountain range, and the Paranal Hill, about 2,634 m.a.s.l., being this the place where one of the largest telescopes in the world us installed: the Paranal Observatory, managed by the European Southern Observatory (ESO).

The hydrography present in the area shows a strong contrast between the scant runoff due to predominance of an arid climate, and the presence of the Loa River, the longest river in Chile, the waters of which are mostly used for irrigation, mining and drinking water.

Due to the desert nature of the region, many closed or endorheic basins are found in the region, with the Salar de Atacama Basin standing out. The San Pedro river flows into this area originating the San Pedro de Atacama Oasis.

A series of Ravines are located in the area which in rainy seasons and extreme events becoming increasingly more frequent, originate large alluvial movements dragging everything in its path, as is the case of the Bonilla Ravine in Antofagasta, and the Cortaderas Ravine in Taltal.

The region´s Intermediate Depression is a wide area right by the Atacama Desert. This area is reduced in size to the South-East due to the formation of a Western section of the Andes Mountain Range, known as Domeyko Mountain Range, reaching a 4,114M height at the Quimal Hill. Between the Domeyko mountain range and the Andes, a high plateau is formed where the Cordillera de la Sal (Saltt Range), a small branch of the Domeyko mountain range, the Salar de Atacama and the Loa River source stand out: the only river crossing the arid Atacama plains, and extending over a 440Km area.

The highly volcanic Andes Mountain Range is located to the East, as are volcanoes such as Ollagüe (5,865m.a.s.l.), Linzor (5,555m.a.s.l.) and the Licancabur (5,916m.a.s.l.), among others. A high geothermal activity in the area gives origin to the Tatio geysers. The Puna de Atacama, a plateau near the Andes mountain range, is found along the Eastern end of the

region, on the Bolivia and Argentina border.

As mentioned above, a desert-type climate prevails in the inner area showing a substantial thermal oscillation accentuated at greater heights. Meanwhile, the coastal climate is tempered by the Humboldt Current influence. The coastal cliff gives way to the *camanchaca*: A heavy and low fog travelling from the coast into the inner lands, especially in the Tarapacá desert, allowing for desert irrigation thanks to fog collection devices, known as foggers.

In geological terms, the rock description sequence can be summarized as follows: a tertiary terrace is formed at the ravine source consisting of sandstones and sparse coquinas stretching over towards South Bonilla, in the territory of which an aggregates exploitation operation has been in place for some time now, with the concomitant instability of the area and, therefore, a non-stop erosion of the terrace. A cone has recently taken shape at the foothills of the hills, which has been formed by a colluvial process while fine wind-deposited sands are formed.

Porphyritic andesites surface in the area: hard rock, showing little weathering, and a low to moderate fracturing level. Fine sediments along the Hill slopes show a 0.5m thickness: however, scant sedimentary material is found in some tributaries along hills slopes.

In terms of physical environmental factors, due care should be taken of slope sections along watercourse, since aggregates exploitation materials, most of them illegal and mined in these sites, could become into an important input.

<u>Esmeraldas, Ecuador</u>
The city of Esmeraldas is located in the North-Western part of the country, some 318km from Quito, with a population of 154,035 inhabitants according to the 2010 census, making it the city with the largest population in the country, and one of the most important harbours in Ecuador.

Esmeraldas and its surroundings are located in a coastal strip of the Ecuadorian Coast, showing geological characteristics of a tectonic rise produced by the influence of the inner oceanic pit wall: both characteristics being the outcome of the subduction of the Nazca oceanic plate below the South American continental plate. This situation gives the region in general and the site in particular the characteristics of a very dynamic area if considered from a tectonic point of view.

Gatazo Hill and some other high-relief areas surrounding the city of Esmeraldas are formed

by Pliocene age rocks known as a whole as the Onzole formation, emerging from sedimentary deposits in a deep continental platform marine environment, which were to be raised by the lithospheric plates tectonic movements. Gatazo Hill has a 260m.a.s.l. altitude, is located at the 104726.818N 649726.062E coordinates, and a rotational slip originating a clay material avalanche, has become reactivated.

The detached material is made up of sediments such as clayey shales originating up to 30cm diametre blocks. The material composition and the water input make up a muddy mass flooding at times the streets and some houses located at the foot of the hill.

A typically monsoon climate regime prevails in Esmeraldas; i.e., there is only one more or less long drought period, or a huge rainfall surplus over the rainy season which is lost by runoff. Average annual precipitation ranges between 750mm and 1100mm, while temperature varies between 24° - 34° C; relative humidity is 58 - 72% in Summer. The humidity regime in this sector corresponds to a sub-humid regime. The rainy season goes from December to May, with a dry season in between, going from June to November, with drizzles over the dry period.

Gatazo Hill belonged to the ecological dry Tropical forest formation (d.T.f.), according to the Holdridge classification. Gatazo Hill shows a geological faults mechanism activated by hydraulic conditions exacerbated by the aggressive 1998 El Niño phenomenon impact. Rather heavy rains affected a greater depth of the Hill soil upper layer altering the latter´s mechanical conditions by increasing the moist soil mass weight and decreasing the soil mass resistance. Subsequently, in drought times, soil strata show deep cracking. Subsequent heavy rains caused a deeper infiltration, weakening a larger unstable soil mass, and producing a huge and severe landslide in 2005 affecting 475 people. A similar event was recorded in 2010, killing three people and destroying ten houses, while eight homes were destroyed in 2016, and the rupture of a water supply pipeline left more than 22,000 people without drinking water.

The city of Esmeraldas is located at the mouth of the Esmeraldas River: the second most important and largest river system along the Ecuadorian coast. The river´s rather wide watershed covers 20,000Km², entirely comprised within a constant fainfall area. Rivers originate in the confluence of several streams, among which the Blanco, Guayllabamba, Toachi and Quinindé Rivers stand out. Rivers are borne out of the melting of the Andes. The Guayllabamba is formed in the Quito Valley, from which it flows through a narrow gorge leading to a green hills area, and then to an large alluvial plain, where the river bed opens up

between island formed by pebbles. The Esmeraldas River flows into the Pacific Ocean forming a deep estuary, at the end of which the Esmeralda city rises, some 3km from the Esmeraldas river mouth. The Teaone River lies in the Esmeraldas Canton: This is another tributary of the Esmeraldas River, which crosses much of the Southern zone of the Canton and is located within the survey area which is contaminated by wastes disposed of along the river banks, and by the State Refinery pools spills. This river quadruples its flow in Winter (rainy season) dragging sediments that are deposited downstream, causing damages in houses located along the riverbanks. Unusual rainfall regimes in the basin cause rather extraordinary flooding rises which, in turn, lead to flooding in the estuarine islands, some of them populated as the Luis Vargas Torres Island.

b. Biotic Environmental Factors

Antofagasta – Chile

This is a very arid area and, for the Bonilla Ravine work area, neither wildlife nor vegetation individuals were identified that should be highlighted.

Likewise, the area is not deemed as a particular environmental interest area, as shown in the Environmental Impact Assessment (IAS) undertaken by the Project Developer and reviewed by the Environmental Authority, in order for the relevant authorization to be issued. In fact, the Regional Environment Commission, attached to the Antofagasta II Region, in Exempt Resolution No. 0203/2001, dated 23 August 2001, issued the authorization to carry out the works which, to this date, have not undergone any alteration or change whatsoever.

Over the Assessment Mission, at the headquarters of the Regional Environment Commission, attached to the Antofagasta II Region, in turn attached to the Ministry of the Environment, confirmation was made that this authorization, although issued more than fifteen (15) years ago, does not require any updating since neither the work nor the environmental setting surrounding it have undergone any change. And, it was known from the start that fourteen (14) works were scheduled to be executed in three (3) cities, all of them large-scale works, out of which eight (8) works are already finished, namely: Tocopilla, in Tocopilla; Cortaderas (Figure N ° 4), in Taltal; Salar del Carmen, La Cadena, Uribe (Stage 1), Baquedano, El Ancla, and Farellones (Stage 1), in Antofagasta.

Figure 5 below shows an overview of the area where some of the works will be located, and it is possible to verify that the area is a desert. In fact, according to some inhabitants in urban areas nearby at the Eastern edge of the city, and who know the area, only a few birds and small mammals are to be seen over rainy times.

Figure N° 5. Works location area. Bonilla Ravine. Antofagasta

***Source*: J.Blanco, photograph taken on 16/05/17.**

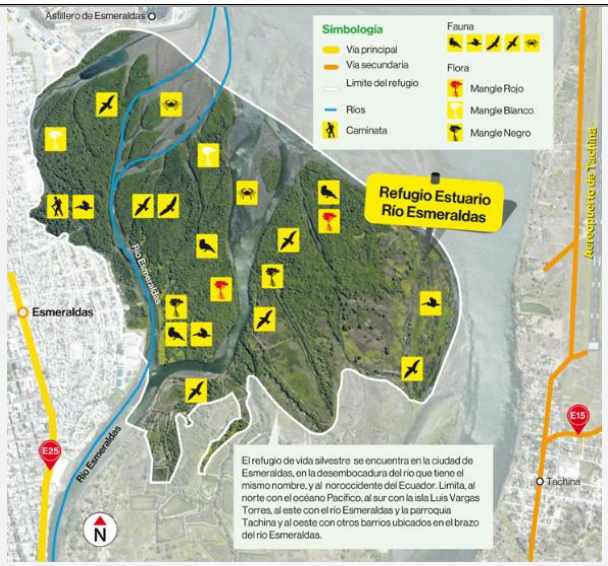
As far as Taltal's work is concerned and as shown in Figure 3, vegetation and wildlife are scarce, if non-existent, thus no particular problems are expected to arise.

So, a conclusion can be reached that, as far as biotic factors are concerned, the whole project does not imply any risk that should be highlighted.

Esmeraldas, Ecuador

The Mangrove Wildlife Refuge, Esmeraldas River Estuary, is located close to the Esmeraldas River mouth, in the Northern part of the Luis Vargas Torres Island (Figure No. 6).

FIGURE No. 6. Location of the Mangrove Wildlife Refuge, Esmeraldas River Estuary



This is a242Ha area protected since year 2008, and comprising Esmeraldas River mouth mangroves and a nearby place showing dry scrub patches.

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Mangroves in this estuary are the last remnants of the wide-reaching forests once stretching over the area and later transformed by the advance of the Esmeraldas city, and the increase of farming areas and pools for shrimp farming. This is a little-known and rarely-visited area because of access constraints and a lack of touristic infrastructure.

Three types of mangrove are present in this protected area: *Rizophora mangle* (red mangrove), *Laguncularia racemosa* (white mangrove) and *Avicenia germinans* (black mangrove). Some areas have even been invaded by the Acrostichum aureum (ranconcha fern).

Seven types of herons thrive in this protected habitat: White, blue, snowy, striated, brunette, crab-fishing and coronine herons. Their habitat are the mangroves and they can be sighted when they are returning from their eating forages. The area is also the habitat for seagulls, frigates, pelicans, kingfisher, piures, beach shoe, ospreys, jacanas, cormorants, water birds, and swallows. This wildlife´s habitat is located along the Luis Vargas Torres Island mangrove strip; however, an estimation has been made that project´s intervention in this area will be minimal, since these interventions will be implementing disaster risk reduction, early warning systems, local capacity-building components among other activities. A Management Plan is in

place at the reserve, as approved by the Ministry of the Environment in year 2015.

Marine biodiversity plays a key environmental role in the city of Esmeraldas: On 11 October 2016, at 16:26 hours, on Las Palmas beach sector, in the extreme Western side of the city, staff attached to the Provincial Environment Directorate of Esmeraldas detected a nest of sea turtles (*Lepidochelis olivacea*) in hatching. One-hundred-and-three (103) turtles safely reached the Pacific Ocean.

In the past, the Gatazo Hill was a tropical dry forest exposed to manifold human interventions such as deforestation, urban growth, farming, installation of public utilities and services structure (drinking water pipes, radio antennas, television and cellular telephone services). In addition, in recent years, landslides have further degraded the remnants of trees and shrubs that were plucked out by mud and rock flows. Over the visit made for assessment purposes, only pastures, and some shrubs with no ecological importance were noticed. Therefore, it is expected that the interventions for slope reconstruction, and installation of anchors and drains will not have any significant adverse environmental impacts.

Due to the presence of the Mangrove Wildlife Refuge, Esmeraldas River Estuary, a few metres from the project intervention area on the Luis Vargas Torres Island, a suggestion is made in this document that the S03 Biological Diversity Conservation Safeguard is activated. Within the Reserve territorial limits, 47 families and a total of 205 people are settled inside this protected area.

Mangrove ecosystems in the Refuge are being threatened by demographic pressure, debris accumulation and vegetation removal. Being a small-size area with natural places greatly impaired by natural and anthropic factors, in-depth changes are required in people´s demeanour and in institutions´ approach vis-à-vis ecosystems territorial arrangement in the estuary.

Social, Economic and Cultural Factors

Antofagasta – Chile

Works scheduled by the executing agency are as follows: sinks or settling pools which get filled up from top to bottom due to heavy rainfall and floods , and the low-laying pools are the only ones located close to the population.

While people have not begun to migrate upstream, in order for them to dispose of their waste they have indeed begun to "occupy" these spaces with concomitant problems for the municipality and the Ministry of Public Works, and increasing pools maintenance costs, since those pools should remain empty at all times so as to taking advantage of their design capability.

The low-income population settled close to cities boundaries shows some differences: In Antofagasta, these people are more consolidated insofar the houses they live in have been built up with better building materials, and are provided for with public utilities and road communication. On the other hand, the houses in Taltal are more precarious, constructed in wood, sticks and plastic, with a more limited access to roads, and lacking public utilities, such as the collection of solid urban waste. These is why the Taltal works got under way some time before those in Bonilla, in Antofagasta.

The Ministry of Public Works, together with Governments in six Regions, including Antofagasta, where both cities in this Operation, and their respective Municipalities are located, have entered into a "Programming Agreement 2015-2022" including a 56,000 MM Chilean pesos budget (about US $90 million) to precisely funding a large number of Hydraulic Works to protect human lives and urban infrastructure, and pursuant to this agreement addressing awareness-rising activities for the population on the need to keep pools empty for an extreme event, and backing up Mayors in these cities to implement garbage collection plans additional to awareness-rising education.

Further, capacity-building activities are also being envisaged to train the population in maintenance of works and other trades´ capacity-building, so people may have access to a possibility to enter into the labour market.

This is the reason why actions were included in this programme to implementing the Emergency Programme which, while already in place, should be consolidated for the ordinary citizen who, otherwise, is very used to actions of this type because, for decades, citizens have been ready to react in Tsunami cases. Indeed, evacuation plans in cases of floods and alluvial rains should be closely coordinated with those intended for Tsunamis, because although unlikely and hitherto unprecedented, due account should be taken of the possibility for simultaneous alluvia and tsunami occurrences.

Finally, the Agreement also provides for post-alluvial event-focused education and capacity-building, since after an event, the water accumulated in the pools should be evacuated

through the city down to the sea; or, in fact, during the event itself, the works may become clogged, while water should indeed reach the sea.

In both cases, the water will flow along each city's road system, since several streets and avenues have been designed as actual open channels with capacities commensurate with the capacity of each set of settling pools. Additionally, post-event sediments will have to be removed. Thus, awareness-rising should also address these issues.

Bearing in mind the experiences accrued over three of the six works already in place and under way in Antofagasta, and the work in Cortaderas in Taltal, and having even gotten in touch with people living in areas bordering the last pools, people are already committed to up-keeping those works which, according to many "*have changed their lives*..." Once the seriousness with which institutions plan and implement actions as set forth in the Scheduling Agreement has been confirmed, and having visited areas, i.e., before works (Bonilla) over works (Uribe Stage 2) and after works (Farallones Stage 1, Salar del Carmen, La Cadena and Cortaderas), we believe that although the work to be implemented is rather substantial and complex, risks entailed are rather few, in particular if a comparison is made with the experience cities have vis-à-vis Tsunamis.

Mining is the main economic activity in Region II, because the climate is so dry that farming and livestock raising activities are rather limited and not so regular in the Southern regions in the country. According to estimates, at last 60% of Chile's mining GDP is originated in this Region. This rating makes mining into the largest economic sector in the country, the first labour source, and the main consumer of industry, trade and regional services.

Another important stakeholder in the regional economy is the fishing sector, with industries producing fishmeal and fish oil, frozen fish, preserved fish and smoked fish. Also, gracilaric algae extraction and farming activities are implemented in the Mejillones and Taltal area, while artisanal fishing is concentrated in several nearby villages, reaching up to 7.6% of the overall country´s catch.

Most people currently living in this region are immigrants from Chico North and the Central Region in the country. And the Second Region, according to the 2002 census, is populated by about 500,000 inhabitants. Population density reached 3.9 inhabitants per square kilometre.

<u>Esmeraldas – Ecuador</u>
The city of Esmeraldas population are 161,868 inhabitants (INEC, 2010); Out of them, 52.1% are women. The population is mostly Afro-Ecuadorian (42%) and the second Indigenous

People are the Mestizos with a 37.4% share. Esmeraldas is the only province in Ecuador where most of the population is of Afro-Ecuadorian origin. Indigenous People is considered a minority nation (7.2%), while most of the country´s population are mestizos (72%). A few number of Chachis indigenous people live in the Luis Vargas Torres island, and who settled there some years ago, speak Spanish and also their ancestral language cha'apalachi[5]. The last national INEC 2010 census determined that 600 families were settled in the island, of which 100 were of Chachis nationality[6]. The Chachis´ original home was the Imbabura province from which they were expelled by the Inca invasion, to later settle down in the Esmeraldas jungles. Therefore, Safeguard S06 "Indigenous Populations and cultural diversity" should be activated.

According to the 2010 Census, the local economy is quite diverse, the three main activities being trade, education and farming. The Esmeraldas Municipality is working to boost tourism as a development driver for the city, and is undertaking urban rehabilitation in several sectors in the city, such as Las Palmas Beach, and in some other downtown area to tackle high poverty levels. In 2010, 57% of the population recorded unmet basic needs (UBN). Access to drinking water, sanitation, garbage collection, and electricity figures were 75.3%, 56.6%, 77.6%, and 79.5%, respectively. However, some 130 MMUSD have been allocated by the Ecuadorian government to supply drinking water to the city. This investment allows for the improvement of the water collection system from the Esmeraldas River, the construction of new water treatment plants, and the expansion of water supply networks (70km up to April 2017), which, together, will supply quality water on a constant basis to more than 414 thousand people living in the city and surrounding cantons, like Rio Verde and Atacames[7]. As regards the Project´s direct area of influence, the November 20 (Guacharaca) population in Gatazo Hill will also benefit, as water supply piping going through this place will be removed, as leakages were the cause behind large landslides.

A final issue to highlight is the informal growth and lack of planning the city has recorded on several mangrove ecosystems and dry forests. An estimation was made in 2014 that about 70% of the urban area of the Esmeraldas city was not recorded in the city Land Registry. The municipal government is making inroads into this matter, and is enacting a set of regulations, such as a Partial Territorial Arrangement Plan (PPTSM) of Las Islas, and Tachina and San Mateo Parishes to avoid an unplanned growth of the city in these areas in which important development hotspots have been identified. Some flagship projects have been scheduled within this legal framework to be executed in the Luis Vargas Torres Island, such as: 1) Theme culture and diversity park in Esmeraldas (57Ha); 2) Recreational and sports park in

[5] http://www.elcomercio.com/tendencias/migracion-urbes-amenaza-lengua-chachi.html
[6] http://www.elcomercio.com/actualidad/ecuador-poblacion-chachi-instalo-isla.html
[7] http://bde.fin.ec/primera-fase-del-sistema-de-agua-potable-inicia-sus-pruebas/

Esmeraldas (86Ha); Social Interest Housing Developments.

The above should be deemed as an issue deserving a careful review, since these housing developments are scheduled to be located in a flood-risk area, where tidal levels have been reported reaching more than 2M high, with heavy material losses to people living nearby, while human lives could be lost in the future.

e. Institutional and Organisational Issues

Antofagasta – Chile

The high integration and coordination capacity between the Ministry of Environment, the Hydraulics Works Department, the Ministry of Public Works of Chile, the municipalities and all institutions involved should be highlighted. Clearly, every decision-making process is shared by all of them together, in a concerted way and even, in most cases, with citizen involvement.

As mentioned above, individual plans, agreements, programmes and actions are carried out in a timely and transparent manner, and in accordance with pre-established agreements and subject to accountability procedures.

It is CAF's own opinion that the capacity-building and awareness-raising programme focused on people living in areas close to the projects (people who are settled around the last pool) and on people carrying out their activities in places close to streets and avenues which eventually operate as drainage channels, could generate job opportunities for all of them.

In this sense, over the Assessment Mission, the characteristics of the PASOS Programme for social inclusion, led by CAF´s Social Development Vice-Presidency, were brought to the attention of organisations participating in this Mission, and an offer was made to facilitating coordination between the two organizations and those responsible for the PASOS programme so that, together, they can maximize results.

Esmeraldas – Ecuador

A sound coordination has been in place between the Ministry of the Environment and the Municipality of Esmeraldas vis-à-vis protection of mangrove, sea turtle nesting sites, as well as the monitoring and control role these two entities play regarding works being carried out by the Municipality of Esmerlaldas, such as the construction of retaining walls, breakwater works, rehabilitation and maintenance of rainwater drainage, among others also showing the

technical capacity of local human resources and their experience, as well as the involvement of the local population in these tasks.

Another important stakeholder in the local setting is the Provincial Government of Esmeraldas, which will undertake project-related actions with the National Meteorology and Hydrology Institute (INAMHI, for its acronym in Spanish) to install meteorological systems for storm detection and, together with the National Secretariat for Risk Management (SNGR, for its acronym in Spanish) to install floods early warning systems, particularly on the Vargas Torres Island.

Coordination between the different institutions in the area is positive; a friendly atmosphere is in place among stakeholders, and a technical alignment is apparent to drafting up the proposal and deciding upon steps that should be taken to reduce vulnerability of Gatazo Hill and Luis Vargas Island Torres populations to extreme weather events.

Therefore, a conclusion should be reached that there are no significant risks in terms of environmental and social risks management in the two Chilean cities and the coastal city of Esmeraldas, as mentioned above.

III. Assessment of environmental and social impacts and risks

Antofagasta – Chile

The IAS submitted to the Ministry of the Environment to secure necessary and sufficient authorizations to executing hydraulic works in all Ravines in Tocopilla, Taltal and Antofagasta was indeed far-reaching, duly addressing all the environmental impacts on those areas that the execution of these works have already brought about, are causing, and shall cause in the future.

On the other hand, the Ministry of Public Works, as executor of these works, has internalized in its own dynamics the incorporation of lessons learned, from one work to the next work, so as to prevent work executions impacts and their aftermath.

After an inspection of some already-finished works, and of work under way, it was possible to verify that two major problems are being brought about by works execution, i.e., generation of erosive processes in channels´ slopes, and a direct impact to people living close to the last decantation sink / pool downstream the system.

Regarding the first problem, work specifications as set forth in Bidding Documents already

include a Contractor´s obligation to evaluate slopes stability and to correct, pursuant to contractual terms, any situation likely showing potential erosion processes. Solutions such as slope lining, increasing dimensions of energy dissipating devices at each pool discharge point, assisting the system which by its own characteristics depletes runoff water energy by storing large water volumes in each pool. Likewise, in some instances, the construction of similar but smaller-scale systems in some of the main Ravine tributaries is also undertaken.

Regarding the discomfort that the Ravines Alluvial Energy Dissipation System may generate in the population settled close to the last pool or sink, all precautions are being taken so that the stored water courses drainage, and floods transit courses, already cleared of sediment, have the smallest possible impact on people´s regular activities, sometimes by burying the water courses so that discomfort is not generated at surface level to people living in the area and to bystanders.

Notwithstanding the above, the MOP, and the contractors, coincide that the biggest problem is the accumulation of waste of all kinds in the pools / settling pools, during rainless times. Indeed, over the assessment mission, abandoned vehicles were found floating in the basins, with a rather adverse impact on works effectiveness once the rainy season gets under way: these works capacity reduction will be directly proportional to the volume of waste disposed of onto the Basin, as this can drastically affect the basin´s waste retention capacity.

The MOP, together with the Ministry of the Environment and municipalities concerned, and pursuant to the 2015-2022 Programming Covenant, have undertaken an evaluation of this situation, and likely solutions such as awareness-raising endeavours to educating the population. At the same time, and bearing in mind past experiences, service roads remaining in the systems are blocked with a sort of dikes that, when it is necessary to access to the pools above, is removed and the road is again open to traffic. They have also pondered a likelihood for the creation of recreational areas for families close to the pools, so that people consider the area as a place for their amusement and relaxation. Thus, plans are in the making to install sports fields, hiking and jogging tracks, etc. All is needed is to adjust early warning issues for people using those facilities at the time a flooding event becomes apparent. It was within the latter case´s framework that stakeholders in the Project submitted to the Adaptation Fund were advised to contact CAF´s PASOS Programme representatives, led by the **VDS**.

Finally, mention should be made of the fact that, as the MOP states in the IAS[8], the Project is, as a whole, one of the largest environmental projects in Chile, since Project works prevent that high-frequency rainfall -previously wreaking havoc on the population- now flows through without even being noticed by people, in particular if they live far from the area where the last pool is located, as was the case of the 2015 rains, the heaviest rains recorded over the last 20 years, and people living in Taltal did not notice it, because the Cortaderas works were already in operation.

The above highlights how important it is to keep people abreast of these works, explaining people why those works have been executed in that place, how much money was invested in them, and how their operation is saving human lives. According to estimates, it is only through a well-planned and suitable communication campaign, and awareness-raising endeavours within the community, that people being benefited by the project could take care of the works operation.

The MOP and the Municipality of Taltal representatives reported that, while they are implementing an information dissemination campaign, the Law forbids them to "advertising" State work, the budgets of which prevent State organisms from hiring advertising services. Thais is the reason why they are undertaking these information dissemination campaigns with the city´s educational and social institutions, a work involving more time and effort.

<u>Esmeraldas – Ecuador</u>

The Gatazo Hills Slopes Stability Design surveys in the city of Esmeraldas, conducted by the Ministry of Urban Development and Housing (MIDUVI) and the National Risks Secretariat of Ecuador in 2012, included an Environmental Impact Assessment Survey of this Project.

This document shows that the technical information on the Survey has to be updated taking into account that the Survey is from 2000 and it has not included the climate change scenarios, while the environmental and social impacts assessment therein is rather very general. Furthermore, this document was not approved by the Ministry of the Environment, the national competent authority for the Unified Environmental Information System (SUIA, for its acronym in Spanish).

The Environmental Management Plan implementation budget is considered as too small, and it is a reflection of the poor quality of this Survey (Table No.1).

[8] This recognition is shared by the Ministry of the Environment in Resolution approving the EIA for the Dissipation of the Alluvial Energy Dissipation System Project

TABLE No. 1. ENVIRONMENTAL MANAGEMENT PLAN BUDGET

Awareness-raising talks	U	10.00	315.00	3.130.00
Prevention signboards	Gb	25.00	109.80	2.745.00
Informational signboards	Gb	10.00	109.80	1.098.00
Waste disposal pit	Gb	1.00	2.500.00	2.500.00
Biodegradables	Gb	1.00	10.000.00	10.000.00
Latrine	Gb	1.00	1.500.00	1.500.00
			TOTAL	**20.993.00**

An Environmental Impact Assessment (IAS) should be drafted up addressing the final design of works, and abiding by the requirements of CAF´s own safeguards and the Adaptation Fund´s environmental and social principles, and including an Environmental Management Plan incorporating standards pursuant to Environmental Legislation in force in Ecuador.

Further to the above, a strategic environmental assessment survey should be immediately conducted of all interventions already implemented and to be carried out in Esmeraldas and having a synergic impact on the area where the project this IAS refers to is being implemented. The Strategic Environmental Assessment (SEA) involves applying Environmental Impact Assessment (IAS) guidelines to (environmental and non-environmental) policy, sector (sector and spatial) plans, and action programmes already in place and foreseen (this project). SEA key principles buttressing and integrating it are: screening, scoping, key data, impact forecasting, impact assessment, reporting, audit, and monitoring.

Likewise, CAF deems a priority to assess environmental risks involved in the installation of Doppler radars and meteorological stations in sites already marked down for their location, as well as in access road to those places (in particular, if those places are ecosystems with little human intervention).

a. Project Impacts on the Physical Component

Antofagasta – Chile

From the standpoint of the physical component, most relevant impacts are:

1. Generation of erosive processes over execution of works; and
2. Generation of dust over construction works (this impact has been reduced since, even in the absence of works, dust swirls or blowing dust are frequent in the area).
3. Obstruction of watercourses, this impact is deemed as positive in this particular case since

it is through water retention that safety is generated for people settled downstream in the Ravine (Antofagasta and Taltal populations).

Esmeraldas – Ecuador

Some of the most serious impacts on the physical component being envisaged are:

1) The large volume of debris accumulated: When this debris weight is removed from the upper Gatazo Hill slopes areas, it should be disposed of in a suitable dumping site, as marked out by the environmental authority. According to the existing Environmental Survey, an estimation has been made that this waste material should be disposed of at a site located in the South-Western area and knows as La Chamera. But this Survey does not warrant that the suitability of the suggested site has been technically determined.
2) A deteriorated air quality, and noise resulting from the permanent presence of dump trucks transporting surplus material resulting from terrace formation processes in Gatazo Hill.
3) The temporary obstruction of water courses which will have positive impacts on Gatazo Hill, provided work is undertaken over the dry season (Summer), since natural drainage was altered by mass displacements and should be restored.
4) Deterioration of asphalt pavement in roads adjacent to the project site due to high traffic of dump trucks and work vehicles.
5) High sound pressure levels over drilling for Gatazo Hill anchoring works.

b. Project impacts on the biotic component

Antofagasta – Chile

As mentioned above, the area is lacking wildlife and flora components likely to be impaired by execution of works.

Esmeraldas - Ecuador

1) Impact on the mangrove ecosystem. Due to the proximity of the Wildlife Refuge in the Esmeraldas River Estuary Mangrove, a few metres from the project intervention area in Luis Vargas Torres Island, which is lacking sanitary sewage, and harbours a population of more than 2000 people, there is a high potential that pollution and extraction of resources from this area can generate rather adverse impacts on this ecosystem. Batioja Thesis work (2017) shows that 64% of the Reserve management indicators **entail a low external perception** (by neighbouring population) vis-à-vis that of members of the technical team responsible for the Protected Area.
2) Impact on Gatazo Hill vegetation cover. Vegetation will be removed from approximately a

2Ha intervention area over slope stabilisation works; however, revegetation of the site will be carried out later on, abiding by the green infrastructure plan to be designed with project resources.

c. Project impacts on the socio-economic component

Antofagasta - Chile

The socioeconomic component shall be the most impaired by this project: the key goal of the latter being to save lives. As recorded in Taltal, the Cortaderas Ravines System allows for an eight (8) hours timeframe for authorities to activate emergency plans in case of a water upsurge since, according to experience, pools in place shall fill up within this timespan and up to the moment water starts to outflow the last pools.

However, even if by comparison these impacts could be discarded, the largest adverse Project impact is the bearing the project may have on people living close to the pool downstream each System, and on people living nearby or routinely moving along streets and avenues being used both, for waters to flow through during the flood, and to drain the pools once the flooding event is over. Similarly, but at a lower intensity, people using communication channels through which mudflow wastes shall be carried (mud, earth, rocks, etc.), could also be impaired in their daily lives.

Esmeraldas - Ecuador

Impacts as below are foreseen for Gatazo Hill slopes stabilization works:

1) Discomfort caused by traffic noise and pollution on people living in the November 20, and the Guacharaca neighbourhoods. Roads are narrow, steep, with inadequate signage, conditions having on impact on pedestrians´ safety and traffic of light vehicles through the area of influence.
2) Project components 2 and 3 do not entail adverse social impacts for the project; rather, they generate positive impacts, so implementation measures should be properly designed to ensure the highest participation and appropriation of the project by the Gatazo and the Luis Vargas Torres Island communities.

d. Project impacts on institutional and organisational component

Antofagasta – Chile

While not reported over the Assessment Mission, a synergy among those involved (Ministry of Public Works, Ministry of the Environment, and Municipal Governments) has been created strengthening them up as a team, and benefiting the communities being intervened.

Esmeraldas - Ecuador
The Esmeraldas' green infrastructure plan will have a positive and highly significant impact on Ecuador as it will enable local authorities and a number of sector institutions to co-ordinately work within the National Risk Management System framework attached to the Emerging Operations Committee. Thus, local stakeholders will be prepared to implement both, protection actions against floods and landslides (mass movements), and strategies designed for risk and disaster management and adaptation to climate change in Esmeraldas.

IV. Environmental and social management of the Operation

Antofagasta-Chile
The team implementing the Programme including the Antofagasta (Bonilla Ravine) and Taltal (Cortaderas Ravine), has not only fully carried through the Environmental and Social Management Plan suggested in the IAS, and approved by the Ministry of the Environment through a specific resolution, but has also enriched and improved this Plan, thanks to the knowledge team members have acquired over works team members have already built up.

The team´s environmental and social management starts with bidding documents-related activities: bidders are informed of the obligations that environmental and social contractors shall abide by. One of these obligations is an Environmental and Social Unit the contractor shall set up for those obligations to be performed throughout the work, and for the Contractor to be a counterpart to the Ministry of Public Works´ attached Environmental Team, in the first instance, and to the Ministry of the Environment in case the latter undertakes an unexpected inspection.

The exchange of information with the affected or beneficiary population is permanent and both, the MOP and its contractors are aware of the obligation they have to address stakeholders´ doubts and expectations vis-à-vis the project in question.

Esmeraldas - Ecuador
The environmental and social management strategy being considered for interventions in Ecuador is:

1) Conducting a strategic environmental assessment of the Esmeraldas area the project is being executing in.
2) Simultaneously, the Gatazo Hill Slope Stabilization Project surveys designs will be updated. An IAS shall be attached to this Project as one of the components of the Product

to be delivered by consultants hired by the Municipality of Esmeraldas.

3) The IAS will be approved by the Ministry of the Environment: the national environmental authority, who will issue an environmental licence.
4) The Environmental Management Plan format will be the one established by the Responsible Application Environmental Authority (RAEA);
5) During the approval process, mechanisms for public participation with communities in the direct and indirect Project´s area of influence, as well as with other stakeholders, will have to be abode by.

Environmental and social management commitments entered into are mandatory; measures that should be fulfilled as spelled out in this project, originate in one or more of sources as follows: a) the contents of each approved Environmental Management Plan (EMP); b) Agreement entered into with the executing agency, and CAF; C) findings made by CAF (and / or the Adaptation Fund) over follow-up of ongoing projects; and c) emerging actions identified as necessary over the Project assessment phase.

Contractors, therefore, should abide by the conditions as set forth in each EMP, executing environmental budgets and implementing measures as recommended by CAF. On the other hand, external environmental and social auditors will contribute with verification reports addressing compliance of above mentioned commitments, and will be responsible for turning this information into a digital format and loading it onto a web page for access by stakeholders. Their work should be timely, in such a way that those audits will allow to recommend and condition the works executed by the contractor. Also, the recommendations made by environmental inspectors, and included in their reports, should be sent through a formal letter to the executing agency, to CAF, and to the municipal DMA: The parties responsible for compliance with those conditions.

The external audit should report on the progress of the programme to strengthen up air and noise quality monitoring, as well as the debris management verification programme to avoid the illegal disposal of debris on water bodies banks, and on other natural areas around the Esmeraldas Canton.

a. Preventive, mitigating and / or corrective measures

Antofagasta – Chile

The Environmental and Social Management Plan undertaken by the Ministry of Public Works for all projects included in the Programme, and involving those in Antofagasta and Taltal, embodies all that CAF deems as important in these cases, since this Plan incorporates

measures to deal with a wide spectrum of potential impacts, measures which are summarised in components as follows:

1. Relationship with the community plan
2. Monitoring of erosion processes
3. Inventory of plant species at work sites (not applicable to works in this IAS, but applicable to other Ravines that are included in this programme)
4. Protection of wildlife and vegetation (monitoring of presence of threatened or endangered species) (not applicable to works subject to this IAS, but applicable to other Ravines that are included in the programme)
5. Contingency plan
6. Solid Waste Collection Plan
7. Hazardous Materials Management Plan
8. Protocol in case of archaeological findings
9. Occupational Safety and Health Unit
10. Monitoring Plan for Environmental Variables

All of these components to be performed by trained and highly committed personnel, as noticed over the Assessment Mission.

<u>Esmeraldas – Ecuador</u>

The Environmental Management Plan in place involving the Gatazo Hill Slopes stability is a document devoid of the sufficient efficiency which is mandatory in a scientific paper, therefore, that document cannot be used as a foundation to manage the Project´s own adverse environmental and social impacts. Therefore, and as a precautionary measure, a Strategic Environmental Assessment will be drafted up on the intervention in Esmeraldas, and addressing the three components and their interaction with several projects currently under way in the city of Esmeraldas, Gatazo Hill, the Esmeraldas River Estuary, and in the Esmeraldas River area of influence.

The IAS will then be updated for Survey purposes concerning the final design of the Gatazo Hill Slopes stability, and for installation of meteorological stations and Doppler radars at sites as determined by INAMHI. It is very likely that this IAS includes:

Measures to mitigate adverse traffic impacts (social impacts) such as: a) improving signposting on roads along the direct Gatazo Hill area of influence over slope stabilization works; b) monitoring compliance of debris transportation routes to the approved final disposal site; c) a road safety audit of the project design, to avoid unnecessary damage to

pedestrians and light vehicles of people living in the project´s area of influence.

Preventive measures such as hiring an external and independent environmental and social audit for Component 1 of Project.

Corrective measures such as the implementation of the green infrastructure plan, specifically the revegetation and reforestation of Gatazo Hill, once the slopes and anchorage remodelling works have been completed, among other measures to be set forth in the Environmental and Social Management Plan requested.

b. Citizen Participation Mechanisms and Communicational Strategy

Antofagasta – Chile

The Programme foresees that each project -including the two projects dealing with the Ravines Alluvial Power Dissipation System in Antofagasta and Taltal- should get into a close relationship with people being affected by the works, in the first instance, and then, over a second Stage, with those people who will be affected by the open channels some streets and avenues will be converted into, once a flooding event occurs.

Furthermore, once the work is completed, this project team should interact with the same people so the works are kept in good condition and their smooth operation becomes into a positive contribution. People responsible for this task have shown their thorough mastery of the worksite, an in-depth knowledge about the project, and their readiness to interact with project users who may require it.

The communication strategy works on three fronts: 1) the community itself; 2) contracting companies and subcontractors; and 3) senior management attached to the Ministry of Public Works and other institutions, to unify positions among public bodies, and avoid dissimilar standings vis-à-vis the public opinion.

At present, meetings are being held with representatives of communities settled close to the last pool in Taltal (Cortaderas Ravine), so that, together, a definition can be reached about what uses should be given to the pool areas, on the one hand, and how to avoid people from disposing of their waste in the pools system, on the other. At the same time, talks are under way with the MOP authorities, contractors, and the Municipal Government to try and establish a waste collection schedule in these areas, so that citizens are prevented from having to dispose of their waste themselves.

Esmeraldas – Ecuador

Due verification should be made that the Gatazo Hill Slope Stabilization Project, as well as the installation of equipment and actions being envisaged in project components 2 and 3, have duly implemented citizen participation mechanisms as pursuant to Law (i.e., public consultations), to ensure that components´ results have been incorporated. Also, informing CAF in a timely manner of the communicational strategy towards the community, and results obtained, so that obligations are abode by as set forth in Regulations for the Application of Social Participation Mechanisms, as stipulated in the Environmental Management Law, enacted in Executive Decree 1040 of April 22, 2008, and the Instruction for Application of the Social Participation Mechanisms Regulation, as set forth in Executive Decree 1040.

The citizen participation component should be managed as a system allowing for community involvement in the information and incorporation of criteria stages, precisely to detract from potential expressions of discontent or complaints from inhabitants of the programme´s areas of influence who could deem to have been disadvantaged by Projects.

The Project's Strategic Environmental Assessment process will also be useful to improve public participation at the time of assessing the environmental impacts of the project's initiatives, so as to ensuring that these initiatives are fully included and properly communicated in the early decision-making stages, bringing them in line with social and economic considerations.

The activation of the S06 Indigenous Populations Safeguard, bearing in mind the presence of the Indigenous Chachi population, requires the involvement of an Indigenous Population through consultation and relational means, setting forth measures to ensuring that Indigenous Population access to project´s benefits, measures about which communities should be duly aware through appropriate dissemination channels. This will be required in the public participation process of the EASE and IAS surveys to be conducted upon request by CAF.

V. *Most Pressing Risks and Critical Issues*

a. Main Risks

Antofagasta – Chile

The most pressing risk is a likelihood for damages in the pools storage capacity due to the ever-present habit of people living close to the works disposing of their waste in the pools; until now this situation is apparent only in the last pool, the only one near populated areas,

but, perhaps some time in the future, this situation may become apparent upstream.

Esmeraldas - Ecuador

• The absence of up-to-date engineering surveys, and final design surveys for the Gatazo Hill Slopes Stability.
• An uncertain possibility is in place to activating the S07 Population Resettlement Safeguard, which could only be determined once technical specifications and details for stabilization interventions in Gatazo Hill are ready.
• The absence of an Environmental and Social Impact Assessment of the Gatazo Hill Slopes Stabilization Project.
• Several urban development projects have been envisaged in Luis Vargas Torres Island (highly vulnerable to extreme flooding), as well as social housing development projects.

b. Critical Issues

Antofagasta – Chile

The most important critical issue to refer to is that concerning pool maintenance over those periods when the system is not in use, because the worst that could happen is that the pools are full at the moment a high-magnitude flooding event occurs. On the other hand, pools should be cleaned after each event, not only after the last one, and if the MOP is late in getting down to do it, and another event occurs, the problem would be exacerbated and impacts would be dire.

Esmeraldas - Ecuador

a) The need to carry out a Strategic Environmental Assessment integrational exercise so that main environmental and social strategic factors may be assessed that may be become into a constraint to reaching the Project goals throughout the area of influence of actions sets (or subprojects), such as Luis Vargas Torres Island, where a series of projects are being considered in the Esmeraldas Land Arrangement Plan.
b) Activation of the S02 Biodiversity Conservation Safeguard, requiring to frame actions to be carried out in the Luis Vargas Torres Island within the framework of the protected area management plan (Mangrove Wildlife Refuge of the Esmeraldas River Estuary) on account of the Estuary´s location within the project´s area of influence; and including, as a part to the project, backup measures to strengthen up management of the protected area.

c) Activation of the S06 Indigenous Populations Safeguard, on account of the presence of a significant group of indigenous Chachi (100 families) on Luis Vargas Torres Island. This

safeguard poses requirements for involvement of Indigenous Populations through consultation and **relations**, the incorporation of measures to warrant their access to the project benefits, project which should ensure that these benefits are indeed accessed to through the provision of resources accordingly, and assurances that communities are duly aware of the project through proper disclosure, as set forth in a Plan for Indigenous People.

VI. Main environmental and social opportunities

Antofagasta – Chile
The Ministry of Public Works, with a10 years-plus experience in planning, design, hiring, construction, supervision, operation and maintenance of this type of alluvial control works, could become into an organism assisting others in Latin America. A proposal was made to the Ministry to submit papers to regional conferences and to evaluate the possibility of providing advisory services to authorities outside Chile in matters related to alluvial control works.

Another opportunity is to take advantage of the intervention, experience and social inclusion methodology CAF has been implementing through its PASOS programme in a large number of communities in Latin America.

Further, in accordance with the S02 Renewable Natural Resources Safeguard mandate, stipulating that "... CAF requires the client to establish and implement measures and tools warrantying a sustainable and efficient use of resources and the application of good conservation practices ... ". a suggestion is made to evaluate that stored water is used for irrigation of municipal green areas, street washing, and even for future human consumption, among other actions to adapt the area to climate change impacts. All of the above, to incorporate added-value to the works objective, works that should be properly managed so that their capacity to deal with the next alluvial event is upheld.

<u>Esmeraldas - Ecuador</u>
The coordinated work of the Ministry of the Environment of Ecuador (MAE) with the Municipality of Esmeraldas in the Gatazo Hill area should be taken advantage of to design a proposal to declare a 2Ha forest as a protected vegetation area, together with Gatazo Hill slopes stabilized and reforested with its restored drainage, to warranting soil use and avoiding formal or informal settlements in the future.

Furthermore, work should be done to back up a project for implementation of the Education, Communication and Environmental Participation Programme of the Esmeraldas River Estuary Wildlife Refuge Management Plan. The implementation of this programme is based on

providing environmental education to communities living close to the protected area, in order to generate environmental awareness on a proper use and harnessing of resources, thus, threats to the protected area can be reduced, and the perception of neighbouring and of Luis Vargas Torres Island communities about management of the protected area can be enhanced.

VII. Environmental and Social Measures set forth by CAF

Antofagasta – Chile

Over the Assessment mission to Ravine Cortaderas works, in Taltal, wall stains showed that the last pool landfill had been flooded by the 2015 rains. This data was later confirmed, and when technicians were questioned whether landfills upstream had behaved in the same way, their answer was negative. Their explanation was that perhaps, the presence of large amounts of debris of all types reduced the pool capacity, bringing about the overflow of the landfill.

Three causes could account for this situation: i) that mentioned by the Executing Agency regarding solid waste; ii) intermediate, intermittent tributaries contribute more water than the water flowing from the main channel, or iii) pools upstream have been designed for higher flow rates than the last pool can sustain. Depending upon these alternatives, one of the Conditions established was the hydraulic verification of works.

Esmeraldas – Ecuador

Because the existing IAS and **WFP** are non-technical documents, all conditions may be considered as "identified by CAF", and include:

1) Preparation of a Strategic Environmental Assessment on the intervention in Esmeraldas, in the three Project components "Reducing climate vulnerability in urban and semi urban areas in Latin America" and its interaction with several projects being executed in Gatazo Hill, city of Esmeraldas, in the Estuary of the Esmeraldas River, and in its area of influence.
2) Updating the IAS for the Survey addressing the final design for Gatazo Hill Slopes Stability, and for installation of meteorological stations and Doppler radars at sites chosen by INAMHI.
3) Improvement of signalling in roads in the direct area of influence of Gatazo Hill over slopes stabilization works.
4) Monitoring compliance of debris transportation routes (originating in Gatazo Hill) to the approved final disposal site,
5) Road Safety Audit to the project design, to avoid unnecessary damages to pedestrians and light vehicles for transportation of people living in the area of influence of the Gatazo

Hill Slopes Stabilization Project.

6) Hiring of an external environmental and social audit for component 1 of Project.
7) Implementation of the green infrastructure plan, specifically the revegetation and reforestation of Gatazo Hill, once the slopes remodelling and anchorage tasks have been carried out, among others to be included in the Environmental and Social Management Plan requested.
8) Social Survey incorporating the consultation process results, and a plan for the Ethnic Community in the project (in response to enactment of Safeguard S06).
9) Capacity-building in environmental interpretation to inform and educate visitors and local residents, so that they can work in tourism activities in the protected area (in response to enactment of Safeguard S03).

Environmental and Social Budget

Project Components	Expected Results	Expected Products	Countries	(USD)
Component1. Priority Actions to Increase Resilience			Chile, Ecuador	**12.865.351**
SC 1.1. Construction of alluvial control works and defining designs necessary to reduce alluvial and flood risk	- Works Construction (rainwater flow, control works), in priority basins. - Procurement of software for review, layout and prioritization (for example ArcGIS, Aquaveo WMS, or Mike She and/or flood).	- Mitigation Works for alluvial control. - Updated Master Rainwater Plan incorporating micro-basins in Antofagasta and Taltal.	Chile (Antofagasta and Taltal)	8.450.704[9]
	- Reducing exposure of people living in highly vulnerable coastal areas.	- Layout, feasibility survey and implementation of adaptation measures	Ecuador	2.260.000
SC 1.2. Climate Early Warning Systems	- Improving response ability.	- Installation of a Early Climate Warning System (emergency Room)	Ecuador	380.000
SC 1.3. Signage equipment and Warning System	- Implementing signage to guiding evacuation of people over alluvial risks emergencies. - Installation of an alluvial warning system.	- Procurement and installation of 500 signage devices for alluvial risk areas and evacuation routes	Chile (Antofagasta and Taltal)	1.070.422

[9] Del total, entre un 10-15% se considera para estudios, el resto para obras de mitigación para control aluvional.

Project Components	Expected Results	Expected Products	Countries	(USD)
		- Procurement and installation of 10 specific sirens.		
SC 1.4. Coastal border emergency network, linked to the monitoring of meteorological parameters	- Improving the current coastal border emergency network (increasing the number of stations and measuring parametres, (installation of a meteorology radar). - Implementing on-line platform for meteorological data.	- Enhanced emergency network: 10 new stations, widening of monitoring parametres, expanding monitoring parametres - Meteorological radar system - On-line operation platform	Chile (Antofagasta and Taltal)	704.225
Component 2. Capacity-building			Chile, Ecuador	**1.423.380**
SC 2.1. Capacity-building for local residents	- Replicating the pilot programme attached to the "Storytellers" project in Japan. - Dissemination material and media plan	- Implementation of a pilot environmental storytelling programme	Chile (Antofagasta)	563.380
	- Awareness-raising: Local adaptation and climate risks reduction.	- Communicational stragety. Awareness-raising Campaign (floods and landslides)	Ecuador	210.000
SC 2.2. Capacity-building for local governments.	- Incorporation of technical capacity-building tools to improving response ability.	Training of local Staff.	Ecuador	650.000
Component 3. I&CTs and Latin American Coastal Cities Alliance			Chile, Ecuador	**300.000**
SC 3.1.I&CTs and Latin American Coastal Cities Alliance	Ensuring dissemination of lessons learned, strategic opportunities, and generation of strategic alliances	Layout/implementation of a web portal	Chile, Ecuador	100.000
SC 3.2. Regional exchange of visitors to display sites	Warranting direct contact and learning of implementation processes.	Implementation of a series of learning visits by countries concerned.	Chile Ecuador; Latin American Visitors: Latin America	100.000

Project Components	Expected Results	Expected Products	Countries	(USD)
SC 3.3. Integration Committee	Warranting Exchange of experiences and lessons learned among Project executors.	1 Yearly report for each Project: Assessment, feedback, and lessons learned.	Chile, Ecuador	100.000
4. Project/Programme Execution Costs				**350.000**
5. Project/Programme Total Cost				**14.938.731**
6. Payment of Project management cycle/Programme commissioned by the Implementation Entity (8%)				**1.195.098**
Funding amount requested				**16.133.829**

IX. Environmental and Social Viability of the Operation

From an environmental and social outlook, the operation´s viability is warranted by the works to be executed in Antofagasta and Taltal; the quality standards in the execution of similar projects by the Chilean Ministry of Public Works, as confirmed through the assessment visited.

Their competences, and the dedication shown by staff attached to the Ministry of Public Works (MOP) Environmental Unit, the fine execution of works by contractors (also in charge of some other works), and the permanent presence of the environmental authority: the Ministry of the Environment, playing its main monitoring and control role, explain what has been noticed up to now, and allow us to expect similar or better results vis-à-vis projects being executed within the framework of this Operation with the Adaptation Fund: Bonilla, in Antofagasta, and Cortaderas, in Taltal.

As regards the execution of works in Esmeraldas, compliance with the environmental and social measures identified by CAF shall warrant the environmental and social viability of the Project

Environmental and Social Safeguards				
No.	***Issue***	***Complies***		***Remarks (*)***
		Yes	***No***	

Environmental and Social Safeguards				
No.	***Issue***	***Complies***		***Remarks (*)***
		Yes	***No***	
i.	Evaluation and Management of environmental and social impacts	X Chile	X Ecuador	An overall programme IAS was drafted up and, together with a series of technical reports for each work or set of works, was submitted to authorities. IAS as mentioned, together with a specific survey, were also conducted for Taltal works, already in operation. This Survey was approved by the Ministry of the Environment, as set forth in Exempt Resolution N° 0203/2001, issued in August 2001. Regarding the Ecuador case, the IAS in place is not acceptable for the operation to be funded. Thus, a request is being filed for an Strategic Environmental and Social Assessment to be conducted, and an IAS suitable to the Project should be issued.
ii.	Harnessing of Natural Renewable Resources	X Chile		Land movements and excavations are contemplated in Works, all of which are subject to authorisation by Chilean authorities. Works envisaged for Ecuador do not harm any water bodies, neither do their execution require soil harnessing. therefore, related Safeguard is not enforceable.

Environmental and Social Safeguards				
No.	***Issue***	***Complies***		***Remarks (*)***
		Yes	***No***	
iii.	Preservation of biological diversity	X Chile	X Ecuador	While biological diversity is scarce in intervention areas in Antofagasta and Taltal, what little remains of flora and wildlife is protected by way of legal agreements or through direct actions to be determined *in situ*. In Ecuador, bearing in mind the close proximity to the Esmeraldas River Estuary Wildlife Refuge, the Safeguard is activated, and a mitigation measure is identified.
iv.	Pollution Prevention and Management	X Chile	X Ecuador	In Chile, notwithstanding that the area is quite dusty, and people are used to dust, the generation and emission of dust into the atmosphere was controlled at sites. Combustion gases of vehicles used at the worksite are negligible, but emissions are still required to be reduced through vehicle maintenance programmes, etc. En Ecuador, an IAS, together with its related PMA is scheduled to be implemented to helping mitigate, prevent, and deal with pollution.
v.	Cultural Heritage	X Chile	X Ecuador	For Chile, a protocol is scheduled to be applied by the Contractor in case of archaeological findings. In Ecuador, an IAS, together with its scheduled protocol to be applied by the Contractor in case of archaeological findings.

Environmental and Social Safeguards				
No.	***Issue***	***Complies***		***Remarks (*)***
		Yes	***No***	
vi.	Indigenous Populations		X Ecuador	No Indigenous Populations members are settle in worksites in Chile. However, both in Antofagasta and Taltal cities, Indigenous people naturally coexist who do not differ from non-indigenous people, so the Safeguard is not enforceable. In Ecuador, there is a Chachi Indigenous Population, living on Luis Vargas Torres Island, so that the relevant Safeguard is activated and, over the IAS preparation, and throughout the Project´s execution, measures shall be taken to warrant participation by and consultation with this Indigenous Population. In Chile, no Indigenous Population members are settled in worksites. Nevertheless, Indigenous Populations are naturally settled in both cities who are not different from non-indigenous populations member. Therefore, the related Safeguard is not enforceable. In Ecuador, a Chachi Indigenous Population is settled in the Luis Vargas Torres Vargas; Therefore, the Safeguard is enforceable, and measures shall be taken throughout the preparation of the IAS and the Project execution to warrant the involvement of and consultation with this Indigenous Population.

Environmental and Social Safeguards				
No.	***Issue***	***Complies***		***Remarks (*)***
		Yes	***No***	
vii.	Resettlement		X Ecuador	No resettlement of people shall be required in Chile. Information is still lacking whether resettlement is required in Ecuador, since final Gatazo Hill Slopes stabilization Work surveys are still pending to be received.
viii.	Working conditions and training			No risks are envisioned in Chile and Ecuador that child work is permitted in Works involved in this Operation.
ix.	Gender Equity			Gender Equity is not violated by any action whatsoever in this Operation. A Gender Mainstreaming Unit is attached to the Social Inclusion Directorate, Esmeraldas Municipality, the Staff of which shall be involved in the Project to warrant abidance by this Safeguard.

The Chile´s Executing Agency fully abides by both, the Chilean legislation, and CAF's own Safeguards and Policy.

In Ecuador, environmental and social conditions have been identified to ensure compliance with national environmental legislation and CAF's own institutional Safeguards and Policy.

Furthermore, a comparison has been made between the Adaptation Fund´s Environmental and Social Principles, and CAF´s own Safeguards, showing results as follows:

FA	CAF
Principle 1: Compliance with the Law	S01 – Environmental and Social Impacts Assessment and Management
Principle 2: Access and Equity	S01 – Environmental and Social Impacts Assessment and Management

Principle 3: Marginalized and Vulnerable Groups	S08 – Working conditions and training
	S09 – Gender Equity
Principle 4: Human Rights	S01 – Environmental and Social Impacts Assessment and Management
Principle 5: Gender Equity and Women's Empowerment	S09 – Gender Equity
Principle 6: Core Labour Rights	S08 – Working conditions and training
Principle 7: Indigenous Peoples	S06 – Indigenous Peoples and cultural diversity
Principle 8: Involuntary Resettlement	S07 – Resettlement of People
Principle 9: Protection of Natural Habitats	S03 – Natural Habitats Protection
Principle 10: Conservation of Biological Diversity	S03 – Biodiversity Conservation
Principle 11: Climate Change	S04 – Pollution prevention and management
Principle 12: Pollution Prevention and Resource Efficiency	
Principle 13: Public Health	S01 – Environmental and Social Impacts Assessment and Management
Principle 14: Physical and Cultural Heritage	S05 – Cultural Heritage
Principle 15: Lands and Soil Conservation	S02 – Sustainable harnessing of natural renewable resources
Not included	S01 – Environmental and Social Impacts Assessment and Management. Specifically assessment of environmental and social impacts, risks, and opportunities, management measures, environmental budget, and community involvement and development
Not included	S02 – Sustainable harnessing of natural renewable resources (Conservation of the water resource)

Once the compliance or non-compliance of CAF safeguards has been made evident, the same situation is verified vis-à-vis the Adaptation Fund´s own Environmental and Social Principles and, thus, measures for compliance of what is appropriate are duly set forth in conditions.

X. Action Plan. Environmental and social conditions for funding

No withstanding CAF's compliance with the performance of implementing agencies, and in order for DACC to ensure the Project´s environmental and social sustainability, the latter recommends that Environmental and Social Conditions as set forth in the Agreement are entered into by CAF (as the Adaptation Fund´s Implementing Agency) and executing agencies in Chile and Ecuador, as follows:

FOR PROJECT IN CHILE

Conditions over the disbursement period: The Executing Agency shall submit to CAF's satisfaction:

1. No later than 30 days after the conclusion of the reported quarter (Jan-Mar, Apr-Jun, Jul-Sep or Oct-Dec): Quarterly reports on the progress of the Environmental and Social Management Plan for Antofagasta, and Actions envisaged at Taltal's works.
2. In the event that during Contractual term, any extreme rainfall event resulting in alluvial or other processes, likely generates emergencies in any of the Ravines - with or without works - and not later than 90 days after the emergency is over: A Report explaining the event characteristics, impacts, how the event was dealt with, and all relevant information according to the entity in charge.
3. Not later than 30 days after being signed: Minutes on Agreements for the proper operation of the works with the communities or other third parties, on which Minutes commitment is recorded not to dispose of any type of waste in the pools which have been built over the Agreement term period.
4. Timely notification to CAF of any changes in project characteristics, or in the environmental or social situations occurring over the Agreement term.

FOR PROJECT IN ECUADOR

Conditions prior to the first disbursement: The Executing Agency will submit, to CAF's satisfaction:

1. The ToRs for the Preparation of a Strategic Environmental Assessment on the intervention in Esmeraldas in the 3 components of "Reducing climate vulnerability in urban and semi urban areas in cities in Latin America" Project.

2. The ToRs for Updating the IAS for the final design of the Gatazo Hill Slopes Stabilization Survey, and for installation of meteorological stations and Doppler radars at the sites selected by INAMHI.

Conditions at 120 days after the first disbursement: The Executing Agency will submit, to CAF's satisfaction:

3. The IAS for the final design of the Gatazo Hill Slopes Stabilization, and for installation of meteorological stations and Doppler radars at sites selected by INAMHI. This IAS should include all information requested in CAF Environmental and Social Safeguards: S01, S03, S06 and S07 which have been activated for this operation and which the Executing Agency declares to be aware of. This final design should include a road safety audit of the project design to avoid unnecessary damage to pedestrians and light transportation vehicles of residents in the area of influence of the Gatazo Hill Slope Stabilization Project. Signage should be designed to include messages in both, Spanish and the Chachi´s own Cha'apalachi language.
4. The final Survey involving Gatazo Hill Slopes Stability, and installation of meteorological stations and Doppler radars in sites selected by INAMHI.

Conditions at 180 days after the first disbursement: The Executing Agency will submit, to CAF's satisfaction:

1. The Strategic Environmental Assessment document on the intervention in Esmeraldas in the three Project components "Reducing climate vulnerability in urban and semi urban aeas in Latin America" and the project´s interaction with several other projects being executed in the Esmeraldas city: Gatazo Hill, the Estuary of the Esmeraldas River, and in its area of influence.

Conditions over the disbursement period: The Executing Agency will submit, to CAF's satisfaction:

1. Evidence that an external and independent environmental and social audit has been hired for Component 1 of the Project, submitting quarterly reports.
2. These quarterly reports on the progress of the Environmental and Social Management Plan for the works entailed under component 1 should inform on the following issues:

    a. Signalling improvement in roads in Gatazo Hill area of direct influence, over slopes stabilization works;

b. Monitoring of compliance of debris transportation routes from Gatazo Hill to the final disposal site, as approved;
c. Implementation of the green infrastructure plan, specifically the revegetation and reforestation of Gatazo Hill, once the slopes remodelling and anchorage works have been carried out, among other works to be set forth in the Environmental and Social Management Plan requested;
d. A social survey incorporating the consultation process results, and a Chachi Indigenous People-focused plan addressing the fact that they are settled within the project area (in response to enactment of Safeguard S06).

3. Evidence that the Environmental Interpretation Capacity-building programme has been conducted to inform and educate visitors and local residents so that they can work in tourism activities within the protected area (in response to enactment of Safeguard S03). This capacity-building should be given in both Spanish and the Ch'in Ch'apalachi language.

SCREENING OF AF'S ENVIRONMENTAL AND SOCIAL PRINCIPLES

Project Type (PT)

Type of Project	Characteristics
Type a	*Those that by their dimensions and components are known that can generate multiple and complex environmental and social impacts.*
Type b	*Those medium impacts, however, can significantly affect some features of the natural, social, economic or cultural environment.*
Type c	*Those with low or negative environmental and social impacts, which generally include planning programs and social and institutional improvement, which usually do not include infrastructure.*

Type a		Project (*)
Electric Energy	- Plants hydroelectric power generation (large-scale) - Plants thermoelectric power generation - Plants nuclear power generation	
Water y Sanitation	- Dams and reservoirs for drinking water - Use of watersheds - Transfer of basins - Macro drains	
Transport	Construction and / or opening, reconstruction: - Primary Roads - Secondary roads - Rural roads and / or tertiary - Railways and underground - International and domestic airports - Sea and river ports - Major urban roads	
Agriculture y Fishing	- Irrigation and drainage (large scale) - Aquaculture and ocean-culture (large scale) - Expansion and agricultural development - Forestry - Agro-industrial scale projects (e.g. industrial plantations for biofuel)	
Environmental	- Facilities for handling solid waste and / or hazardous - Forestry production	
Hydrocarbons	- Exploration - Production - Pipelines - Refining	

Mining	- All	
Other	*Specify*	
Type b		
Electric Energy	- Electric power transmission / Rural Electrification - Small hydroelectric power plants (PCH) - Use of alternative energies (wind , biomass)	
Water y Sanitation	- Treatment Plants drinking water and / or wastewater - Transmission and distribution of drinking water - Public Sewer	
Transport	Rehabilitation / Maintenance : - Secondary roads - Rural roads and / or tertiary - Urban Roads	
Agriculture y Fishing	- Irrigation and drainage (small scale) - Aquaculture and ocean-culture (small scale)	
Environmental	- Facilities for the recycling of solid waste	
Hydrocarbons	- Distribution of domestic gas	
Other	- Ecotourism infrastructure - Industrial Restructuring - Expansion projects , operation and maintenance of category "A " - Projects involving significant generation of electromagnetic fields	
Type c		
Electric Energy	- Commercial distribution of electricity - Photovoltaic Parks	
Telecommunications	- Projects involving the use of optical fiber and minimal generation of electromagnetic fields	
Health	- Health Programs - Health infrastructure (hospitals)	
Education	- Education Programs - Infrastructure in Education (schools)	
Environmental	- Integrated Watershed Management - Comprehensive Management of Protected Areas - Restoration of degraded natural areas	
Other	- Institutional Development - Technical assistance - Ecotourism no infrastructure - Risk management infrastructure: [1] Alluvial Energy Dissipation and mudflow containment systems in Antofagasta / [2] Retaining wall / Slope stabilization in Esmeraldas.	*X*

(*) Mark the appropriate

Meanwhile, the CS may be divided into three grades:

Context Sensitivity (CS)

Context Sensitivity	Characteristics
High Sensitivity (1)	*It corresponds to an environment in which certain physical, natural, economic, social and cultural characteristics, their level of fragility or vulnerability, enhance the level of involvement of the intervention. The mere presence of one of the variables considered high sensitivity is crucial and overrides the other classified as moderate or low sensitivity.*
Moderate Sensitivity (2)	*It corresponds to an environment where the nature or extent of current intervention of the physical, natural, economic, social and cultural environment , determine a lower level of involvement by the intervention , to the extent that the values that may be lost are lower with respect to an ecosystem without intervention.*
Low Sensitivity (3)	*It corresponds to an environment where the characteristics or degree of actual physical intervention , natural, economic , social and cultural environment, determined little to no level of involvement by the intervention.*

High Sensitivity (1)		Project (*)
Physical component	- Mountain area with rugged terrain (> 35 % slope) - Areas of high seismic activity - Areas highly vulnerable to El Niño / La Niña and extreme weather events - Areas under the influence of volcanic activity - High potential for erosion - Rising water or water bodies of environmental and social strategic importance	*X*
Biological component	- Wetlands and / or mangroves, permanently flooded areas, corals - Primary or secondary forest mature - Exceptional Ecosystems - Presence of local or regional protected areas - Presence of threatened or endangered	

Social, Economic and Cultural component	- Sites of archaeological and anthropological - Areas with armed conflicts or conflicts over the use of natural resources - Urban settlements with low levels of social equipment - Areas subject to resettlement population (> 20 people) - Areas with incompatible uses for the purposes of the project - Use wooden or products from natural forests primary or secondary - High water consumption in areas of low abundance or intensive - High power consumption in areas of low abundance or intensive - High production of discharges, emissions and / or solid waste - Areas or settlements with high levels of Unsatisfied Basic Needs - Areas with presence of indigenous communities - Areas with high tourist value	
Moderate Sensitivity (2)		
Physical component	- Undulating land (15-35 % slope) - Moderate earthquake risk - Moderate potential for erosion - Sporadically flooded areas	
Biological component	- Young secondary forests or in succession	
Social, Economic and Cultural component	- Urban settlements with moderate levels of social equipment - Areas of uses not defined - Areas subject to resettlement population (<20 people) - Use or wood products from planted forests. - Moderate consumption of water in areas of low abundance or heavy use - Moderate energy consumption in areas of low abundance or heavy use - Areas or settlements with high levels of Unsatisfied Basic Needs	*x*
Low Sensitivity (3)		
Physical component	- Land undulating planes (< 15 % slope) - Areas without flooding	
Biological component	- Herbaceous vegetation operated and / or wide geographical distribution	*x*

Social, Economic and Cultural component	- Urban settlements with high levels of social equipment - Areas with low levels of social conflict - Areas with alternative uses or consonant to the purposes of the project - Low water consumption in areas of low abundance or heavy use - Low power consumption in areas of low abundance or heavy use	

(*)Mark the appropriate

Resume

Name of the Project	PT	CS
Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America	**Type C**	**1**

This previous analysis was done only for the Component 1 of the project. Output 2.2. Landslide mitigation works in Esmeraldas, Output 1.2 Green infrastructure and Plan for Esmeraldas and Output 2.1. Mudflow control infrastructure in Antofagasta, taking into account that Component 1 is the hard infrastructure construction process.

With these said, both infrastructures are for risk mitigation and for the protection of the Esmeralda's and Antofagasta's people. This is why it if a Type C project. However analysing the Physical component for the Sensitivity Context it is important to remark that these infrastructures are going to be built in areas highly vulnerable to El Niño / La Niña and extreme weather events as is it presented in the project and also are in mountains with high potential for erosion.

Matrix Preliminary Analysis of Environmental and Social Risk (CAF Model)

Category of the Project				Associated Risk
TO / ***SM***	***a***	***b***	***c***	■ *Category I High risk (1a,1b, 2a)*

1	*1a*	*1b*	*1c*	➢ *Category II Moderate risk (3a, 2b, 1c)* ■ *Category III Low Risk (3b, 2c, 3c)*
2	*2a*	*2b*	*2c*	
3	*3a*	*3b*	*3c*	

Assigned Category: 1C - ☐ Category II Moderate risk (3a, 2b, 1c)

However, also taking into account the AF's environmental and social principles (ESP) applicable to the project (Table 01) (Compliance with the Law - Access and equity - Marginalized and vulnerable groups - Human rights - Gender equity and women´s empowerment - Core labour rights - Involuntary resettlement - Protection of natural habitats - Conservation of biological diversity - Climate change - Pollution prevention and resource efficiency - Physical and cultural heritage) another screening was developed for all the Components of the projects.

With both results the project has a **Moderate risk, which in AF terms is Type B project.**

The moderate risk established with CAF methodology corresponds to projects that are likely to have:

- adverse social and environmental impacts that are site specific
- limited in scale
- can be identified with a reasonable degree of certainty
- can be addressed through the application of standard best practice
- mitigation measures and stakeholder engagement during Project implementation

In equivalence, Projects/programmes that have potentially adverse impacts or they are fewer in number, smaller in scale, less widespread, reversible or easily mitigated are categorized as Category B for AF.

Annex 16. ARG-MOP agreement "mudflow disaster mitigation and evacuation of rainwater, Antofagasta Region 2015-2020".

[a] Decree 232 of the Ministry of Finance of 27 July 2015

Dirección de Presupuestos
Gobierno de Chile

Ministerio de Hacienda

REF.: APRUEBA CONVENIO DE PROGRAMACIÓN ENTRE EL GOBIERNO REGIONAL DE ANTOFAGASTA Y EL MINISTERIO DE OBRAS PÚBLICAS.

Reg. 0867 12

MINISTERIO DE HACIENDA
30 JUL 2015
TOTALMENTE TRAMITADO
DOCUMENTO OFICIAL

RECIBIDO
04 AGO 2015
OFICINA DE PARTES
PLANEAMIENTO M.O.P.

MINISTERIO DE HACIENDA
OFICINA DE PARTES
RECEPCIÓN

SANTIAGO 27 JUL 2015

CONTRALORÍA GENERAL
TOMA DE RAZON
RECEPCIÓN

DEPART. JURIDICO		
DEP.T.R. Y REGISTRO		
DEPART. CONTABIL		
SUB. DEP. C. CENTRAL		
SUB. DEP. E. CUENTAS		
SUB. DEP. C.P. Y BIENES NAC.		
DEPART. AUDITORIA		
DEPART. V.O.P., U. y T.		
SUB. DEP. MUNICIP.		

REFRENDACION

REF.POR $.....
IMPUTAC.....
ANOT.POR $.....
IMPUTAC.....
DEDUC.DTO.....

06499/2015

DIRECCION DE PRESUPUESTOS
SUB DIRECTOR
Ministerio de Hacienda

EXENTO N° 232 /

VISTOS el inciso cuarto del artículo 115° de la Constitución Política de la República, en su texto refundido, coordinado y sistematizado, fijado por el D.S. N°100, de 2005, del Ministerio Secretaría General de la Presidencia, el artículo 81° de la Ley N°19.175, Orgánica Constitucional de Gobierno y Administración Regional, cuyo texto refundido, coordinado, sistematizado y actualizado fue fijado mediante el DFL N°1-19.175, de 2005, del Ministerio del Interior,

DECRETO

1. **APRUÉBASE** el convenio de programación suscrito en la ciudad de Antofagasta, entre el Gobierno Regional de Antofagasta y el Ministerio de Obras Públicas (MOP), denominado "Mitigación de Desastres Aluvionales y Evacuación de Aguas Lluvias, Región de Antofagasta 2015 - 2020", por un monto de $56.152 millones en un plazo de ejecución de seis años.

SUBSECRETARIA OO. PP.
OFICINA DE PARTES
FECHA 31 JUL 2015
PROCESO Nº 9020495

2. El total de las inversiones se financiarán en un 39,5% por el Gobierno Regional de Antofagasta y un 60,5% por el Ministerio de Obras Públicas, de acuerdo al siguiente calendario:

FINANCIAMIENTO DEL CONVENIO

Miles de $

Año	GORE	MOP	Total
2015	1.025.500	6.036.000	7.061.500
2016	5.567.499	5.568.412	11.135.911
2017	4.978.670	4.921.826	9.900.496
2018	4.105.300	4.836.973	8.942.273
2019	5.361.682	5.797.804	11.159.486
2020	1.151.650	6.801.024	7.952.674
Total	**22.190.301**	**33.962.039**	**56.152.340**
%	**39,5**	**60,5**	**100,0**

3. Estos montos están expresados en moneda de 2015 y son los máximos que se comprometen para cada año, sin perjuicio que se apliquen los procedimientos de reajustabilidad correspondientes. Asimismo, según las necesidades que se presenten en la ejecución de los proyectos y las disponibilidades presupuestarias, las partes podrán acordar la revisión de la programación y de los montos.

La ejecución de los proyectos de inversión, considerados en el convenio de programación que se aprueba, se efectuará con los recursos que cada año se considere, para las instituciones involucradas, en las respectivas leyes de presupuestos. Será responsabilidad de estas instituciones asignar prioritariamente sus recursos regulares para la ejecución del programa convenido.

4. La ejecución de los proyectos que forman parte de este convenio de programación deberá dar cumplimiento a lo dispuesto en los artículos 111 y 115 inciso cuarto de la Constitución Política de la República de Chile, en los artículos 81, 24 letra e) y 36 letra f) de la Ley N° 19.175 Orgánica Constitucional sobre Gobierno y Administración Regional y en el art. 19 bis del D.L. N° 1.263, de 1975, que establece la Ley Orgánica de Administración Financiera del Estado.

5. El financiamiento consultado en el Convenio de Programación que se aprueba no implica transferencia de fondos entre los suscriptores del mismo.

ANÓTESE Y COMUNÍQUESE

POR ORDEN DE LA PRESIDENTA DE LA REPÚBLICA

REPUBLICA DE CHILE
MINISTRO
MINISTERIO DE HACIENDA

RODRIGO VALDÉS PULIDO
Ministro de Hacienda

DIRECCION DE PRESUPUESTOS
DIRECTOR
Ministerio de Hacienda

REPUBLICA DE CHILE
JEFE DE GABINETE
MINISTERIO DE HACIENDA

Lo que transcribo a usted para su conocim...
Saluda Atte. a usted

Alejandro Micco Aguayo
Subsecretario de Hacienda

[b] ARG - MOP agreement

Dirección de Planeamiento
Ministerio de Obras Públicas
Gobierno de Chile

ORD: Nº 449 / 161 /

MAT: Convenio de Programación entre el Ministerio de Obras Públicas y el Gobierno Regional de la Región de Antofagasta.

INC: Original del Convenio de Programación.

SANTIAGO, 24 JUN 2015

DE: DIRECTORA NACIONAL DE PLANEAMIENTO (S)

A: DIRECTOR DE PRESUPUESTOS - MINISTERIO DE HACIENDA

Adjunto un original del Convenio de Programación, **"Mitigación de Desastres Aluvionales y Evacuación de Aguas Lluvias, Región de Antofagasta 2015-2020"**, suscrito por el Sr. Ministro de Obras Públicas y el Sr. Intendente Regional de la Región de Antofagasta, para la confección del Decreto aprobatorio correspondiente.

Además del texto del Convenio, se incluyen: Anexo 1 "Cuadro Detalle Proyectos de Inversión del Convenio de Programación", y Anexo 2 "Acuerdo CORE Aprobación del Convenio de Programación por parte del Consejo Regional de Antofagasta".

Saluda atentamente a usted,

MARÍA PÍA ROSSETTI GALLARDO

DIRECTORA NACIONAL DE PLANEAMIENTO (S)

MPR/CBG/icv

DISTRIBUCIÓN:

- Sr. Director de Presupuestos – Ministerio de Hacienda
- DIRPLAN II Región
- Subdirección de Planificación Estratégica-DP.(2)
- Oficina de Partes – DP.

Nº PROCESO 8917062
SUBDIRECCION PLANIFICACION ESTRATEGICA
D. PLANEAMIENTO

Gobierno de Chile

Ministerio de Obras Públicas

CONVENIO DE PROGRAMACION
"MITIGACIÓN DE DESASTRES ALUVIONALES Y EVACUACIÓN DE AGUAS LLUVIAS, REGIÓN DE ANTOFAGASTA 2015 - 2020"

ENTRE

GOBIERNO REGIONAL DE ANTOFAGASTA
y
MINISTERIO DE OBRAS PÚBLICAS

En Antofagasta, a 22 de Mayo de 2015, el Gobierno Regional de la Región **de Antofagasta**, persona jurídica de derecho público, representado según se acreditará por el Sr. Intendente de la Región de Antofagasta, don **Valentín Volta Valencia**, ambos domiciliados en la ciudad de Antofagasta, calle Arturo Prat N° 384, piso 2, en adelante "el Gobierno Regional", el Ministerio de Obras Públicas, representado por el Sr. Ministro de Obras Públicas, don **Alberto Undurraga Vicuña**, ambos domiciliados en la ciudad de Santiago, Calle Morandé N° 59, 6° piso, en adelante "el MOP", proceden a formalizar el siguiente Convenio de Programación.

PRIMERA.- De conformidad a lo dispuesto en el artículo 115 inciso 4° de la Constitución Política de la República, en su texto refundido, coordinado y sistematizado fijado por D.S. N°100, de 2005, del Ministerio Secretaría General de la Presidencia y en el artículo 81 de la Ley N° 19.175 Orgánica Constitucional de Gobierno y Administración Regional, en su texto refundido, coordinado y sistematizado fijado por D.F.L. N°20.035 de 2005, del Ministerio del Interior, los comparecientes vienen en suscribir el Convenio de Programación ***"MITIGACIÓN DE DESASTRES ALUVIONALES Y EVACUACIÓN DE AGUAS LLUVIAS, REGIÓN DE ANTOFAGASTA 2015 - 2020"*** con el objeto de unir esfuerzos, concretar acciones y coordinar inversiones relacionados con la mitigación de desastres, la seguridad, la integración social y la calidad de vida en las ciudades de la región.

El objetivo del Convenio es ampliar el porcentaje de avance de la ejecución del Plan de Obras de Control Aluvional de Antofagasta, Taltal y Tocopilla, pasando de un 40,4% de Cobertura del Caudal Máximo Líquido esperado para el conjunto de las 15 quebradas con riesgo urbano el año 2014, a un 82% de cobertura el año 2020; en el caso de la ciudad de Taltal, se pasará de un 79,6% el año 2014, a un 100% el año 2020; y en la ciudad de Tocopilla se pasará de un 81,8% de cobertura el año 2014, a un 100% de cobertura el año 2020. El Plan igualmente incorpora el avance en la etapa de diseño de diversas obras de los Planes Maestros de Evacuación de Aguas Lluvias de las ciudades de Antofagasta, Calama, San Pedro de Atacama, Sierra Gorda, entre otras obras.

Se deja constancia que el Consejo Regional de la Región de **Antofagasta** aprobó la celebración del presente Convenio, en ejercicio de las facultades que le confiere el artículo 36, letra f) de la Ley N° 19.175, según consta en el compendio de Acuerdos correspondiente a la **Sesión Ordinaria N°537** del Consejo, de fecha 15 de Mayo de 2015, mediante **Acuerdo N°12229-15**, el que es parte integrante del presente convenio, junto con el listado de proyectos.

SEGUNDA.- De conformidad al artículo 16 de la Ley 19.175 antes citada, es función general del Gobierno Regional entre otras, elaborar y aprobar las políticas, planes y programas de desarrollo de la Región, y en particular, definir y llevar a cabo las medidas para consolidar la infraestructura para la integración regional que establece la Estrategia de Desarrollo Regional de la Región de **Antofagasta** y el Plan Regional de Infraestructura y Gestión del Recurso Hídrico.

TERCERA.- El presente convenio tendrá una duración de **6 años**. Su costo total será de **M$ 56.152.340** (**Cincuenta y Seis mil ciento cincuenta y dos millones trescientos cuarenta mil pesos**), en **moneda nacional del año 2015**.

El financiamiento del convenio proviene en un **39,5%**, esto es **M$ 22.190.301 (Veinte y dos mil ciento noventa millones trecientos un mil pesos)**, de recursos del Gobierno Regional de **Antofagasta**; en un **60,5%**, esto es **M$ 33.962.039 (treinta y tres mil novecientos sesenta y dos millones treinta y nueve mil pesos**), de recursos del **MOP**.

CUARTA.- Para ejecutar el presente Convenio, cada una de las partes acepta concurrir con el financiamiento en la proporción y la calendarización que se detallan más adelante, siendo su fuente de financiamiento los recursos financieros de su asignación exclusiva, una vez dado cumplimiento al trámite de identificación previa a que hacen referencia el Artículo 19 bis del Decreto Ley N° 1.263 de 1975 y a las leyes de presupuestos aprobadas para cada año de su vigencia.

En atención a lo dispuesto en la presente cláusula, los montos tanto regionales y sectoriales, señalados más adelante, se entienden como **referenciales, preliminares e indicativos**, incluyendo items de prefactibilidad, factibilidad, diseños de ingeniería, asesorías, expropiaciones y obras, y estarán sujetos a la identificación pormenorizada de los proyectos específicos de inversión a que se refiere este Convenio y que se incluyen en el Anexo 1 de este documento. Por esta razón las partes dejan constancia que este convenio está referido a la coordinación en un tiempo y espacio determinado de un conjunto de obras públicas.

El mayor o menor valor de las obras resultante de su comparación con los montos de referencia, será asumido o rebajado por las partes a prorrata de su participación en el presente convenio, por lo cual, para los efectos de mantener el debido equilibrio en los aportes de cada una de las partes, se establecerá un sistema de compensación para los aumentos y disminución de aportes, que será objeto de una Modificación del Convenio la que deberá ser aprobada por las partes. Los débitos y créditos respectivos que se generen entre ellas deberán ser establecidos mediante un balance semestral.

QUINTA.- Con el objeto de materializar la ejecución del presente Convenio de Programación, las partes se comprometen a concurrir con los montos (expresados en miles de pesos del año 2015) y cumplir los plazos que siguen, teniendo presente lo señalado en el inciso segundo de la Cláusula Cuarta anterior:

CUADRO RESUMEN

	2015	2016	2017	2018	2019	2020	TOTAL M$	TOTAL %
SECTORIAL MOP	6.036.000	5.568.412	4.921.826	4.836.973	5.797.804	6.801.024	33.962.039	60,5%
F.N.D.R.	1.025.500	5.567.499	4.978.670	4.105.300	5.361.682	1.151.650	22.190.301	39,5%
TOTAL	7.061.500	11.135.911	9.900.496	8.942.273	11.159.486	7.952.674	56.152.340	100,0%

Los montos señalados correspondientes al Gobierno Regional de **Antofagasta** se efectuarán con financiamiento del F.N.D.R. y los del MOP serán con cargo a su respectivo presupuesto sectorial. Para tal efecto, las partes se comprometen a disponer los mecanismos necesarios para considerar las reservas de fondos que aseguren el financiamiento contemplado en este.

SEXTA.- En caso que en algún año no se cumpla con la inversión señalada, la parte correspondiente propondrá a la **Comisión Evaluadora del Convenio**, que se establece en la Cláusula Décima del presente Convenio, la reasignación de los recursos en un nuevo programa financiero, el que deberá ser aprobado por las partes, previo acuerdo del CORE.

SEPTIMA.- Los montos señalados son los comprometidos para cada período, en pesos, **moneda nacional del año 2015**, sin perjuicio de los procedimientos de reajustabilidad que sean procedentes, las necesidades que presente la ejecución de los proyectos y las posibles modificaciones de los montos que se han indicado en la Cláusula precedente.

OCTAVA.- La ejecución del presente Convenio será de responsabilidad de cada una de las partes involucradas y su aplicación operará únicamente cuando se cumpla con los requisitos reglamentarios correspondientes. La gestión financiera de los recursos del Gobierno Regional de **Antofagasta** quedará radicada en este organismo, en tanto que la gestión financiera de los recursos provenientes del MOP será responsabilidad de él. No obstante, el seguimiento y control de la gestión de los proyectos involucrados en este Convenio será realizada por la Comisión Evaluadora que se establece en la Cláusula Décima del presente documento, en los casos en que lo amerite o requiera podrá ser invitado (a) el Secretario (a) Regional Ministerial del MDS u otra autoridad.

NOVENA.- Será requisito obligatorio para obtener el financiamiento de los proyectos que componen el presente Convenio, que tanto las etapas de pre inversión como de diseño y ejecución de obras, cumplan con los requisitos administrativos legales vigentes establecidos en el Artículo 19 bis del Decreto Ley Nº 1.263 de 1975 y a las leyes de presupuestos aprobadas para cada año de su vigencia.

DECIMA.- La ejecución del presente Convenio será controlada regionalmente por una **"Comisión Evaluadora del Convenio"**.

La Comisión estará integrada por el **Sr. Intendente Regional** o su representante, que la preside, por **dos miembros del Consejo Regional** designados para ese efecto, por el **Seremi de Obras Públicas**, el **Director Regional de la Dirección de Obras Hidráulicas del MOP**, por el **Jefe de la División de Análisis y Control de Gestión del Gobierno Regional** y por el **Director Regional de Planeamiento del MOP**, quien actuará como Secretario Técnico de la Comisión.

Esta Comisión podrá ser convocada por cualquiera de sus partes y podrá sesionar siempre que se encuentren presente la mayoría de los miembros de la Comisión, oportunamente citados por escrito para tal efecto. A su vez, los acuerdos serán aprobados sólo en sesiones que cuenten con al menos la presencia del representante de la Seremi MOP, además del Intendente o su representante. Esta Comisión deberá reunirse a lo menos una vez cada seis meses.

El objetivo de la Comisión será realizar el seguimiento y evaluación periódicamente de la ejecución del Convenio, así como resolver los problemas de coordinación que se pudiesen generar en su aplicación, tomando conocimiento y procediendo en consecuencia para la generación del Informe de Seguimiento.

Luego de cada sesión, se levantará un acta, firmada por los asistentes, con los acuerdos de la reunión, copia de la cual deberá ser enviada a la Dirección Nacional de Planeamiento del Ministerio de Obras Públicas; al Jefe de la División de Análisis y Control de Gestión del Gobierno Regional de Antofagasta y a la Comisión de Obras Públicas, Vivienda y Transporte del CORE de Antofagasta.

La Comisión Evaluadora del Convenio deberá remitir el informe de seguimiento a la Dirección Nacional de Planeamiento del Ministerio de Obras Públicas, a la División de Análisis y Control de Gestión del Gobierno Regional de Antofagasta, y a la Comisión de Obras Públicas, Vivienda y Transporte del CORE de Antofagasta; informe que deberá incluir el avance físico y financiero (en moneda del año) de cada una de los proyectos en ejecución, cualquiera sea su financiamiento y las alertas o dificultades en la ejecución.

DECIMA PRIMERA.- El presente Convenio podrá ser revocado total o parcialmente, sólo por acuerdo unánime de las partes que lo suscriben, quienes, a través de sus representantes, se transforman en la máxima instancia de decisión de todas las diferencias que no puedan ser resueltas a nivel de la Comisión Evaluadora del Convenio y que incidan en la revocación o modificación del presente Convenio de Programación. Igualmente las partes podrán incorporar en el Convenio, la programación de las etapas de ejecución de los proyectos de los Planes Maestros de Evacuación de Aguas Lluvias, que se incorporan al presente convenio en su etapa de diseño, u otras obras nuevas necesarias para conseguir sus objetivos.

DECIMA SEGUNDA.- Este documento se suscribe en **seis (6)** ejemplares originales del mismo tenor y fecha quedando **tres (3)** en poder del Ministerio de Obras Públicas, y **tres (3)** en poder del Gobierno Regional de **Antofagasta**.

DECIMA TERCERA.- El presente Convenio entrará en vigencia una vez tramitado el decreto que lo autorice, dictado por el Ministerio de Hacienda, de acuerdo al artículo 70 del Decreto Ley N° 1.263.

DECIMA CUARTA.- Forman parte integrante del presente Convenio los documentos que a continuación se señalan: (1) Anexo N°1 Cuadro de detalle Proyectos de Inversión en Convenio de Programación, y (2) Acuerdo correspondiente a la **Sesión Ordinaria N°537** del Consejo, de fecha 15 de Mayo de 2015, mediante Acuerdo **N°12229-15**; que se insertan como anexos.

DECIMA QUINTA.- La personería con que comparece en este acto Don **ALBERTO UNDURRAGA VICUÑA** para actuar en representación del Ministerio de Obras Públicas, consta en el Decreto Supremo N°669 de fecha 11 de marzo de 2014 y la personería con que comparece Don **VALENTIN VOLTA VALENCIA**, en representación del Gobierno Regional de Antofagasta, consta en el Decreto Supremo N° 675 del Ministerio del Interior, de fecha 11 de Marzo de 2014.

ALBERTO UNDURRAGA VICUÑA
MINISTRO DE OBRAS PÚBLICAS

GOBIERNO REGIONAL II REGIÓN ANTOFAGASTA

Ministro de Obras Públicas

Intendente Región de Antofagasta

MINISTERIO DE OBRAS PÚBLICAS DIRECTOR DIRPLAN

Gobierno de Chile

Ministerio de Obras Públicas

Anexo Nº1

Cuadro Detalle Proyectos de Inversión del Convenio de Programación

"MITIGACIÓN DE DESASTRES ALUVIONALES Y EVACUACIÓN DE AGUAS LLUVIAS, REGIÓN DE ANTOFAGASTA 2015 - 2020"

(Montos en Miles de pesos del año 2015)

	NOMBRE PROYECTO	CÓDIGO IDI	ETAPA	ITEM	FUENTE FINANCIAMIENTO	2015	2016	2017	2018	2019	2020	TOTAL POR ITEM	TOTAL PROYECTO
1	CONSTRUCCION OBRAS DE CONTROL ALUVIONAL EN QUEBRADA FARELLONES	20183300-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	750	2.250	0	0	0	3.000	5.424.121
				GASTOS ADMINISTRATIVOS	F.N.D.R.	500	500	1.000	0	0	0	2.000	
				CONSULTORÍAS	SECTORIAL MOP	0	48.000	132.743	0	0	0	180.743	
				CONSULTORÍAS	F.N.D.R.	1.000	25.000	100.000	0	0	0	126.000	
				OBRAS CIVILES	SECTORIAL MOP	0	0	2.781.000	0	0	0	2.781.000	
				OBRAS CIVILES	F.N.D.R.	500.000	1.011.000	820.378	0	0	0	2.331.378	
2	CONSTRUCCION OBRAS DE CONTROL ALUVIONAL EN QUEBRADA LA CHIMBA	20183313-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	500	500	1.000	1.000	0	3.000	11.176.830
				GASTOS ADMINISTRATIVOS	F.N.D.R.	500	500	0	500	500	0	2.000	
				CONSULTORÍAS	SECTORIAL MOP	0	0	100.000	100.000	99.000	0	299.000	
				CONSULTORÍAS	F.N.D.R.	1.000	180.000	0	67.800	148.500	0	397.300	
				OBRAS CIVILES	SECTORIAL MOP	0	0	1.833.333	3.300.000	0	0	5.133.333	
				OBRAS CIVILES	F.N.D.R.	500.000	2.016.667	0	0	2.825.530	0	5.342.197	
3	CONSTRUCCION DE OBRAS DE CONTROL ALUVIONAL QUEBRADA EL TORO - ANTOF	30315824-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	500	500	500	500	500	2.500	7.487.790
				GASTOS ADMINISTRATIVOS	F.N.D.R.	500	0	2.000	0	0	0	2.500	
				CONSULTORÍAS	SECTORIAL MOP	0	0	0	100.000	143.554	100.000	343.554	
				CONSULTORÍAS	F.N.D.R.	0	0	80.000	0	0	0	80.000	
				OBRAS CIVILES	SECTORIAL MOP	0	0	0	0	1.800.000	1.499.236	3.299.236	
				OBRAS CIVILES	F.N.D.R.	10.000	500.000	1.550.000	1.700.000	0	0	3.760.000	
4	CONSTRUCCION DE OBRAS DE CONTROL ALUVIONAL QUEBRADA JARDINES DEL SUR	30316124-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	500	500	1.000	1.000	0	3.000	8.174.807
				GASTOS ADMINISTRATIVOS	F.N.D.R.	500	0	500			1.000	2.000	
				CONSULTORÍAS	SECTORIAL MOP	0	0	0		100.000	197.000	297.000	
				CONSULTORÍAS	F.N.D.R.	0	0	55.442	60.000	0	50.000	165.442	
				OBRAS CIVILES	SECTORIAL MOP	0	0	0	1.223.000	1.500.000	2.474.365	5.197.365	
				OBRAS CIVILES	F.N.D.R.	10.000	500.000	1.000.000	0	0	1.000.000	2.510.000	
5	CONSTRUCCION OBRAS DE CONTROL ALUVIONAL EN QUEBRADA RIQUELME	20183310-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	0	0	750	750	500	2.000	3.035.639
				GASTOS ADMINISTRATIVOS	F.N.D.R.	500	500	1.000	1.000	0	0	3.000	
				CONSULTORÍAS	SECTORIAL MOP	0	0	0	25.000	51.000	70.546	146.546	
				CONSULTORÍAS	F.N.D.R.	0	0	0	25.000	0	0	25.000	
				OBRAS CIVILES	SECTORIAL MOP	0	0	0	0	600.000	709.093	1.309.093	
				OBRAS CIVILES	F.N.D.R.	0	250.000	500.000	800.000	0	0	1.550.000	

	NOMBRE PROYECTO	CÓDIGO IDI	ETAPA	ITEM	FUENTE FINANCIAMIENTO	2015	2016	2017	2018	2019	2020	TOTAL POR ITEM	TOTAL PROYECTO
6	CONSTRUCCION OBRAS DE CONTROL ALUVIONAL EN QUEBRADA URIBE	30390924-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	0	0	750	1.000	1.000	2.750	4.978.739
				GASTOS ADMINISTRATIVOS	F.N.D.R.	500	500	500	0	0	750	2.250	
				CONSULTORÍAS	SECTORIAL MOP	0	0	0	84.973	100.000	100.000	284.973	
				CONSULTORÍAS	F.N.D.R.	0	0	0	50.000	40.082	99.900	189.982	
				OBRAS CIVILES	SECTORIAL MOP	0	0	0	0	1.400.000	1.648.784	3.048.784	
				OBRAS CIVILES	F.N.D.R.	0	250.000	400.000	800.000	0	0	1.450.000	
7	CONSTRUCCION OBRAS DE CONTROL ALUVIONAL EN TOCOPILLA (VÍA ALUVIONAL BARRILES)	30315222-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	0	0	0	0	0	0	3.113.920
				GASTOS ADMINISTRATIVOS	F.N.D.R.	0	0	850	1.000	1.000	0	2.850	
				CONSULTORÍAS	SECTORIAL MOP	0	0	0	0	0	0	0	
				CONSULTORÍAS	F.N.D.R.	0	0	15.000	100.000	146.070	0	261.070	
				OBRAS CIVILES	SECTORIAL MOP	0	0	0	0	0	0	0	
				OBRAS CIVILES	F.N.D.R.	0	0	150.000	500.000	2.200.000	0	2.850.000	
8	CONSTRUCCIÓN OBRAS DE CONTROL ALUVIONAL EN TOCOPILLA (VÍA ALUVIONAL URBANA CALLE COLÓN	N.A.	DISEÑO	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	500	1.000	0	0	0	0	1.500	201.500
				GASTOS ADMINISTRATIVOS	FNDR	0	0	0	0	0	0	0	
				CONSULTORÍAS	SECTORIAL MOP	0	200.000	0	0	0	0	200.000	
				CONSULTORÍAS	FNDR	0	0	0	0	0	0	0	
9	CONSTRUCCION OBRAS DE CONTROL TOCOPILLA (QDA. TRES AMIGOS)	30073685-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	500	1.500	0	0	0	0	2.000	2.446.000
				GASTOS ADMINISTRATIVOS	FNDR	0	0	0	0	0	0	0	
				CONSULTORÍAS	SECTORIAL MOP	0	184.000	0	0	0	0	184.000	
				CONSULTORÍAS	F.N.D.R.	0	0	0	0	0	0	0	
				OBRAS CIVILES	SECTORIAL MOP	10.000	2.250.000	0	0	0	0	2.260.000	
				OBRAS CIVILES	F.N.D.R.	0	0	0	0	0	0	0	
10	CONSTRUCCION OBRAS DE CONTROL TALTAL (VÍA BAJA Y QDA. CORTADERAS)	30073685-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	1.000	0	0	0	0	0	1.000	3.255.000
				GASTOS ADMINISTRATIVOS	F.N.D.R.	0	0	0	0	0	0	0	
				CONSULTORÍAS	SECTORIAL MOP	196.000	0	0	0	0	0	196.000	
				CONSULTORÍAS	F.N.D.R.	0	0	0	0	0	0	0	
				OBRAS CIVILES	SECTORIAL MOP	3.058.000	0	0	0	0	0	3.058.000	
				OBRAS CIVILES	F.N.D.R.	0	0	0	0	0	0	0	
11	CONSTRUCCIÓN VÍAS PRIMARIAS DE EVACUACIÓN DE AGUAS LLUVIAS EN ANTOFAGASTA , CALAMA y SIERRA GORDA.	30396975-0	DISEÑO	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	0	0	0	0	0	0	805.000
				GASTOS ADMINISTRATIVOS	F.N.D.R.	0	3.000	2.000	0	0	0	5.000	
				CONSULTORÍAS	SECTORIAL MOP	0	0	0	0	0	0	0	
				CONSULTORÍAS	F.N.D.R.	0	500.000	300.000	0	0	0	800.000	
12	PLAN MAESTRO AGUAS LLUVIAS SAN PEDRO DE ATACAMA (PM5S SN PEDRO)	30371375-0	DISEÑO	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	1.000	1.000	0	0	0	2.000	252.000
				GASTOS ADMINISTRATIVOS	F.N.D.R.	0	0	0	0	0	0	0	
				CONSULTORÍAS	SECTORIAL MOP	0	180.000	70.000	0	0	0	250.000	
				CONSULTORÍAS	F.N.D.R.	0	0	0	0	0	0	0	

	NOMBRE PROYECTO	CÓDIGO IDI	ETAPA	ITEM	FUENTE FINANCIAMIENTO	2015	2016	2017	2018	2019	2020	TOTAL POR ITEM	TOTAL PROYECTO
13	REDISEÑO VIA ALUVIONAL TALTAL	N.A.	DISEÑO	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	1.000	3.000	0	0	0	0	4.000	150.000
				GASTOS ADMINISTRATIVOS	F.N.D.R.	0	0	0	0	0	0	0	
				CONSULTORÍAS	SECTORIAL MOP	66.000	80.000	0	0	0	0	146.000	
				CONSULTORÍAS	F.N.D.R.	0	0	0	0	0	0	0	
14	CONSTRUCCION OBRAS DE CONTROL DE CRECIDAS RIO SALADO	30036786-0	DISEÑO	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	1.000	3.000	0	0	0	0	4.000	254.000
				GASTOS ADMINISTRATIVOS	F.N.D.R.	0	0	0	0	0	0	0	
				CONSULTORÍAS	SECTORIAL MOP	50.000	200.000	0	0	0	0	250.000	
				CONSULTORÍAS	F.N.D.R.	0	0	0	0	0	0	0	
15	CONSERVACION Y MANEJO DE CAUCE EN EL SECTOR TRANQUE DE TOCONAO	30377125-0	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	0	0	0	0	0	0	464.994
				GASTOS ADMINISTRATIVOS	F.N.D.R.	500	3.200	0	0	0	0	3.700	
				OBRAS CIVILES	SECTORIAL MOP	20.000	114.662	0	0	0	0	134.662	
				OBRAS CIVILES	F.N.D.R.	0	326.632	0	0	0	0	326.632	
16	OBRAS DE EMERGENCIA TALTAL + CONSTRUCCION NUEVAS POZAS	N.A.	EJECUCIÓN	GASTOS ADMINISTRATIVOS	SECTORIAL MOP	0	0	0	0	0	0	0	4.932.000
				GASTOS ADMINISTRATIVOS	F.N.D.R.	0	0	0	0	0	0	0	
				CONSULTORÍAS	SECTORIAL MOP	0	0	0	0	0	0		
				CONSULTORÍAS	FNDR	0	0	0	0	0	0		
				OBRAS CIVILES	SECTORIAL MOP	2.632.000	2.300.000	0	0	0	0	4.932.000	
				OBRAS CIVILES	F.N.D.R.	0	0	0	0	0	0	0	
	TOTALES					7.061.500	11.135.911	9.900.496	8.942.273	11.159.486	7.952.674	56.152.340	56.152.340

CUADRO RESUMEN

	2015	2016	2017	2018	2019	2020	TOTAL M$	TOTAL %
SECTORIAL MOP	6.036.000	5.568.412	4.921.826	4.836.973	5.797.804	6.801.024	33.962.039	60,5%
F.N.D.R.	1.025.500	5.567.499	4.978.670	4.105.300	5.361.682	1.151.650	22.190.301	39,5%
TOTAL	7.061.500	11.135.911	9.900.496	8.942.273	11.159.486	7.952.674	56.152.340	100,0%

Anexo N°2

"Acuerdo CORE Aprobación del Convenio de Programación por parte del Consejo Regional de Antofagasta"

COMPENDIO ACUERDOS 537ª SESIÓN ORDINARIA
AÑO 2015
CONSEJO REGIONAL, CORE
REGIÓN DE ANTOFAGASTA

En Antofagasta, a 15 de mayo de 2015, iniciándose a las 16:11 horas, y terminando a las 20:21 horas, en la 537ª Sesión Ordinaria del Consejo Regional de Antofagasta, presidida por don Mario Acuña Villalobos y con la asistencia de las señoras y señores Consejeros (as) Regionales:
-Carlos Álvarez Chan.
-Salvador Barrientos Muñoz.
-Luis Caprioglio Rabello.
-Gonzalo Dantagnan Vergara.
-Luis Garrido Ampuero.
-Pablo Iriarte Ramírez.
-Marcos Madrigal Videla.
-Mirta Moreno Moreno.
-Alejandra Oliden Vega.
-Guibaldo Ormazábal Arancibia.
-Sandra Pastenes Muñoz.
-María Eugenia Ramírez Díaz.
-Silvia Soto Ovies.
-Daniela Vecchiola Riquelme.
-Constantino Zafirópulos Bossy.
Asimismo, estuvieron presentes:
-Alcaldesa San Pedro de Atacama, doña Sandra Berna Martínez.
-SEREMI de Obras Públicas, don César Benítez Espinoza.
-Director Regional de Vialidad, don Félix Gallardo Seura.
-Director Regional de Obras Hidráulicas, don Gabriel Valdivia González.
-Director Regional de Obras Portuarias, don Jorge Araya Caroca.
-Director Regional IND, don Hernán Muñoz Antiquera.
-Jefa División de Análisis y Control de Gestión, doña Vicky Gutiérrez Cortés.
-Jefe División de Planificación y Desarrollo Regional, don Pedro Barrios Castillo.
-Administradora Municipal SPA, doña Patricia Lanas Véliz.
-Jefe SECOPLAC IMA, don Dante Novoa Arredondo.
-Director Obras Municipales SPA, don Daniel Rodríguez M.
-Jefe Planificación CMDS Antofagasta, don Julio Santander Fuentes
-Jefe de Estudio y Diseño IMA, don Claudio Quiquincha Sakuda.
-Arquitecta CMDS Antofagasta, doña Aída Ulloa Santelices.
-Profesional Dirección de Arquitectura, doña Viviana Fuentes Orellana.
-Profesional SECOPLAC SPA, doña Loreto Rivera C.
-Profesional Servicio Salud de Antofagasta, don Percy Hernández Angulo.
-Pdta. CGPA Escuela N°10 de Tocopilla, doña Emilia Alfaro S.
-Coordinadora Escuela N°10 de Tocopilla, doña Alicia López Cliff.
-Periodista MOP Antofagasta, doña Lorena Martínez Godoy.

SE ADOPTARON LOS SIGUIENTES ACUERDO (12224-15 A 12253-15):

ACUERDO 12224-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, **APROBAR** el **ACTA de la 535° Sesión Ordinaria,** la cual se aprueba sin objeciones, ni observaciones.
Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Lunes 25 de mayo de 2015:
Actos conmemoración aniversario patrio Argentina.
Lugar: Comuna de Antofagasta.
Participan: Consejero Regional, señor Constantino Zafirópulos Bossy.

Martes 26 de mayo de 2015:
Cuenta pública Servicio País.
Lugar: Comuna de Antofagasta.
Participan: Consejero Regional, señor Mario Acuña Villalobos.

Martes 26 y miércoles 27 de mayo de 2015:
Primera escuela de capacitación asuntos internacionales.
Lugar: Comuna de Iquique.
Participan: Consejeros (as) Regionales Comisión de Sustentabilidad y Relaciones Internacionales.

Miércoles 27 de mayo de 2015:
Capacitación proceso emprendedor.
Lugar: Comuna de Antofagasta.
Participan: Todos (as) Consejeros (as) Regionales.

Miércoles 27 de mayo de 2015:
Presentación proyecto FIC-R ERNC Universidad de Antofagasta.
Lugar: Comuna de Antofagasta.
Participan: Todos (as) Consejeros (as) Regionales.

Miércoles 27 de mayo de 2015:
Seminario diagnóstico y gestión ambiental humedales.
Lugar: Comuna de Antofagasta.
Participan: Todos (as) Consejeros (as) Regionales.

Miércoles 27 de mayo de 2015:
Seminario finalización estudio F.N.D.R. humedales altoandinos.
Lugar: Comuna de Antofagasta.
Participan: Todos (as) Consejeros (as) Regionales.

Jueves 28 de mayo de 2015:
Seminario desafíos nueva constitución política para Chile.
Lugar: Comuna de Antofagasta.
Participan: Todos (as) Consejeros (as) Regionales.

Viernes 29 de mayo de 2015:
Estreno documental La Cruz de Hierro.
Lugar: Comuna de Antofagasta.
Participan: Consejeros (as) Regionales Comisión de Educación, Ciencia y Tecnología.

Domingo 31 de mayo de 2015:
Presentación obra "La Tierra está Viva".
Lugar: Comuna de Antofagasta.
Participan: Todos (as) Consejeros (as) Regionales.

Miércoles 03 de junio de 2015:
Seminario cambio climático y efectos producción agropecuaria.
Lugar: Comuna de Antofagasta.
Participan: Todos (as) Consejeros (as) Regionales.

presentada por el señor Intendente Regional e informada por la Comisión de Sociedad Civil y Participación Ciudadana, sancionando la siguiente priorización:
- Proyecto C. BIP 30385728-0, **"ADQUISICIÓN CAMIONES ALJIBES PARA EMERGENCIAS COMUNA S.P. DE ATAC"**, por un monto total F.N.D.R. 2015 y monto total del proyecto de **M$165.000.-** (Valores ficha IDI). Proyecto financiado a través de la modalidad establecida en la Circular N°33 del Ministerio de Hacienda.

Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.4.12228-15.002 "Ordinario 001000, Antofagasta 13 de mayo de 2015".

ACUERDO 12229-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, **APROBAR** el Convenio de Programación **"MITIGACIÓN DE DESASTRES ALUVIONALES Y EVACUACIÓN DE AGUAS LLUVIAS, REGIÓN DE ANTOFAGASTA 2015 - 2020"**, entre el Gobierno Regional de Antofagasta y el Ministerio de Obras Públicas, con una duración de 6 años a contar del año 2015 hasta el 2020 y con un costo Total de **M$56.152.340**.
El aporte F.N.D.R. para el presente Convenio será de **M$22.190.301**, lo que corresponde a un **39,5 %** y el aporte sectorial será de **M$33.962.039**, lo que corresponde a un **60,5 %**. La distribución anual será como se indica a continuación en el cuadro de inversiones establecido en el Convenio:

FUENTE	VALORES ANUALES EN M$						TOTAL	TOTAL
	2015	2016	2017	2018	2019	2020	M$	%
F.N.D.R.	1.025.500	5.567.499	4.978.670	4.105.300	5.361.682	1.151.650	22.190.301	39,5%
SECTORIAL MOP	6.036.000	5.568.412	4.921.826	4.836.973	5.797.804	6.801.024	33.962.039	60,5%
TOTAL	7.061.500	11.135.911	9.900.496	8.942.273	11.159.486	7.952.674	56.152.340	100,0%

El Convenio contempla 16 iniciativas y se texto se adjunta como anexo del presente acuerdo.

Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.5.12229-15.003 "Convenio de Programación..."

ACUERDO 12230-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, **APROBAR** la Propuesta de **PRIORIZACIÓN** del proyecto **del Fondo Nacional de Desarrollo Regional, F.N.D.R., Proceso Presupuestario 2015**, presentada por el señor Intendente Regional e informada por la Comisión de Educación, Ciencia y Tecnología, sancionando la siguiente priorización:
- Proyecto C.BIP 30120017-0 **"REPOSICIÓN ESCUELA LOCALIDAD DE CAMAR, COMUNA SAN PEDRO DE ATACAMA"**, por un monto F.N.D.R. 2015 de **M$300.000.-**, y un costo total F.N.D.R del proyecto de **M$592.558.-** (Ambos Valores Ficha IDI).

Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.6.12230-15.004 "Ficha CORE Código BIP 30120017-0".

ACUERDO 12231-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, **APROBAR** la Propuesta de **PRIORIZACIÓN** del proyecto **del Fondo Nacional de Desarrollo Regional, F.N.D.R., Proceso Presupuestario 2015**, presentada por el señor Intendente Regional e informada por la Comisión de Educación, Ciencia y Tecnología, sancionando la siguiente priorización:

financiado a través de la modalidad establecida en la Circular N°33 del Ministerio de Hacienda.

Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.6.12234-15.008 "Ficha CORE Código BIP 30389624-0".

ACUERDO 12235-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, salvo las inhabilidades indicadas al final, **APROBAR** la **Propuesta de Priorización** del Proyecto del **Fondo Nacional de Desarrollo Regional, F.N.D.R., PROCESO PRESUPUESTARIO 2015**, presentada por el señor Intendente Regional e informada por la Comisión de Salud y Medio Ambiente, sancionando la siguiente priorización:

- Proyecto C. BIP 30370415-0, **"REPOSICIÓN DE AUTOCLAVES Y PLANTAS DE AGUA EN HOSPITAL ANTOFAGASTA"**, por un monto total F.N.D.R. 2015 y monto total del proyecto de **M$586.222.-** (Valores ficha IDI). Proyecto financiado a través de la modalidad establecida en la Circular N°33 del Ministerio de Hacienda.

Concurren al acuerdo los (las) Consejeros (as) Regionales:

	ÁLVAREZ	BARRIENTOS	
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Se inhabilitan los Consejeros Regionales:

ACUÑA			CAPRIOGLIO

Ver Anexo 537.6.12235-15.009 "Ficha CORE Código BIP 30370415-0".

ACUERDO 12236-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, **APROBAR** la Propuesta de **PRIORIZACIÓN** del proyecto **del Fondo Nacional de Desarrollo Regional, F.N.D.R., Proceso Presupuestario 2015**, presentada por el señor Intendente Regional e informada por la Comisión de Educación, Ciencia y Tecnología, sancionando la siguiente priorización:

- Proyecto C.BIP 30137114-0 **"ADQUISICIÓN EQUIPOS Y HERRAMIENTA ESP. TP, LICEOS A-16, A-22 Y A-26"**, por un monto F.N.D.R. 2015 de **M$661.361.-**, y un monto total F.N.D.R. del proyecto de **M$661.361.-** (Ambos Valores Ficha IDI). Proyecto financiado a través de la modalidad establecida en la Circular N°33 del Ministerio de Hacienda.

Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.6.12236-15.010 "Ficha CORE Código BIP 30137114-0".

ACUERDO 12237-15 (S.Ord.537.15.05): Se acuerda, por unanimidad,, **APROBAR** la propuesta de **PRIORIZACIÓN** del proyecto **del Fondo Nacional de Desarrollo Regional, F.N.D.R., Proceso Presupuestario 2015**, presentada por el señor Intendente Regional e informado por la Comisión de Obras Públicas y Transportes, sancionando la siguiente priorización:

- Proyecto C.BIP 20183313-0 **"CONSTRUCCIÓN OBRAS DE CONTROL ALUVIONAL EN QUEBRADA LA CHIMBA ANTOFA"**, por un monto total F.N.D.R. 2015 de **M$1.883.843.-**, un monto sectorial 2015 de **M$717.-**, un costo total FNDR de **M$5.489.002.-**, un costo total sectorial de **M$5.196.303.-** y un costo total del proyecto de **M$10.685.305.-** (Todos Valores Ficha IDI). Cabe destacar que este proyecto forma parte del **CONVENIO DE PROGRAMACIÓN**

Votan a favor los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ		VECCHIOLA	ZAFIRÓPULOS

Se abstienen las Consejeras Regionales:

MORENO			
	SOTO		

Ver Anexo 537.7.12240-15.014 "Ordinario DOP II N° 000180".

ACUERDO 12241-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, **APROBAR** la propuesta de **INCREMENTO** de **RECURSOS** por reevaluación, correspondientes al Fondo Nacional de Desarrollo Regional, F.N.D.R., **Proceso Presupuestario Año 2015**, presentada por el señor Intendente Regional e informada por la Comisión de Obras Públicas y Transportes, para la iniciativa y en el monto que se indica:

-Proyecto C.BIP 30277737-0 **"CONSERVACIÓN RED VIAL REGIÓN DE ANTOFAGASTA 2014 – 2015"**, por un monto total de incremento F.N.D.R. 2015 de **$432.109.292.-** (Moneda Presupuestaria) quedando en consecuencia con un costo total F.N.D.R. del proyecto de **M$6.475.047.-** (Valor Ficha IDI).

Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.7.12241-15.015 "Memorándum-Interno N°28".

ACUERDO 12242-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, manifestar el siguiente **PRONUNCIAMIENTO**, del Gobierno Regional en los términos que a continuación se detallan y que se encuentran dentro del proceso de evaluación ambiental:

PROYECTO	TITULAR	COMUNA	ESTRATEGIA	TERRITORIALIDAD
Proyecto Aumento Capacidad de Producción Mina El Way	Minera El Way	Antofagasta	**Favorable: N°2:** Desarrollo Económico Territorial **N°6:** Identidad Regional	**Favorable:** De acuerdo al análisis del instrumento **PRDU y PRIBCA,** se establece que **existe compatibilidad territorial** entre el Proyecto y la planificación del área de emplazamiento.

Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.8.12242-15.016 "Resumen de Evaluaciones..."

ACUERDO 12243-15 (S.Ord.537.15.05): Se acuerda, por 14 votos a favor y 02 abstenciones, **DESIGNAR** como integrantes de la **COMISIÓN TÉCNICA DE EVALUACIÓN**, del Fondo de Innovación para la Competitividad FIC-R, año 2015, en la categoría **"Representantes del Sector Empresarial"**, a doña Maritza Ivanovic, Gerente de Hidrohuerto y don Roberto Cifuentes, Gerente General de G-Process.

Votan a favor los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO		ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO		ZAFIRÓPULOS

Instituciones de Educación Superior de la Región	Rudi Hermann Seifert García	Universidad de Antofagasta	Antofagasta
Instituciones de la Defensa Nacional (Delegado Regional del Canal Militar)	Cristian Barría Lincoman	Fuerza Aérea (CODEFEN)	Antofagasta
Con grado académico en Educación Física, con residencia en la respectiva región.	Eduardo Verdejo Green	Profesor de Educación Física, con grado Académico	Antofagasta
	Alejandro González Cuturrufo	Profesor de Educación Física, con grado Académico	Taltal
Designado por la Dirección Regional del Servicio Nacional de la Mujer	Carlos Riveros Mena	SERNAM Antofagasta	

Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ALVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.11.12246-15.020 "IND II REG/D. Regional (O) N° 434".

ACUERDO 12247-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, **APROBAR** la **MODIFICACIÓN** planteada por el formulador de proyecto ganador del **F.N.D.R. 2 % DEPORTES, Proceso Presupuestario 2014**, según el siguiente detalle:

PROYECTO	INSTITUCIÓN	SOLICITUD APROBADA
Campeonato Nacional Siempre en Nuestra Memoria CEBA	Club Deportivo y Social CEBA	Solicita modificación de fechas de ejecución del proyecto para los días 20,21,22 y 23 de Mayo 2015

Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.12.12247-15.021 "Memorándum N°150".

ACUERDO 12248-15 (S.Ord.537.15.05): Se acuerda, por 15 votos a favor y 01 abstención, **APROBAR** la **MODIFICACIÓN** planteada por el formulador del proyecto del **Fondo de Subvención de Actividades de Carácter Cultural, 2% del Fondo Nacional de Desarrollo Regional, Proceso Presupuestario 2014** y presentada por la Comisión de Educación Ciencia y Tecnología, según lo siguiente:

-Proyecto **"MEMORIA MINERA: DOCUMENTAL PARA EL RESCATE DEL PATRIMONIO INMATERIAL DE ANTOFAGASTA"** de la **AGRUPACIÓN CULTURAL CINE SOCIAL ANDINO DE ANTOFAGASTA.** Se autoriza ampliar el plazo de ejecución del proyecto hasta Agosto de 2015.

Votan a favor los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Se abstiene la Consejera Regional:

Participan: Todos (as) Consejeros (as) Regionales.

Lunes 18 de mayo de 2015:
Lanzamiento Plan Especial Inversiones para Calama. (*)
Lugar: Comuna de Calama.
Participan: Todos (as) Consejeros (as) Regionales.
Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.14.12251-15.023 "Valentín Volta Valencia..."

ACUERDO 12252-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, aprobar la participación del Consejo Regional de Antofagasta y señores (as) consejeros (as) regionales, que en cada caso se indica, en la siguiente actividad:
Viernes 19 al domingo 28 de junio de 2015:
Pasantía para autoridades regionales y comunales. (**)
Lugar: México y Cuba.
Participan: Consejeros Regionales Salvador Barrientos Muñoz, Luis Garrido Ampuero y Guibaldo Ormazábal Arancibia.
Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

Ver Anexo 537.14.12252-15.024 "Instituto Pedagógico Latinoamericano..."

ACUERDO 12253-15 (S.Ord.537.15.05): Se acuerda, por unanimidad, solicitar a Jefa de División de Análisis y Control de Gestión del Gobierno Regional, entregue informe que dé cuenta sobre la programación financiera del presupuesto F.N.D.R., para el año 2015 y años posteriores, según el arrastre existente a la fecha.
Concurren al acuerdo los (las) Consejeros (as) Regionales:

ACUÑA	ÁLVAREZ	BARRIENTOS	CAPRIOGLIO
DANTAGNAN	GARRIDO	IRIARTE	MADRIGAL
MORENO	OLIDEN	ORMAZÁBAL	PASTENES
RAMÍREZ	SOTO	VECCHIOLA	ZAFIRÓPULOS

VÍCTOR HUGO VÉLIZ FANTA
Secretario Ejecutivo
Consejo Regional de Antofagasta

El presente documento contiene los Acuerdos adoptados en la sesión respectiva, sin perjuicio que su texto definitivo corresponde a aquel señalado en las actas, una vez aprobada.

Annex 17. Letter from Antogafasta´s Regional Government endorsing the present project proposal.

GOBIERNO REGIONAL
¡Más región, mejor calidad de vida!

ORD. Nº: 002874 /2016

COPIA

MAT.: "Proyecto Regional Fondo de Adaptación"

ANTOFAGASTA, - 6 DIC. 2016

DE: FABIOLA RIVERO ROJAS
INTENDENTE REGIÓN DE ANTOFAGASTA (S)

A: PABLO BADENIER MARTINEZ
MINISTRO DEL MEDIO AMBIENTE

Junto con saludar, expreso a usted nuestro interés en respaldar al Ministerio del Medio Ambiente en la postulación del proyecto "Reducción de la Vulnerabilidad Climática y Riesgo de Inundación en Áreas Costeras Urbanas y Semi-Urbanas de las ciudades de América Latina" al Fondo de Adaptación de la Organización de las Naciones Unidas, iniciativa que incluye las comunas de Antofagasta y Taltal, de nuestra Región de Antofagasta, las cuales se han visto fuertemente afectadas por eventos meteorológicos extremos.

Los productos propuestos en el proyecto, tales como la renovación del Plan de manejo de aguas lluvias de Antofagasta, la construcción de infraestructura para el control de aluviones en la Quebrada Bonilla de la ciudad de Antofagasta, son medidas que apuntan directamente a la adaptación a los eventos climáticos y por otra parte la adquisición de instrumental y nueva tecnología como lo son el radar meteorológico y las nuevas estaciones meteorológicas para Antofagasta y Taltal, permitirán mejorar sustantivamente el pronóstico y el sistema de alerta temprana. Ello, sumado a las acciones de señaléticas, vías de evacuación y desarrollo de capacidades de la población, permitirán que las personas más vulnerables están mejor preparadas para los eventos extremos y mejor adaptadas a los efectos del cambio climático.

El Gobierno Regional con el objeto de unir esfuerzos, concretar acciones y coordinar inversiones relacionados con la mitigación de desastres, la seguridad, la integración social y calidad de vida en las ciudades de Antofagasta, Taltal y Tocopilla en el mejoramiento de 15 quebradas con riesgo urbano, para resolver el problema 15 quebradas Sin embargo se detalla Convenio de Programación "Mitigación de Desastres Aluvionales y Evacuación de Aguas Lluvias, Región de Antofagasta 2015- 2020", Resolución Exenta N°402 con fecha 13/05/2015.

En relación a iniciativas de inversión en Equipamiento se menciona "Proyecto Adquisición de Red Meteorológica" Código BIP N° 30296472, aprobada en Acuerdo 11801-2014, por un monto $467.736.-

Los resultados de este proyecto serán insumos para internalizar la variable climática en futuros diseños de obras de control aluvional de proyectos de la región.

Le saluda atentamente,

GOBIERNO REGIONAL

Gender Analysis

Reducing climate vulnerability and flood risk in coastal urban and semi urban areas in cities in Latin America

Title of Operation	Reducing climate change vulnerability and flood risk in coastal urban and semi urban areas in cities Latin America	
Country	Chile, Ecuador	
Date	July 7th, 2017	
Operation Manager	Adriana Carolina Cortés	
Fund	Adaptation Fund	
UIEG Officer	Elena Cardona	
UIEG Coordinator	Violeta Domínguez	

Firma

Executive Summary

The project strategy is based on active learning and sharing knowledge to empower local authorities and communities, and contribute to build resilient cities. The project will cultivate communities of practice among practitioners and stakeholder of both countries to foster the development of collective learning. Also new infrastructure will be built and plans for enhanced disaster preparedness developed, as well as expansion of early warning systems.

Both Chile and Ecuador present high Gender Index Gaps[1], however, gender inequalities still persist, particularly in political participation and access to decision-making processes. While there is a higher presence of women´s grassroots organizations in Chile, that could be useful stakeholders for project implementation, women's representation is specially low in public offices at the local level and in technological and scientific fields. Also, most of single-parent households are women-led and have dependents on their charge, which means that when facing a flood and proceeding with evacuation they may face particular difficulties. Given that illiteracy rates (functional and digital) in Ecuador are higher for women, communication strategies will need to gender-sensitive and convey appropriate and understandable messages for both sexes. Women are more vulnerable to climate change and disasters than men, because of gender roles and responsibilities, premise that underlines this Project: outputs 1.1, 4.1, 4.2, 4.3, 5.1, 6.1, 6.2, and 7.1 have been designed in such way to take into consideration gender differences and to promote women's participation.

I. Description of the Operation

The purpose of this regional project, with a requested financing amount of US$ 13,9 MM, is to generate lessons on increasing adaptive capacity to be useful in Latin America and the Caribbean. The governments of Chile and Ecuador have agreed to collaborate and jointly implement an action learning approach to address the issues of climate change adaptation in coastal cities. Ministries of the Environment of Chile and Ecuador will be the responsible entities, accountable for the implementation of agreed national activities; while PNUD will be the Program Executing Entity, responsible for project execution and for ensuring collaborative and coherent regional action.

The project objective is to reduce vulnerability to climate-related floods, mudflows and landslides in three coastal cities by mainstreaming a risk-based approach to adaptation, building collaboration and

[1] WEO, Global Gender Gap Index.

networking, and developing a culture of adaptation. The project focus on the hydrometeorological hazards of mudflows in Antofagasta and Taltal, and flooding and landslides in Esmeraldas. The expected mid-term impacts are improved enabling conditions to sustain DRR adaptation in the three cities. In the long-term, it is expected that this will result in improved adaptive capacity. It is also envisioned that the lessons of the project are useful to other countries in Latin America and the Caribbean, and other regions of the world.

The project is organised into three components:

1. *Component 1 will focus on priority actions to increase resilience in the three cities. Four outcomes will be generated by mainstreaming DRR into local planning, building infrastructure which incorporate climate-related variables, improving climate monitoring, and strengthening the existing early warning and response systems.*
2. *Component 2 will focus on strengthen the capacities of local government officers and communities, as well as fortifying connections between communities and local and national government. Two outcomes will be generated by developing an online training course on risk-based adaptation for municipal and government officers, and implementing communication and education strategies to increase local awareness and contribute to build cultural memory. The online course will be open to professionals from other coastal cities of Latin America and the Caribbean.*
3. *Component 3 will focus on nurturing the project´s communities of practice and to document and disseminate the lessons. The backbone of the regional project are the communities of practice that allow the development of collective learning on specific topics. This component includes:*
    - *i. An electronic platform to facilitate interaction and collaboration among project participants of both countries (e.g., teleconference, webinars), and the dissemination of lessons for the benefit of other coastal cities in the region and the world. It is expected that this platform will serve to motivate further participation of other coastal cities in the region.*
    - *ii. Nurturing the communities of practice and facilitating networking among practitioners.*
    - *iii. The systematic documentation of lessons in different formats (e.g., YouTube channel, formal documents) and their world-wide dissemination through various channels (e.g., mailing list server, twitter, website).*

The rationale of the regional project is to generate practical lessons on risk-based adaptation in coastal cities with different adaptive capacities and disseminate the lessons to Latin America and the Caribbean to motivate interest and involvement of other cities of the region.

II. Gender Analysis: Description of social, economic and cultural characteristics

In Chile, the project will benefit the entire population of Antofagasta and Taltal, who is at risk of mudflows caused by extreme weather events (ca., 390 thousand people). These people will benefit from early warnings, information and knowledge to act in case of emergency and expedite evacuation, when necessary.

The direct beneficiaries are the people living in hazard areas. This is the population that will have to be evacuated in case of emergency: (i) about 116 thousand people from Antofagasta´s 17 gorges (Saavedra, 2016), and (ii) the entire population of Taltal (ca., 10,000 people). This includes people living in "campamentos", which are the most vulnerable groups. The project intervention will contribute to

protect the estimated 4.593 families that live in 44 campamentos in Antofagasta and the estimated 400 families living in 4 campamentos in Taltal[2].

In Ecuador, the entire population of Esmeraldas will benefit from the project: about 161 thousand inhabitants. These people will benefit from early warnings, information and knowledge to act in case of emergency and expedite evacuation, when necessary.

Chile

In 2015, Chile[3] had roughly over 18 million inhabitants, 87,4% of which lived in urban areas. The country has a Global Gender Gap Index of 0.69810, there is almost complete equality in educational attainment and health and survival, but major gaps remain in political empowerment and economic participation and opportunities (WEF, 2015).

The city of Antofagasta is the capital of the Antofagasta Region (2nd Region) and the Antofagasta province, and the seat of the Antofagasta commune. The city has about 380 thousand people and is the country´s sixth largest city. Antofagasta has the country highest per capita income, at about USD 23,000 per year. Despite general high living conditions, Antofagasta has informal neighbourhoods called "campamentos", located mainly on the hillsides. These are unplanned illegal occupations of public land with deficient infrastructure and services, and roughly built houses. The poverty level is low (ca., 8%) and houses have almost full access to potable water, sanitation and electricity[4].

TECHO[5] reported 44 campamentos in 2016, housing 4.593 families (11,8% of total number of families living in campamentos at the national level) in Antofagasta commune, while in the whole region there are 56 campamentos, or 6.229 families. TECHO also reports that 71,4% of these campamentos are not registered by the Ministry of Housing and Urbanism (MINVU) census done in 2011 (back then, there were 28 campamentos and 1.061 families accounted in the region).

In Taltal, a small city (ca., 10,400 people in 2013) located about 195 km south of Antofagasta in the coastal plain of the Atacama Desert, TECHO (2016) also identified the presence of campamentos, with 400 families living in 4 of them. In 2011 the poverty level was 2,7%, well below the national average (INE, 2014b). About 25,1% of houses had sanitation deficit, higher than the national and regional deficits (i.e., 17.0% and 13.7%) (INE, 2014b).

Due to regional economic dynamism[6] and mining employment opportunities, Antofagasta has attracted both Chilean and foreigner migrants, increasing the number of campamentos. A social study done by MINVU in 2013 exposed that 35% of population living in campamentos in Antofagasta region were aged 15 years old or younger, and people under 30 years accounted for 62% of them. Also, 75% of single parent families, which accounted for 24% of total families, were headed by a woman. Even though there was no sex-disaggregated data, it was revealed that 67% of household heads had basic education or less; 73% were working, either self-employed (59%) or as employees (41%), and 78% did not pay contributions to the public pensions system. Most of the employees were wage earners in a company (75%), 18% worked as a farmer and 8% in private homes.

a. Health

[2] Catastro de campamentos 2016, TECHO.
[3] Instituto Nacional de Estadísticas, projections based on 2002 census.
[4] In 2010, the urban population of Antofagasta region had 100% cover of potable water and 99.7% cover of sewage system. In 2013, 7.1% of houses of the Antofagasta commune had a deficit in sanitation (MDS, 2014a).
[5] Catastro de campamentos 2016, TECHO
[6] Mapa social de campamentos 2013, Secretaría Ejecutiva de Campamentos, Ministerio de Vivienda y Urbanismo

In 2015[7], 25,1% of women had been or were mothers in their teens, proportion that has been rather constant both in 2013 and 2011. Prevalence of adolescent pregnancy (girls aged 12 to 19 years old) decreases when per capita household income levels increase: 9,2% in poorest quintile, while in the richest quintile this proportion is 1,1%; and decreases with level of education:

Education Level	***%women who have been adolescent mothers***
No formal education	*39%*
Primary education completed	*36%*
Secondary education completed	*25%*
Tertiary education completed	*9%*

In 2015, more women (396 thousand) than men (228 thousand) were functional dependents[8]. Among these, 69,5% of those who do not have a care-taker are women; while 68,2% of care-takers are women.

b. Education

There is gender parity in both basic (ages 6 to 13) and secondary (ages 14 to 18) school enrolment (97% and 93%, respectively and regardless of sex)[9]. However, there is horizontal segregation among students in secondary education: more boys (64%) choose Industries, Agriculture and Maritime, while more girls concentrate on Technical and Commercial. Regarding quality, girls outperform boys in all levels of basic and secondary education[10]. In tertiary education[11], enrolment is higher for females, with a ratio of 1,14 in 2016, and there is also horizontal segregation[12]: male students concentrate in engineer and technology (79%); agronomy, forestry (70,6%); while there is female predominance in social work (84,1%), medical sciences (74,6%) and education (74,6%). Female proportion in all other branches of study ranges from 51% to 58%: economics; business administration; tourism; gastronomy; arts; journalism & communications; law; biology; maths; physics; chemistry.

Finally, there is a small gender gap in use and access to ICTs: 67,6% of male aged 5 years old or older use internet (or has access to) versus 65,4% of female.

c. Income

At the national level[13], 23% of families were single-parent households, and 93% of those were headed by a female, in 2011. Both Antofagasta and Taltal communes show similar ratios for the same year: single-parent households account for 26% of the total, 95% of which are headed by females, in Antofagasta; while in Taltal those percentages are 19% and 93%, respectively. Female headed households have lower incomes: per capita average monthly earnings are 1,1 higher in male-led households at the national level, while this ratio increases up to 1,24 in Taltal and up to 1,28 in Antofagasta. This situation is even worse for female single-parent households, with the following male to female per capita monthly average earning ratios: 1,44 at the national level; 1,62 in Antofagasta commune and more than double (2,01) in the Taltal commune. This contrasts with the level of

[7] CASEN 2015, Ministerio de Desarrollo Social.
[8] Functional dependents (CASEN 2015): are those people older than 15 years old that: (i) state to have extreme difficulties or inability to perform basic activities (such as eat, bathe, move within the house; use WC; lay down and get up, dress) or instrumental to daily life (go out; do the shopping; go to the doctor; domestic chores; make or receive calls); or (ii) receive help frequently to perform an activity; or (iii) present moderate or severe difficultires in, at least, one basic activity or two instrumental activities of daily life.
[9] Global Gender Gap Index, World Economic Forum.
[10] Informe del Sistema Educacional con análisis de género, 2015, Ministerio de Educación.
[11] Global Gender Gap Index, World Economic Forum.
[12] CASEN 2015, Ministerio de Desarrollo Social.
[13] Ministerio de Desarrollo Social, 2011.

education, since usually females have one or more years of education than males in monoparental households.

The proportion of female-headed households has been increasing in time since 1990[14], reaching 39,5% in 2015 from 20,2% in 1990. In urban areas this level reaches 41%, compared to 29% in rural areas. The poorest decile concentrates the higher proportion of female-headed households, with 52,8%, while the richest one has the lowest participation, with 30% of those households led by a woman.

A look into female-headed households shows[15] that, in 2011, 50% were single-parent, 23% were one-person households, 17% included extended family and 12% were biparental. Furthermore, female-headed single-parent households were bigger in terms of size: they tended to have 2,7 people in them, in contrast to male-headed ones, where total family size is 1,9.

Even though female-headed households tend to be poorer than male-headed ones (12,9% vs 8,8%), more male-headed (16,9%) households suffer from multidimensional poverty (16,2% female-led households) in 2015[16]. Similar gender gaps can be seen in terms of individuals, poverty and extreme poverty affected more females than males, but multidimensional poverty was worst among men:

People	*Poverty*	*Extreme poverty*	*Multidimensional poverty*
Women	*8,4%*	*3,7%*	*20,4%*
Men	*7,8%*	*3,4%*	*21,4%*

A reason behind prevalence of multidimensional poverty among male-headed households may be reduced access to support nets: 9,4% of these do not have any other person outside the household who can come for help in 8 different situations, while for female headed households this proportion is 8,7%. However, female-headed households tend to be more deprived of decent housing[17] (20,5%) and environmental[18] conditions (10,5%) than male-led homes (18,1% and 9,5%, respectively).

Intersection of ethnicity, rurality or migrant situation worsens indicators, for both genders:

	Poverty		*Multidimensional poverty*	
	Rural	*Indigenous*	*Rural*	*Indigenous*
Women	*23,1%*	*18,4%*	*34,8%*	*29,8%*
Men	*21,1%*	*18,1%*	*35,7%*	*31,9%*

According to the last family survey[19] (2015) held in campamentos located in the city of Antofagasta, the profile of head of household is: average age is 36 years old; 51% are females; 58% are foreigners (Colombian 22,1%, Peruvian 17,7%, Bolivian 15,0%); 74% are working (either as employee or self-employed); 40% are employed without a formal contract; 45% have access to social protection services; average family size is 3 people; only 3% have tertiary education (completed or incompleted), 35% have completed secondary education, and 14% have completed only primary education; 73% migrated searching for a work and 6% because of personal security reasons.

[14] CASEN 2015, Ministerio de Desarrollo Social.

[15] Ministerio de Desarrollo Social, 2011.

[16] CASEN 2015, Ministerio de Desarrollo Social.

[17] A home is considered deprived of decent housing conditions if it is overcrowded (numer of people per per bedroom is equal or greater than 2,5) or if walls, ceilings and floors are in bad state of preservation or even in a state of precariousness.

[18] A home is considered deprived of decent environmental conditions if: (i) in the last 12 months has suffered always or frequently from air pollution, water pollution or urban waste; (ii) is lcoated far away from public transport, educational centres or health centres; or (iii) commuting for working household members takes more than an hour per journey).

[19] Plan Superación de Campamentos, Catastro y encuesta a familias de campamentos, 2015, Gobierno Regional de Antofagasta. 2.657 families were surveyed, out of the estimated 3.043 families.

d. Labour markets

Even though female labor participation rate[20] (47,4%) in 2015 was lower than male's (71%), it has been increasing since 1990, when was set at 32,5% (men's participation rate was then 73,6%), thus reducing gender gap over time. Also, gender gap in labor participation decreases with per capita earnings per household, except for the poorest decile, where gender gap is almost equal to that of the richest decile (16,7% and 16,5%, respectively).

Care-giving responsibilities may be one of the major reasons for women to stay out of the labor force: 20,9% of women stated so against 0,4% of men. When controlling for income levels, situation aggravates: 30,2% of women in the poorest quintile do not work because they are care-givers, while in the richest quintile only 10,9% stay at home. Men show similar behavior: proportion of male care-givers is higher in the poorest quintile (1,1%) and lowest in the richest quintile (0,1%).

Higher unemployment rates, both for men and women, are concentrated in the poorest deciles, but also show higher gender gaps, since women tend to have even higher unemployment rates. This is even worse for people aged 15 to 19 years old, who present highest rates for both sexes and the highest gender gap[21]: female unemployment rate is 39,4% and male is 28,9%. however, in Antofagasta region[22], women face a lower unemployment rate (8,2%) than men (9,6%).

As in education, there is horizontal segregation in labour markets: Construction, Mining and Fishing concentrate highest proportion of male workers, with 94,3%, 90,6% and 82,8%, respectively; while Housekeeping services, Social and health services and Education seem to be more "feminine", with 82,8%, 73,6% and 72% of workers being women. There is gender parity in the Sales workforce.

Regarding occupational category, women tend to prefer public-sector jobs more than men and constitute almost entirely housekeeping services workforce.

	Employers	*Self- employed*	*Public-sector Employees*	*Private-sector Employees*	*Housekeepers*
Men	*3,3%*	*19,7%*	*7,4%*	*67,8%*	*0,1%*
Women	*1,9%*	*18,6%*	*14,7%*	*55,7%*	*8,4%*

Earnings gender gap increases with the number of years of education: with 8 years of education, women earn 70% of what men do; while women with 18 years of education earn 65% of a man's salary.

Finally, 76% of people, older than 15 years old, without independent personal income are women. This is consistent, altogether with lower female labour participation rate, with the amount of women who receive either a retirement or an old age pension, 30,3% women older than 59 years old against 63,5% of men older than 64 years old. Also, there are gender gaps among retributions: women earn, in average, 67,5% of what men do.

e. Political participation

There is a quota for women on candidate lists in national elections set at 40; however, political parties are not obliged to use quotas. Both legislative chambers in 2013[23] show low rates of women representation: women hold 16% of Congress seats, while female senators account for 20% of total seats. Executive power presents higher women participation rates: in 2006 gender parity in ministerial

[20] CASEN 2015
[21] CASEN 2015
[22] Instituto Nacional de Estadísticas, 2017 February – April quarterly moving average
[23] Gender statistics, Instituto nacional de estadísticas de Chile.

positions was achieved, in 2015 35% of ministers were females[24]. Until 2002 there were no female judges in the Supreme Court, in 2015, 26,3% of the justices were female[25].

At the local level, 11,9% of city mayors were women in 2016[26], proportion that has been somewhat steady since 2000.

Finally, women represent 26,6% of trade union leaders, even though employee participation in trade unions is similar for both sexes: 13,3% men against 13,1% women.

f. Gender-based violence

There is no clear trend on the number of femicides[27], however, Chile's femicides rate in 2014 was lowest in the region[28]:

	2010	*2011*	*2012*	*2013*	*2014*	*2015*
# Femicides	*49*	*40*	*34*	*40*	*40*	*45*
Rate (per 100.000 women)	*0,57*	*0,46*	*0,39*	*0,45*	*0,44*	*0,49*

In 2015, the number of femicide attempts was of 113 (1,23 attempts per 100.000 women).

In 2012, 35,1% of women stated to have experienced physical and/or sexual violence from an intimate partner at some time in their lives.

Ecuador

In 2010, Ecuador had 14.306.876 inhabitants (INEC, 2011), 62,8% of those lived in urban areas, while 50% lived in the coast. The country has a high Global Gender Gap Index[29] (0.738), there is almost complete equality in educational attainment and health and survival, and a high level in economic participation and opportunities, but a major gap in political empowerment (WEF, 2015). Also, the country has a low OECD´s Social Institutions and Gender Index (i.e., 0.0422), which indicates low level of gender discrimination in social institutions.

a. Health

Prenatal control increased from 80% in 1999 to 96,1% in 2012[30], also 96,3% of births were attended by skilled health personnel in 2014[31]. This has led to a reduction in neonatal mortality rates, from 16,1 deaths per 1.000 live births in 2002 to 10,8 deaths per 1.000 live births in 2015[32].

However, maternal mortality rate[33] presents a diiferent trend: between 1990 and 2006 it decreased to its lowest level, with 48,46 deaths per 100.000 live births; from 2007 onwards this rate picked up and increased up until 2012, when registered 87,15 deaths per 100.000 live births. Public Health Ministry identified these factors among the reasons that could have led to this increase: medical centers

[24] Global gender gap index, World Economic Forum.
[25] Gender statistics, Instituto nacional de estadísticas de Chile.
[26] Gender statistics, Instituto nacional de estadísticas de Chile.
[27] Gender statistics, Instituto nacional de estadísticas de Chile.
[28] CEPAL, 2014. Selected countries: Argentina, Barbados, Chile, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panamá, Paraguay, Perú, Puerto Rico; Dominican Republic, Suriname, Uruguay and Venezuela.
[29] World Economic Forum
[30] Data from Public Health Ministry, found in Logros de la revolución ciudadana en clave de género, Consejo Nacional para la Igualdad de Género.
[31] World Health Organization.
[32] World Health Organization.
[33] Public Health Ministry.

infrastructure; medical equipment; health care services model; poverty; gender violence; other. According to the World Health Organization, in 2015 this rate was 64 deahts per 100.000 live births.

Adolescent pregnancy rates[34] descended in rural areas, between 2003 and 2013, however, they have increased slighty in urban :

	Girls aged 12 to 19		Girls aged 15 to 19	
	2003	2013	2003	2013
Urban	4,9%	5,0%	8,7%	8,2%
Rural	6,5%	5,3%	11,2%	8,8%

b. Education

According to the Women and Gender Equality National Agenda 2014 – 2017 (WGENA), and based upon data from INEC (2013), women present higher illiteracy rates than men, specially in rural areas:

	Illiteracy rates		Funciontal illiteracy rates		Digital illiteracy rates	
	Urban	Rural	Urban	Rural	Urban	Rural
Men	3,2%	4,6%	7,0%	20,2%	18,6%	34,4%
Women	10,7%	15,2%	8,9%	25,6%	24,7%	43,2%

Digital illiteracy refers to access and use of information and telecommunication technologies, while functional illiterates refers to people with 3 years or less of education[35].

In 2015, primary and secondary education enrolment rates and attainment rates[36] were close to parity, however, women tend to outnumber men in tertiary studies:

	Enrolment			Attainment		
	Female	Male	F/M ratio	Female	Male	F/M ratio
Primary	96%	94%	1,02	80%	82%	0,97
Secondary	84%	81%	1,04	38%	39%	0,96
Tertiary	45%	35%	1,31	11%	10%	1,06

Also, there is horizontal segregation in tertiary[37] studies, with 7% of female graduates against 26% of male graduates in STEM[38]. Women have reduced access to credit and scholarships, receiving 28% of grants awarded by the Science, Technology and Innovation Superior Education National Secretary's Office in 2011. According to WGENA, reasons behind this gap may refer to the lower participation of female students in STEM fields.

Finally, 73% of professors in tertiary education were male. This gap further increases in dean's and rector's offices[39].

c. Income

[34] Women and Gender Equality National Agenda 2014 – 2017.
[35] Sistemas de indicadores sociales del Ecuador.
[36] World Economic Forum, Gender Gap Index, Ecuador 2016.
[37] Bachelor's or equivalent level, Master's or equivalent level, Doctoral or equivalent level, according to the International Standard Classification of Education (ISCED) by UNESCO 2011.
[38] Science, Technology, Engineering and Mathematics.
[39] WGENA

In 2014, 28,7% of 3,8 M homes are led by women[40], 70% of those are located in urban areas and, also, 70% of those are single-parent households. Within afroecuadorian community, the rate of female-led households increases, up to 32,2%, while the montubio community has the lowest proportion: 21,4%.

d. Labour markets

In March 2017, according to the latest Employment, Unemployment and Underemployment National Survey[41], 69% of total working-age population constitute labor force: 81% men, 57% women. Out of the 8 million people, 3,1 million people are fully employed (38,5%), 7,1 million people are underemployed (21,4%), 0,9 million people have a non-remunerated employment (10,9%), and 1,9 million people have a non full-time job (24,7%). Public servants constitute 18,7% of all wage-earning people and informal sector accounts for 45,6% of total employment.

Only 31% of females have an adequate job[42] , while 47% of working men do. This category includes people who either: (i) earn, at least, the minimum salary; (ii) work, at least, 40h a week; (iii) earn, at least, the minimum salary, work less than 40h, but they do not wish to work more than those hours.

However, underemployment[43] is greater for men 24% vs 21% women. This is consistent with (1) gender differences in average number of working hours: women work 32h/week, while men do around 40h/week; and (2) gender roles: more women than men are employed in non-remunerated jobs[44]: 19% of women vs 6% of men.

Unemployment rate is higher for women (5,5%) than for men (3,6%), even though women earn less: average monthly earnings are 277,08 US$, 78% of male average monthly earnings (US$ 354,69).

e. Political participation

In general terms, women held about 23% of public elected offices in 2009[45]. In 2013, 38,7% of legislative seats were occupied by women, ratio that had been increasing since 1990 from a 6,9% and after having passed a quota law in 1998. At the local level, female participation in city councils was 28,61% in 2009, while only 6,3% of elected mayors and 8,7% of prefects were women.

f. Gender-based violence

According to data[46] from Gender violence and family relationships survery (2011), 61% of women has suffered, at least, an episode of any type of gender violence perpetrated by any person in their lifes. When discriminating by type of aggression, psychological violence appears to be the most common (54%), followed by physical aggression (38%), sexual violence (26%) and economic violence (17%). Regardless of violence typology, in most of the cases perpetrator is victim's (former) partner. This is true for 87% of physical aggression cases, on one end of the scope, and 54% of sexual aggression cases, at the other end. Prevalence of intimate partner violence is 25%, understood as the percentage of women who have suffered more than one episode of violence ("many times" or "some times") in the last 12 months. A the regional level, Esmeraldas presents similar rates to the national level:

	Physical	*Psychological*	*Sexual*	*Economic*

[40] Agenda Nacional para las Mujeres y la Igualdad de Género, 2014 – 2017
[41] Instituto Nacional de Estadísticas y Censos (INEC), Ecuador
[42] Own calculations based on tabulations from Encuesta Nacional de Empleo, Desempleo y Subempleo, 2017.
[43] Underemployment considers two situations: (i) working less than 40 hours a week but wanting to work more; and (ii) earning less than the minimum salary.
[44] This category includes: (i) people who work at their own homes and receive no salary; (ii) people who work at somebody else's own home and receive no salary; and (iii) non-remunerated assistants and/or temporary workers.
[45] Women and Gender Equality National Agenda 2014 – 2017, based upon data from INEC, CONAMU and Electoral National Council.
[46] La violencia de género contra las mujers en el Ecuadro: Análisis de los resultados de la encuesta nacional sobre relaciones familiaries y de violencia de género contra las mujeres, 2014.

Esmeraldas	*36%*	*42%*	*13%*	*7%*
Total País	*35%*	*43%*	*14%*	*11%*

The study[47] analyses some socio-economic factors that may be linked to gender violence, revealing:

(a) Income: gender violence levels are similar for the first four income quintiles, but descend on the fifth, specially psychological and physical agressions (differences between 1st and 5th quintile are 10 percentage points and 9 percentage points, respectively);

(b) Ehtnicity: prevalence of intimate-partner gender violence varies with ethnicity: indigenous women (59,3%), afroecuadorian women (55,3%), montubian women (48,0%), mestizo women (47,5%), and white women (43,2%);

(c) Education: women with no education (57,4%) or basic education (54,5%) suffer more from psychological and physical violence than women with tertiary studies (36,3%);

(d) Disabilities: women with some type of permanent[48] disability[49] suffer more gender violence than women without disabilities, specially sexual aggressions (more than 7 percentage points), followed by physical aggressions (with 6 percantages points of difference).

According to CEPAL, Ecuador's femicides rate in 2014 was 1,2 deaths per 100.000 women.

III. Institutional framework

Chile

a. National regulation

Chile's Constitution, under article 19.2 expresses "equality under the law. In Chile there is no person or group of people who are privileged. In Chile there are no slaves and if one steps into its territories becomes free. Men and women are equal under the law. No law nor authority will be able to establish arbitrary differences". And article 19.3 declares "equal law protection in the exercise of their rights".

Also, Chile has passed specific laws to promote gender equality and prevent gender violence, such as:

- *Law 20066 on Domestic violence was passed in October 2005, but it is not until December 2010 that Penal Code is modified by Law 20480, including the definition of "Femicide", as the violent death of a woman by the current of former partner, and increasing sentences for this crime.*
- *Law 20005 on sexual harassment, passed on March 2005, defines sexual harassment as inappropriate requests and behaviours of a sexual nature, without the consent of the other party, that impair his or her work situation and future professional opportunities[50].*

Gender equity is addressed in the Government Program[51] of President Bachelet's administration (2014 – 2018). It exposes the need for "a New Gender Agenda, based on women's rights, equality and autonomy, fostered by a renovated and higher-ranked institution". In this regard, the Ministry of Woman was created on March 2015 (see below). This agenda envisages "incorporating the gender perspective in the design of education reforms, electoral system, labor policies and the New Political Constitution". Also, a "similar vision exist within the Investment National Services and in the design of a national care-services system". Other legal measures are included, such as a new law on sexual and reproductive

[47] La violencia de género contra las mujers en el Ecuadro: Análisis de los resultados de la encuesta nacional sobre relaciones familiaries y de violencia de género contra las mujeres, 2014.
[48] Permanent disability referes to disabilities suffered for at least a year, or longer.
[49] It includes the following types: cognitive, developmental, physical, mental, and deafness.
[50] OECD, Social Institutions & Gender Index, Chile Profile 2016
[51] Availablle at: http://www.minmujeryeg.gob.cl/agenda-de-genero/programa-de-gobierno/

rights, a law on abortion, reforming law on equal pay and modifying regulation that currently impedes equal access to property for married women.

Regarding the intersection with environmental regulation and gender, the National Climate Change Adaptation Plan (NCCAP) 2017 – 2022[52] sets out equity as one of its guiding principles, with "special consideration to gender equity, human rights and ethnicities". NCAPP specific adaptation objectives are: (1) to determine country's natural and human systems vulnerability, taking into consideration climate change possible and projected impacts; (2) to enhance disasters risk management in face of climate change impacts; and (3) to adapt to climate change, by means of national socio-ecological systems reduced vulnerability and increased adaptative capacity. Specific objective 1 gives special attention to recollecting vulnerability data disaggregated by sex, given the fact that women and men can be affected differently by climate change. Women suffer from increased vulnerability, since they are in charge of other vulnerable groups such as lactating infants, minors, elder people, disabled and sick. Under specific objective 3 there is an action line for the development of mechanisms to integrate adaptation and social aspects in climate change, more precisely, NCAPP sets out a measure to "mainstream gender and Chilean traditional knowledge into climate change adaptation tools".

b. Institutions

Under law 20820 the Ministry of Woman and Gender equity was created, on March 2015. It took on responsibilities held before by the Woman National Service, established in 1991 with the purpose of promoting equal opportunities for men and women. Since 1994, WNS developed three Opportunities Equality Plans that ended with the constitution of the Ministries Committee for the Equality of Opportunities.

Ecuador

a. National regulation

Under National Constitution Art 3.1 it is guaranteed no discrimination to all people in full exercise of their rights. Art. 11.2 states that all people are equal and that "no one will be discriminated because of their ethnicity, place of birth, age, sex, gender identity, cultural identity, marital status, language, religion, ideology, political affiliation, judicial past, socioeconomic condition, migratory condition, sexual orientation, health status, VIH condition, discapacity, physical difference, or any other distinction, be it personal or collective, temporary or permanent […]". Among priority attention groups identified in Art 35, "boys and girls, teenagers, pregnant women" are mentioned.

Under Art 70, "the State will formulate and carry out policies to reach equality among women and men, by means of a specialized mechanism according to the Law, and it will mainstream gender into plans and programas, providing technical assistance for its compulsory implementation in the public sector".

Also, Constitution guarantees women's right to live a life free of violence and Law 103 on Violence against women and family was passed in 1995. However, CEDAW[53] (2007) declared that "some doubt remains with respect to the treatment of women under Ecuador's criminal law; violence against women is still considered a 11isdemeanor rather than a crime". In this sense, its Implementing Regulations, issued in 2004, were adopted as a strategy to proper implementation of Law 103. Also, in 2007 a National Plan to Erradicate Gender Violence against childhood, adolescence and women was approved

b. Institutions

[52] It has not yet been approved.

[53] Consideration of reports submitted by States parties under article 18 of the Convention on the Elimination of All Forms of Discrimination against Women, Combined sixth and seventh periodic reports of States parties, Ecuador, March 2007.

National Council on Gender Equality (NCGE) is the specialized mechanism responsible for ensuring full formal and de facto women and LGBTI rights, as established by the Constitution and other human rights international agreements. Its main objectives are to mainstream gender into the different functions of the state and public sector institutions; to develop public policies to reduce gender gaps that create inequailities and discrimination against women and LGBTI; and to monitor and evaluate compliance with women & LGBTI human rights.

Women and Gender Equality National Agenda (2014 – 2017) is the main tool for the NCGE to mainstream gender equality, including into the Plan Nacional del Buen Vivir. It has 9 core areas: reproduction and life sustainability; a life free of violencia; education and knowledge; health; sports and leisure; culture, communication and arts; production and employment; environment; power and decision-taking.

IV. Potential gendered impacts and risks assessment

Men and women have different roles and responsibilities within their communities. Gendered division of labour assigns different jobs to women and men, which implies different knowledge and sets of skills. Also, they have different access to assets and resources, including access to information as well as to decision-making processes. Thus, women and men are exposed differently to climate change vulnerability and have different tools and strategies to cope with it[54]. In this sense, project interventions should be gender-sensitive, age and culturally appropriate, as well as take into consideration persons with disabilities.

One out of every 4 homes is a single-parent family in Antofagasta, in Taltal is 1 out of every 5 homes. Given that most of single-parent households are led (95%) by a female in Chile, special considerations should be taken when designing evacuation plans (outcome 4), since these women are alone and in charge of children and/or other dependents (average family size for this group is 2.7).

Also, in order to increase awareness of local population (outcome 6), public communication and education strategies should contain and spread understandable warning messages both for women and for men. This is specially important in Ecuador, considering that women face higher illiteracy rates. It has been proven that the lack of a gender perspective in dissemination and communication exacerbates the negative impacts that a disaster can have (UNISDR 2009).

Horizontal segregation in tertiary education, both in Chile and Ecuador, with males outnumbering females in STEMs studies and careers, implies that less women are and will be represented in these fields. Mechanisms to ensure female presence in communities of practice established with this project (outcome 7) should be promoted. Usually women are included within vulnerable groups, however, "their role in fostering a culture of resilience and their active contribution to building disaster resilience has often been overlooked and has not been adequately recognized" (UNISDR 2009).

Along the same lines, it may be needed to ensure and foster women's involvement in all public consultations generated by the project. Although stakeholders analyses (Annexes 8 and 9) did not find factors that could impede or limit women's participation in project activities, women's partaking in inception workshops in Antofagasta and Esmeraldas was 40% (14 out of 35) and 11% (3 out of 28), respectively; and in validation workshops it was 46% (11 out of 24) and only one woman was present in Esmeraldas (CAF climate change officer).

[54] People-centred climate change adaptation: integrating gender issues, FAO 2007.

V. Gender Action Plan

As a result of this Gender Analysis, a gender perspective has been incorporated into some project components:

Component 1. Priority actions to increase resilience. In order to achieve Outcome 4. Improved means to respond to floods, landslides and mudflows, expansion of public early warning systems will be put in place, which entails: (i) installing new sirens in Antofagasta and Taltal (output 1); and (ii) developing evacuation maps, on-site signals and implementing annual evacuation drills (output 2). ***Evacuation maps and protocols should be designed with a gender perspective and it should be encouraged to identify women to be trained*** *to facilitate community action and to guide people to safe areas. In Esmeraldas, the pilot community-based early warning system (output 4.2) will be implemented together with the informal settlers who live in Luis Vargas Torres island. By fostering women's participation within the pilot, their needs should be more easily addressed within the system, they could transfer their knowledge and it could also help empower them in front of their community.*

Component 2. Strengthen capacities for adaptation. Regional ***online course*** *to be developed to reach Outcome 5. Local governments with improved capacity to design and implement adaptation measures* ***should be gender-sensitive and include a module dedicated to explain linkages between gender, climate change and adaptation*** *measures.*

Outcome 6. Local governments with improved capacity to design and implement adaptation measures calls for designing both a ***public communication strategy and an education strategy*** *for each city (output 6.1), to raise awareness among inhabitants and to engage them into risk-based adaptation. These strategies* ***should be gender-sensitive****, so they can effectively reach both men and women. Also,* ***mechanisms to encourage women to participate in Narrators' initiative*** *(output 6.2) should be implemented.*

Component 3. ICTs and partnership between coastal cities in Latin America. Communities of practice are to be set to accomplish Outcome 7. Lessons and best practices on reducing vulnerability to climate flooding, landslides and mudflows in coastal cities have been shared in the region. ***Gender should be a cross-cutting topic all along 5 communities and female scientists should be identified and encourage to participate.***

All ***public consultations should***

To monitor project implementation, some gender-sensitive indicators have been incorporated in the results matrix.

Finally, other means to foster women's participation recommended to be considered are the following:

- *It would be advisable to adjust existing vulnerability, risk and capacity assessments to be gender-sensitive. Also, if new assessments need to be made, it is recommended that they incorporate a gender perspective.*
- *It should be evaluated if the stormwater management plan for Antofagasta (output 1.1) could incorporate a gender perspective. Because of gender differences, analyzing roles and responsibilities in flood prone areas and identifiying any potential differential impact of floods on men and women are needed to develop mitigation, coping and recovery strategies that will be targeted based on gender perspectives[55].*

[55] Urban stormwater management in developing countries, J. Parkinson, O. Mark,

- *If Project is going to contemplate any measures or protocols for post-disaster relief coordination, these should be designed identifying women as relevant actors, and not only as vulnerable groups.*
- *When sourcing staff and consultants, gender equality wil be a guiding principle. Using gender-sensitive language in hiring procedures; determining a quota (i.e. 30%) or facilitating training for women so as they can access traditionally male-dominated positions, are some of the measures that could be implemented. Also, these procedures can be included as requirements for contractors to be hired to do the works.*

Objeto	TERMINOS DE REFERECIA PARA LA CONTRATACIÓN DE "ESTUDIOS PARA EL DISEÑO DEFINITIVO DE LAS OBRAS DE ESTABILIZACIÓN Y REFORZAMIENTO DEL TALUD DE GATAZO EN LA 20 DE NOVIEMBRE DE LA CIUDAD DE ESMERALDAS, PROVINCIA DE ESMERALDAS, ECUADOR"; A TRAVÉS DEL PROCEDIMIENTO DE CONSULTORÍA LISTA CORTA
Fecha	17/05/2017
Área Requirente	DIRECCIÓN DE OBRAS PUBLICAS
Responsable del Requerimiento	ING. MIGUEL MOEIRA
Responsable o Jefe de la Unidad	ING. MIGUEL MOREIRA

1. ANTECEDENTES

El deslizamiento progresivo de las faldas del cerro Gatazo provocado en las temporadas de fuertes lluvias a generado erosión de sus taludes, en este caso no por inundación, sino por la falta de drenajes pluviales que canalicen el agua lejos de las viviendas. Además las fuertes lluvias que influyen directamente en la inestabilidad del terreno debido a la erosión provocada por el agua, que contribuye a causar los deslizamientos que afectan especialmente a esta zona; constituyéndose el sector en un sector en emergencia, pues es descrita como un área de alto peligro potencial a la ocurrencia de movimientos en masa.

El problema antes descrito es algo que tiene en zozobra a varias familias que habitan en el sector de la 20 de noviembre, al final de la calle de acceso; la intervención por parte del Municipio de Esmeraldas a través de sus diferentes unidades ha permitido evacuar de manera inmediata a más de 20 familias que han habitado en este sector, sitio en el que nunca debieron edificar sus casas.

De manera específica al del final de la calle El Oro, barrio conocido como 20 de Noviembre, los continuos deslizamientos del cerro Gatazo ya ha ocasionado la pérdida de varias casas, y puede también producir la caída de antenas de medios de comunicación ubicadas cerca de la esta falla.

La Constitución Política de la República, en el artículo 396 párrafo segundo establece: "la responsabilidad por daños ambientales es objetiva. Todo daño al ambiente, además de las sanciones correspondientes, implicará también la

obligación de restaurar integralmente los ecosistemas e indemnizar a las personas y comunidades afectadas".

La Ley de Gestión Ambiental en su artículo 20 establece: "Para el inicio de toda actividad que suponga riesgo ambiental se deberá contar con la licencia respectiva, otorgada por el Ministerio del ramo".

El Proyecto "ESTUDIOS PARA EL DISEÑO DEFINITIVO DE LAS OBRAS DE ESTABILIZACIÓN Y REFORZAMIENTO DEL TALUD DE GATAZO EN LA 20 DE NOVIEMBRE DE LA CIUDAD DE ESMERALDAS, PROVINCIA DE ESMERALDAS"; A TRAVÉS DEL PROCEDIMIENTO DE CONSULTORÍA LISTA CORTA, busca satisfacer una de las necesidades más importantes de este sector de la sociedad Esmeraldeña, como es la de salvaguardar los bienes y las vidas de sus habitantes, de los embates de la naturaleza , escorrentías, erosión o deslizamientos, prevenir la perdida de tierras, necesarias para el futuro crecimiento urbano de este importante barrio, de la ciudad y de este cantón; a propósito del elevado crecimiento poblacional.

El Gobierno Autónomo Descentralizado Municipal del Cantón Esmeraldas (GADMCE), entiende que el propósito de este proyecto, es el dar protección a las laderas, taludes del talud del gatazo del sector de la 20 de noviembre, debido a que el proceso de erosión, escorrentías y deslizamientos permanente de este sector; mantiene en zozobra y alerta permanente a las familias del sector; principalmente en la etapa invernal o del Fenómeno natural "El Niño"
El proyecto contribuye a prevenir y a disminuir el riesgo ambiental, por la pérdida de estabilidad del terreno y vegetación, y darle a los moradores de este sector, tranquilidad y seguridad, para que dé a poco puedan incrementar las mejoras a sus viviendas, de parte de la Municipalidad, la dotación de los servicios básicos (agua potable, alcantarillado aguas lluvias y residuales domesticas).

2. OBJETIVOS

2.1. Objetivo General

El objeto de la consultoría es realizar los: "ESTUDIOS PARA EL DISEÑO DEFINITIVO DE LAS OBRAS DE ESTABILIZACION Y REFORZAMIENTO DEL TALUD OESTE DE LA LOMA EL GATAZO, SECTOR 20 DE NOVIEMBRE"

El Consultor será responsable de todos los trabajos y estudios que realice en cumplimiento de los presentes términos de referencia.

2.2. Objetivos específicos

- Desarrollar los estudios de factibilidad para implementar obras de estabilización, drenaje y reforzamiento del talud, para la protección de la infraestructura en caso de desastres o imprevistos teniendo en cuenta los escenarios de cambio climático de Ecuador.

- Realizar el presupuesto, especificaciones técnicas, memorias técnicas, planos y análisis de precios unitarios de todas las intervenciones que se plantean ejecutar en las edificaciones existentes, áreas exteriores.

- Realizar los diseñar definitivos de las obras de estabilización, drenaje y reforzamiento del talud, para protección de la infraestructura en caso de desastres o imprevistos teniendo en cuenta los escenarios de cambio climático presentados en la Tercera Comunicación Nacional de Cambio Climático de Ecuador.

- Desarrollar diseños que permitan agilitar el proceso correctivo mediante el uso de tecnologías constructivas optimizando el tiempo de construcción.

- La estructura no debe sufrir daños en sí misma, sino que al asegurar su funcionamiento, como se indica en la Norma Ecuatoriana de Construcción vigente (NEC), en el capítulo de evaluación de estructuras existentes.

- Brindar asesoría durante todo el tiempo que demande la ejecución del proyecto, hasta la recepción provisional y definitiva, si así lo solicita la institución.

- Realizar el presupuesto, especificaciones técnicas, memorias técnicas, planos y análisis de precios unitarios de todas las intervenciones que se plantean ejecutar en las edificaciones existentes, áreas exteriores.

- Realizar una actualización del Estudio de Impacto Ambiental y Plan de Manejo Ambiental del proyecto.

3. ALCANCE

Las actividades que el Contratista ejecutara para el cumplimiento del Objeto del Contrato tienen el siguiente alcance y descripción:

- Desarrollar los estudios para implementar obras de estabilización y drenaje para protección de la infraestructura en caso de desastres o imprevistos.

- Identificar objetivos de costo, cronograma o alcance realistas y viables, dados los riesgos del proyecto.
- Desarrollar diseños que permitan agilitar el proceso correctivo mediante el uso de tecnologías constructivas optimizando el tiempo de construcción.
- Todas las actividades necesarias para llevar a cabo los objetivos específicos antes planteados.

4. DETALLE EL ALCANCE DEL REQUERIMIENTO

El Consultor deberá identificar claramente, propósitos, objetivos, resultados esperados, actividades y metas, el alcance de los estudios que se contempla para cada uno de los procesos de este contrato, son los siguientes:

- Estudios de factibilidad.
- Estudio definitivo y Regularización ambiental.
  - Estudios de factibilidad de las Obras de Estabilización y Reforzamiento del Talud de Gatazo en el Barrio 20 de Noviembre de la Ciudad de Esmeraldas, Provincia de Esmeraldas de Ecuador.
  - Diseños definitivos incluyendo el componente de escenarios de cambio climático del Ecuador en las Obras de Estabilización y Reforzamiento del Talud de Gatazo en el Barrio 20 de Noviembre de la Ciudad de Esmeraldas.
  - Estudio de Impacto Ambiental y Social y Plan de Manejo Ambiental del proyecto de infraestructura.
  - Documentación actualizada para la gestión de la regularización ambiental del proyecto.

5. CRONOGRAMA DE EJECUCIÓN DE LOS ESTUDIOS

ESTUDIO DE FACTIBILIDAD Y DISEÑO DEFINITIVO PARA LA ESTABILIZACION DE TALUDES DEL SECTOR 20 DE NOVIEMBRE DE LA CIDAD DE ESMERALDAS, CANTÓN ESMERALDAS					
ACTIVIDAD	***MESES***				
	1	***2***	***3***	***4***	***5***
PRIMERA FASE					
Topografia					
Sondeos geotécnicos					
Geología y geofísica					
SEGUNDA FASE					
Hidrología e hidráulica					
Estabilidad de taludes					
Diseño de anclajes					
TERCERA FASE					
Informe de Ingeniería					

6. METODOLOGÍA DE TRABAJO

El Consultor elaborará el Proyecto Definitivo de ingeniería. Todo el estudio y trabajo estará en coordinación e integración con los diseños de las ingenierías geológica, geotecnica, hidráulica y estructural, para obtener un producto integral y acorde a la importancia de este proyecto. Para dar cumplimiento a los objetivos específicos se plantea la siguiente metodología:

- El equipo consultor, en primera instancia hará un reconocimiento del sitio, recopilará información respecto a infraestructura básica y toda la necesaria para realizar el diseño del reforzamiento de las edificaciones existentes
- Elaborar las memorias de cálculo de cada uno de los diseños de las ingenierías y los planos respectivos.
- El consultor deberá recopilar toda la documentación necesaria para cumplir con el
- objetivo general de este estudio.
- Presupuestar los volúmenes de obra.
- En el estudio el consultor deberá incluir las recomendaciones de las normas de diseño, los temas que considere necesarios y que no se encuentren dentro de los requerimientos solicitados.
- El consultor deberá entregar la información en archivos digitales – modificables como son Word, Excel, Autocad, Shapefiles.

NORMATIVA A SER APLICADA.

- NEC, Norma Ecuatoriana de la Construcción, NEC-SE-CG: Cargas (No sísmicas);
- NEC, Norma Ecuatoriana de la Construcción, NEC-SE-DS: Peligro Sísmico y Diseño Sismo resistente;
- NEC, Norma Ecuatoriana de la Construcción, NEC-SE-CM: Geotecnia y Cimentaciones;
- NEC, Norma Ecuatoriana de la Construcción, NEC-SE-RE: Riesgo Sísmico, Evaluación, Rehabilitación de Estructuras;
- ASTM, American Society Testing And Materials
- AASHTO, American Association of State Highway and Transportation Officials.

METODOLOGIA GENERAL DE LOS ESTUDIOS.

TOPOGRAFIA

Se procederá a realizar u levantamiento a detalle con equipos de tierra y drones con georreferenciación y determinando el comportamiento y del movimiento de masas.

Se deberá determinar los detalles del movimiento, escarpas, grietas y canales.

ESTUDIOS GEOLÓGICOS.

Los trabajos de campo y laboratorio se ejecutarán bajo la supervisión de un ingeniero Geólogo.

Trabajos de campo

Se realizará la recopilación de información geológica regional, mediante la utilización de Drones para evaluar las condiciones de estabilidad y zonas en peligro, y la afectación de la geología regional en el proyecto. Así como también la comprobación de las características geológicas, geología estructural, litología y los riesgos geológicos (inundaciones, movimiento de masas, sismicidad, riesgo volcánico, etc.),

Informe de Estudios

Se entregará un informe en formato físico y digital con las respectivas firmas de responsabilidad, el cual deberá incluir todos los estudios de Geología de campo y gabinete realizados, mapas geológicos regionales, mapa geológico local, cortes

geológicos, referencias técnicas, bibliográficas, conclusiones, recomendaciones, así como todas las alternativas de protección para la estabilidad de los sitios donde se encuentran las estructuras.

ESTUDIOS GEOTÉCNICOS.

Los trabajos de campo y laboratorio se realizarán bajo la supervisión de un Ingeniero Geotécnico.

Elaboración de alternativas de solución para la estabilización de la zona.

Trabajos de Campo

Para analizar y validar el Estudio de Análisis de Riesgos, se comprobará los datos registrados en dicho estudio mediante inspecciones directas de campo y caracterización geotécnica del subsuelo

Se efectuarán las pruebas de campo necesarias, con la aplicación de las técnicas más apropiadas, con el fin de obtener de la manera más directa los parámetros de comportamiento geomecánico del subsuelo.

Trabajos de laboratorio

Se ejecutarán todas las pruebas de laboratorio que complementen y comprueben los parámetros obtenidos en los ensayos de campo, y así obtener todos aquellos requeridos para cumplir con los objetivos del estudio.

Trabajos de gabinete

Se entregará un informe en formato físico y digital con las respectivas firmas de responsabilidad, el cual incluirá todos los estudios de Geotecnia de campo, laboratorio y gabinete realizados con la correspondiente georreferenciación, conclusiones y recomendaciones. Adicionalmente se incluirá un escrito firmado por el profesional independiente que realizó las revisiones, en el que se certifique que todas estas se han realizado.

Propuestas de Solución

.

La consultora elaborará la alternativa de solución para la estabilización de la zona afectada, las cuales deben ser tanto técnica como económicamente viables. Las propuestas de solución deben contener como mínimo:

- Memoria técnica.
- Memoria de proceso constructivo.
- Planos.
- Tabla de cantidades
  Especificaciones técnicas
- Análisis de precios unitarios y presupuesto referencial.

INGENIERÍA ESTRUCTURAL

Los trabajos de evaluación estructural se ejecutarán bajo la supervisión de un ingeniero civil especialista y consistirán en analizar y diseñar las estructuras de contención necesarias y acorde a la solución general de estabilización y reforzamiento.

Trabajos de gabinete

Se reportará lo siguiente:

- Modelos de análisis estructural de acuerdo a los parámetros de carga y peligro sísmico dados en la Norma Ecuatoriana de la Construcción.
- Análisis de resultados obtenidos.
- Conclusiones y recomendaciones.

ÁREA HIDRAULICA

Consultor deberá obtener toda la información necesaria para realizar los diseños de los respectivos sistemas de drenaje.
Se realizará todos los estudios técnicos que permita obtener un diseño definitivo de las obras de drenaje necesarias con el fin de garantizar el funcionamiento hidráulico óptimo con el propósito de asegurar el comportamiento del macizo.

El estudio de impacto ambiental es el instrumento básico para la toma de decisiones sobre los proyectos, obras o actividades que requieren licencia ambiental y se exigirá en todos los casos en que se requiera licencia ambiental de acuerdo con la ley y este reglamento. Este estudio deberá corresponder en su contenido y profundidad a las características y entorno del proyecto. El Consultor deberá estar alineado con los requerimientos nacionales para este tipo de estudios.

NORMAS TECNICAS.

Para el diseño se considerará las siguientes Normas Técnicas:

- NEC-11 Norma Ecuatoriana de la Construcción.
- INEN Instituto Ecuatoriano de Normalización.
- ANSI American National Standards Institute.
- ASTM American Society for Testing Materials.
- IEOS Ex Instituto Ecuatoriano de Obras y Saneamiento.

7. INFORMACIÓN QUE DISPONE LA ENTIDAD

Documentos de catastros, planos, estudios previos en la zona de referencia. Todos los documentos, informes y productos desarrollados como parte de las actividades, son propiedad del Gobierno Autónomo Descentralizado del Municipio de Esmeraldas.

8. PRODUCTOS O SERVICIOS ESPERADOS

PRODUCTOS ESPERADOS

El Consultor presentará el respectivo Estudio por fases en 2 copias cada una y en documentos individuales:

PRIMERA FASE (plazo de 60 días): El plazo para entrega de los productos de la primera fase es de 60 días contados a partir de la suscripción del contrato. A partir de la entrega, el Administrador de contrato tendrá un plazo posterior de hasta 15 días para la emisión de observaciones, de igual forma el Consultor tendrá hasta 15 días plazo para realizar las correcciones, estos plazos no son imputables al plazo del contrato. A partir de la entrega de las observaciones por parte de la institución la consultora deberá seguir realizando los trabajos de la segunda fase.

TOPOGRAFÍA

Planos y detalle de la superficie de la zona afectada

GEOLOGÍA

- Informe Geológico (Geología, Geomorfología, Riesgos Geológicos).
- Anexos: memoria con una descripción clara y precisa del respaldo técnico, anexos fotográficos

GEOTÉCNIA.

- Resultados de sondeos, ensayos de campo y laboratorio, estratigrafía perfiles caracterización.

ESTUDIO DE IMPACTO AMBIENTAL

Según lo indica la legislación nacional, el estudio deberá proporciona antecedentes para la predicción e identificación de los impactos ambientales. Además describen las medidas para prevenir, controlar, mitigar y compensar las alteraciones ambientales significativas.

Tener en consideración que debe contener como mínimo:

1. La delimitación del área de influencia directa e indirecta del proyecto, obra o actividad.

2. La descripción del proyecto, obra o actividad, la cual incluirá: localización, etapas, dimensiones, costos estimados, cronograma de ejecución, procesos, identificación y estimación básica de los insumos, productos, residuos, emisiones, vertimientos y riesgos inherentes a la tecnología a utilizar, sus fuentes y sistemas de control.

3. La información sobre la compatibilidad del proyecto con los usos del suelo establecidos en los Planes de Ordenamiento Territorial.

4. La información sobre los recursos naturales renovables que se pretenden usar, aprovechar o afectar para el desarrollo del proyecto, obra o actividad.

5. Identificación de las comunidades y de los mecanismos utilizados para informarles sobre el proyecto, obra o actividad.

6. La descripción, caracterización y análisis del medio biótico, abiótico, socioeconómico en el cual se pretende desarrollar el proyecto, obra o actividad.

Para el desarrollo del Plan de Manejo Ambiental se tendrá en cuenta:

- La identificación y evaluación de los impactos ambientales que puedan ocasionar el proyecto, obra o actividad, indicando cuáles pueden prevenirse, mitigarse, corregirse o compensarse.

- La propuesta de Plan de Manejo Ambiental del proyecto, obra o actividad que deberá contener lo siguiente:

- Plan de Prevención y Mitigación de Impactos. Las medidas de prevención, mitigación, corrección y compensación de los impactos ambientales negativos que pueda ocasionar el proyecto, obra o actividad en el medio ambiente y/o a las comunidades durante las fases de construcción, operación, mantenimiento, desmantelamiento, abandono y/o terminación del proyecto obra o actividad;

- Plan de Monitoreo y Seguimiento. El programa de monitoreo del proyecto, obra o actividad con el fin de verificar el cumplimiento de los compromisos y obligaciones ambientales durante la implementación del Plan de Manejo Ambiental, y verificar el cumplimiento de los estándares de calidad ambiental establecidos en las normas vigentes. Asimismo, evaluar mediante indicadores el desempeño ambiental previsto del proyecto, obra o actividad, la eficiencia y eficacia de las medidas de manejo ambiental adoptadas y la pertinencia de las medidas correctivas necesarias y aplicables a cada caso en particular;

- Plan de Contingencias. El plan de contingencia el cual contendrá las medidas de prevención y atención de la emergencias que se puedan ocasionar durante la vida del proyecto, obra o actividad;

- Plan de Capacitación; Plan de Seguridad y Salud ocupacional; Plan de Manejo de Desechos; Plan de Relaciones Comunitarias; Plan de Rehabilitación de Áreas afectadas; Plan de Abandono y Entrega del Área;

- Los costos proyectados del Plan de Manejo en relación con el costo total del proyecto obra o actividad y cronograma de ejecución del Plan de Manejo.

SEGUNDA FASE (plazo de 60 DÍAS): El plazo para entrega de la segunda fase es de 60 días contados a partir de la entrega de las observaciones de la primera fase por parte de la institución. A la entrega de los productos el Administrador de contrato tendrá un plazo de hasta 15 días para la emisión de observaciones, de igual forma el Consultor tendrá hasta 15 días plazo para realizar las correcciones. Este plzo no es imputable al plazo del contrato. De existir observaciones adicionales de la fase 2 por segunda vez, se otorgara por ultima vez al consultor 15 días para su aclaración y de no resolverse el inconveniente se procederá aplicar las multas por los días que

se demore en realizar las correcciones a partir de la emisión de las observaciones por parte de la institución, hasta su solución, y transcurrirá el plazo de la tercera fase.

GEOTECNIA

Se presentará la alternativa de solución mas idónea, con su memoria de calculo y análisis de estabilidad de taludes definición del sistema de estabilización, planos y especificaciones constructivas.

ÁREA ESTRUCTURAL

- Memoria estructural, la cual deberá detallar como mínimo, parámetros de diseño adoptados para la evaluación estructural, modelos matemáticos, análisis de resultados, diseño de elementos estructurales y propuesta de reforzamiento.
- Memoria descriptiva de los trabajos a realizarse.
- El consultor debe presentar un listado de planos con sus respectivos nombres y numeración, las mismas que deberán ser adjuntas a la memoria técnica descriptiva. Los planos deberán ser presentados con las respectivas firmas de responsabilidad del Ingeniero asignado al proyecto.

HIDRAULICA

Se presentará la alternativa de solución de drenaje y subdrenaje más idóneas, con su memoria de cálculo y análisis de caudales y definición del sistema de evacuación y conducción de las aguas, planos y especificaciones constructivas.

TERCERA FASE Y DEFINITIVA (PLAZO DE 30 DÍAS): El plazo para entrega de la tercera fase y el Informe final es de 30 días contados a partir de la aceptación de la solución final, que completa 150 días contados a partir de la entrega del anticipo sin contar los tiempos de revisión, corrección y aprobación.

Se entregará en esta fase los presupuestos, especificaciones, análisis de precios unitarios y cronogramas de la solución aprobada y aceptada por la institución y el informe final con todos los documentos y anexos.

A la entrega final de los productos, la institución tendrá hasta 15 días término para la emisión de observaciones y el Consultor hasta 15 días término para subsanar las observaciones de ser el caso y presentar el Informe Final definitivo. Estos plazos no son imputables al plazo contractual.

A los 15 días de entregados todos los productos de la consultoría, debidamente aprobados por el administrador del contrato, se suscribirá el acta Entrega Recepción Única en los términos establecidos en el Artículo 123 del Reglamento General de la Ley Orgánica del Sistema Nacional de Contratación Pública.

DOCUMENTOS

MEMORIA TÉCNICA: La memoria técnica descriptiva deberá contener:

Carátula: en la cual se incluirá nombre del proyecto, nombre del profesional que lo realiza, Fecha de creación o de actualización.
Introducción.
Antecedentes.
Descripción del trabajo realizado.
Comentarios.
Observaciones.

Especificaciones técnicas:

Deben presentarse el mismo código y orden del presupuesto referencial de la consultoría
Las especificaciones técnicas son los documentos en los cuales se definen las normas, exigencias y procedimientos a ser empleados y aplicados en todos los trabajos de construcción de obras.

Dentro de las especificaciones técnicas se debe presentar la siguiente información:

Descripción: Donde se describe en forma breve a que ítem de las obras se refiere.
Procedimiento: En donde se describen los requisitos necesarios para la realización o instalación de los rubros, incluyendo normas que deben cumplir los equipos y/o materiales a utilizarse.
Equipo mínimo: Se detalla la herramienta necesaria para instalar el equipo.
Mano de obra calificada: Con la categoría ocupacional dada por la Contraloría General del Estado. (archivo actualizado)
Ensayos: Se refiere a las pruebas que se realizan a los materiales o equipos a instalarse.
Unidad de medida: En donde se describe con precisión como se efectuará la medición de cada rubro, para proceder al pago correspondiente.

Forma de pago: En donde se detalla cómo será pagado el rubro.

PRESUPUESTO REFERENCIAL:

El presupuesto referencial de acuerdo al formato dela institución y el cronograma valorado del avance de obra.
Análisis de precios unitarios (con el mismo código y orden del presupuesto referencial de la consultoría), en el cual se debe desglosar los materiales, equipos y mano de obra, que componen cada uno de los APUS, no pueden existir rubros globales, el rendimiento debe ser el adecuado para ejecutar el rubro en obra. Se deberá presentar la desagregación tecnológica.

CRONOGRAMA VALORADO:
Debe presentar un documento en el cual se proyecte cada una de las fases de construcción del proyecto.

FORMATO Y DOCUMENTOS DE ENTREGA:

Se elaborarán planos del proyecto en formato PDF y DWG 2013 o superior y en formato INEN A1, que deberá incluir: Planos del estado actual y de propuesta a escala dependiendo de La magnitud del proyecto, además de cada lámina correspondiente a la ingeniería estructural.
La entrega de toda la información (documentos y planos) se hará en físico y digital en un original y dos copias y en digital de toda la información correspondiente (CD) con toda la documentación requerida.
Se entregarán en CDs, todos los planos escaneados en formato PDF con las respectivas firmas de la ingeniería estructural y arquitectura, en buena calidad gráfica para su fácil reproducción.

9. PROCEDIMIENTO CONTRACTUAL SUGERIDO (JUSTIFICAR)

La razón por la que se escogió este tipo de contratación, se sustenta en lo establecido en el artículo 6 numeral 8, LOSNCP, "*La consultoría se refiere a la prestación de servicios profesionales especializados no normalizados, que tengan por objeto identificar, auditar, planificar, elaborar o evaluar estudios y proyectos de desarrollo, en sus niveles de pre factibilidad, factibilidad, diseño u operación. Comprende, además, la supervisión, fiscalización, auditoria y evaluación de proyectos ex ante y ex post, el desarrollo de software o programas informáticos así como los servicios de asesoría y asistencia técnica y elaboración de estudios*".

Además en el artículo 40 numeral 2, LOSNCP se establece lo siguiente:

"Contratación mediante lista corta: Cuando el presupuesto referencial del contrato supere el fijado en el número anterior y sea inferior al valor que resulte de multiplicar el coeficiente 0,000015 por el monto del presupuesto inicial del Estado correspondiente ejercicio económico; y"

10. PRESUPUESTO REFERENCIAL

El monto referencial de la contratación alcanza la suma de CIENTO SESENTA Y SIETE MIL, OCHO CIENTOS DOCE, CON 00/50 DOLARES DE LOS ESTADOS UNIDOS DE AMÉRICA (USD $ 167.812,50).

11. DISPONIBILIDAD PRESUPUESTARIA (ESPECIFICAR Y ADJUNTAR)

La presente contratación se aplicará a la partida presupuestaria No. 310.73.06.01, denominada "CONSULTORÍA, ASESORÍA E INVESTIGACIONES ESPECIALIZADAS", la misma que se encuentra prevista en el PAC año 2017, con memorando No. 3038-GADMCE-DF-2017 de fecha 15 de febrero del 2017 de la Dirección Financiera.

12. PLAZO DE LA CONTRATACIÓN

El tiempo para la prestación del servicio es de 150 días (5 meses), contados a partir del día de la notificación al Contratista que el anticipo se encuentra disponible.

13. PERSONAL TÉCNICO/EQUIPO DE TRABAJO/RECURSOS

PERSONAL TÉCNICO CLAVE

Para cumplir con el objeto del contrato, el Consultor contará con la participación del siguiente personal Técnico Clave considerado para la evaluación:

CANTIDAD	PERSONAL	PORCENTAJE DE PARTICIPACIÓN
1	Director de proyecto (Ing. Civil)	50,00%
1	Coordinador de Proyecto (ing. Civil)	100,00%
1	Ingeniero Civil Geotécnico	50,00%

1	Ingeniero Civil Geólogo	40,00%
1	Ingeniero Civil Hidrólogo	40,00%
1	Ingeniero Civil Estructural	40,00%
1	Arquitecto	20,00%
1	Sociólogo	80,00%
1	Ingeniero Planificador	40,00%
1	Ingeniero Ambiental, con experiencia en temas de cambio climático.	70,00%

Adicionalmente se considerará como parte del equipo al siguiente personal, el mismo que no será evaluado:

CANTIDAD	PERSONAL	PORCENTAJE DE PARTICIPACIÓN
2	Dibujante	80,00%
1	Secretaria	40,00%
1	Chofer	80,00%
1	Laboratorista	80,00%
1	Perforistas	40,00%

EQUIPO MÍNIMO

- Equipo de topografía (1 estación total).
- Perforadora de suelo
- Equipo de laboratorio de suelos
- Equipos de procesamiento de datos (1 computadores, 1 impresora).
- Vehículo (1 vehículo adecuado para el proyecto).

Para la prestación de los servicios correspondientes a la elaboración del estudio, el Consultor utilizará el personal profesional calificado especificado en su Propuesta Técnica, no se permitirán cambios, salvo por razones de fuerza mayor debidamente comprobadas. En estos casos, el Consultor deberá proponer al GADMCE, con diez (10) días hábiles de anticipación, el cambio de personal a fin de obtener la aprobación del mencionado cambio.

El incumplimiento por parte del Consultor, de lo señalado en los presentes parámetros de calificación, conlleva a la aplicación de las multas señaladas en las Bases del Concurso y/o en el contrato respectivo.

14. FORMA DE PAGO

Anticipo: El 50% del monto total convenido, esto es la suma de CINCUENTA MIL, TRES CIENTOS CUARENTA Y TRES, 75/100; DÓLARES DE LOS ESTADOS UNIDOS DE AMERICA (USD $ 50.343,75) sin IVA, previa presentación de la garantía bancaria o póliza de seguro que cubra el 100% delo valor del anticipo. Será entregado a la firma del contrato.

El 50% restante se, esto es la suma de, esto es la suma de CIENTO DIECISIETE MIL, CUATROCIENTOS SESENTTA Y OCHO, 75/100; DOLARES DE LOS ESTADOS UNIDOS DE AMERICA (USD $ 117.468,75) sin IVA, será cancelado contra entrega de:

Primera Fase 50%
Segunda Fase 25%
Tercera Fase 25%

A la entrega de los productos de cada etapa, se tendrá 5 días para revisión y observaciones y 5 días para correcciones (tiempo no imputable al contratista).

Garantías: Serán las que determinen la LOSNCP.

15. FORMA DE ENTREGA

Total

16. VIGENCIA DE LA OFERTA

El tiempo para la vigencia de la oferta es de 30 días, o hasta la suscripción del contrato

17. TIPO DE ADJUDICACIÓN

Total

18. NATURALEZA DEL CONSULTOR

NATURALEZA: FIRMAS CONSULTORES
RECOMENDACIÓN DE CONSULTORES PARA INVITACIÓN:

No.	RAZÓN SOCIAL	RUC
1	CONGEOTEC SA	1391781288001
2	GEOESTUDIOS SA	0992337931 01
3	TRICONSUL TRIANGULO ASOCIADOS CIA. LTDA.	0891706723001

19. OBLIGACIONES DEL CONTRATISTA

Obligaciones del Contratista: El contratista se obliga a:

- Prestar servicios de consultoría; y todo aquello que fuere necesario para la total ejecución del contrato, de conformidad con la oferta negociada, los términos de referencia, las condiciones generales y específicas y los demás documentos contractuales.
- Para el cumplimiento de los servicios de consultoría, contará durante la vigencia del contrato, con el personal técnico clave señalado en su oferta negociada, conforme al cronograma de actividades aprobado.
- Para sustituir personal técnico clave, asignado al proyecto, solicitará la previa autorización, por escrito, del administrador del contrato.
- A solicitud de la entidad, fundamentada en la ineficiencia comprobada del personal, a su costo, deberá sustituir uno o más de los profesionales, empleados o trabajadores asignados al proyecto.
- Solicitará a la entidad la aprobación correspondiente en caso de que requiera personal adicional al indicado en su oferta.
- El Consultor asumirá la responsabilidad técnica total por los servicios profesionales prestados, para la elaboración del Estudio Definitivo, de acuerdo a la LEY ORGANICA DEL SISTEMA NACIONAL DE CONTRATACION PUBLICA Y SU REGLAMENTO GENERAL (Agosto de 2008), Capitulo XI, RESPONSABILIDADES: Articulo 100. (Responsabilidad de los Consultores).
- El Consultor, será responsable de dar información precisa de todos los ensayos geotécnicos y su fecha de ejecución, su localización (± 50 cm.) en la época del diseño, con el fin de poder comprobar los resultados de los ensayos, en la etapa de ejecución de la obra y efectuar reclamos.

- La revisión de los documentos y planos por parte del GADMCE, durante la elaboración del Estudio, no exime al Consultor de la responsabilidad final y total del mismo.
- El Consultor, también será responsable por la precisión de las cantidades de obra del proyecto, los cuales deben estar dentro de un rango razonable, definido como ± 5% de dichas cantidades de obra reales. Como consecuencia de la precisión del proyecto, el costo real final de obra, deberá estar dentro del rango de ± 5% del costo total inicial de la obra.
- En atención a que el Consultor, es el responsable absoluto del Estudio que realiza, deberá garantizar la calidad del Estudio y responder del trabajo realizado, de acuerdo a las normas legales durante los siguientes (5) años desde la fecha de aprobación del Informe Final por parte del GADMCE; por lo que, en caso de ser requerido para cualquier aclaración o corrección, no podrá negar su concurrencia.
- En caso de no concurrir a la citación, se hará conocer su negativa a la Contraloría General del Estado, a los efectos legales consiguientes, en razón a que el servicio prestado es un acto administrativo, por el cual es responsable ante el Estado

Además de las responsabilidades contempladas en el art. 100 de la LOSNCP

20. NATURALEZA DEL CONSULTOR

Además de las responsabilidades contempladas en el art. 100 de la LOSNCP

21. OBLIGACIONES DEL CONTRATANTE

- Dar solución a las peticiones y problemas que se presentaren en la ejecución del contrato, en un plazo días contados a partir de la petición escrita formulada por el contratista.

- Proporcionar al contratista los documentos, accesos e información relevante relacionada con los trabajos de consultoría, de los que dispusiera, y realizar las gestiones que le corresponda efectuar al contratante, ante los distintos organismos públicos, en un plazo de 15 días contados a partir de la petición escrita formulada por el contratista.

- En caso de ser necesario y previo el trámite legal y administrativo respectivo, celebrar los contratos complementarios en un plazo de 15 días contados a partir de la decisión de la máxima autoridad.

- Suscribir las actas de entrega recepción de los trabajos recibidos, siempre que se haya cumplido con lo previsto en la ley para la entrega recepción; y, en general, cumplir con las obligaciones derivadas del contrato.

22. REQUISITOS MÍNIMOS

1.- Equipo Mínimo

No.	Descripción	Cantidad	Características
1	Perforadora de suelo	1	
2	Equipo de laboratorio de suelo	1	
3	Equipos de topografía (estaciones totales electrónicas)	1	1 equipo, precisión 5" (5 segundos)
4	Equipos de procesamiento de datos (computadoras i5)	2	Core i5
	Equipos de procesamiento de datos (impresora)	1	A4 a color
5	Vehículo	1	Tipo 4x4

2.-Personal técnico clave

No.	Función	Nivel de Estudio	Titulación	Cant.
1	Director de Proyecto	Tercer nivel	Ingeniero Civil	1
2	Coordinador de Proyecto	Tercer nivel	Ingeniero Civil	1
3	Geotécnico	Tercer nivel	Ingeniero Civil	1
4	Geólogo	Tercer nivel	Ingeniero Geólogo	1
5	Hidrólogo	Tercer nivel	Ingeniero Civil	1
6	Estructural	Tercer Nivel	Ingeniero Civil	1
7	Arquitecto	Tercer Nivel	Arquitecto	1
8	Sociólogo	Tercer Nivel	Sociólogo	1
9	Planificador	Tercer Nivel	Ingeniero Civil, Comercial o Economista	1

10	Ambiental. Transversalizar la gestión ambiental del proyecto y verificar la inclusión del variable climática en el proyecto (considerando los resultados de la tercera comunicación de Cambio Climático)	Tercer Nivel	IngenieroAmbiental, con experiencia en Cambio Climático	1

Se considerará como parte del equipo al siguiente personal técnico de apoyo:

No.	Funnción	Nivel de Estudio	Cantidad
1	Dibujante	Bachiller	2
1	Secretaria	Bachiller	1
1	Chofer	Bachiller	1
1	Laboratorista	Bachiller	1
1	Perforistas	Bachiller	1

3.- Experiencia mínima del personal técnico

a. El área requirente deberá definir la experiencia que cada uno de los miembros del personal técnico deberá acreditar como mínimo, sea en años, número o monto de proyectos en los que haya participado.

b. Se reconocerá la experiencia adquirida en relación de dependencia, si el certificado emitido por el contratista o el representante legal de la Entidad Contratante demuestra su participación efectiva, como empleado privado o servidor público, en la ejecución de la o las obras.

c. Para cada caso ha de establecerse el instrumento o medio por el que se comprobará la experiencia adquirida.

El personal técnico deberá presentar mínimo 2 contratos o certificados que acrediten su experiencia obtenida de mínimo 3 meses en los últimos 5 años, cuya suma mínima del monto de los trabajos sumen el 10% del presupuesto referencial de la contratación.

No.	Descripción	Temporalidad (años)	Numero Proyectos mínimos	Monto Mínimo	Experiencia
1	Director del proyecto	5	2	16.781	Proyectos civiles
2	Coordinador del Proyecto	5	2	16.781	Trabajos y/o diseño de estabilidad de taludes
3	Geotécnico	5	2	16.781	Trabajos y/o estudios de geotecnia
4	Geólogo	5	2	16.781	Trabajos y/o estudios de geología
5	Hidrólogo	5	2	16.781	Trabajos y/o estudios de geología
6	Estructural	5	2	16.781	Trabajos, diseños y/o estudios estructurales
7	Arquitecto	5	2	16.781	Trabajos, diseños y/ estudios arquitectónicos
8	Sociólogo	5	2	16.781	Trabajos y/o estudios sociológicos
9	Planificador	5	2	16.781	Trabajos y/o estudios de Planificación
10	Ambiental	5	2	16.781	Trabajos y/ estudios ambientales, en gestión ambiental y en cambio climático

En relación al requisito mínimo de "Tiempo" este será considerado desde la obtención del título académico requerido, con la correspondiente documentación de respaldo.

4.-Experiencia General y Específica Mínima

No.	Descripción	temporalidad	Numero Proyectos	Monto Mínimo	Contratos Permitidos	Monto Mínimo Por Contrato

1	Experiencia General.- Presentar mínimo 2 máximo 5 contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente que acrediten experiencia obtenida en los últimos 5 años en fiscalización, supervisión, administración y/o diseño de obras civiles, cuya suma mínima alcanzara el 20% del presupuesto referencial del proyecto.	5	2	33.562		
2	Experiencia Específica.- Presentar mínimo 2 máximo 5 contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente que acrediten experiencia obtenida en los últimos 5 años en Estudios y Diseños de proyectos de residuos sólidos,	5	2	16.781		

	cuya suma mínima alcanzara el 10% del presupuesto referencial del proyecto.					

Nota: Los certificados utilizados en la experiencia especifica mínima pueden ser utilizados en la experiencia general mínima siempre y cuando estos se enmarquen dentro de la elaboración de estudios, servicios de consultoría y/o fiscalización de proyectos en general.

PARÁMETROS DE CALIFICACIÓN		
PARÁMETRO	CUMPLE/NO CUMPLE	VALORACIÓN (*para Lista Corta y Concurso Público)*
Integridad de la Oferta		
Experiencia Mínima del Personal Técnico clave		
Experiencia general mínima		
Experiencia específica mínima		
Patrimonio (Aplica para personas jurídicas) *		
Metodología y cronograma de ejecución		
Equipo e instrumentos disponibles		
Otros que considere el área requirente (Experiencia, plazo de entrega, calidad, etc.)		

23. METODOLOGÍA DE VALORACIÓN

Para la metodología de valoración se tomará en cuenta los siguientes parámetros con su respectivo puntaje:

PARÁMETROS	PUNTAJE
a) Experiencia general	10
b) Experiencia específica	30
c) Experiencia del personal técnico clave	50
d) Instrumentos y equipos disponibles	5
g) Metodología y cronograma de ejecución	5
TOTAL	100

El puntaje total de cada Propuesta, se obtendrá sumando las calificaciones parciales antes descritas. La propuesta que tenga la más alta calificación final será la seleccionada en el primer lugar de preferencia para la negociación de la Oferta Económica. Se requieren mínimo 70 puntos sobre 100 para calificar.

PARAMETRO 1

Integridad de la Oferta

METODOLOGÍA DE EVALUACIÓN PARÁMETRO 1

Se revisará que la oferta hayan incorporado todos los formularios definidos en el presente pliego, conforme el siguiente detalle:

a.) FORMULARIO DE OFERTA
b.) FORMULARIOS DE COMPROMISO DE PARTICIPACIÓN DEL PERSONAL TÉCNICO Y HOJA DE VIDA
c.) FORMULARIO DE COMPROMISO DE ASOCIACIÓN O CONSORCIO (De ser el caso)

PARAMETRO 2
Experiencia del Personal Técnico clave

Director del proyecto (Ing. Civil)

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente, como director de proyectos civiles; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Coordinador del proyecto (Ing. Civil)

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente, como Ingeniero de proyectos civiles; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Ingeniero Civil Geotécnico

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente, como Ingeniero civil geotécnico; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Ingeniero Geólogo

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente, como Ingeniero geólogo; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres

Ingeniero civil Hidrólogo

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente; que

demuestren experiencia en trabajos de hidrología; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Ingeniero Civil Estructural

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente, que demuestren experiencia en trabajos de diseños de estructuras civiles; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Ingeniero Ambiental

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente, que demuestren experiencia en trabajos y/o estudios ambientales; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres. Así también, se deberá presentar evidencia demostrable de trabajos en la temática de cambio climático y conocimientos en modelización de proyecciones climáticas.

Arquitecto

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente, que demuestren experiencia en trabajos y/o estudios arquitectónicos; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Sociólogo

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente, que demuestren experiencia en trabajos y/o estudios sociales; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Ingeniero Planificador

Se deberá presentar un mínimo de 2 y máximo de 4, contratos, actas de recepción provisional o definitiva y/o certificados emitidos por autoridad competente, que demuestre experiencia en elaboración de proyectos y planificación; cuyo monto mínimo será del 10% del presupuesto referencial del presente proceso ($ 16.781,00), que se podrán acreditar de forma individual o acumulada entre varios proyectos. Si justifica valores igual o mayores a éste se le asignarán 10 puntos; los que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Tabla resumen calificación y porcentaje de participación Personal Técnico Clave

CANT.	PERSONAL	PORCENTAJE DE PARTICIPACIÓN	CALIFICACION
1	Director de proyecto (Ing. Civil)	50,00%	5
1	Coordinador de Proyecto (ing. Civil)	100,00%	5
1	Ingeniero Civil Geotécnico	50,00%	5
1	Ingeniero Geólogo	40,00%	5
1	Ingeniero Civil Hidrólogo	40,00%	5
1	Ingeniero Civil Estructural	40,00%	5
1	Arquitecto	20,00%	5
1	Sociólogo	80,00%	5
1	Ingeniero Planificador, Comercial o Economista	40,00%	5
1	Ingeniero Ambiental	70,00%	5
			50

PARAMETRO 3

Experiencia General mínima

Presentar mínimo 2 y máximo 5 contratos, actas y/o certificados que acrediten experiencia obtenida en los últimos 5 años en fiscalización, supervisión, administración y/o diseño de obras civiles, cuya suma mínima alcanzara el 50% del presupuesto referencial del proyecto ($100.050,00). Las ofertas que justifiquen valores igual o mayores a éste, se le asignará la máxima puntuación (10 puntos); los oferentes que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Adicionalmente, para valorar la experiencia, se tomará en cuenta la obtenida por el oferente en situación de dependencia, tanto en el ámbito público como privado, para acreditar la misma presentará certificados emitidos por la Institución Pública o privada que acredite su experiencia.

PARAMETRO 4

Experiencia Específica mínima

Presentar mínimo 2 y máximo 5 contratos, actas y/o certificados que acrediten experiencia obtenida en los últimos 5 años en Estudios y Diseños de proyectos de residuos sólidos, cuya suma mínima alcanzara el 70% del presupuesto referencial del proyecto ($140.070,00). Las ofertas que justifiquen valores igual o mayores a éste, se le asignará la máxima puntuación (30 puntos); los oferentes que justifiquen valores inferiores a lo establecido se les calificará proporcionalmente aplicando una regla de tres.

Para valorar la experiencia, se tomará en cuenta también aquella obtenida por el oferente en situación de dependencia laboral, tanto en el ámbito público como en el privado, para acreditar la misma presentará certificados emitidos por la Institución Pública o privada que acredite su experiencia

Nota: Los certificados utilizados en la experiencia específica pueden ser utilizados en la experiencia general siempre y cuando estos se enmarquen dentro de la elaboración de estudios y/o fiscalización de proyectos en general.

PARÁMETRO 5

Patrimonio (Aplica para personas jurídicas) *

Análisis de los índices financieros:
Los índices financieros constituirán información de referencia respecto de los participantes en el procedimiento y en tal medida, su análisis se registrará conforme el detalle a continuación:
Índice de solvencia: 1.0(mayor o igual a 1,0)
Índice de endeudamiento: 1.5(menor a 1,5)
Además se deberá adjuntar la declaración del impuesto a la renta del último ejercicio fiscal realizado ante el servicio de Rentas Internas, y la última declaración a la Súper Intendencia de Compañías.

PARAMETRO 6

Metodología y cronograma de ejecución

La empresa consultora deberá cumplir lo especificado en los términos de referencia y lo que exige el formulario correspondiente a metodología y alcance del trabajo.

Se deberá presentar claramente definido los criterios de trabajo, presentación de cronogramas de ejecución / uso de equipo / participación del personal técnico clave, se calificará con un máximo de 5 puntos.

Ítem	Valoración
Desarrollo de actividades, acciones, productos del proyecto	1
Descripción del enfoque, alcance y metodología del trabajo del proyecto	2
Organigrama funcional del servicio propuesto	1
Programa o programas de actividades, asignación de profesionales y tiempos	1
Total	5

PARAMETRO 7
Equipo e instrumentos disponibles

El GADME, calificará la disponibilidad y no la propiedad del equipo mínimo, por lo tanto los instrumentos y los equipos que presenten deberán ser justificados con facturas, contratos de compra venta, o cualquier documento legal en el caso de propiedad del oferente, así como compromisos de venta o de arrendamiento en el caso de no ser de propiedad del mismo.

N°	Equipos y/o instrumentos	Cantidad	Puntos
1	Perforadora de suelos	1	1
1	Equipo de laboratorio de suelos	1	1
1	Estación Total	1	1
2	Computadoras I5	1	0,5
3	Impresora gran formato (Plotter), impresiones hasta A1	1	0,5
4	Camioneta 4x4 doble canina	1	1
TOTAL PUNTOS			5

Nota: Si el equipo es propio, presentar facturas caso contrario presentar las cartas compromiso de arrendamiento.

24. DATOS DEL PROVEEDOR (EN CASO DE CONTRATACIONES DIRECTAS)

No aplica

25. METODOLOGÍA DE EVALUACIÓN DE LA OFERTA ECONÓMICA

Evaluación de la oferta económica.- La entidad contratante no tendrá acceso a las propuestas económicas, sino hasta que la evaluación técnica haya concluido y solamente de las ofertas que hayan obtenido por lo menos setenta (70) puntos en la evaluación técnica.

La asignación de puntajes de las ofertas económicas de los consultores que hayan alcanzado el puntaje mínimo en la calificación de la oferta técnica, se realizará mediante la aplicación de una relación inversamente proporcional a partir de la oferta económica más baja, en donde la totalidad del puntaje (100 puntos) se le otorgará a esta última conforme la siguiente fórmula:

Pei = (POEm x 100) / POEi

Dónde:

Pei = Puntaje por Evaluación Económica del oferente i.
POEm = Precio de la Oferta Económica más baja.
POEi = Precio de la Oferta Económica del oferente i

El puntaje total de la propuesta será el promedio ponderado de ambas evaluaciones, obtenido de la aplicación de la siguiente fórmula:

PTOi = (c1*Pti) + (c2*Pei)

Donde:

PTOi = Puntaje Total del Oferente i
Pti = Puntaje por Evaluación Técnica del oferente i
Pei = Puntaje por Evaluación Económica del oferente i
c1 = Coeficiente de ponderación para la evaluación técnica
c2 = Coeficiente de ponderación para la evaluación económica

Los coeficientes de ponderación deberán cumplir las condiciones siguientes:

- La suma de ambos coeficientes deberá ser igual a la unidad (1.00).
- Los valores que se aplicarán en cada caso deberán estar comprendidos dentro de los márgenes siguientes:

  - 0,80 <= c1 <= 0,90
  - 0,10 <= c2 <= 0,20

En caso de empate en la puntuación final, para establecer el orden de prelación se atenderá a las siguientes reglas:

a) Si el empate se originare en diferentes calificaciones en la oferta técnica y económica, la oferta ganadora será aquella que tuviere el mayor puntaje en la oferta técnica.
b) Si el empate se originare en idénticas calificaciones en la oferta técnica y económica, la oferta ganadora se determinará de acuerdo a los siguientes criterios:

b.1) La oferta que tuviera el mayor puntaje en el parámetro "Experiencia Específica";
De persistir el empate, se aplicará progresivamente y en el siguiente orden los

criterios:
b.2) La oferta que tuviera el mayor puntaje en el parámetro "Experiencia del Personal Técnico";
b.3) La oferta que tuviera el mayor puntaje en el parámetro "Experiencia General";
b.4) La oferta que tuviera el mayor puntaje en el parámetro "Plan de Trabajo";
b.5) La oferta que tuviera el mayor puntaje en el parámetro "Instrumentos y equipos disponibles".

Si aún después de evaluar los criterios anteriores, subsistiera un empate entre los participantes, el orden de prelación se establecerá por sorteo realizado por la herramienta electrónica del portal del SERCOP.

La evaluación de la propuesta se realizará en función del cumplimiento de los parámetros establecidos en los Pliegos, conforme lo dispone el numeral 19 del artículo 6 de la Ley Orgánica del Sistema Nacional de Contratación Pública. Si las ofertas obtuvieren una calificación menor del 70% del puntaje total no serán habilitadas.

26. MULTAS

Por cada día de retardo en la entrega de los productos contratados; se aplicará una multa correspondiente al 1 x 1000 del valor del contrato, valores que serán descontados de la liquidación del contrato.

Por cada día de retraso en la entrega de los informes mensuales, se aplicará la multa del 0.25 por 1.000 del valor del contrato.

Por incumplimiento de las disposiciones del Administrador del contrato, se impondrá una multa equivalente al 0.5 por 1000 del valor del contrato.

Notas: Si la suma de las multas establecidas superan el 5% del valor del contrato el Gobierno Autónomo Descentralizado Municipal del Cantón Esmeraldas podrá y deberá terminar unilateralmente el contrato.

No habrá lugar a la imposición de multa, cuando hubiere sido por fuerza mayor, caso fortuito o hecho imputable al GADMCE.

27. ADMINISTRADOR Y FISCALIZADOR DEL CONTRATO/ SUPERVISOR DE TRABAJO (PARA ÍNFIMAS CUANTÍAS)

La entidad contratante designará de manera expresa al Administrador y los Fiscalizadores del Contrato, acorde con lo establecido en el artículo 121 del Reglamento General de la LOSNCP, quienes velaran por el cabal y oportuno cumplimiento de todas y cada una de las obligaciones derivadas del contrato. Adoptarán las acciones que sean necesarias para evitar retrasos injustificados e impondrán las multas y sanciones a que hubiere lugar.

La Administración y Fiscalización del Contrato la ejercerán los servidores que designen la máxima autoridad o su delegado. El Administrador y Fiscalizador del Contrato tendrán las obligaciones y deberes establecidos en los artículos 80 de la LOSNCP y 121 de su Reglamento General de Aplicación

Del Administrador del Contrato

El Administrador debidamente designado, actúa a nombre y en representación de la entidad durante la vigencia del contrato y tendrá los siguientes deberes:

a) Velar por el cabal y oportuno cumplimiento de las obligaciones derivadas del contrato.
b) Adoptar las acciones que sean necesarias para evitar retrasos injustificados del contrato
c) Imponer las multas y sanciones a que hubiere lugar en este contrato, en base a los informes que al efecto presentarán los Fiscalizadores.
d) Aprobar los informes de la fiscalización.
e) Controlar que los Fiscalizadores de cada sede cumplan con las obligaciones establecidas en los pliegos y en el presente contrato.
f) Y demás obligaciones estipuladas en la Ley y Reglamento del Sistema Nacional de Contratación Pública; además de las establecidas en las Normas de Control Interno de la Contraloría General del Estado 408-29.
g) Nota: La documentación que se genera durante la ejecución del contrato deberá ser publicada en el portal web www.compraspublicas.gob.ec, por el Administrador del Contrato.

Anexos Obligatorios

- ✓ Informe de Necesidad
- ✓ Certificación Presupuestaria
- ✓ Autorización del señor Alcalde
- ✓ Certificado o escrito que señala que la contratación se encuentra incluido en el POA de cada área para la cualquier proceso de obras, bienes, servicios o consultorías

28. FIRMAS DE RESPONSABILIDAD DEL TÉCNICO

Firma: _____
ING. ROBERTO SOLORZANO
TÉCNICO DE PLANIFICACIÓN

29. AUTORIZACIÓN DEL JEFE DE LA UNIDAD

Firma: _____
ING. MIGUEL MOREIRA
DIRECTOR DE OBRAS PUBLICAS MUNICIPALES

ENVIRONMENTAL AND SOCIAL SAFEGUARDS

CORPORACIÓN ANDINA DE FOMENTO - CAF

September 2016

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PRESENTATION

The main aspects of CAF's Environmental Sustainability and Climate Change Strategy include facilitating access to financial resources to member countries, in order to comply with the 2030 Agenda, generate and disseminate knowledge for the achievement of these objectives, and strengthen the capacity of countries to access green financing.

As part of this mission, it is necessary to ensure that all credit operations financed by CAF develop in the framework of compliance with the countries' local norms, while at the same time complying with high standards in the environmental and social management of operations, through compliance with a group of Environmental and Social Safeguards that translate the principles established by CAF in environmental and social matters.

These safeguards expect to continue contributing to sustainable development, seeking to increase competitiveness, reduce social lags, stop the deterioration of the environment, support economic growth, improve the life conditions of the inhabitants of the region, and support the mitigation and adaptation measures to combat climate change, aware of the fact that this is essential to achieve environmental and social sustainability.

The application of these safeguards is intended to:

- Prevent, mitigate, and/or compensate diverse impacts for the population and the environment.
- Consider climate risk at a project level, across the operations.
- Promote the participation of interested parties through public participation.
- Preserve biological diversity and natural habitats.
- Promote the sustainable use of natural resources and ecosystem services.
- Avoid and minimize negative impacts to the health of people, biodiversity, and ecosystems, through the prevention of contamination.
- Recognize, respect, highlight the value, promote protection, and prevent impacts on the cultural heritage of the region.
- Ensure compliance with international commitments regarding indigenous populations and other minorities and vulnerable groups.
- Supervise compliance with the norms related to working conditions.

CAF's Environmental and Social Safeguards, presented in this document, constitute another contribution by the Institution to the consolidation of a regional environmental culture, and to the commitment of national and international entities to the preservation and sustainable use of natural assets in the region.

L. Enrique García
Executive President at CAF

SALVAGUARDA S01 EVALUATION AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL IMPACTS

I. INTRODUCTION

CAF has placed its experience, knowledge, resources, and action strategies at the service of an Agenda for the Comprehensive Development of the region, in order to achieve quality, sustained, equitable, and inclusive growth that contributes to reduce poverty, inequality, and unemployment, strengthen democracy in a framework of governance, and involve society through the generation of social and human capital, productive transformation, and low-in-carbon economy, considering the sustainability of the natural base of its shareholder countries.

In these objectives, of paramount importance for the present and future of the region, the cross-cutting nature of the environmental subject is evident, and for this reason, CAF has committed, in a permanent and coordinated effort with its member countries, to sustainably preserve and use the natural capital and environment as an essential support and source of development.

In this respect, throughout its trajectory, CAF has developed a clear environmental strategy aimed at two essential objectives: (i) permanently generate and improve the frameworks, spaces, and processes that guarantee a responsible environmental and social management to the Institution; and (ii) support its shareholder countries in the preservation and sustainable use of their natural resources as well as their ecosystems.

To carry out the first objective, CAF has designed and implemented a *Programa de Evaluación y Seguimiento Ambiental y Social de Operaciones (PESASO)* (Program for Environmental and Social Evaluation and Follow-Up of Operations), with the purpose of guaranteeing physical, environmental, and social sustainability and gender equity in operations financed by the Institution. This program integrates all the technical, human, technological, and financial resources that are available within each phase of the credit process (Figure 1), providing instruments and criteria for decision making regarding the feasibility and subsequent environmental and social management of the operations.

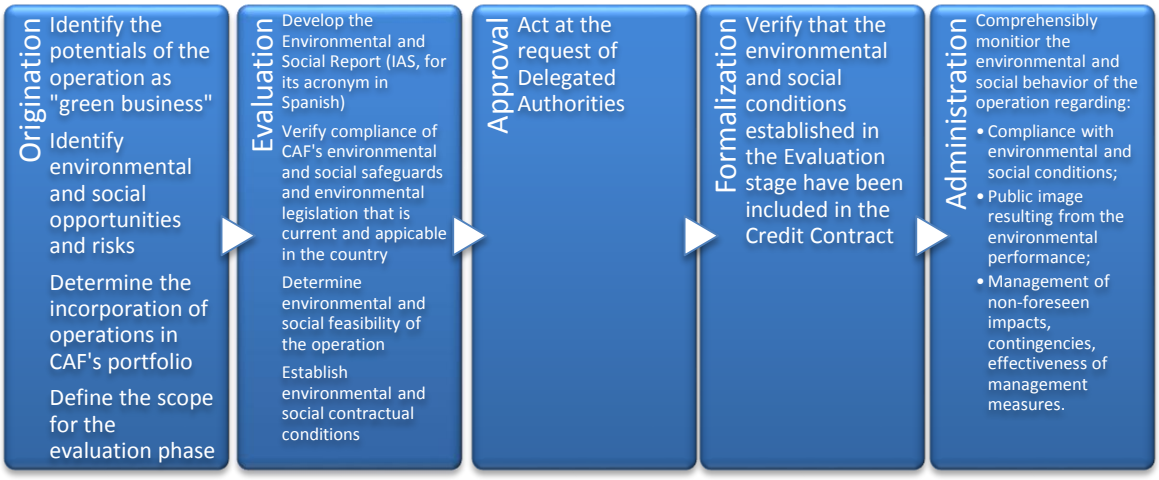

Figure 1
Program for Environmental and Social Evaluation and Follow-Up of Operations

This Safeguard is an essential part of the PESASO, and seeks to achieve the following environmental and social results that are consistent with its Environmental Strategy and the specific Safeguards:[1] (i) provide the technical criteria and the most important conceptual guidelines for the environmental and social evaluation, coherent and applicable to all of CAF's credit operations; (ii) establish the client's responsibilities with respect to the evaluation and follow-up of the environmental and social impacts associated with all credit operations financed by CAF.

The client is responsible for carrying out an environmental and social evaluation of the operations for which CAF financing is requested, with the objective of ensuring that the operations will be environmentally and socially feasible and sustainable. This environmental and social evaluation must take into consideration the type and magnitude of the project, as well as the environmental and social characteristics of its location, and must be able to identify and understand the potential impacts that enable a recommendation of the most adequate measures and solutions.

II. DEFINITIONS

Environment is the set of physical, biological, social, and cultural factors that interact systematically. Therefore, it should not be considered as what surrounds humans. For analytical purposes, it may be classified in different ways; for example: biophysical surroundings, socio-cultural surroundings, natural surroundings, constructed surroundings, urban surroundings, rural surroundings. In all cases, the analysis includes the human population and its activities. For the purpose of this safeguard, it is used as a synonym of environment.

[1] Specific safeguards are:

S02	Sustainable use of renewable resources	S03	Preservation of biological diversity
S04	Prevention and management of contamination	S05	Cultural heritage
S06	Ethnic groups and cultural diversity	S07	Population relocation
S08	Working and training conditions	S09	Gender equity

Direct area of influence, is the area in which impacts take place (both direct and indirect) as a result of the activities of the project, an area in which the project's promoter is responsible for the management of impacts, including prevention, mitigation, control, and/or compensation for the negative impacts, and for the enhancement of the positive impacts.

Indirect area of influence, is the area where impacts are produced as a result of the activities of the project, where the responsibility of the project's promoter is to alert the corresponding authority, through the identification of impacts and measures in the environmental study, about the possible presence of impacts caused by the activities of the project and/or program proposed to CAF, and cooperate jointly with them in managing these impacts.

Environmental audit, is the accumulation and objective exam of the evidence, carried out with the purpose of issuing an independent opinion regarding the degree of compliance of the current environmental norms and of the environmental commitments adopted in the (i) Environmental and Social Management Plan, (ii) the Loan Contract, (iii) CAF's performance standards or safeguards, and/or (iv) the Environmental and Social legislation (which may include: environmental impact evaluation, quality of water, quality of air, management of dangerous residues, SSO norms, etc.), at specific times during the development of the project. The environmental audit may be carried out: (i) at the conclusion of an operation to determine the performance of those involved in the management during the development of the operation; or (ii) at any time, called mid-term evaluation, which verifies environmental conditions at specific times during the development of the operation, or may be carried out in case of environmental pollution or social conflict resulting from non-compliance or accident (major spill). The time at which it is conducted and the cause determine its objective and scope.

Climate Change, is understood as a change in climate attributed directly or indirectly to human activity, which alters the composition of the world's atmosphere and adds to the natural variability of climate observed during comparable periods of times.[2]

Project cycle, or cycle of life of a project, is a set of generally sequential phases, on occasion overlapping, whose name and number are determined by the organization's management and control needs, To facilitate management, projects can be divided into phases, with the corresponding links to the organization's operations. In general, the stages of the cycle of life of a project are: (i) start of the project; (ii) organization and preparation; (iii) implementation of work; and (iv) closing of project.

Client, is the entity that requests a loan from CAF. This entity does not necessarily implement the project directly. However, the client is responsible for guaranteeing that the project will be designed and implemented in compliance with the current norms in the country, and that it complies with CAF's Safeguards, as appropriate. The client will guarantee compliance with all the conditions established in the Credit Contract, for himself and those contracted by him, having to show that his contracts and contractors include these conditions, as appropriate. For CAF, the client is the only party responsible for compliance with such conditions.

[2] United Nations Framework Convention on Climate Change. United Nations, 1992.

Environmental components or factors, the environment is defined as the "set of physical, chemical, biological, or social components capable of causing direct and indirect effects in the short or long-term on living beings and human activities" (Stockholm, 1972). Under this definition, each part of the environment is the environmental component or factor. Environmental components are grouped in two systems: abiotic system and biotic system.

Social components or factors, considering the above mentioned definition of environment, the social component or factor is each part of the environment regarding human beings, which are part of said environment.

Environmental impact evaluation, EIE, is the technical-administrative procedure that helps identify, prevent, and interpret environmental and social impacts produced by a project in its environment when executed, so that the competent administration may accept it, reject it, or modify it. This technical-administrative procedure has different characteristics in every country, according to the regulations. However, in all cases, it is carried out by developing an Environmental Impact Study up to the issuance of the Environmental License by the corresponding environmental authority.

Administration Phase. According to CAF's Credit Process Manual, this phase seeks to ensure compliance of the contractual conditions and the agreed upon amortization, verifying the due debt servicing and recovery of the disbursed capital. In addition, it seeks to adequately implement the disbursement of the credit amounts and ensure compliance of the terms and conditions established in the legal documentation.

Evaluation phase, includes all activities from the incorporation of the Operation approved at the CNC in the Bank's Inventory of Operations, up to the approval of the Credit Evaluation Document (DEC, for its acronym in Spanish) by the corresponding approving authorities.

Formalization phase, includes all activities from the approval of the Operation in the Loans and Investments Committee (CPI, for its acronym in Spanish) or the relevant body, up to the signature of the respective Loan Contract.

Identification phase, involves the activities carried out by CAF's client prior to the credit application.

Origination phase, according to the provisions established in CAF's Credit Process Manual, the objective of this phase is to carry out a brief review of the available information regarding the client's quality and the adaptation of the business proposal to the Management Policies, the guidelines established in the Credit Process Manual, the Guidelines for the Capital Legalization, the annual business plans, and CAF's specific strategies. Based on the aforementioned, a decision is made regarding the incorporation, or not, of the operation to the Inventory of Operations. If the operation is incorporated, a work team is created to carry out the respective evaluation of the operation.

Environmental and social management, understands the environment as the combination of natural and social components, the series of actions that lead to a comprehensive management of the environmental system. In other words, including the concept of sustainable management, it is the strategy through which anthropic activities that affect the environment are organized, in order to achieve an adequate quality of life, preventing or mitigating the impacts that may occur on any of

the environmental and social components or factors.[3] Environmental and social management applies to all the stages of a project.

Impact management, for the purpose of this Safeguard, the management of negative impacts is understood as the prevention, mitigation, control, compensation, and enhancement of positive impacts that may be the result of an operation.

Carbon footprint, includes all greenhouse gasses (GHG) emitted as a direct or indirect effect of an individual, organization, event, or product. This environmental impact is measured by carrying out an inventory of GHG emissions or a life cycle analysis according to the type of footprint, following recognized international regulations such as ISO 14064, PAS 2050 or GHG Protocol,[4] among others. The carbon footprint is measured as equivalent CO_2 mass.

Ecological footprint, an environmental impact indicator generated by human demands for natural resources that exist in the planet's ecosystems, related to the ecological capacity of the Earth to regenerate its resources. It represents the area of land and water that is ecologically productive (crops, grasses, forests, or water ecosystems) and, ideally, also the volume of air, both of which are necessary to generate resources and assimilate the residues produced by each population, determined according to their way of life, indefinitely. The measure may be performed at different scales: individual (the ecological footprint of one person), population (the ecological footprint of a city, a region, a country...), or communities (the ecological footprint of agricultural societies, industrialized societies, etc.). The main objective of calculating ecological footprints is to evaluate the impact of a determined way of life on the planet, and compare it with the planet's biocapacity. Consequently, it is a key indicator for sustainability.

Water footprint, is an indicator that measures the volume of fresh water used to produce goods and services.[5] It enables the establishment of the consumption situation and development of strategies to optimize the resource and reduce the associated environmental impacts. To establish the Water Footprint of a project or organization, three types of water must be considered: (i) Green Water Footprint, refers to the consumption of rain water stored in the ground, which does not become runoff water, and satisfies demand without requiring human intervention; (ii) Blue Water Footprint: refers to the consumption of water associated to the extraction from a superficial and/or underground source, to satisfy demands originated in a process, requiring human intervention; and (iii) Grey Water Footprint: defined as the volume of fresh water necessary to assimilate the load of contaminants by a receiving body, considering the environmental quality regulations as a reference, and associating the limits established for a good quality for the environment and the population.

Environmental impact is the effect of human activity on the environment.

Final evaluation report, is the report sent by the client to CAF when the project ends, which must include the following information: (i) description of the finalized operation; (ii) description of the

[4] The GHG Protocol was developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), jointly with companies, governments, and environmental groups around the world, in order to build a new generation of effective and credible programs to address climate change

[5] The concept was developed in 2002 by Arjen Hoekstra - Professor at UNESCO's Institute for Water Education.

environmental and social characteristics when works finish; (iii) comparative analysis of the expected impacts versus the impacts detected on-site; (iv) comparative analysis of the intended measures versus the measures really applied; (v) list and explanation of unsatisfactory environmental and social aspects, including causes and consequences (residual impacts); (vi) verification of compliance of contractual requirements, and in case of non-compliance, explain why it was not executed and how it was corrected; (vii) comparative analysis between the original budget and the one effectively executed, justifying any differences; (viii) lessons learned; and (ix) conclusions and recommendations.

Follow-up reports, are periodic reports that the client must send CAF, including all the information that can help carry out an adequate control of activities, and verify the project's environmental and social performance. Said reports must include at least the following information: (i) advances in the implementation of the project's PMAS (Spanish acronym for Environmental and Social Management Program) and PSCAS (Spanish acronym for Program for Environmental and Social Follow-Up and Control) during the follow-up period; (ii) status and advance of compliance of the environmental regulation and environmental and social commitments derived from licenses, permits, or Environmental Management Instruments that are applicable to the project; (iii) advance of social relationships; (iv) report and results of environmental and social components monitoring (when applicable); (v) report of environmental accidents and/or emergencies; (vi) measures applied to correct or repair damages, or deal with other adverse consequences resulting from any occasional operation failure; (vii) physical and financial advance of the environmental and social component; and (viii) report on the status of the Penalizing Processes, when applicable.

Base line, is a description of the current environmental situation, at the time of the study, without influences from new anthropic interventions. In other words, it is a photograph of the current environmental situation, considering the corresponding environmental components at the time of the study, prior to the project's implementation. From this situation, the positive and negative modifications of the interventions are evaluated in later stages of the Environmental Impact Evaluation.

Compensation measures, are the works or activities that compensate for damages caused by the construction or implementation of a project, work, or activity. These measures are aimed at unavoidable impacts, which cannot be completely prevented or mitigated. These measures also include financial compensation for the damages caused. Their objective is to produce or generate a positive alternative effect which is equivalent to the identified adverse effect. They include the replacement or substitution of the natural resources or environmental elements that were affected by others of similar characteristics, class, nature, and quality.

Mitigation measures, are the works or activities that reduce the impacts resulting from the construction or implementation of a project. These measures are aimed at impacts that cannot be completely prevented. Their objective is to reduce the identified adverse effect.

Enhancement measures, are the works or activities that increase the impacts caused by the construction or implementation of a project. These measures are aimed at increasing the identified positive effect.

Prevention measures, are the works or activities applied to prevent impacts caused by the construction or implementation of a project. These measures are preferably applied during the implementation of a project. Their objective is to avoid the identified adverse effect. .

Restoration measures, are the works or activities that reestablish the conditions prior to the occurrence of the impacts caused by the construction or implementation of a project. These measures are aimed at unavoidable impacts that cannot be completely prevented or mitigated. Their objective is to reestablish the conditions that existed in the site before the implementation of a project.

Mitigation of environmental impacts, actions for the prevention, control, attenuation, restoration, and compensation for negative environmental impacts that must accompany the development of a project to ensure a sustainable use of natural resources and protection of the environment. They emerge from the Environmental Impact Study, and its follow-up is incorporated to the Environmental and Social Management Program.

Environmental monitoring, is the repetitive measure[6] of environmental parameters/indicators to determine changes in said parameters/indicators during the execution and operation of projects, using specialized equipment for in situ monitoring and/or collection of samples for lab analysis, to obtain qualitative and/or quantitative results that may be compared over time and enable the follow-up of the performance of the parameters/indicators.

Environmental liability, is a concept that may materialize or not in a geographic site which is contaminated by the release of materials or residues which were not remedied in a timely manner, and they continue to cause negative effects on the environment. As a result of the existence of environmental liabilities, it is necessary to resort not only to remediation or mitigation, but also to compensate for the damages caused in the past.

Environmental and Social Management Program [PMAS, for its acronym in Spanish], set of measures for the prevention, mitigation, enhancement, and compensation for environmental and social impacts, which are part of the Environmental Impact Study that must be executed, following the timeline approved during each project phase, structured as sub-programs and/or projects, each of which must have a design of the measures, provision of human, material, and economic resources for their implementation, according to a timeline determined in agreement with the execution of the project's implementation activities.

Program for Environmental and Social Follow-Up and Control [PSCAS], set of technical references that enable the follow-up of the implementation of measures proposed in the Environmental and Social Management Program, as well as the environmental control applied during the different phases of the project. The document must include a prospect of types of controls, and projection of human, material, and economic resources, to achieve its objectives.

Environmental risk, for the purpose of this Safeguard, it refers to the probability of occurrence of possible damage. The concept is associated to the possibility of environmental damage, which may

[6] Beanlands and Duncker, 1983

be the result of activities carried out for the implementation, operation, or maintenance of a project, or due to natural causes.

Climate Risk, the concept of climate risk implies the presence of an extreme but foreseeable natural phenomenon, and human activity that is susceptible to damages by such phenomenon.

Environmental Follow-Up, set of actions planned to continually or periodically supervise the activities of a project to be able to identify, in a timely manner, the shortfalls in complying with the established environmental agreements in: (i) Environmental and Social Management Plan, (ii) Loan Contract; (iii) CAF's performance standards or safeguards; and/or (iv) Environmental and Social legislation (that may include: EIA, water quality, air quality, management of dangerous residues, SSO regulation, etc.). It is developed during a process of implementation of the operation, for the immediate application of temporary measures that prevent the accumulation of environmental impacts.

Local sensibility, is the perception that local actors have regarding the appearance of an impact, an activity that takes place considering the experience of the Consultant and consultations with the local population. For the normalization of the population's feelings with respect to the appearance of different impacts, scales must be adopted to determine indifference, passive, and active levels.

Climate variability, is defined as variations of the average state and other statistical climate data in temporal and spatial scales that are broader than those of meteorological specific phenomena. Variability may be due to internal natural processes of the climate system, which is known as internal variability, or processes influenced by external or anthropogenic natural forces, called external variability (IPCC, 2007)[7].

III. OBJECTIVES

The general objective of this safeguard is to establish CAF's requirements regarding environmental and social matters to consider financing for a specific operation, and guide the actions that the client must take to comply with them in a satisfactory manner.

The specific objectives of the safeguard are:

- identify, evaluate, and manage the environmental and social impacts of the project;
- identify the climate variability risks and adaptation measures;
- manage the identified impacts through: (i) prevention; (ii) mitigation; and (iii) compensation when prevention and/or mitigation are not possible;
- comply with the current regulations in the country where the operation is developed;
- inform and consult the population that resides in the area of the project, as well as other actors interested in environmental and social impacts, management measures, and their results;

[7] IPCC, 2007: Cambio climático 2007 (Climate Change 2007): Summary report. Contribution of working groups I, II, and III for the fourth evaluation report of the Intergovernmental Group of Experts regarding Climate Change [Main editorial group: Pachauri, R.K, and. Reisinger, A. (publication directors)]. IPCC, Geneva, Switzerland, 104 pages.

- promote the improvement of environmental and social management of operations, by means of strengthening the institutions; and
- standardize the documents delivered by the client for the evaluation of the operation

IV. SCOPE

The requirements established in this Safeguard apply to all operations that imply environmental and social impacts, financed by CAF in member countries.

Financed operations may be from the public or private sector, and they may include industrial, infrastructure, and social and environmental development projects, and corporate and special operations. The requirements established by CAF will apply in all the different stages of an operation, that is: (i) design, (ii) construction, (iii) operation, (iv) expansions and/or modifications and, eventually (v) closing.

This safeguard applies to all the components of the project/program, independently of whether it is completely financed by CAF or if it is co-financed, and also applies to the operation's associated facilities, understanding that associate facilities are those that, although they are not part of the operation, (i) they are directly and significantly related to the operation; (ii) they are carried out or planned in parallel with the financed operation; and (iii) they are necessary for the operation to be feasible, and they would not have been built or expanded if the operation had not existed.

CAF will not finance or support the execution of projects that contravene some of the following aspects: (i) the list of exclusions included in Annex 1; (ii) the requirements of this Safeguard; (iii) the country's applicable legislation; and (iv) the international legislation subscribed by the country.

This Safeguard will provide a preliminary definition of the activation of the other Safeguards, based on the tables of Annex 2. The decision will be verified and approved by an Environmental Executive at the DACC, before the approval of the loan, at which time an activation of additional Safeguards may be requested under the precautionary principle, if there are any doubts regarding its applicability.

V. REQUIREMENTS

In all projects and programs to be financed by CAF, the client must:

- Identify and evaluate the environmental and social impacts of the project, to provide feedback to the project's design. The design must be developed by experts in each required specialty;
- Develop a plan with hierarchical measures aimed at preventing and avoiding or, failing this, minimizing, and where there are residual impacts, compensating and restoring the impacts of the project on the workers, the communities, and the environment, in case the current environmental legislation does not establish it as a requirement;
- Carry out a timely follow-up of the implementation of the measures for impact management relative to the project, and adjust those measures according to the evolution of the impacts during the different phases of the project's cycle;
- Promote informed, timely, effective, and transparent participation of the affected communities, supply the means to maintain this participation throughout the project's cycle, and guarantee that all the relevant information to this end will be provided in a timely manner;
- Expect to have, and if necessary develop, institutional, technical, and financial capacities to implement and follow-up on the strategy of hierarchical measures to manage the impacts of the project.
- Identify and/or present, if possible, complementary actions that address climate risk aspects, and/or enhance actions for the environmental and social improvements of the program;
- Financial intermediaries must have a System for the Analysis of Environmental and Social Risks.

V.1. Environmental and Social Evaluation

The Environmental and Social Evaluation of the operation will be carried out by the client, and presented to CAF when applying for the loan, or before the start of the evaluation phase. which will be notified by CAF.

V.1.1. Definition of the area of influence

The area of influence of an operation is divided into two geographic spaces called direct area of influence and indirect area of influence.

For the definition of an operation's area of influence, it is necessary to consider several aspects, among which the main are: (i) the characteristics of the natural and social environment where the operation will take place; and (ii) the characteristics of the operation.

Initially, it is necessary to analyze the characteristics of the activities and works that will be carried out as part of the operation (direct actions), and determine those that are attributed to activities directly related with the operation, and those related to induced development (indirect actions), which are carried out by third parties but influenced by the presence of the new infrastructure.

The definition of the area of influence will depend on the interaction of the actions (direct and indirect) with the environment in which the operation takes place, establishing a limit that will correspond to the direct area of influence, and another for the indirect area of influence. The direct area of influence is generally located within the indirect area of influence.

The definition of areas of influence will establish the scope of the study, and define the depth or measure with which environmental components will be studied. In this respect, the discrimination of these areas will be based on criteria that considers how the different environmental components are affected (physical, biotic, and socio-economic), as well as those that are potentially accessible during the useful life of the project.

The definition of the area of influence may be modified based on the results of the identification and evaluation of the environmental impacts described in numeral V.1.3.

V.1.2. Characterization of the environment

The characterization of the environment or environmental base line will be based on information that is: (i) specific to the project and site, constituted by available, updated, and verifiable data; (ii) its level of detail and geographic scale is in agreement with the project's direct and indirect area of influence, as well as with the project's magnitude, and it enables a proposal and design of specific and achievable measures; and (iii) it covers all the environmental and social components or factors that may be affected by the project. A base line supported by environmental and social data with an adequate level of detail helps identify, describe, and evaluate environmental impacts in the best possible manner, as well as appropriately propose prevention, mitigation, or compensation measures.

The characterization of the environment in which the operation develops must address the environmental components (physical, biotic, and socio-economic) that may be modified by the operation, contributing value judgments regarding the sensitivity and vulnerability of the environment, to facilitate the determination of environmental impacts that may result from the works of the project or program being financed. The definition of environmental components that must be studied in each case, depends on the characteristics of the operation and the sensitivity of the environment in which it takes place. In this respect, the components to be studied in each case will be specific, except in large projects that develop in highly sensitive environments, where it will be necessary to study all environmental components.

The characterization of the environment must also incorporate a climate analysis and the implications of climate variability and climate change on the project.

Natural risk factors of the area where the project will develop must be included in order to determine if the impacts generated by the operation may exacerbate the effects of those factors.

V.1.3. Identification and evaluation of environmental and social impacts

The identification and evaluation of environmental and social impacts will take into consideration, in an integrated manner, all the direct, indirect, and accumulated environmental and social impacts that are relevant to all the activities associated with each stage of the project (construction,

operation, closing, and abandonment), as well as over all the components of the natural and social environment.

In addition, environmental liabilities must be identified in the area of influence to be able to establish responsibilities.

The Evaluation will be based on the information of the base line and actions of the operations, with the purpose of achieving a prioritization of the potential impacts, taking into consideration their characteristics, such as: character (positive/negative), magnitude, probability of occurrence, development time, length of duration, temporality, possibility of recovery, reversibility, and concentration, including local sensitivity.

Additionally, a risk evaluation associated to climate change and climate variability must be carried out, as necessary.

V.1.4. Environmental and social management

The client will establish an Environmental and Social Management Program (PMAS, for its acronym in Spanish) compatible with the current local environmental regulation, which specifically describes the measures and actions aimed at preventing, mitigating, compensating, and enhancing the environmental and social impacts that have been identified and evaluated, that may be a result of the operation, prioritizing the most significant impacts. These measures will also include actions to face the risks associated to climate change and climate vulnerability.

The PMAS or its equivalent, according to the current local environmental regulation, consists of a group of subprograms or projects aimed at managing the evaluated environmental impacts, and must define the measures necessary to manage environmental impacts with their respective dimensions, budget, identification of source of resources, application timeline, and evidence of technical, environmental, and social feasibility for its implementation, according to the nature and scale of the project.

The hierarchy of environmental and social measures to address the identified impacts will prioritize the prevention of impacts above all measures to minimize (mitigate) them, and when residual impacts persist, restore them or compensate for them.

With respect to the environmental liabilities previously identified, measures must be taken to restore those that have the potential to affect the financed works, or those that are in the areas effectively intervened by the operation.

The environmental and social measures proposed by the PMAS or equivalent will guarantee that the operation is implemented according to the applicable laws and regulations, considering the risks associated to climate change and climate variability, and complying with the requirements of this Safeguard and the other CAF Safeguards that apply.

The PMAS will define the desired results, the measures and actions that must be taken to achieve the results, the budget that is necessary for the implementation, as well as the organizational

structure, human and technical resources required for their development, and the economic resources necessary for their implementation

The operation's PMAS will be reviewed by CAF and eventually complemented by the client as required by CAF, and it will be a part of the loan contract following the procedures established for sovereign and private operations in CAF's member countries.

The planned measures will be differentiated to address environmental and social aspects.

The budget for the execution of the planned measures must be included in the total cost of the project, and the sources of financing must be specified (paid by item or through general expenditures).

The PMAS must state all the measures that are necessary to guarantee:

a) That the emission of greenhouse gasses or other factors that impact on climate change are not significantly or unjustifiably increased.
b) Fair and equitable access to the benefits of the project, in an inclusive manner, facilitating access to basic health services, potable water and sanitation, energy, education, housing, safe and decent working conditions, and land property rights.
c) That existing inequalities are not exacerbated, particularly with respect to marginal or vulnerable groups.
d) That human rights are respected and promoted.
e) That public health is not affected.

Specific measures must be adopted with respect to the dissemination of information (communication) and relationships with the community (interaction), as well as to address complaints. These costs must also be specified in the PMAS.

In addition, the client must identify and prioritize the environmental liabilities that are present in the area of the project, establishing those that: (i) have the potential to affect the project; (ii) may suffer an increase as a result of the execution of the project; and (iii) are within the area of direct influence of the project.

V.1.5. Environmental and social follow-up

An Environmental and Social Follow-Up and Control Program [PSCAS][8] must be included with the presented documents, which includes a description of the measurement verification indicators, the allowable limits, the monitoring frequency, and the applicable legal norms, when appropriate, including the use of authorized/accredited labs when required by the national regulation.

The PSCAS must have its own budget, which must include the economic resources to hire the personnel in charge of monitoring activities.

Monitoring compliance with the measures established in the PMAS will produce periodical follow-up reports that must be presented to CAF in accordance with the frequency agreed upon in the loan contract.

[8] Or equivalent, according to the current local environmental regulation.

The follow-up reports will clearly and succinctly include the status of the implementation of mitigation measures, and the adoption of complementary measures when their formulation and execution are necessary, in addition to the results obtained. Follow-up reports must be accompanied by verifiable registrations that accredit the results through a comparison of these data with the reference levels previously established or the PMAS requirements.

The monitoring program must be carried out by the client's appropriate entities, so the client must provide an independent Environmental Supervision.

When the complexity of the operation so advices, the client must ensure the participation of representatives of the affected communities in the follow-up activities.

In the follow-up reports, the client will inform CAF in a timely manner about any change in the scope, design, implementation, or operation of the project, that may result in a material change in its environmental or social impacts. In such cases, CAF may request the Proponent to carry out: (i) additional evaluations (ii) consultations with interested parties; (iii) pertinent changes in the PMAS and its management tools, as appropriate, according to the findings of such evaluations and consultations.

In this respect, the client must include in the contract with the Contractor: i) the obligation of bearing the costs of all works that imply environmental and social management and industrial security during the development of the project, charged to his general expenditures if they are not explicit in the "Environmental Budget" by item; ii) sanction mechanisms for non-compliance of all environmental, social, and contract obligations, which enable the control and supervision systems to demand adequate compliance of the environmental regulation, including the specific conditions agreed upon with CAF (internal environmental and social safeguards), and the provisions established in the studies and other environmental management documents according to the current environmental legislation.

The client must guarantee that CAF personnel or consultants representing it, may visit the facilities, areas where works are being developed, and/or project area, when requested by CAF.

At the end of the project, PMAS must carry out an evaluation to determine the achievement of the executed environmental and social objectives.

V.2. Dissemination of information and participation of social actors

The local authorities and institutions, and the population residing in the area where the project will be developed, must be informed about its objective and scope, as well as of the potential impacts that it may generate, both positive and negative, and the management measures that will be applied to prevent, mitigate, or compensate the negative, and enhance the positive and the respective results, starting on the pre-investment stage.

Early information and relationships between the project's proponent and the population involved enables the establishment of a constructive and solid relationship that benefits both parties, while their absence is generally a source of conflict.

Therefore, the Proponent will guarantee the participation of the actors involved, paying special attention to the participation of women. For this, the Proponent must design a broad and inclusive participation strategy for the complete project cycle, which includes (i) identification of actors; (ii) dissemination of information; (iii) consultation; (iv) response to petitions, complaints, and claims; and (v) resolution of conflicts.

The scope of each component of the participation strategy will depend on the type of project, its magnitude, impacts, and if the social actors will receive any type of impact from the project or if they only have a legitimate interest in it. The participation strategy must be designed according to the characteristics of the identified social actors, and must be free of any manipulation, interference, coercion, and intimidation.

Once the social actors are identified and according to their characteristics and those of the project, a Communications and Participation Plan will be designed to be implemented during the cycle of the project. The Plan must consider differences such as gender, age, ethnic groups, or any other that is relevant, and must include special measures so that the population in vulnerable conditions may participate.

V.2.1. Identification of actors

The Proponent will identify the social actors, in reference to individuals or groups that may be interested in the project (interested or involved actors), and may be affected by the project (affected actors) [or affected, or individuals, or groups that receive any of the impacts of the project].

Aspects to be taken into consideration include the place of residence of interested actors and the type of interest to define the information that will be provided to them, the channels of communications that will be used, and its frequency.

For the case of Affected Actors, groups or individuals that may face any of the impacts of the project will be identified, characterizing them according to the type of impact they will face, their socio-economic characteristics, and cultural patterns, in order to establish differentiated mechanisms that enable the effective participation of all parties. To design the participation strategy, the characteristics and interests of each group will be considered based on: (i) age; (ii) gender; and (iii) ethnic and cultural diversity.

V.2.2. Information

Information is the essential base for the participation of social actors. Therefore, the client will provide the authorities and institutions information that is clear, relevant, timely, and culturally appropriate. The client must also provide the Interested and Affected Actors information regarding the purpose, nature, and dimension of the project, the entity responsible for it, the activities that will take place for its design and implementation, the studies that will be carried out in the area, and the timeline planned.

Once the studies are done, the results must be informed, and during the execution and operation of the project or program, information must be provided regarding the advance and results of the

application of the measures for impact management. The information must be disseminated during all the cycle of the project/program.

The content and type of information will depend on the stage of the project, it will be provided in the area of the project and where the Interested Actors are; it will be adapted to the characteristics of the population to which it is targeted so that it is easily understood, and in the local language, if necessary. Access to information must be facilitated.

Information regarding relevant aspects both of the project as well as the management of impacts will be provided continuously during all the cycle of the project.

V.2.3. Communication

A communications plan must be established, including bilateral communications channels through which the project may provide information to social actors while at the same time receive information, questions, and concern of these actors during the complete cycle of the project. These channels will respond to the characteristics of the population and the context in which the project develops. They must be agreed upon with the social actors, with easy and free access for all.

V.2.4. Consultation

The Affected Actors (or groups of population that face any of the impacts of the project) must be informed and consulted about the studies that will be carried out to identify and evaluate the impacts generated by the project. In projects with significant impacts, this consultation may start during the preparation of the terms of reference of said studies, and the events that will provide information on their advance and results will be agreed upon.

Once the impacts are evaluated, Affected Actors will be informed and consulted regarding the type of impacts identified (positive, negative), their magnitude, the affected area, population involved, and their temporality, as well as the measures designed for their management, monitoring, and evaluation. Complaints, opinions, and suggestions from the Affected Actors will be considered, in order to complement the identification and evaluation of the impacts and the design of the management measures, either to reformulate the planned measures or for the incorporation of other measures that were not considered. If conditions allow, it may be possible to consider the active participation of social actors in monitoring and evaluating the measures for impact management through the identification and implementation of joint mechanisms.

The call for information and consultation events must be broad, so that all interested parties can attend. All consultations must be based on a prior dissemination of relevant and adequate information. Participation of all social actors must be facilitated, emphasizing the contribution of women, and must take place under the same principles applied for the dissemination of information. The development and conclusions of the consultations must be documented so that all the actors can have access to their results. If the population is large and diverse, several consultation events should take place to facilitate the participation of Affected Actors.

Consultations may continue throughout the project at the time there are changes in the context, in the design of the project, or in the identified impacts.

V.2.5. Response to petitions, complaints, and claims

In order to respond adequately and effectively to petitions, complaints, or claims that may arise in any of the stages of the project's cycle, the Proponent must design a mechanism that allows receiving and responding to them efficiently and quickly. All the population should be informed of said mechanisms, the form in which to present a petition, complaint, or claim, and the time and manner in which they will receive a response. The mechanism should be agreed upon with the local population, and transparency and privacy, if required, should be guaranteed.

Periodically, the results of the cases addressed should be disseminated, and this information will also be used as a feedback mechanisms to improve the project's practices.

V.2.6. Resolution of conflicts

It is necessary to define a mechanism for the resolution of conflicts that may emerge during any stage of the project. Mechanisms that exist in the area or country where the project is developed may be used, ensuring impartiality and efficiency in their resolution. Social actors must be informed about the existence of said mechanisms and the way to access them, if required. Using these mechanisms must not imply any cost for the person who decides to use it. To access these mechanisms, an individual must prove that a petition, complaint or claim was presented to the Proponent through a mechanism designed for that purpose, and the individual did not receive a response, or the response was not satisfactory according to the person's arguments.

V.3. Financial intermediaries

The financial intermediary must have an environmental and social policy, and based on it, a System for the Analysis of Environmental and Social Risk for the categorization of its operations and for the evaluation of environmental and social risk of its portfolio.

The measures to be applied by the financial intermediary will be the following:

- Verify that the operations it finances are not prohibited by law;
- Verify that the operations it finances are not in CAF's List of Exclusions, established in Annex 1;
- Demand compliance with the national legislation regarding the procurement of environmental permits and licenses, use of natural resources, and activities with dangerous substances;
- Categorize and evaluate environmental and social risk of the operations it finances
- Verify that the amounts requested by its clients include the implementation of the measures established to minimize the environmental and social risks of its operations;
- Present reports on the environmental and social management of its operations, according to the frequency established in the loan contract, which will be set according to the risks of its portfolio and the magnitude of the credit granted by CAF.

V.4. Institutional strengthening

The Proponent must identify his capacities for environmental and social management, and the capacities of those he has contracted.

With respect to his own capacities, CAF may support institutional strengthening by providing administrative, financial, and human support that will enable the development of a structure that guarantees a correct environmental and social performance of the project/program, charged to the Loan.

The client must guarantee that the individuals hired have the adequate capacity for the magnitude of the environmental and social management project or program, in line with the requirements of the project.

V.5. Current environmental legislation

All projects financed by CAF adjust to the environmental legislation in the country where the projected is implemented, as well as to the agreements and international commitments subscribed by the shareholder countries. However, CAF requires the application of additional precautions, or selects internationally accepted technical benchmarks in cases it deems necessary.

The client will identify the Environmental Safeguards of CAF that apply to the operation for which credit is requested, through the application of the tool in Annex 2. These Safeguards are obligatory. During the evaluation stage, the DACC Executive will verify that the activation of the Safeguards is adequate, and if one has been omitted, will ask the Client for compliance with the established requirements in a peremptory period of time, which is agreed upon.

VI. PROCEDURES

CAF will follow-up on the documentation prepared by the client, considering the items described below for each phase of the credit cycle.

VI.1. Origination

In the origination phase, the client will provide information that enables the identification of the magnitude of the project, and carry out an environmental and social evaluation of the project to identify the risks it represents. The corresponding Environmental Executive at CAF will analyze the information and conduct a preliminary analysis of environmental and social risks. The application of this Safeguard is compulsory for all operations financed by CAF.

For the development of this phase, the client must present a preliminary design of the operation, including environmental and social arguments for the definition of the selected alternative, and present (if possible) its annual entrepreneurial social responsibility report (especially in cases of financial intermediaries). In addition, the client must present information of the climate risks of the operation.

VI.2. Evaluation

In the evaluation phase, the client will present the environmental and social evaluation studies of the project, in line with the requirements of this Safeguard.

The Environmental Executive will review the documentation presented, verifying that:

- it complies with the environmental and social safeguards established by CAF, the current environmental and labor legislation, and all the requirements identified by CAF during the origination.
- the client, those contracted by him, and the social organizations of the project's location, have the institutional capacity that is necessary for an adequate environmental and social management of the project.
- the environmental and social impacts that may be generated by the project have been identified, and the PMAS addresses each of these impacts.
- there is a follow-up program in line with the established measures.
- consultation and participation has taken place, considering all the actors involved and affected.

Additionally, the Environmental Executive will conduct his own risk evaluation, and must:

- prepare an Environmental and Social Report (IAS, for its acronym in Spanish), according to the category established in the origination stage.
- define the project's contractual conditions.

This requires the client to present the complete design of the operation, having defined all the characteristics of the project for which credit is requested. With respect to environmental and social aspects, the client must present the complete Environmental and Social Evaluation, including the corresponding permits and authorizations, according to the current regulation in the country where the operation takes place.

VI.3. Formalization

In the formalization phase, the Environmental Executive will verify that the conditions established during the evaluation phase have been incorporated to the credit contract.

VI.4. Administration

In the administration phase, the client will implement the complete PMAS, including monitoring of compliance and performance indicators.

CAF will verify that the client conducts a follow-up of the application of the PMAS, on their own or by contracted third parties. This situation will be defined in the loan Contract by the Environmental Executive, according to the characteristics and magnitude of the operation.

The client will present periodical follow-up reports, with the frequency established in the Loan Contract, which will be defined by the Environmental Executive according to the characteristics of the project and the identified risks.

CAF will review the reports and, if necessary, will suggest corrective or complementary measures, as needed.

The Environmental Executive will issue technical criteria for the approval of disbursements, after reviewing the reports presented, or after a field inspection, which will be informed through a Follow-Up Environmental and Social Report.

To carry out the above mentioned activities, the client must present the Environmental and Social Follow-Up reports, with the frequency established in the Loan Contract. This frequency will be established considering the characteristics of the operation.

The periodical follow-up reports to be presented by the client must provide detailed information on:

(a) Activities of the period
(b) Social management
(c) Activities related to building social relationships
(d) Monitoring of environmental components (when applicable)
(e) Impacts occurred
(f) Measures applied
(g) Physical and financial advance of the environmental component

When finalizing the operation, the Environmental Executive will conduct a field inspection, and based on this visit and the client's final evaluation report, he will write his own Environmental and Social Final Follow-Up Report.

The client's final evaluation report must include information relative to the conditions of the environmental and social environment, considering the following information:

(a) Intended impacts versus generated impacts
(b) Residual impacts
(c) Planned measures versus applied measures
(d) Planned investments versus executed investments
(e) Achievement of planned objectives and results
(f) Other key aspects for the evaluation
(g) Conclusions and recommendations
(h) Lessons learned

VII. ANNEXES

VII.1. Annex 1 List of exclusions

CAF does not finance projects with the following characteristics:

- Production or trade of any product or activity considered illegal under the laws of the host country or regulations or international agreements, or subject to international prohibitions, such as pharmaceutical products, pesticides/herbicides, ozone-depleting substances, PCBs, fauna, or products regulated by the CITES.
- Arms and munitions production or trade.
- Production or trade of alcoholic beverages (excluding beer and wine).
- Tobacco production or trade.
- Gambling activities, casinos, and equivalent companies.
- Production or trade of radioactive materials. This does not apply to the purchase of medical equipment, quality control equipment (measurement), and any other equipment when CAF considers that the radioactive source is trivial and/or adequately protected.
- Production or trade of chrysotile asbestos fiber. This does not apply to the purchase and use of asbestos cement plates, where the asbestos content is less than 20 percent.
- Production and use of polychlorinated biphenyl compounds (PCB).
- Production of pharmaceutical products that are being gradually withdrawn from the market, or have been prohibited at an international level, according to the United Nations' list of forbidden products. The consolidated list of products which have been prohibited, withdrawn, or subject to rigorous restrictions or not approved by governments may be found at: www.who.int/medicines/library/qsm/edm-qsm-2001-3/edm-qsm-2001_3.pdf (latest version, 2001, in English).
- Pesticides or herbicides that are being gradually withdrawn from the market, or have been prohibited at an international level, according to the Rotterdam Agreement (www.pic.int) and the Stockholm Agreement (www.pops.int).
- Production of harmful substances for the ozone layer, which are being gradually withdrawn from the international market. These substances, known as ODS, are regulated by the Montreal Protocol, where a list of these substances may be found, together with the dates established as an objective for their reduction and withdrawal from the market. Some of the chemical compounds regulated by the Montreal Protocol are sprays, refrigerants, foaming agents, solvents, and fire protection agents (www.unep.org/ozone/montreal.shtml).
- Production or use of persistent organic contaminants (POC).
- Ocean fishing with nets of over 2.5 km. in length.
- Commercial logging operations with raw materials from primary tropical rainforests and primary tropical dry forest.
- Production or trade of wood or other forestry products that are not from forests managed in a sustainable manner.
- Production, trade, storage, or transportation of large volumes[9] of dangerous chemical products, or use of dangerous chemical products at a commercial scale.
- Production or activities that have an impact on the property of the land, or lands claimed by indigenous people, without full documented consent from these people.

[9] The definition of large volumes will depend of the applicable national legislation.

- Operations in protected spaces (Protected Areas)[10] with special legislation, when the operation has the potential to place the objective of creating a protected area at risk.
- Activities that involve the introduction of exotic species and/or genetically modified organisms (GMO), without having the corresponding technical studies and the authorization to enter the country provided by the relevant regulatory institutions.

In addition, CAF will not finance operations for clients or executing organizations that produce or carry out activities that involve harmful activities or forced labor[11] / child labor.

[10] In addition to the areas designated by each country, this includes, among others: natural world heritage sites (defined by the World Heritage Convention: http://whc.unesco.org/nwhc/pages/doc/main.htm), The United Nations list of national parks and protected reserves, wetlands of international importance (defined in the RAMSAR Convention: www.ramsar.org), or determined areas (for example, comprehensive natural reserves or wilderness areas, natural parks, natural monuments or habitat or species management areas) defined by the International Union for the Conservation of Nature (IUCN: www.iucn.org).

[11] Forced labor means all work or service that is not carried out voluntarily, obtained under threat of force or punishment.

VII.2. Annex 2 Tool for safeguard activation

VII.2.1. Safeguard S01 – Evaluation and management of environmental and social impacts

VII.2.1.1. Summary

Since the start, and during the development of a loan operation, CAF establishes the need to carry out: (i) environmental and social evaluations of the operations; (ii) evaluation of risks emerging from climate change; (iii) design, implementation, and follow-up of environmental and social management measures associated to the operation; and (iv) strengthening of informed, active, and timely participation of the inhabitants of the area of influence of the operations it supports.

All projects financed by CAF adjust to the environmental law of the country where the project is executed, as well as to international commitments and agreements subscribed by member countries. However, CAF may request the application of additional precautions or select internationally accepted technical referents in cases it deems necessary.

Although all relevant risks and possible environmental and social impacts must be considered in the context of the evaluation, Safeguards 2 to 8 describe the possible risks and environmental and social impacts that demand special attention that lead to complementary evaluation, management, and follow-up processes.

VII.2.1.2. Activation conditions

This Safeguard is activated for all operations

VII.2.2. Safeguard S02 – Use of renewable natural resources

VII.2.2.1. Summary

CAF promotes and safeguards the sustainable use of natural resources, manages mechanisms for the prevention, mitigation, and control of negative environmental aspects (for example: contamination, loss of agricultural land, serious draught or desertification, among others), and the enhancement of positive environmental impacts. Therefore, CAF requires the client to establish and implement measures and tools that guarantee sustainable and efficient use of resources and the application of conservation best practices.

VII.2.2.2. Activation conditions

For the activation of this safeguard, the following questions must be answered:

Criterion	YES	NO
Does the project imply construction, expansion, rehabilitation, maintenance, and/or operation of infrastructure, among others, irrigation systems, transfers from basins, dams and reservoirs, hydraulic energy production systems, or systems to capture, treat, and supply water to urban centers?		
Does the project imply the use of superficial or underground water for industrial purposes, and or mineral and hydrocarbon exploitation and/or processing , or aggregate washing processes?		
Does the project imply the use of water for large scale aquaculture? (exclude use of floating cages in bodies of water		
Does the project imply large scale agricultural crops, industrial production, livestock, and/or forestry plantations?		
Is the project implemented or would it affect dry, semi-dry, and sub-humid dry areas?		
Is the project implemented or would it affect areas that historically have presented vulnerability to droughts due to climate variability phenomena such as the cycles of El Niño and La Niña?		
Is the project implemented or would it affect areas that have conflicts in the use of water and soil resources?		
Is the project implemented or would it affect areas that, according to the available official technical information, present high levels or risks of erosion?		
Does the project imply movement of land with the removal of large volumes of soil?		

The safeguard is applicable if a response is positive in one or several questions. If the safeguard is applicable, the client is asked to include in the project's social and environmental evaluation the relevant detailed analysis established in the corresponding safeguard

VII.2.3. Safeguard S03 – Preservation of biological diversity

VII.2.3.1. Summary

CAF promotes the preservation of protected areas, critical habitats, and other sensitive areas. adjusting to the relevant legislation of the country where the operation is implemented, and to the applicable international regulations. The Institution finances projects in these areas as long as they do not affect the objectives of the creation of protected areas and the sustainability of the critical habitats and sensitive areas.

As mentioned, CAF considers it is essential that all credit operations consider possible negative impacts on the native biodiversity, as well as the design and application of measures to prevent, mitigate, control, and compensate said impacts.

VII.2.3.2. Activation conditions

For the activation of this safeguard, the following questions must be answered:

Criterion	YES	NO
Is the project implemented in natural habitats? (for example, primary forests, coral reefs).		
Can the project directly affect natural habitats?		
Is the project implemented in critical habitats? (for example mangroves, moors). Some countries have dispositions and regulations that identify habitats or ecosystems of special interest for conservation, they may be called fragile, priority, or sensitive.		
Can the project directly affect critical habitats?		
Is the project implemented in protected areas?		
Can the project directly affect protected areas?		
Is the project implemented in areas designated with international recognition resulting from the conservation value? For example, Ramsar site, natural heritage of humanity, biosphere reserve, AICA.		
Can the project directly affect areas designated with international recognition resulting from the conservation value?		
Is the project implemented in habitats that have been modified and have a significant value for biodiversity? (for example, reservoirs). These are areas that can hold populations of endemic species, species classified as in critical danger, danger, or vulnerable in the red list, or permanent or seasonal aggregations.		
Can the project directly affect modified habitats with significant value for biodiversity?		
Can the project directly or indirectly alter ecosystemic services or functions?		
Does the project include the use of live resources of the native biodiversity? That is, fishing, agricultural crops, animal farming, aquaculture, or forestry.		
Does the project include the use of tropical species? That is, agricultural crops, animal farming, aquaculture, forestry plantations.		
Does the project present the risk of introducing exotic species? For example, ports and international or intercontinental airports, urban green areas/reforestation with exotic species.		
Does the project include the use of traditional knowledge of the native biodiversity with productive or commercial purposes? For example, use of natural dyes, pharmaceutical use, cultivation or breeding of native species.		

The safeguard is applicable if the response is positive for one or several questions. If the safeguard is applicable, the client is asked to include in the project's social and environmental evaluation the relevant detailed analysis established in the corresponding safeguard

VII.2.4. Safeguard S04 – Prevention and management of contamination

VII.2.4.1. Summary

CAF recognizes that contamination is a critical factor that deteriorates the conditions of life of people and contributes to the degradation of natural resources and loss of biodiversity in the region. Consequently, CAF considers it is essential that all credit operations include measures to prevent, mitigate, and control contamination in all the environmental components, and promotes the introduction of measures in this direction for all its operations.

In addition, for industrial operations, CAF expects to integrate a reduction of contamination and consumption of natural resources into the production process, promotes the use of clean and alternative energy, and a contributes to reduce greenhouse gas emissions, all of this in the framework of cleaner production and energy efficiency.

CAF applies the precautionary principle, that is, it requests the application of additional protective measures when suspicions arise regarding certain products or technologies that can create a serious risk for public health or the environment,

VII.2.4.2. Activation conditions

For the activation of this safeguard, the following questions have to be answered:

Criterion	YES	NO
Does the project imply the construction, rehabilitation, operation, or closure of residual water management systems and/or solid residues in populated centers? (for example, sanitary sewage system, treatment plant for residual waters, waste collection and disposal system, sanitary filling).		
Does the project imply the generation and management of large quantities of contaminants? (for example, industrial residual waters, particulate matter, noise, unpleasant odors, garbage).		
Does the project imply activities related to the extraction and/or transformation of metallic or non-metallic minerals, hydrocarbons, and/or aggregate washing?		
Does the project imply the production, use, or marketing of dangerous substances? (for example, pesticides, sulfuric acid). Dangerous substances are those identified as such in the respective national listing, or through the international risk rating established in the Globally Harmonized System of Classification and Labeling for Chemical Products.		
Will the project produce and manage dangerous waste? (for example, hospital waste, mining waste, expired pesticides, heavy metals). Dangerous wastes are those identifies as such in the national listings or in international lists/catalogues (for example, the European waste list)		
Does the project imply a large scale application of pesticides? (for example, industrial monoculture, control of mosquitoes or disease vectors).		
Could the activities of the project generate environmental liabilities and/or residual impacts?		
Does the operation emit now or during its life cycle > 25 000 tons of CO_2 equivalent /		

year?		

The safeguard is applicable if the response is positive for one or several of the above questions. If the safeguard is applicable, the client is asked to include in the project's social and environmental evaluation the relevant detailed analysis established in the corresponding safeguard.

VII.2.5. Safeguard S05 – Cultural heritage

VII.2.5.1. Summary

CAF acknowledges the importance of cultural heritage for the communities, and in some cases, for the people of the world. Therefore, when there exists physical or intangible cultural heritage in the area of influence of a project, CAF requires the presentation of plans for the protection of archeological or historical resources, or sacred sites, which must be approved by the competent scientific or cultural institutions, and the relevant legislation of the respective country.

In the operations to be developed in areas with archeological or historical resources, or sacred sites for indigenous people and/or Afro-descendants, the client must guarantee their protection and avoid actions which directly or indirectly may cause harm.

VII.2.5.2. Activation conditions

For the activation of this safeguard, the following questions must be answered:

Criterion	YES	NO
Is the project being developed in areas with historical background of pre-colonial human settlements?		
Does the project include archeological prospecting, and has it reported the existence of archeological remains in the area?		
Does the project require land movement?		

The safeguard is applicable if the response is positive for one or several of the above questions. If the safeguard is applicable, the client is asked to include in the project's social and environmental evaluation the relevant detailed analysis established in the corresponding safeguard.

VII.2.6. Safeguard S06 – Ethnic groups

VII.2.6.1. Summary

CAF acknowledges the importance of human cultural diversity in the region and watches over its preservation and strengthening. In that context, for cases of projects with ethnic groups or important sacred sites in its area of influence, CAF requires the preparation of a specific Plan for said group, in order to safeguard its physical, territorial, social, cultural, and economic integrity; CAF also requires that the operation ensures a consultation and participation process that is free and informed, to provide benefits that are culturally appropriate.

VII.2.6.2. Activation conditions

For the activation of this Safeguard, the following questions must be answered:

Criterion	YES	NO
Does the project have an influence on legally constituted indigenous territories?		
Does the project have an influence on indigenous communities?		
Does the project directly affect indigenous families?		
Does the project affect areas normally used for indigenous people to hunt, fish, or gather food?		

The safeguard is applicable if the response is positive for one or several of the above questions. If the safeguard is applicable, the client is asked to include in the project's social and environmental evaluation the relevant detailed analysis established in the corresponding safeguard

VII.2.7. Safeguard S07 – Resettlement

VII.2.7.1. Summary

For operations that require the purchase or use of lands that imply physical or economic displacement of people who reside there, and/or derive their sustenance, as well as resettlement and/or relocation of human groups, CAF requires the development of a Resettlement Plan and/or a Plan for the Reestablishment of Socioeconomic Conditions, in order to improve, or at least reestablish the life conditions of those displaced. CAF also requires from organizations and entities that develop a project or activity over a territory, causing compulsory displacement, to resettle the people to reduce the risk of impoverishment and deterioration of the quality of life of those who will continue living in the place, as well as the receiving population.

VII.2.7.2. Activation conditions

For the activation of this Safeguard, the following questions must be answered:

Criterion	YES	NO
Does the project require the purchase of land for its implementation? (the answer is yes even if only one property needs to be purchased).		

The safeguard is applicable if the response is positive for the above questions. If the safeguard is applicable, the client is asked to include in the project's social and environmental evaluation the relevant detailed analysis established in the corresponding safeguard.

VII.2.8. Safeguard S08 – Working and training conditions

VII.2.8.1. Summary

CAF safeguards people's voluntary work, dignified and fair, and ensures that workers in the projects enjoy safe and healthy conditions through prevention and control of diseases and accidents, and the elimination of factors and conditions that endanger health and safety at work.

CAF does not finance projects that imply direct or indirect exploitation of minors

In addition, CAF promotes worker training in the operations it finances.

VII.2.8.2. Activation conditions

For the activation of this Safeguard, the following questions must be answered:

Criterion	YES	NO
Does the project have associated occupational risks that are inherent to the activities carried out in the construction and/or operation phases? (for example, electrical risks, physical risks, mechanical risks, chemical risks, psychosocial risks, biological risks, and/or ergonomic risks).		
Does the project imply high risk activities such as work in confined spaces, work at height, high power electric works, hot work, lifting cargo, and/or excavations?		
Does the project imply production, storage, use and/or trading of dangerous chemical products? (for example, solvents, acids, pesticides). Dangerous chemical products are those with corrosive, reactive, explosive, toxic, inflammable, and/or bio-infectious characteristics, and are identified in the national listings or through the international risk rating established in the Globally Harmonized System of Classification and Labeling for Chemical Products.		
Does the project, due to its characteristics, have associated risks such as fire, explosion, flood, leak of toxic, irritant, or corrosive gasses, spills (uncontrolled) of dangerous chemical products?		
Does the project, due to its characteristics, have associated risks relative to the presence of forced labor or child labor?		
Does the project generate or manage dangerous residues defined as such by the respective national legislation?		

The safeguard is applicable if the response is positive for one or several of the above questions. If the safeguard is applicable, the client is asked to include in the project's social and environmental evaluation the relevant detailed analysis established in the corresponding safeguard.

VII.2.9. Safeguard S09 – Gender equity

VII.2.9.1. Summary

CAF watches over gender equity in the operations it finances. Therefore, it requires that in the operations it finances there is no gender discrimination, it promotes access of women to decision making jobs, and equal remuneration for men and women in similar jobs, as well as positive differentiation toward women in situations of noticeable vulnerability, risk, or inequality.

VII.2.9.2. Activation conditions

For the activation of this Safeguard, the following questions must be answered:

Criterion	YES	NO
Does the project/program negatively affect groups or sectors of women or gender equity?		
Has the project/program been designed specifically to promote gender equity or women's empowerment?		
Does the project/program present opportunities to promote gender equity or the empowerment of women through any of its components?		

The safeguard is applicable if the response is positive for one or several of the above questions. If the safeguard is applicable, the client is asked to include in the project's social and environmental evaluation the relevant detailed analysis established in the corresponding safeguard.

SAFEGUARD S02 SUSTAINABLE USE OF RENEWABLE NATURAL RESOURCES

I. INTRODUCTION

Water, the soil, and the biota are comprehensive elements of the ecosystems. They are renewable natural resources that are essential for human survival. Latin America and the Caribbean is a region which is rich in water and fertile soil. However, bad productive and extractive practices, disorganized urban development, inadequate introduction of technology and exotic organisms, and lack of control have accelerated the degradation of these valuable resources.

The region has one third of the planet's internal renewable water resources[12] (that is, 13.5 trillion m^3/year). Annual extraction reaches 245 billion m^3/year, of which 71 percent is aimed at agriculture[13] (including irrigation, stockbreeding, and aquaculture), 17 percent for municipal use[14], and 12 percent for industrial use. The dams of the region have the capacity to store close to 1.1 trillion m^3, although this storage capacity is concentrated in South America[15] (close to 94 percent). However, the availability of the water resource is very different in the region. The greatest availability is in Brazil and the Andean area, while the lowest availability is in the Caribbean and Mexico. In 2014[16], Brazil's availability reached [17] 42,800 m^3 $inhabitant^{-1}$ $year^{-1}$, while in the other extreme, Barbados' availability only reached 279.7 m^3 $inhabitant^{-1}$ $year^{-1}$. Within countries, that are also areas with a severe lack of water, such as the Peruvian coast, the Bolivian highlands, the Central American Pacific coast, and most of Mexico.

Managing of water resources requires collaboration between countries. The American continent has 84 of the 286 cross-border hydrographic basins[18] in the planet (39 are in South America). The largest cross-border basins of the region are those of the Amazon river (shared by nine countries), the Plata basin (shared by five countries), and the Orinoco basin (shared by four countries).

Latin America and the Caribbean also have large underground water reserves. Among these, the Guarani Aquifer, which is a cross-border system which encompasses 1.1 million $km^{2,}$ shared by Argentina, Brazil, Paraguay, and Uruguay. As with superficial waters, many aquifers are shared resources, Until 2009, 63 cross-border aquifers had been identified in the region.[19] [20].

[12] AQUASTAT 2015. América del Sur, Centroamérica y Caribe en comparación con el mundo. http://www.fao.org/nr/water/aquastat/countries_regions/americas/index.stm

[13] AQUASTAT 2015. Extracción de agua por sector. http://www.fao.org/nr/water/aquastat/countries_regions/americas/index.stm

[14] Water extracted for direct use of the population, may include the part used by industries and urban agriculture connected to the municipal network.

[15] AQUASTAT 2015. Presas. http://www.fao.org/nr/water/aquastat/countries_regions/americas/index.stm

[16] AQUASTAT statistics.

[17] Total per capita renewable water resources.

[18] Transboundary Waters Assessment Programme. http://twap-rivers.org.

[19] 18 cross-border aquifers in Central America, 4 in the Caribbean, 30 in South America, and 11 shared between Mexico and the United States of America.

[20] UNESCO. 2010. Aspectos socioeconómicos, ambientales y climáticos de los sistemas acuíferos transfronterizos de las Américas. Serie ISARM Américas 3. United Nations Organization for Education and Diversification, Science, and Culture (UNESCO) Uruguay: 544.

Surface and groundwater resources are under pressure due to the growth in the demand for water, contamination, and the degradation of water sources. Added to this is climate change, which may alter the region's hydric cycle. Underground water becomes more important as the availability of surface water becomes unreliable. However, world reserves are decreasing in the main aquifers of the world[21] (including the Guarani aquifer).

With respect to agricultural land, Latin America and the Caribbean have the greatest reserves in the planet. At the start of 2000, it was estimated that the region had 1.066 billion hectares suited for dry farming , of which 203 million were used.[22] However, there is a serious and accelerated degradation of the soil resulting from agricultural bad practices, intensive use of pesticides, deforestation, and erosion. Fourteen percent of the world surface affected by degradation of the soil is in the region, and it is estimated that it affects close to 150 million people.[23] It has been calculated that in South and Central America, respectively, 45 percent and 74 percent of the ground is degraded.[24] Guatemala is the country with the largest extension of degraded land (51 percent of the national territory). Agricultural land is also lost due to contamination from several sources (for example, mining), and conversion to other land uses (for example, urbanization, infrastructure works).

Desertification is a serious threat in the region, as 25 percent of the territory is made up of arid, semi-arid, and dry sub-humid areas, of which 18 percent is degraded.[25] It is estimated that of the arid agricultural areas, 17 percent of the land with irrigation is degraded, plus 31 percent of the dry farming areas, and 76 percent of pastures.[26] In addition to this, the impact of climate change could intensify desertification through the alteration of temperatures, rains, solar radiation, and winds. It is believed that climate change will cause the salinization and desertification of agricultural lands in the driest areas of Latin America.[27]

CAF acknowledges that it is essential to use water and land resources in a sustainable manner, and fight against contamination, loss of agricultural land, and severe draught or desertification. This safeguard contributes to the implementation of several international instruments that have been subscribed by the countries of the region, among them:

1. The United Nations Convention to Fight Against Desertification in countries affected by serious droughts or desertification, particularly Africa.
2. The Agreement on Biological Diversity.

[21] Famiglietti, J.S. 2014. The global groundwater crisis. Nat.Clim.Change 4(11): 945–948.
Richey, A.S., Thomas,B. F., Lo, M., Reager, J. T.J., Famiglietti, S., Voss, K., Swenson, S. & M. Rodell. 2015. Quantifying renewable groundwater stress with GRACE, Water Resour. Res. 51: 5217–5238.

[22] FAO. 2002. Agricultura mundial: hacia los años 2015/2030. Summarized report. United Nations Food and Agriculture Organization (FAO). Rome, Italy: 97 pp.

[23] UNEP. 2010. Perspectivas del medio ambiente: América Latina y el Caribe GEO ALC 3. United Nations Environmental Programme (UNEP). Regional Office for Latin America and the Caribbean. Panama City, Panama: 375 pp.

[24] Santibáñez, F. & P. Santibáñez. 2007. Trends in Land Degradation in Latin America and the Caribbean, the Role of Climate Change. Pages 65-81 in Sivakumar, M. V. & N. Ndiang'Ui (eds.) Climate and land degradation. Springer Science & Business Media.

[25] Zika, M. & K.H. Erb. 2009. The global loss of net primary production resulting from human-induced soil degradation in dry lands. Ecological Economics 69(2): 310-388.

[26] GIZ. 2012. Fact sheet desertification Latin America & the Caribbean. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Bonn, Germany: 2 pp.

[27] OMT. 2007. Cambio climático y desertificación. World Meteorological Organization (WMO). Geneva, Switzerland: 4 pp.

3. The United Nations Convention on Climate Change.
4. Law on Cross-Border Aquifers.[28]

II. DEFINITIONS

Aquifer, is a permeable geological formation which carries water, located in a less permeable layer, with the water contained in the saturated area of the formation [Law on Cross-border Aquifers].

Cross-border aquifer or cross-border aquifer system, is an aquifer or aquifer system with parts located in different States [Law on Cross-border Aquifers].

Afforestation, is the plantation of new forests in lands which historically have not had tree cover [Intergovernmental Panel on Climate Change (IPCC)].

Desertification, is the degradation of the soil in arid, semi-arid, and dry sub-humid zones, resulting from diverse factors such as climate variability and human activities [United Nations Convention to Combat Desertification in countries affected by severe droughts or desertification, particularly in Africa].

Comprehensive Management of Water Resources, is a process that promotes a coordinated management and development of water and related resources, in order to maximize the resulting social and economic wellbeing in an equitable manner, without compromising the sustainability of vital ecosystems. Source: Technical Committee of the International Water Association.

Natural habitat, are areas made up by a series of viable plant and animal species, most of the them native, or where human activity has not produced any substantial modification of the primary ecological functions or of the composition of the species in the area.

Fight against desertification, activities that are part of the comprehensive use of the soil in arid, semi-arid, and dry sub-humid zones for sustainable development. Their objective is to: (i) prevent or reduce soil degradation; (ii) rehabilitation of soils partially degraded; (iii) recovery of desertified lands [United Nations Convention to Combat Desertification in countries affected by severe droughts or desertification, particularly in Africa].

Forest plantations, are forest stands established through plantation and/or seeding during the forestation or reforestation process. They may include: (i) introduced species (all planted stands); or native stands subject to intensive exploitation, complying with the following requirements: one or two species at the time of planting, with a homogenous age and regular spacing [United Nations Food and Agricultural Organization].[29]

Endogenous precipitations, rain within the borders of a country [United Nations Food and Agricultural Organization].

[28] A/RES/63/124 Resolution of the General Assembly of the United Nations, approved in 2008.

[29] FAO. 1999. Modelo de suministro mundial de fibras. [United Nations Food and Agricultural Organization]. (FAO). Rome, Italy: 141 pp.

Renewable internal water resources, the conventional measure of fresh water available in a country (surface and ground water), including resources coming from rain within national frontiers. Excludes cross-border and fossil water resources [United Nations Food and Agricultural Organization].

Total renewable water resources, the maximum theoretical amount of water really available each year in a country at a determined time [United Nations Food and Agricultural Organization, AQUASTAT].

Total per capita renewable water resources, total real renewable water resources per inhabitant per year (m^3 $inhabitant^{-1}$ $year^{-1}$).

Drought, is the natural phenomenon that happens when rains have been considerably inferior than the normal levels registered, causing an acute water imbalance that harms the production systems of soil resources [United Nations Convention to fight against desertification in countries affected by serious droughts or desertification, particularly Africa].

Aquifer system, is series of two or more aquifers that are hydraulically connected [Law on Cross-Border Aquifers].

Soil, top covering layer of soil, thin and vulnerable. Made up of mineral particles, organic material, microorganisms, water, and air [United Nations Food and Agricultural Organization].

Soil, the bio-productive land system that comprises the soil, vegetation, other components of the biota, and the ecological and hydrologic processes that develop in the system [United Nations Convention to fight against desertification in countries affected by serious droughts or desertification, particularly Africa].

Agricultural land, the farming land, dedicated to permanent crops or prairies.

Sustainable use, use of components from the biological diversity in a manner and at a pace that does not enable a long term reduction of biological diversity, thus maintaining its possibilities of satisfying the needs and aspirations of current and future generations [Biological Diversity Agreement].

Download Zone, is the area through which water coming from aquifers flows up to its exit points, such as a water stream, lake, oasis, wetland, or ocean [Law on Cross-border Aquifers].

Arid, semi-arid, and dry sub-humid zones, those in which the proportion between annual precipitation and potential evapotranspiration ranges between 0.05 and 0,65, excluding the polar and sub-polar regions [United Nations Convention to fight against desertification in countries affected by serious droughts or desertification, particularly Africa].

III. OBJECTIVES

Prevent projects financed by CAF to cause degradation of water and soil resources.

IV. SCOPE

This safeguard applies to all credit operations that imply the construction, expansion, rehabilitation, maintenance, and/or operation of infrastructure, or the use of water and soil resources for their development with public and private clients in the following types of projects:

(1) Construction, rehabilitation, maintenance, and/or operation of:
   a. Irrigation systems,
   b. Basin transfers,
   c. Water dams and reservoirs,
   d. Hydro energy production systems,
   e. Water intake, treatment, and supply systems for urban centers.

(2) Use of surface or ground water for industrial purposes (for example, cooling towers, process water), and mining and hydrocarbon processes.

(3) Use of fresh or salt water, surface or ground, for large scale aquaculture[30] (for example, pools for fish or shrimp breeding).

(4) Large scale and industrial crops (for example, cotton, sugar cane, quinoa, cereals, grasses, fodder grasses, cocoa, biofuels, African palm), large scale animal farming, and forestry plantations.

(5) Projects that imply the conversion (change in the use of the soil) of large extensions of agricultural lands (for example, urbanization), or the movement of large volumes of soil that imply loss of soil (for example, refineries, aqueducts, railroad lines, highways).

The applicability of the safeguard is determined during all the phases of CAF's credit cycle, with special attention durring the project's social and environmental evaluation process (Safeguard 1). Special attention will be given to the projects that intervene in (i) basin headwaters and sources of water; (ii) aquifer recharge and discharge zones; (iii) arid, semi-arid, and dry sub-humid zones; (iv) areas that have historically presented vulnerability to droughts resulting from climate variability such as the cycle of El Niño/La Niña; (v) areas with conflicts in the use of water and/or soil resources; (vi) zones with high levels or risks of erosion according to the available official technical information. In cases where there are areas with high value for conservation, the conservation of biodiversity safeguard will also be applied.

V. REQUIREMENTS

As part of the project's social and environmental evaluation, the client will:

1. Guarantee that the sources of water will not be affected negatively, and there will not be any continuous or permanent deterioration (for example, headwaters, high Andean lakes, moors) of aquifer recharge and discharge zones.

2. Ensure a sustainable use of resources and use of the lowest possible amount of water, and that total consumption (for example, surface and ground water) is within the limits of the resources availability, and that it will not alter the hydrological cycle of the hydrographic basin.

[30] Excludes the house of floating cages in natural or artificial bodies of water.

3. Evaluate the direct, synergic, and/or cumulative affectation of the project in terms of the availability of water for other users, and the probability of generating conflicts or tension in the area.
4. Present evidence that local inhabitants are aware of the need to use the water resource.
5. Present evidence of compliance with national, regional, and local regulations for the use of the water resource.
6. Guarantee that the project is framed within the principles and practices of comprehensive management of water resources.
7. Analyze the characteristics and quality of the soil to ensure that crops are appropriate for the productive conditions and capacity of the location.
8. Propose measures to minimize the withdrawal of soil and adequately manage it.
9. Present evidence that the local inhabitants are aware of the need to use the soil resource.
10. Present evidence of compliance with national, regional, and local regulations regarding the use of the soil resource.

The client will design and apply, as needed, measures to:

1. Ensure an efficient use of the water, reducing consumption to a bare minimum.
2. Apply best practices for the conservation of water (for example, reuse, efficiency, adequate take-in and storage).
3. Apply best practices for the conservation of the soil (for example, zero tillage, soil storage in cases of operations that involve ground movement), and prevention and control of erosion and soil degradation.

When the project develops in, or may affect arid, semi-arid, or dry sub-humid areas, the client must apply comprehensive measures for the conservation of water and soil, to protect the soil from erosion, salinization, and other forms of degradation. Where relevant, practices will be implemented to control grazing, recovery of soils, reforestation, and afforestation, among others. The client will guarantee that the project is framed in the national dispositions and plans to combat desertification and mitigate the effects of droughts.

When the project uses resources from cross-border basins and aquifers, the client will guarantee that the project is framed within the national regulations and agreements between countries.

The project will include a monitoring plan that provides information on the efficiency of the project regarding the use of water and soil and the impact of the measures applied. Some key indicators to consider are: (i) the amount and quality of the water used in the project; (ii) efficiency in the use of water (for example, volume of water used per production unit; (iii) surface of land recovered or protected from erosion; and (iv) number of conflicts related to the use of water or soil.

VI. PROCEDURE

CAF will conduct a follow-up of the documentation prepared by the client, considering the description below for each phase of the credit cycle.

VI.1. Origination

In the origination phase (at the time the credit es requested) the client will provide information to enable the identification of whether the project is within the scope of application of this safeguard. In the preliminary analysis of environmental and social risks, the corresponding Environmental Executive will analyze the information and indicate if this safeguard is applicable. The application of the safeguard will be based on the questions established in annex 2 of S01.

VI.2. Evaluation

In the evaluation phase, once in has been included in the inventory of operations, the client will present the social and environmental evaluation studies, The studies will also verify compliance of the applicable national regulation and of the relevant international commitments that the country has adopted, as well as the subjects included in the key questions considered for the application of the safeguard.

VI.3. Formalization

In the formalization phase, (before signing the credit contract), it must be ensured that the contract includes specific commitments for water and soil conservation, as deemed relevant.

VI.4. Administration

In the administration phase, (during the implementation of the project), the client will implement the measures agreed upon, including monitoring compliance and performance indicators. The client will present advance reports with the frequency established in the contract. The report will be a public document, available for all interested parties. CAF will review the reports and, if necessary, will propose the corrective or complementary measures needed.

At the close of the project, the client must present a final evaluation that verifies the specific compliance of the results and the direct and indirect impacts that have been generated, and will identify the lessons learned and identified best practices. The final evaluation will serve as input for the preparation of the final environmental and social follow-up report, and for the closing report of the Program.

SAFEGUARD S03 CONSERVATION OF BIOLOGICAL DIVERSITY

I. INTRODUCTION

CAF acknowledges that conservation of biological or biodiversity is essential to maintain life in the planet and to sustain development in the countries and the wellbeing of people.

The region of Latin America and the Caribbean is rich in biodiversity. It includes six of the 17 mega-diverse countries of the world (Brazil, Colombia, Ecuador, Mexico, Peru, and Venezuela), and 70 percent of the mammals, birds, amphibians, plants, and insects of the planet.[31] The region houses 50 percent of the known amphibious species, and 41 percent of bird species. In addition, 49 centers of diversity and endemic plants have been identified.[32] The region is the center of corn and potato domestication, two essential crops for world food, and also of cocoa, whose world value chain produces and processes close to four million tons per year. It is estimated that there are close to 4,000 native varieties of potato in the Andes in Bolivia, Ecuador, and Peru, and about 151 species of wild potatoes in all the region.

Marine biodiversity is also important. To date, about 13,656 marine species have been identified in South America, of which 22 percent are endemic.[33] Marine biodiversity has been important for the development of the region. For example, anchovy fishery (*Engraulis ringens*), developed mainly in Peru and in the north of Chile, is the largest fishery in the history of humanity. The maximum yield in 1971 reached 13 million tons per year. It currently constitutes 10 percent of the world capture.

Despite the wealth and value of biodiversity, there are strong pressures on ecosystems, wild species, and genetic diversity. The strongest pressures on land environments are degradation, fragmentation, and loss of habitats generated by land conversion which is generated by several causes such as the expansion of farming production frontier, contamination of many sources, impact of infrastructure works, and introduction of invasive exotic species, such as the tilapia fish[34] in its different species and hybrids, and the giant African snail[35] (*Achatina fulica*). Coastal and

[31] UNEP. 2010. Perspectivas del medio ambiente: América Latina y el Caribe GEO ALC 3. United Nation environmental Programme (UNEP). Regional Office for Latin America and the Caribbean. Panama City. Panama: 375 pp.

[32] Davis, S.D., Heywood, V.H., Herrera-MacBryde, O., Villa-Lobos, J. & A. Hamilton (eds.) 1997. Centres of Plant Diversity: A Guide and Strategy for Their Conservation. Volume 3: The Americas. IUCN Publications Unit, Cambridge, England. http://botany.si.edu/projects/cpd/.

[33] Miloslavich, P., Klein, E., Díaz, J.M., Hernández, C.E., Bigatti, G., Campos, L., Artigas, F., Castillo, J., Penchaszadeh, P.E., Neill, P.E., Carranza, A., Retana, M.V., Días de Astarloa, J.M., Lewis, M., Yorio, P., Piriz, M.L., Rodriguez, D., Yoneshigue-Valenting, Y., Gamboa, L. & A. Martin. 2011. Marine Biodiversity in the Atlantic and Pacific Coasts of South America: Knowledge and Gaps. PLoS ONE 6(1): e14631. doi:10.1371/journal.pone.0014631

[34] Canonico, G.C., Arthington, A., McCrary, J.K. & M.L. Thieme. 2005. The effects of introduced tilapias on native biodiversity. Aquatic Conservation: Marine and Freshwater Ecosystems 15(5): 463-483. Applies for Orechromis spp and/or its hybrids.

[35] Thiengo, S. C., Faraco, F. A., Salgado, N. C., Cowie, R. H. & M.A. Fernandez. 2007. Rapid spread of an invasive snail in South America: the giant African snail, Achatina fulica, in Brasil. Biological Invasions 9(6): 693-702.

marine environments also suffer strong pressure from changes in the coastline, contaminating land and marine sources, intense fishing pressure, impacts of aquaculture, and introduction of invasive exotic species.

It is estimated that climate change may accentuate the risks faced by biodiversity in the region, altering the processes and functions of ecosystems, and accelerating the processes of extinction of species.

Consequently, CAF considers it is essential that all credit operations consider their possible negative impacts on native biodiversity, and that measures are designed and applied to revert and mitigate these impacts. This safeguard is in line with the objectives of several international instruments that have been subscribed by the countries of the region, such as:

1. Convention on Biological Diversity.
2. Convention on Wetlands of International Importance, especially as Habitat for Water Birds (Ramsar Convention).
3. Convention on International Trade in Endangered Species of Wild Fauna and Flora, (CITES).
4. Convention for the protection of the world cultural and natural heritage
5. United Nations Convention to Combat Desertification.
6. International Plant Protection Convention
7. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Agreement).
8. Inter-American Convention for the Protection of Marine Turtles.
9. Agreement on the Conservation of Albatrosses and Petrels.

II. DEFINITIONS

Important Bird and Biodiversity Area (IBA), is a coastal o marine land area which has been identified based on standardized technical criteria that considers the presence of species or groups of birds that are a priority for conservation.

Protected Area, is a geographically defined area that has been designed or regulated and managed in order to reach specific conservation objectives [Agreement on Biological Diversity[36]].

Compensation for biodiversity, are measurable conservation results produced by actions designed to compensate significant and adverse residual impacts on biodiversity, resulting from the development of projects, after the adequate prevention and mitigation measures have been taken. The objective of compensation for biodiversity is to achieve Zero Net Loss and preferably Net Gains in biodiversity on the site, with respect to composition of species, structure of habitats, function of

Vogler, R.E., Beltramino, A.A., Sede, M.M., Gregoric, D.E. G., Núñez, V. & A. Rumi. 2013. The Giant African snail, Achatina fulica (Gastropoda: Achatinidae): using bioclimatic models to identify South American areas susceptible to invasion. American Malacological Bulletin 31(1): 39-50.

[36] Agreement on Biological Diversity. UN, 1992. Its objectives are the conservation of biological diversity, the sustainable use of its components, and a fair and equitable participation in the benefits derived from the use of genetic resources through, among other things, adequate access to these resources and an appropriate transfer of relevant technologies, considering all the rights over those resources and technologies, as well as through appropriate financing.

the ecosystem, and use of people and cultural values associated to biodiversity [Standard on Biodiversity Offsets[37]].

Traditional knowledge, refers to knowledge, innovations, and practices of indigenous and local communities around the world. Developed from the experience of centuries, and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. It tends to be owned collectively, and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices, including the development of plant species and animal races. Sometimes, it is called an oral tradition because it is practiced, sung, danced, painted, carved, and practiced for millennia. Traditional knowledge is mainly practical, particularly in fields like agriculture, fisheries, health, horticulture, and environmental management in general [Secretariat of the Agreement on Biological Biodiversity].

Ex situ conservation, refers to the conservation of components of the biological diversity outside of their natural habitats [Agreement on Biological Biodiversity].

In situ conservation, refers to the conservation of ecosystems and natural habitats, and the maintenance and recovery of viable populations of species in their natural environment and, in the case of domesticated or cultivated species, in the environments in which they have developed their specific characteristics [Agreement on Biological Diversity].

Biological Diversity, is the variability of live organisms from any source, included, among other things, land and marine ecosystems and other aquatic ecosystems and ecological complexes of which they are part: it includes diversity within each species, between species, and of the ecosystems [Agreement on Biological Diversity].

Ecosystem, refers to a dynamic complex of plants, animals, and microorganisms communities and their non-living environment, which interact as a functional unit [Agreement on Biological Diversity].

Ecosystem approach, is a strategy for the comprehensive management of land, water, and live resources that promotes conservation and equitable sustainable use[38] [Decision V/6 of the Conference of the Parties of the Agreement on Biological Diversity].

Exotic species, refers to the species, sub-species, or lower taxon, introduced outside of its past or present natural distribution: it includes any part, gamete, seed, egg, or propagule of said species, that may survive and subsequently reproduce itself [Decision VI/23 Conference of the Parties of the Agreement on Biological Diversity].

Invasive exotic species, refers to an exotic species whose introduction and/or dispersion threatens biological diversity [Decision VI/23 Conference of the Parties of the Agreement on Biological Diversity].

[37] BBOP. 2012. Standard on Biodiversity Offsets. Business and Biodiversity Offsets Programme (BBOP). Forest Trends, Washington, D.C., USA: 22pp. Online: http://www.forest-trends.org/documents/files/doc_3078.pdf
BBOP. 2012. Glossary. 2nd updated edition. Business and Biodiversity Offsets Programme (BBOP). Forest Trends, Washington, D.C., USA: 46pp. Online: http://www.forest-trends.org/documents/files/doc_3100.pdf

[38] Decision VII/11 adopted the principles to make the ecosystem approach operational.

Habitat, is a place or type of environment which naturally has an organism or population [Agreement on Biological Diversity].

Artificial habitat, refers to modified structures, constructions, or spaces that have a purpose for people. Examples of these habitats are cities, forest plantations, agricultural monocultures, dams, and sunken ships, among others. Some species of the native biodiversity may colonize and use these spaces.

Critical habitat, refers to areas with a high biodiversity value, such as i) habitats with a significant importance for the survival of threatened or critically threatened species; ii) habitats with a significant importance for the survival of endemic species or species restricted to certain areas; iii) habitats that, at a world level, sustain the survival of significant concentrations of migratory species or species that congregate; iv) unique or highly threatened ecosystems, or v) areas associated to key evolutionary processes

Modified habitat with significant value for diversity, these are habitats that have lost their natural condition due to human intervention or artificial habitats that house endangered or endemic species, or which are used by local or migratory species as part of their life cycle, contributing to maintain viable populations and functional ecosystems. These habitats may include dams, aquaculture pools, agricultural crops, forest plantations, artificial reefs, and sunken ships, among others.

Natural habitat, refers to areas made up by a viable group of plant or animal species, most of them native, o where human activity has not produced any substantial modification of the primary ecological functions, or of the composition of the species in the area.

Environmental impact, refers to the alteration of the environment, produced directly or indirectly by a project or activity in a determined area.

Cumulative environmental impact, is the result of all the impacts that occurred in the past or which are occurring in the present.

Direct environmental impact, is the environmental impact caused by an action of the project.

Indirect environmental impact, is the impact resulting from the effect produced by an action of the project.

Residual environmental impact, is the one that persists after the application of mitigation measures.

Synergic environmental impact, is created when the joint effect of impacts has a greater incidence than the sum of individual impacts.

Red list, the IUCN`s Red List of Threatened Species (also called Red List or Red Book) is a globally recognized tools that provides information and analysis on the status, trends, and threats on species, to inform and catalyze actions for the conservation of biodiversity. Species are classified in nine categories: extinct, extinct in the wilderness, in critical danger, in danger, vulnerable, almost

threatened, minor concern, insufficient data, and not evaluated. The evaluation of the conservation status of a species at a world level, is published in the red list`s web site (www.iucnredlist.org). Several countries have individual evaluations that provide specific information on the conservation status of the species in their territory.

Live modified organism, refers to any live organism that has a new combination of genetic material, obtained through the application of modern biotechnology [Cartagena Protocol on biotechnology safety, of the Agreement on Biological Diversity].

Illegal fishing, are fishing activities: (i) carried out by national or foreign vessels in waters under the jurisdiction of one State, without its permission, or defying its laws and regulations; (ii) carried out by vessels that hoist the flags of States that are part of a competent fishing regional management organization, but work in defiance of the conservation and management measures adopted by said organization, by virtue of which the States are supposed to comply, or the relevant dispositions of the applicable international laws; or (iii) in violation of national laws or international obligations, including those contracted by the partner States with respect to a regional organization for a competent fishing management [FAO. International action plan to prevent, discourage, and eliminate illegal, non-reported, and non-regulated fishing].

Non-reported fishing, are fishing activities that; (i) have not been reported, or have been inaccurately reported to the competent national authority, defying the national laws and regulations; or (ii) executed in the area of competence of a regional organization for competent fishing management, which have not been reported or have been inaccurately reported, in defiance of the reporting procedures of said organization [FAO. International action plan to prevent, discourage, or eliminate illegal, non-reported, or non-regulated fishing].

Non-regulated fishing, refers to fishing activities: (i) in the area of application of a regional organization for competent fishing management, carried out by vessels without nationality, or by vessels hoisting the flag of a State that is not part of that organization, or a fishing entity, in a manner that is not in accordance with the conservation and management of said organization, or that defies it; or (ii) in areas or related to populations of fish for which there are no conservation or management measures that can be applied, and where such fishing activities are not in accordance with the responsibilities relative to the conservation of live marine resources that are the responsibility of the State by virtue of international laws [FAO. International action plan to prevent, mitigate, and eliminate illegal, non-reported, and non-regulated fishing].

Plan for the conservation of biodiversity, is the set of specific measures to prevent, minimize, mitigate, and compensate the negative impacts generated by public or private projects financed by CAF. The plan is made up of a series of measures, each with the respective indicators for compliance, goals, activities, timeline, responsible individuals, and budget.

Resilience, capacity of a system, community, or partnership potentially exposed to threats, resisting or changing in order to achieve and maintain an acceptable level of functioning and structure.

Resilience of the ecosystem, the degree of disturbance that an ecosystem can withstand without surpassing the threshold to become a different structure or provide different products. The capacity

to recover depends on the ecological dynamics, as well as the institutional and organizational human capacity to understand, manage, and respond to these dynamics.

Ecosystemic services, refers to the benefits obtained by individuals from the ecosystems. These include provision of services such as food and water, regulatory services such as flood control, droughts, land degradation and diseases, support services such as soil formation and cycle of nutrients, and cultural services such as recreation and other intangible benefits such as religious and spiritual value [Evaluation of the ecosystems of the millennium].

Sustainable use, refers to the use of components of the biological diversity in such a way and at a pace that does not reduce biological diversity in the long-term, maintaining its possibilities to satisfy the needs and aspirations of current and future generations [Agreement on Biological Diversity].

III. OBJECTIVES

1. Preserve native biodiversity and the integrity of ecosystems.
2. Prevent, and when this is not possible, minimize, mitigate, and compensate the negative impacts generated by public and private operations financed by CAF.

IV. SCOPE

This safeguard applies to all credit operations with public and private clients, that may generate negative impacts on the native biodiversity. The applicability of the safeguard is determined during all the phases of CAF's credit cycle, with special attention during the process of evaluation of environmental and social impacts of the project (safeguard 1).

This safeguard is applied to the operations:

(1) that are located in (i) natural habitats; (ii) critical habitats; and (iii) modified habitats with significant value for biodiversity,
(2) that may negatively affect ecosystemic services and functions,
(3) that include the use of live natural resources (for example, fishing, agriculture, animal farming, aquaculture, forestry), or
(4) that imply the use and trade of traditional knowledge relative to the native biodiversity.

V. REQUIREMENTS

V.1. General

In the process to evaluate environmental and social impacts (safeguard S01), the client will identify and evaluate risks, threats, and impacts that the project may have on the biodiversity. Possible negative direct, indirect, synergic, and cumulative impacts must be identified. Critical factors to consider are fragmentation and degradation of the habitat, loss of habitat, change in the use of the soil, alteration of natural processes (for example, deviation of water courses, alteration of water flows, nutrients, and sediments), over-exploitation of live natural resources (for example, fishing, hunting, gathering of wild flora and fauna), introduction of exotic species, formation of barriers that

limit the movement of animals and ecosystemic connectivity, and use of traditional knowledge regarding native biodiversity.

The main priority is to avoid the potential negative impacts of the project, so effective preventive measures must be included for direct, indirect, synergic, and cumulative impacts. Only if it is not possible to avoid these types of impacts, measures must be taken to reduce, temper, or mitigate the potential negative impacts of the project. Finally, if reduction and mitigation measures are not enough, and residual environmental impacts persist, the effects on biodiversity, or its loss, will be compensated.

Compensation for biodiversity must be used as a last resource, in case the original natural condition observed before the work or intervention cannot be recovered. The objective of the compensation for biodiversity will be to achieve a net gain or zero net loss of the negative impacts on biodiversity in natural and critical habitats. Determining the compensation for biodiversity will be carried out based on the relevant national regulation. If there is no national regulation, compensation for biodiversity will be based on the standard developed by the Business and Biodiversity Offsets Programme[39] (BBOP), the compensation policy for biodiversity of the International Union for the Conservation of Nature[40] (IUCN), and the guidelines regarding this subject of the Organization for Economic Cooperation and Development (OECD).

The client must ensure that access and/or commercialization of traditional knowledge is carried out in fair conditions and in compliance with the commitments and agreements in the framework of the Agreement on Biological Diversity)(article 8j) and other relevant international instruments.[41] In projects that imply use of traditional knowledge, on native biodiversity, this safeguard will be complemented with the safeguard on indigenous peoples.

V.2. Conservation of biodiversity

V.2.1. Projects that affect natural habitats

Projects must not modify, fragment, or degrade natural habitats unless the client can demonstrate that there is compliance with three of the following elements:

1. There are no other viable technical and cost-effective alternatives for the development of the projects within modified habitats.
2. Effective preventive measures have been designed for direct, indirect, synergic, and cumulative negative impacts and, if necessary, impact mitigation measures, When there is net loss of biodiversity, the promoter must implement the compensation for biodiversity.
3. The opinions and concerns of the affected communities have been identified and addressed in the design of the preventive and mitigation measures for negative direct, indirect, synergic, and cumulative impacts. The consultation process will be framed in the dispositions established in safeguard 1 for the evaluation and management of environmental and social impacts.

[39] http://bbop.forest-trends.org/

[40] http://www.iucn.org/about/work/programmes/business/bbp_work/collaborative_platforms/www_iucn_org_offsets/

[41] It is recommended that it is previously agreed upon by the environmental authority and the client, and communicated to the promoter of the works.

4. The risk of escape and dispersion of exotic invasive or potentially invasive species is eliminated.

When applying the precautionary approach, when there is danger that the negative impacts of the project may be highly significant, that, is, that they can cause irreversible, profound, and/or severe damages, CAF may consider not financing it.[42] (See list of exclusion of safeguard 1).

V.2.2. Projects that affect critical habitats

CAF does not finance projects that permanently degrade or change critical habitats. Projects must not intervene in critical habitats or affect them directly or indirectly **unless** the client can show that the following conditions are met:

1. There are no viable technical and cost-effective alternatives for the development of the project in modified habitats. The possible level of degradation must be determined during the environmental and social evaluation phase.
2. There is compliance with the legal requirements of the relevant national regulation and international agreements that are necessary for the country to authorize the execution of a project in a critical habitat or adjacent area.
3. The project does not generate a reduction of populations[43] of endemic species, or species which are classified as vulnerable, in danger, or in critical danger in the red list of the UICN (national or global). If these species may be affected, effective measures for *in situ* or *ex situ* conservation must be ensured to avoid damages.
4. Compensation for biodiversity measures are applied that generate a net gain for the affected critical habitat, including the creation of biological corridors that reduce the potential fragmentation of habitats.
5. The project includes a solid quantitative base line of the biodiversity of the area,[44] and a strong long-term[45] monitoring program to evaluate the status of the area's biodiversity.
6. The opinions and concerns of the affected communities have been identified and addressed. The consultation process will be framed in the disposition established in safeguard 1 for the evaluation and management of environmental and social impacts.
7. The risk of escape and dispersion of exotic invasive or potentially invasive species is eliminated.

When applying the precautionary approach, when there is danger that the negative impacts of the project may be highly significant, that is, that they can cause irreversible, profound, and/or severe damages, CAF may consider not financing it.[46] (See list of exclusions of safeguard 1).

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[42] In the case of this Safeguard, this is a second level, it is known as ***NO-GO CONDITIONS***. That is, cases that are not in the exclusion list, but after evaluation the situation, it is considered that there is such a high risk that it is preferable, as a precaution, not to sponsor de project.

[43] EIt is important to identify the condition of endemic and in danger species in the area of the project.

[44] Especially of the conditions of the critical habitat and populations of endemic species, or which are classified as vulnerable, in danger, or in critical danger.

[45] Monitoring must take place during all the implementation process of the project and, for later, the client must guarantee long term monitoring and inform CAF about the mechanisms identified and applied once the intervention has concluded.

[46] In the case of this Safeguard. this is a second level, it is known as ***NO-GO CONDITIONS***. That is, cases that are not in the exclusion list, but after evaluation the situation, it is considered that there is such a high risk that it is preferable, as a precaution, not to sponsor de project.

V.2.3. Projects that affect modified habitats

This safeguard applies only in case a project affects modified habitats with a significant value for biodiversity. In such case, the client must show that:

1. There are no viable technical and cost-effective alternatives for the development of the project in other modified habitats.
2. Effective preventive measures have been designed for direct, indirect, and cumulative negative impacts and, if necessary, impact mitigation measures,
3. The project does not negatively affect endemic species, or species which are classified as vulnerable, in danger, or in critical danger in the red list of the UICN (national or global). If these species may be affected, effective measures for *in situ* or *ex situ* conservation must be ensured to avoid damages.
4. The risk of escape and dispersion of exotic invasive or potentially invasive species is eliminated.

V.2.4. Projects that affect protected areas

This safeguard applies when projects directly or indirectly affect protected areas, and areas designated with an international recognition as Ramsar site, natural heritage of humanity, or Biosphere Reserves because of their conservation value. CAF will only finance these types of projects when the regulations in the country allow it, and the mitigation and/or compensation measures comply with the minimum standards of this safeguard. In the latter case, the client must process the corresponding permits, and ensure strict compliance of the national and local regulatory demands, and of CAF's applicable safeguards.

The client must comply with the indicated requirements for projects that affect critical habitats. In addition, the client must:

1. Frame his actions in the context of the management plan for the protected area or area with an international recognition for its conservation value. In the absence of a management plan, specific guideless will be requested to the competent authority.
2. Comply with the national, regional, and/or local regulations regarding intervention in protected areas.
3. Include, as part of the project, measures to support the strengthening of management in protected or area with international recognition for its conservation value.

V.3. Care of ecosystem services and functions

When a project is identified as being able to negatively affect the services and functions of ecosystems, the client must conduct a detailed analysis to specify the impacts and probable magnitude. This includes the evaluation of impacts on the natural landscape. The project must include measures to minimize and mitigate the impacts, ensuring that ecosystemic functions and flows of goods and services for the population will remain. Preferably, actions which contribute to the resilience of the ecosystems will be identified.

V.4. Sustainable use of live and derivative natural resources

This safeguard applies to projects that extract live natural products from the natural environment (for example, fishing, forestry extraction, active substances in land and aquatic organisms), or that carry out primary production of them (for example, agriculture, aquaculture).

The client will take the necessary measures and precautions to use biodiversity in a sustainable manner, avoiding negative alterations over: (i) wild populations; and (ii) integrity, and services and functions of ecosystems. In addition, the client must show strict compliance with the relevant regulation, whether national, regional, or international.

In the case of clients who buy live natural resources or its derivatives (for example wood) from a supplier, the following will apply:

1. The client must present documentation that certifies that the suppliers have all the permits and licenses established by law.
2. The client applies policies and procedures for sustainable supply that ensure:
   a. That resources being purchased have a legal origin,
   b. That the origin of the resources may be verified (traceability),
   c. That the procedures and practices of the suppliers may be verified, and
   d. That suppliers who do not comply with sustainable practices may be disregarded.

V.4.1. Exotic species

CAF will not finance breeding, cultivation, or weight gain projects, or any other form of production of exotic species, unless the client guarantees that there will be no escapes to the wilderness, resulting in direct, indirect, and cumulative impacts on the native biodiversity. The measures proposed must be based on a specific risk analysis of invasive species, and no objections from the competent authorities in such matters.[47]

CAF will not finance projects that involve the use or production of invasive exotic species in open environments that facilitate their propagation. Invasive exotic species are those that have been defined as such by the national authorities, or are classified as such in the world data base on invasive species of the UICN[48].

Projects that imply a risk of introduction or dispersion of exotic species must include a risk analysis of invasive species and pests, and apply measures to manage risks and prevent the introduction and dispersion of these types of species. Examples of this kind of projects are land, river, or ocean cargo or passenger transportation, port and airport operations, transfer of water between hydrographic basins, and opening of routes that connect habitats that were not connected, among others.

V.4.2. Modified live organisms

CAF will finance projects that imply the use of live modified or transgenic organisms, if the national environmental authority certifies that the use of these organisms in the country is permitted, and if the actions that must be taken comply with the relevant national regulation. These types of projects must include a risk evaluation of the modified live organisms, and a risk management plan[49] based on the principles, directives, and guidelines of the Cartagena Protocol on Biotechnology Safety[50].

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[47] Andersen, M.C., Adams, H., Hope, B. & M. Powell. 2004. Risk Analysis for Invasive Species: General Framework and Research Need. Risk Analysis 24(4): 893-900.
Parker, I.M., Simberloff, D., Lonsdale, W.M., Goodell, K., Wonham, M., Kareiva, P.M., Williamson, M.H., Von Holle, B., Moyle, P.B., Byers, J.E. & L. Goldwasser. 1999. Impact: Toward a framework for understanding the ecological effects of invaders. Biological Invasions 1(1): 3-19.
Strayer, D.L., Eviner, V.T., Jeschke, J.M. & M.L. Pace. 2006. Understanding the long-term effects of species invasions. Trends in Ecology & Evolution 21(11): 645–651.

[48] http://www.issg.org/database/welcome/ In the case of countries that do not have a list of invasive exotic species, the international reference is the UICN world data base.

[49] Risk evaluation is the process of calculating risks that may be associated to a modified live organisms, on the basis of what adverse effects could result, what is the probability of their occurrence, and consequences if they occurred.
Risk management refers to the measures to ensure that the risks identified in the risk evaluation can be reduced, controlled, or eliminated.
Source: CDB. 2012. Orientación para la evaluación del riesgo de los organismos vivos modificados (Reviewed on July 19th, 2012). Conference of the Parties regarding Biological Diversity, which acts as a meeting of the Parties in the Cartagena Protocol about the safety of biotechnology. Sixth Meeting. Hyderaba, India. Document UNEP/CBD/BS/COP-MOP/6/13/Add.1: 67 pp.

[50] The Cartagena Protocol on Biotechnology Safety, of the Biological Diversity Agreement, is an international treaty that came into force on September 11th, 2003.

When applying the cautionary approach, when there is danger that the project's negative effects may be highly significant, that is, that they produce irreversible, deep, and/or severe damages, CAF may consider not to finance it[51]. (See list of exclusions in safeguard 1).

V.4.3. Fishing projects

The client will ensure that the project will not generate pressures that contribute or entail over-exploitation of the species or target species. The client must ensure compliance with the national regulations and, when applicable, with regional or international regulations, especially regarding capture limits and fishing effort. In addition, the project must have specific measures to avoid negative impacts on by-catch species (also called accompanying fauna), species that interact with the fishing operation (for example birds, marine mammals), and the habitats where fisheries operate. The client must also ensure the application of a traceability system that guarantees that fishing and its derived products may be followed throughout all the stages of production, transformation, and commercialization.

CAF does not finance projects that (i) apply destructive or illegal fishing practices; (ii) carry out fishing practices that infringe national regulations or regulations of the Regional Organizations for Fishing Management; or (iii) that do not declare their captures to the relevant authority. Clients must guarantee that their vessels and those of their suppliers, if that is the case, do not conduct illegal, unreported, or unregulated fishing (IUU).

The project will be framed within the principles of the ecosystem approach for fishing[52] and FAO's Code of Conduct for Responsible Fishing.[53] In addition, when dealing with artisanal fisheries, the client will ensure alignment with the voluntary guidelines to achieve FAO's small-scale fishing sustainability.[54]

V.4.4. Aquaculture projects

The client will ensure that the project does not negatively affect biodiversity in the direct and indirect area of influence. For this, he must ensure compliance with the existing relevant national and international regulations. The project must have specific measures to avoid (i) environmental contamination and proliferation of diseases and pathogens; (ii) aggressions against the fauna that interacts with fish farming;[55] and (iii) significant alteration of the quality of the surrounding water and

[51] In the case of this safeguard, this is a second level, known as ***NO-GO CONDITIONS***. That is, those cases that are not in the list of exclusions but, after evaluating the situation, it is considered that there is such a high level of risk that, as a precaution, it is preferable not to sponsor the project.

[52] FAO. 2003. La ordenación pesquera 2. El enfoque de ecosistemas en la pesca. FAO Orientaciones técnicas para la pesca responsable 4 Supl. 2. United Nations Food and Agriculture Organization (FAO). Rome, Italy: 112 pp.

[53] FAO. 1995. Código de conducta para la pesca responsable. United Nations Food and Agriculture Organization (FAO). Rome, Italy: 46 pp.

[54] FAO. 2015. Directrices voluntarias para lograr la sostenibilidad de la pesca en pequeña escala en el contexto de la seguridad alimentaria y la erradicación de la pobreza. United Nations Food and Agriculture Organization (FAO). Rome, Italy: 23 pp.

[55] It is common that wild fauna to venture into aquaculture systems for feeding. For example, birds that feed on fish and shrimp in fish and shrimp farming pools, or sea wolves that tear the nets of floating cages to eat the salmon. However, dissuasive techniques should be used, to prevent native fauna mortality . CAF will not sponsor projects that use aggressive practices such as harassment, trapping, or killing species of the native fauna.

lake, estuary, or marine bottoms. The client must ensure the application of traceability system that guarantees the origin and passage through the chain of transformation of aquiculture products. If possible, the operation should be certified by renowned international standards for sustainable aquaculture.

V.4.5. Forestry extraction and plantation projects

The client must ensure that the project does not negatively affect biodiversity in the direct and indirect area of influence. The client must also ensure compliance with the relevant national regulations. Financing will be available only for forestry plantation projects that are developed in modified habitats, highly degraded areas, or lands without agriculture and livestock vocation.

If possible, the client must certify the operation with renowned international standards of sustainable forestry production that guarantees the origin and its passage through the processing chain.

V.4.6. Plant and animal production projects

The client will ensure the project does not negatively affect the biodiversity in the direct or indirect area of influence. For this, he must ensure compliance with the relevant national regulations. The client must certify that agricultural plantations or livestock activities are established in modified areas or highly degraded areas. CAF does not finance agriculture or livestock projects that imply the conversion of natural habitats (for example, primary forest) to cultivation areas, areas for cattle farming, or forestry monocultures.

If possible, the client will certify the operation by recognized international standards for sustainable agriculture and animal farming guaranteeing the origin and passage through the processing chain.
The wild flora and fauna cultivation processes must guarantee compliance with the national regulation regarding possession and management of wild life, as well as with the national and international regulations regarding commerce of wild life.

V.5. Protection of traditional knowledge

Projects that imply access and use of traditional knowledge must guarantee fair and equitable participation of the benefits they generate. This type of project will apply the Tkarihwaié:ri[56] [57]Code of Ethical Conduct.

VI. PROCEDURE

VI.1. Origination

[56] The Code of Ethical Conduct to ensure Respect for the Cultural and Intellectual Heritage of the Pertinent Indigenous and Local Communities for the Conservation and Sustainable Conservation and Use of Biological Diversity (abbreviated to Tkarihwaié:ri Code of Ethical Conduct). It is an instrument adopted through Decision X/42 of the Conference of the Parties of the Agreement on Biological Diversity.

[57] CDB. 2012. Tkarihwaié:ri Code of Ethical Conduct to ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities. Secretariat of the Agreement on Biological Diversity. Montreal, Canada: 16 pp.

In the origination phase (at the time of the application for the loan), the client must provide information to enable the identification of whether the project is within the scope of application of this safeguard. The corresponding Environmental Executive will analyze the information and will indicate in the preliminary analysis of environmental and social risks if this safeguard is applicable. The application of the safeguard will be based on the questions established in annex 2 of S01.

VI.2. Evaluation

In the evaluation phase (once the operation has been included in the Inventory of Operations), the client will present the project's social and environmental studies. According to each case, these studies will include the identification of impacts on (i) natural habitats, critical habitats, and modified habitats with significant value for biodiversity (including impacts on protected areas and spaces with international recognition; (ii) ecosystem services and functions; (iii) live natural resources; or (iv) tradition knowledge relative to native biodiversity. The studies will also verify compliance with the applicable national regulation and the relevant international commitments the country has adopted. As an integral part of the project, the study will present a plan for the conservation of biodiversity, including measures to prevent possible negative impacts on the native biodiversity. Exceptionally, when it cannot be avoided, said plan will include measures to minimize, mitigate, and compensate the impacts generated by the project. The measures will be specific, and will include compliance and performance indicators. The cost of the plan for the conservation of biodiversity will be an integral part of CAF's credit.

VI.3. Formalization

In the formalization phase (before the signature of the Credit Contract) the client will ensure that strict compliance with the plan for the conservation of biodiversity will be an essential requirement of the credit contract.

VI.4. Administration

In the administration phase (during the implementation of the project), the client will implement a plan for biodiversity conservation, including monitoring of indicators of compliance and performance. The client will present a report regarding the advance of the plan, which will be presented with the frequency established in the contract. The report will be a public document, available to all interested parties. CAF will review the reports and, if necessary, will propose the necessary corrective or complementary measures.

CAF will contractually establish a mid-term and final evaluation, both at the expense of the client. The mid-term evaluation will focus in compliance with the measures adopted and the expected results. These results and recommendations of the mid-term evaluation will help to adjust the plan for the conservation of biodiversity. The final evaluation will verify the specific compliance of the results and direct and indirect impacts that have been generated, and will identify the lessons learned and best practices. The final evaluation will serve as input for the preparation of the final environmental and social follow-up report and the closing report of the Program.

SAFEGUARD S04 PREVENTION AND MANAGEMENT OF CONTAMINATION

VII. INTRODUCTION

CAF acknowledges that contamination is a critical factor that deteriorates the conditions of life of people and contributes to degradation and loss of biodiversity in the region.

In Latin America, despite important advances in the regulation and control of contamination and private initiatives for cleaner production, the region is still under strong pressures from contamination generated by diverse productive and domestic activities. There are various sources of contamination, such as discharge of residual untreated waters of populated centers, inadequate management of solid residues, agrochemical spills, discharge of untreated industrial residual waters, emission to the atmosphere of combustion gasses, and inadequate management of mining tailings, among others. In addition, multiple activities generate environmental liabilities which, if not corrected, continue to contaminate the environment for a long period of time.

Contamination may cause severe impacts on nature and human beings. For example, it has been calculated that in the decades of 1980 and 1990, during the gold fever in the Amazon, between 3,000 and 4,000 tons of mercury were released in the ecosystems of the region.[58] At the beginning of 2000, it is estimated that Central and South America emitted between 180 and 301 tons per year of mercury from gold mining, and close to 73 tons per year from industrial and urban activities.[59] In addition, in Latin America and the Caribbean, 35,000 deaths per year may be attributed to air pollution.[60]

Consequently, CAF considers it is essential that all credit operations include measures for the prevention and control of contamination. This safeguard contributes to the implementation of several international instruments that have been subscribed by the countries of the region, among them:

1. The Agreement on Biological Diversity.
2. The Basil Agreement regarding control of cross-border movements of dangerous waste and its elimination.
3. The Rotterdam Agreement regarding the prior and informed consent procedure applicable to certain dangerous pesticides and chemical products that are traded internationally.
4. The Stockholm Agreement regarding persistent organic contaminants.
5. The Vienna Agreement for the protection of the ozone layer.
6. The Montreal Protocol regarding substances that deplete the ozone layer.
7. The London Convention, regarding ocean contamination resulting from waste spills and other matters.

[58] Lacerda, L.D. 1995. Amazon mercury emissions. Nature, 374: 20-21.

[59] Lacerda, L.D. 2003. Updating global mercury emissions from small-scale gold mining and assessing its environmental impacts. Environ. Geol. 43: 308 - 314.

[60] UNEP. 2010. Perspectivas del medio ambiente: América Latina y el Caribe GEO ALC 3. United Nations Environmental Programme (UNEP). Regional Office for Latin America and the Caribbean. Panama City, Panama: 375 pp.

8. International Agreement for the prevention of ship contamination (MARPOL 73/78) and its annexes.
9. The Cartagena Agreement, for the protection and development of the marine environment in the region of the great Caribbean and its protocols.
10. Antigua Convention, for the protection and the sustainable development of marine and coastal areas of the Northeast Pacific.
11. Agreement for the protection of the marine and coastal are of the Southeast Pacific and its protocols.
12. Minamata Agreement regarding mercury.[61]

VIII. DEFINITIONS

Agrochemicals, are chemical substances used in agriculture to maintain and preserve crops. This includes pesticides, fertilizers, bio-regulators, and other substances applied to optimize the yield of crops.

Bio-magnification, is the gradual increase of certain substances in the bodies of organisms at the higher trophic levels of the food chains. The organisms in the lower trophic levels accumulate small quantities. Organisms in the following higher level of the food chain feed on many organisms of the lower levels, therefore, accumulate greater amounts. The concentration in the tissues increases in each level of the trophic chain when there is enough assimilation and slow elimination [UNEP - GEO 5].

Agricultural best practices in the use of pesticides, refers to all innocuous use of pesticides. authorized at a national level in the existing conditions, necessary for an effective and reliable control of pests. It includes a range of levels of application of pesticides up to the highest concentration authorized, so that the lowest possible concentration of the residue remains. The authorized innocuous uses are determined at a national level, and expect registered and recommended uses in the country, considering public and professional health, and the security of the environment. Existing conditions include any phase of production, storage, transportation, distribution, and preparation of food for human and animal consumption [Codex Alimentarius – Procedures Manual].[62]

Assimilation capacity, refers to the capacity of the environment to absorb an increasingly higher amount of contaminants while it remains under the acceptable threshold of risks for human health and the environment.

Compensation for biodiversity, compensations for biodiversity[63] are measurable conservation results produced by actions designed to compensate significant and adverse residual impacts on biodiversity, that emerge from the development of projects after the adequate prevention and

[61] The agreement was adopted in 2013, and is open to ratification by the countries. It has been signed by 18 countries of Latin America and the Caribbean.

[62] FAO/OMS. 2015. Codex Alimentarius. Manual de procedimiento. Twenty-fourth edition. Joint FAO/WHO Program regarding food regulations. United Nations Food and Agriculture Organization (FAO) / world Health organization (WHO). Rome, Italy: 239 pp.

[63] Compensations for biodiversity are not pecuniary compensations but rather best environmental management practices for projects or programs.

mitigation measures have been taken. The objective of compensations for biodiversity is to achieve a Zero Net Loss, and preferably a Net Gain of biodiversity in the area with respect to the composition of species, structure of the habitats, function of the ecosystem, and the use of people and cultural values associated to biodiversity [*Standard on Biodiversity Offsets*[64]]

Contamination, refers to the presence of mineral, chemical, or physical properties in levels that exceed the values considered limit between "good" and "acceptable" quality in a living being or environmental components, and a "poor" or "unacceptable" quality, which is a function of a determined contaminant [UNEP - GEO 5].

Historical contamination, refers to the contamination resulting from past activities that affect the land, water, and air, and no party has assumed or received responsibility to address and conduct the necessary repairs.

Contaminant, refers to any substance that harms the environment when mixed with the soil, water, or air [UNEO - GEO 5]. Contaminants include dangerous or non-dangerous substances, in solid, liquid, or gas state, and includes components such as plagues, pathogenic agents, thermal spills in the water, gas and particulate matter emissions, emission of greenhouse gasses, annoying smells, noises, vibrations, radiation, electromagnetic energy, and the creation of possible visual impacts, including light.

Persistent organic contaminants, refers to chemical products that persist in the environment , they bio-accumulate through the trophic chain, and impose the risk of producing adverse effects on human health and the environment [UNEP - GEO 5].

Non-dangerous waste, also called common waste, posing no particular biological, chemical, radioactive, or physical danger [World Health Organization].

Dangerous waste.[65] Refers to used or discarded material that may harm human health and the environment. Dangerous waste may include heavy metals, toxic chemical products, medical waste, or radioactive material [UNEP - GEO 5].

Biological diversity,[66] is the variability of living organisms from any source, including, among others, land and marine ecosystems, and other aquatic ecosystems and the ecological complexes of which they are a part: includes the diversity within each species, between species, and of the ecosystems [Agreement on Biological Diversity).

Greenhouse effect, refers to the process by which the thermal radiation of a planetary surface is absorbed by atmospheric greenhouse gasses, and reradiates in all directions. Because part of this re-radiation is returned to the surface and the lower layers of the atmosphere, it increases the

[64] BBOP. 2012. Standard on Biodiversity Offsets. Business and Biodiversity Offsets Programme (BBOP). Forest Trends, Washington, D.C., USA: 22 pp. Online: http://www.forest-trends.org/documents/files/doc_3078.pdf
BBOP. 2012. Glossary. 2nd updated edition. Business and Biodiversity Offsets Programme (BBOP). Forest Trends, Washington, D.C., USA: 46 pp. Online: http://www.forest-trends.org/documents/files/doc_3100.pdf

[65] This document considers the terms dangerous waste and dangerous residues as equivalent.

[66] In this document, the terms biological diversity and biodiversity are used alternatively.

average superficial temperature, exceeding the temperature existing in the absence of the gasses [UNEP - GEO 5].

Effluent, with respect to the quality of water, this refers to liquid waste (treated or not), released to the environment from sources such as industrial processes and treatment plants for residual waters [UNEP - GEO 5].

Emission of equivalent carbon dioxide,[67] amount of carbon dioxide emissions that would cause the same integrated radiative forcing as a certain emmitted amount of greenhouse gasses or a mix of greenhouse gasses [IPCC, 2013][68] in a determined period of time.

Fertilizer, is any organic and inorganic material, natural or synthetic, that is added to the soil to provide certain essential elements for the growth of plants [Spanish Association of Agro-Nutrient Manufacturers].

Greenhouse gasses (GHG), natural and man-made gas constituents of the atmosphere, that absorb and emit thermal radiation. The main greenhouse gasses in the atmosphere of the Earth are water vapor (H_2O), carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), and ozone (O_3) In the atmosphere there are also greenhouse gasses created by men, such as halocarbons and other substances that contain chlorine or bromine. In addition to CO_2, N_2, and CH_4, the Kyoto Protocol also includes sulphur hexafluoride (SF_6), hydro-fluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF_3) [UNEP - GEO 5].

Habitat, refers to the place or type of environment in which an organism or population naturally exists [Agreement on Biological Diversity].

Critical habitat, critical habitats are places with high biodiversity value, such as: i) habitats with a significant importance for the survival of threatened or critically threatened species; ii) habitats with a significant importance for the survival of endemic species or species restricted to certain areas; iii) habitats that sustain the survival of significant concentrations, at a world level, of migratory species or species that congregate; iv) unique or highly threatened ecosystems; or v) areas associated to key evolutionary processes.

Natural habitat, refers to areas made up by a viable group of plant and animal species, most of them native, or where human activity has not produced any substantial modification of the primary ecologic functions or of the composition of the species of the area.

Comprehensive Management of Pests (CMP), is the careful consideration of all the available techniques for pest control, and the subsequent implementation of adequate measures that discourage the development of pest populations and maintain pesticides and other interventions at levels that are economically justified and that reduce or minimize risks on human health, animal health, and the environment. The CMP emphasizes the growth of a healthy crop with the minimum

[67] Abbreviated CO_2 equivalent, or CO_2-eq.

[68] IPCC. 2013. Glossary. pages 185 to 204. Planton, S. (ed.) In: Cambio Climático 2013. Bases físicas. Contribution of Working Group I to the Fifth Evaluation Report of the Intergovernmental Group of Experts Regarding Climate Change. Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex & P.M. Midgley (eds.) Cambridge University Press, Cambridge, United Kingdom:

alteration possible of the agro-ecosystems, and promotes natural mechanisms for pest control [United Nations Food and Agriculture Organizations (FAO)].

Comprehensive management of vectors, this is a process to control populations of vectors to reduce or interrupt the transmission of diseases. The characteristics of the comprehensive management of vectors include methods based on knowledge of the factors that influence the local biology of the vector, the transmission of the disease, and morbidity; this involves the use of a variety of interventions, often combined and synergic, in collaboration with the same health sector and with other public and private sectors that impact on the vectors; the commitment and joint work of the local communities and other actors involved; and the implementation of a legislative and regulatory framework for public health [World Health Organization[69] (WHO)].

Heavy metals, are a subgroup of elements that have metallic properties, including transition metals and semi-metals (metalloids), such as arsenic, cadmium, chrome, copper, lead, mercury, nickel, and zinc, which have been associated with contamination and potential toxicity [UNEP - GEO 5].

Environmental liability, refers to a concept that may materialize or not in a geographic location, as a result of the release of materials, strange or random residues, that were not remedied in a timely manner, and are still causing negative effects to the environment. As a result of the existence of environmental liabilities, it is necessary not only to remediate or mitigate the situation, but also compensate for the damages caused in the past.

Pest, refers to all species, plant variety or biotype, animal, or pathogen agent which is harmful for plants and products, materials or plant environments: they include vectors of parasites or pathogens of human and animal diseases, as well as animals that cause damages to public health [United Nations Food and Agriculture Organization[70] (FAO)].

Pesticide, are all substances aimed at preventing, destroying, attracting, repelling or combating any pest, including undesirable plant or animal species during the production, storage, transport, distribution, and manufacturing of food, agricultural products, animal foods, or foods which may be given to animals to combat ectoparasites. The term includes substances to be used as regulators of plant growth, defoliants, desiccants, agents to reduce the density of fruit or inhibitors of germination, and the substances applied to crops before or after the harvest to protect the product against deterioration during storage and transportation. The term normally excludes fertilizers, nutrients of plant or animal origin, food additives, and veterinary drugs [*Codex Alimentarius* – Procedure Manual].

Dangerous substance, refers to those which, due to their nature, produce or may produce momentary or permanent damages to human health, the environment, or destruction of goods [Official Chilean Regulation NCh382.Of98].

IX. OBJECTIVE

[69] WHO. 2004. Global Strategic Framework for Integrated Vector Management. World Health Organization (WHO). Geneva, Switzerland: 12 pp.

[70] FAO & OMS. 2015. Código internacional de conducta para la gestión de plaguicidas. United Nations Food and Agriculture Organization (FAO) - World Health Organization (WHO), Rome, Italy: 41 pp.

Avoid and minimize the negative impacts on the health of people, the biodiversity, and ecosystems, caused by public and private operations financed by CAF.

X. SCOPE

All credit operations must incorporate prevention and control measures for contamination. In this respect, this safeguard applies to all credit operations with public and private clients whose actions imply a contamination risk for the environment.

The applicability of the safeguard is determined during all the phases of CAF's credit cycle, paying special attention during the project's evaluation process of social and environmental impacts (safeguard 1). Projects with contaminating risk are those that produce or manage air, water, or soil contaminants, or which produce or manage dangerous residues.

In particular, the safeguard applies to operations:

(1) that manage residual waters and solid residues from populated centers;
(2) that extract or transform metallic and non-metallic minerals and hydrocarbons;
(3) that produce or manage dangerous substances or residues;
(4) that produce pesticides and other agro-chemicals (such as fertilizers) or apply them at a large scale;
(5) that generate or manage environmental liabilities; and
(6) that release emissions into the atmosphere, or result in an increase of emissions, particularly combustion gasses and, within them, greenhouse gasses (GHG).

This safeguard is complemented with the safeguard for working conditions and training. In cases where areas of high value for conservation may be affected, the safeguard for conservation of biodiversity will also apply.

CAF does not finance operations that involve the production of dangerous materials which are the object of international prohibitions, restrictions, or progressive elimination. For more references consult CAF's List of Exclusions, Annex 1 of Safeguard S01.

XI. REQUIREMENTS

XI.1. Prevention and control of contamination

Throughout the project cycle, the client will apply measures to prevent and control contamination, consistent with the national regulation and standards, as well as relevant local and international instruments. Prevention and control measures against contamination will be applied to all emissions of contaminants into the air, water, or soil, due to normal, unusual, or accidental circumstances, with possibilities of generating local, regional, and cross-border impacts. Measures will be technically and financially feasible and cost-effective.

As part of the evaluation of social and environmental impacts, the client:

1. Will identify if there is historical contamination in the area, including environmental liabilities. If the client is legally responsible for repairing the historical contamination, or remedy environmental liabilities, this will be addressed according to the relevant national legislation. In the absence of applicable national regulation, international best practices will apply. The client will be able to identify and take actions so that at the close of the Program there are no residual impacts.
2. Will evaluate the possible negative impacts of the project under the existing environmental conditions, taking into consideration:
    a. The assimilation and/or self-purification capacity of the ecosystems.
    b. The current condition of the use of the soil and the probable future use.
    c. The current condition and use of superficial and underground, and the probable demands for water in the future.
    d. The proximity to areas of high value for conservation.
    e. Proximity to populated centers and the life conditions of neighboring communities.
    f. The presence of other sources of emissions and spills.
    g. The possible cumulative impacts that may be generated.

    The client will design and apply measures for the prevention and control of contamination with the following priorities:

    1. Avoid negative impacts on the environment.
    2. Minimize negative impacts be means of actions that reduce the intensity, during, or reach of the direct, indirect, or cumulative impacts that cannot be fully avoided.
    3. Rehabilitate or restore habitats that have been degraded or altered by negative impacts that cannot be fully avoided or minimized.
    4. Compensate significant and adverse residual impacts on biodiversity that cannot be avoided, minimized, or rehabilitated/restored. The compensation for biodiversity must achieve a Zero Net Loss and, preferably, a Net Gain of biodiversity.

The project will include a monitoring plan that will help take fast corrective measures to minimize negative aspects that may be generated during the normal operation of the project or anomalous situations such as breakdowns or accidents.

XI.2. Management of non-dangerous waste

The client will apply measures to reduce the generation of non-dangerous waste to a maximum. The waste that is generated will be recovered, reused, and recycled in a safe manner for human health and the environment, as far as possible. Final waste, which cannot be used in any way, will be treated, destroyed, or disposed in a manner that is safe and innocuous for the environment, including adequate control of emissions, effluents, and residues resulting from the manipulation and procession of waste material. The manipulation and final disposal of waste will comply with the regulatory dispositions of the country. In the absence of specific regulatory regulations, the manipulation and disposition of waste will be carried out applying international best practices. Waste that may negatively affect people and biodiversity cannot be disposed in the environment.

XI.3. Management of dangerous waste

As much as possible, the client will avoid generating dangerous waste, However, when it is necessary to manipulate and dispose this type of waste, the client will comply with the existing requirements for the management of dangerous waste (including storage, transportation, and elimination), and of the protection of the personnel stipulated in the national regulation and the applicable international conventions, among them, those related with cross-border movements. In the absence of specific national regulations, the client will apply international best practices for the safe management of dangerous residues.

When any phase of the management of dangerous residues is carried out by third parties, the client will use contractors that verify compliance with high performance standards regarding this matter, and legitimate companies that have the authorization of the regulatory entities or relevant governmental authorities, and will ensure that there is a documented and strict chain of custody. The client will also ensure that treatment and final disposal sites for dangerous waste are duly authorized and operate under appropriate standards.

XI.4. Management of domestic and industrial residual waters

Clients cannot dispose of domestic or industrial untreated residual waters in the environment. When effluents are released to the environment, their quality parameters and characteristics must comply with the requirements of the relevant national regulation, In the absence of specific national regulations, the effluents must have, at least, the same quality and characteristics of the receiving body (for example, temperature, pH, dissolved oxygen, and biochemical demand for oxygen).

XI.5. Management of dangerous substances

The client will comply with the requirements for the safe management of dangerous substances (including storage, transportation, and elimination), and protection of personnel, stipulated in the national regulation and the applicable international conventions, among them, those related to cross-border movements. In the absence of specific national regulations, the client will apply international best practices for the safe management of dangerous substances.

XI.6. Management of pesticides

In projects that involve pest control, the client will prefer an integrated management of pests and vectors,[71], and will integrate them to the work program. The pest and/or vector management program will only use pesticides as a last resource.

When the use of pesticides is required, the client will prepare a specific risk analysis as part of the project's social and environmental impact evaluation. The project's action will apply, as appropriate, agricultural best practices in the use of pesticides, the international code of conduct for pesticide management, and the relevant international best practices.

The client will not manufacture, purchase, use, or market:[72]

1. Pesticides prohibited by the national regulation or relevant international instruments,
2. Highly dangerous pesticides, which are those that have one or several of the following characteristics:[73]
    a. Formulations of pesticides the comply with the criteria of classes la or lb of the classification recommended for pesticides by hazard, by the World Health Organization;[74]; or,
    b. Pesticides with active ingredients and formulations that comply with the criteria of carcinogenicity categories 1A and 1B of the Globally Harmonized System for the Classification and Labeling of Chemical Products[75] (GHS); or,
    c. Pesticides with active ingredients and formulations that comply with the criteria of mutagenicity categories 1A and 1B of the Globally Harmonized System for the Classification and Labeling of Chemical Products; or,
    d. Pesticides with active ingredients and formulations that comply with the criteria of reproductive toxicity categories 1A and 1B of the Globally Harmonized System for the Classification and Labeling of Chemical Products; or
    e. Pesticides with active ingredients listed in the Stockholm agreement and its annexes A and B, and those that comply with the criteria in paragraph 1 of annex D of the agreement; or,
    f. Pesticides with active ingredients listed in the Rotterdam Agreement and its Annex III; or,
    g. Pesticides listed in the Montreal Protocol; or
    h. Pesticides with active ingredients and formulations that have shown a high incidence of severe adverse or irreversible effects on human health or the environment.
3. Moderately dangerous pesticides, category II of the recommended classification of pesticides by hazard of the World Health Organization.

[71] WHO. 2004. Global Strategic Framework for Integrated Vector Management. World Health Organization (WHO). Geneva, Switzerland: 12 pp.
OPS/OMS. 2008. El manejo integrado de vectores: una respuesta integral a las enfermedades de transmisión vectorial. Resolución Consejo Directivo OPS/OMS. CD48.R8 (Esp.) October 2nd, 2008. Washington D.C., USA: 3 pp.

[72] See List of Exclusions, Annex 1 of CAF's Safeguard S01.

[73] The definition was established in the Second Joint FAO/WHO Meeting regarding pesticide management (Geneva, October 6-8, 2008). To identify highly dangerous pesticides CAF will always use the definition and criteria established by the United Nations Food and Agriculture Organization (FAO) and the World Health Organization (WHO).

[74] WHO. 2010. The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification 2009. World Health Organization (WHO). Geneva, Switzerland: 78 pp.

[75] UN. 2011. Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Fourth revised edition. United Nations (UN). New York and Geneva: 561 pp.

XI.7. Management of environmental liabilities and/or residual impacts

During the execution of the project, the client will apply the necessary measures to prevent the generation of residual impacts. Before the closing of the project, the client will verify that there are no environmental liabilities generated by direct and/or residual, indirect, or cumulative impacts. If residual impacts are detected, the client will compensate them before the end of the project.

XI.8. Greenhouse gas emissions

The client will design and apply measures to reduce emissions of greenhouse gasses. These measures may include, among others, the use of renewable energies of low in carbon emission energies, substitute refrigerants with a high potential for global warming, use efficient transportation systems with low carbon emissions, and apply sustainable practices in agriculture and forestry.

In the case of projects expected to produce or which are already producing emissions equivalent or exceeding 100,000 tons of CO_2 equivalent/year [EUROPEAN INVESTMENT BANK], except if the local regulation establishes lower limits,[76] the client must quantify (i) the direct emissions that are his property or under his control within the physical limits of the project,[77], and (ii) indirect emissions associated with the generation of energy which is external to the location of the project[78], to be used by the project. The client must annually quantify and report greenhouse gas emissions, using methodologies and best practices that are internationally acknowledged.

XI.9. Capacity to respond to emergencies

The client must design and implement an emergency plan to respond quickly and effectively to accidents and emergencies that may contaminate the environment. The emergency plan must establish the organizational structure, the human, material, and budgetary means available, and the procedures to be applied when facing accidents or emergencies in an orderly manner, mitigating the effects on the environment and people, containment and control of contaminants, and minimization of negative consequences on people and the environment.

XII. PROCEDURE

XII.1. Origination

[76] The quantification of emissions must include all significant sources of emissions of greenhouse gasses, including sources that are not related to energy, such as methane, and nitrous oxide, among others. In Mexico, (which is part of CAF's area), this value (25,000 TCO_2-eq) is used as a threshold which can be used as a starting point to report to the Registro Nacional de Emisiones (National Registry of Emissions) (RENE, for its acronym in Spanish)), which is compulsory since 2015. Therefore, this value has already been considered in one of the countries of the region.

[77] Changes induced by the project in the carbon content of the soil or land biomass, and the decomposition of organic material induced by the project, may contribute to the direct sources of emissions and must be included in this quantification of emissions when it is expected that such emissions will be significant.

[78] These emissions are the result of generating activities outside the location, by other electricity agents, or energy for heating or cooling used in the project.

In the origination phase (at the time of the application for the loan), the client must provide information to enable the identification of whether the project is within the scope of application of this safeguard. The corresponding Environmental Executive will analyze the information and will indicate in the preliminary analysis of environmental and social risks if this safeguard is applicable.

XII.2. Evaluation

In the evaluation phase (once the operation has been included in CAF's Inventory of Operations), the client will present the project's social and environmental studies. Where applicable, these studies will include the identification of historical contamination and existing sources of spills and emissions, the existing inventory of environmental liabilities, the baseline of annual CO_2 equivalent emissions, an estimate of type and quantity of dangerous and non-dangerous waste, and an estimate of the type and quantity of dangerous substances to be used, among others.
The studies will also verify the compliance with the applicable national regulation and of the relevant international that the country has adopted. As an integral part of the project, a contamination prevention and control plan will be included, and its cost will be an integral part of CAF's credit.

XII.3. Formalization

In the formalization phase (before the signature of the Credit Contract) the client will ensure that a strict compliance with the plan for the prevention and control of contamination will be part of the Environmental and Social Management Plan (PMAS, for its acronym in Spanish) of the operation.

XII.4. Administration

In the administration phase (during the implementation of the project), using the environmental supervision of the works as a starting point, the client will implement a plan for the prevention and control of contamination, including monitoring the compliance and performance indicators as part of the operation's PMAS, which will be defined by the client and presented to CAF. The client will present a report of the plan's advance as part of the PSCAS, which will be presented with the frequency established in the contract. CAF will review the reports and, if necessary, will propose the necessary corrective or complementary measures.

The final evaluation will verify compliance of the results and direct and indirect impacts that have been generated, and will identify the lessons learned and best practices. The final evaluation will verify the existence and quantification of the project's residual impacts. If residual impacts are identified, they must be remedied or compensated, charged to the client, before the end of the project . The final report will serve as input for the preparation of the final environmental and social follow-up report and the closing report of the Program.

SAFEGUARD S05 CULTURAL HERITAGE

I. INTRODUCTION

The cultural heritage–physical or intangible - such as goods or irreplaceable practices, are part of the history of a community, a country, and in some cases, of all the peoples of the world, This heritage translates into a source of knowledge and identity for a community, contributing to the survival as a society and culture, and are part of the human cultural diversity.

Latin America is the most exuberant region in terms of cultural heritage in the American continent, It has extraordinary monuments, places, and cities that give testimony of the history of each people.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO), has proposed a protection plan for the cultural assets of the world, through the "Convention for the Protection of the World Cultural and Natural Heritage", approved in 1972. It presents a list of assets that belong to the World Heritage, or Heritage of Humanity. Ecuador has the first two assets declared World Heritage Site; The city of Quito, first cultural heritage, and the Galapagos Islands, first natural heritage, declared in 1978. In total, the region of Latin America and the Caribbean currently have 92 cultural assets, 36 natural assets, and 4 mixed assets, adding to a total of 131 assets declared World Heritage sites; 8 of them are in danger. Mexico is the American country with the biggest number of cultural and natural world assets, reaching 34.

There is world consensus about the need to find a balance between economic development and conservation of the cultural and physical heritage of Humanity. It is understood that the heritage must generate a development that reverts to the communities, and at the same time enhances its value, which would imply the need to not only adequately train the managers, but also the public in general, that is, the beneficiary community.

Therefore, it is the responsibility of any organization or entity that develops a project or activity o a territory that has these kinds of assets, to protect them and avoid actions that directly or indirectly may cause damages.

II. DEFINITIONS[79]

Cultural physical heritage, refers to structures or groups of structures. places, objects, and joint world of men and nature, which have an important value from the historical, religious, paleontological, ethnological, anthropological, esthetic, or artistic point of view.

Intangible cultural heritage, refers to the uses, representations, expressions, knowledge, and techniques, together with instruments, objects, artifacts, and cultural spaces that are inherent, which communities, groups, and in some cases individuals, recognize as an integral part of their cultural heritage. This heritage manifests in a) oral traditions and expressions, including language; b)

[79] These definitions are taken and adapted from the United Nations Convention regarding the world cultural and natural heritage of November 1972, and the UNESCO Convention for the Safe keep of the Intangible Cultural Heritage, of October 2003.

performing arts; c) social, and ritual uses, and festive acts; d) knowledge and uses related to nature and the universe; e) traditional artisan techniques.

III. OBJECTIVES

- Recognize and respect the cultural, physical, or intangible heritage
- Avoid actions that may result in negative impacts.
- Promote its protection and conservation
- Support dissemination and education regarding its significance and the importance of protecting and respecting it.

IV. SCOPE

This safeguard applies to all the projects and operations financed by CAF, where there are cultural, physical, intangible, or natural heritage sites in its direct or indirect area of influence, as previously defined, even if it has not been legally recognized by the country, or if it has been previously disturbed.

It also applies for projects that imply movements of land and which, according to historical registries of the country and region, there could have been ancestral human settlements.

If an operation with the above mentioned characteristics already started operations and requests CAF financing, an evaluation will be conducted of the actions carried out in said operation within the objectives stated in this safeguard in order to determine if it is necessary to formulate and execute remedial plans that guarantee compliance with the objectives proposed in this safeguard.

If the operation financed by CAF is related with the cultural, physical or intangible heritage, all the project must be defined and executed under the guidance of this safeguard, taking into consideration the dispositions established by the national regulation regarding this matter.

In the case of the cultural, physical, or intangible heritage of specific ethnic groups, the safeguard on Ethnic Groups and Cultural Diversity will also apply.

The safeguard applies to all the project's components, independently of the source of financing.

V. REQUIREMENTS

- Comply with the national legislation on cultural –physical or intangible- heritage, and with international agreements subscribed by the country regarding this matter.
- From the early stages of a project's cycle, connect the entities and organizations responsible for the protection and conservation of the cultural heritage, physical or intangible.
- Conduct an early identification and evaluation of the potential positive and negative impacts on the cultural heritage, physical or intangible.
- Determine the presence of all the areas with cultural heritage sites, which could be potentially affected by the project.

- Determine if the potential negative aspects may be adequately prevented or mitigated in order to comply with the objectives established by this safeguard.
- Consult with the communities that reside in the area where there are elements or practices considered cultural heritage, about the evaluation of positive and negative impacts, as well as about the management measured proposed.
- Make the project compatible with the cultural heritage, physical or intangible, which exists in the area where the project is being developed.
- Develop a protocol when there is the possibility of discovering occasional findings, to be obeyed by the executing agents of the project and the contractors that participate in its development. This protocol musty include all the actions that must be followed to comply with the objectives of this safeguard.
- Have sufficient institutional capacity to comply with the objectives and requirements of this safeguard, or strengthen these capacities if necessary.
- If there are significant impacts that negatively affect the cultural heritage, which cannot be prevented or mitigated, CAF will not finance the project.

V.1. Documents

In order to comply with the objectives and requirements of this safeguard, the Environmental and Social Management Plan (see Environmental and Social Evaluation Safeguard), must present a special chapter regarding the cultural heritage, with the following information:

- Type of heritage
- Characteristics
- Current status
- National legislation regarding the subject
- Entities in charge of its protection and conservation
- Existing programs or activities related to this heritage
- Threats that the heritage may be facing
- Results of the evaluation of positive or negative impacts that said heritage may face during the different stages of the project
- Management measures to prevent or mitigate negative impacts
- Management measures to enhance positive impacts
- Measures proposed to conserve and protect the heritage and support dissemination and education regarding its significance and the importance of its protection and respect.
- Each proposed measure must establish its objectives, goals, individuals responsible for them, timeline, and budget for its implementation, the source of resource allocation, and evaluation indicators. The timeline for the development of the management measures must be in line with the project's timeline, so that the measures are applied in a timely manner.
- If the budget to execute these measures is included within the cost structure of the project, an if the resources come from the credit granted by CAF, from the national counterpart, or from a combination of both sources.
- Consultations with the communities in the area of influence and with actors interested in said heritage, and documentation of these consultations.
- Compliance with the national legislation, and with international agreements subscribed by the country regarding this matter.

For cases in which projects imply land movements, where there is no current evidence of elements of cultural or natural heritage by historical analysis or secondary sources indicate there may be possibilities of findings elements that correspond to cultural physical heritage, during the movement of land related with the works of the project, the following must be specified:

- Sources that indicate the possible existence of cultural physical heritage remains
- Potential findings that may emerge
- Entities responsible for the management of these issues in the country
- Protocols developed for the management of occasional findings when they are found
- Approval of said protocols by the country's entity responsible for the conservation and protection of said heritage, if it exists
- Previsions to include said protocol in the work and supervision of works contracts
- Resources assigned and sources of financing for the implementation of the protocol in case it is necessary

VI. PROCEDURE

VI.1. Origination

The client must present enough information to establish the activation or not, of this safeguard, which must consist of at least historical information of the area of influence.

VI.2. Evaluation

When a project is presented to CAF for financing, the documentation related with the evaluation of impacts, risks, and environmental and social opportunities, and the management of these, must specify if whether in the area where the project will be located or close to it, there are, or may be (in the case of archeological remains), elements or practices that constitute cultural, physical, or intangible heritage of local, regional, national, or universal importance, and must include all the information stated in the previous section.

If any of the information above is not included in the documents presented by the project's proponent, CAF will agree with the proponent on the actions to conduct the necessary studies and the formulation of the relevant measures.

VI.3. Formalization

The actions detailed above will be reflected in the credit contract, which will include specific clauses in case of non-compliance by the project's executing agent.

VI.4. Administration

Once the operation has been approved, the client will develop the actions to comply with the agreements established in the credit contract, and will execute the measures formulated for the management of the potential impacts on the cultural or natural heritage. The client must also monitor the execution of the works to determine the degree of advance and the need to take corrective actions if necessary. Periodically, the client will prepare a follow-up and monitoring report

of the plan, which includes the activities carried out and the level of achievement of the objectives proposed. This report must also state whether there were any occasional findings, and the results of the application of the protocol developed for this purpose. The follow-up and monitoring reports will be presented to CAF, to the communities involved, to the entities responsible for the management of this heritage, and to interested parties. Depending on the importance of the identified heritage, the monitoring report must be presented separately (when the heritage is important, or so defined by competent authorities), or included in the monitoring reports established in Safeguard S01 (when the heritage is less important and there are no specific requirements from the competent authority). CAF will review these reports and may suggest corrective measures if necessary.

At the close of the project, the executing agent must evaluate the management measures of the impacts on the cultural heritage in order to determine of the proposed objectives were achieved. The evaluation report will be presented to the communities involved, to the entities responsible for the management of this heritage, and to interested parties. CAF will review the evaluation report of the management measures prepared by the project's executing agent, and may agree on additional measures for compliance with the objectives established in this safeguard, if necessary.

CAF will also prepare a closing report of the project. specifying the level of achievement of the objectives proposed in the management measures for cultural heritage, as well as the lessons learned for future projects.

SAFEGUARD S06 ETHNIC GROUPS AND CULTURAL DIVERSITY

I. INTRODUCTION

Human cultural diversity constitutes a heritage of knowledge, creativity, practices, and customs that humanity has developed over millenniums of processes to adapt to the different ecosystems of the planet. Cultural diversity represents a wealth for humanity, as it provides alternatives, possibilities, and other forms of thought necessary to face the challenges of achieving sustainable development in a context of climate change and the construction of a globalized society.

Ethnic groups, among which in Latin America stand out the indigenous peoples and Afro-American communities, represent that cultural diversity.

Indigenous peoples hiver ancestral origins and have developed a deep knowledge of nature, and a spiritual development that has enabled them to establish harmonious relations with the ecosystems where they live. They are socially and culturally different to majority societies, with close links with the territories they inhabit and the resources they use, which are intrinsically related to their culture and identity. If anything affects their territories, resources, or the links they have with them, their cultural survival may be threatened.

The conquest and colonization processes in Latin America significantly decimated the indigenous population, and imposed a different society which became dominant, changing them to minority groups that are generally excluded and marginalized, without mechanisms to participate in decision making processes that may affect them. For these reasons, and because of the meaning that the territory and the resources have for them, they are more vulnerable to impacts resulting from development projects of the majority society than other population groups. This majority society may threaten their identity, culture, and means of subsistence, and expose them to factors that increase their morbidity and mortality. In other cases, these groups are excluded from the benefits of the projects, or if they receive benefits, they may not be culturally appropriate, which may cause them more harm than good.

The negative impacts on indigenous peoples not only affect them , but all of humanity, as they lead to a loss of ancestral knowledge regarding nature, ecosystems, and specific resources, as well as the adequate forms to relate to them. A large part of the planet's biodiversity is found in indigenous territories, and is being cared by indigenous peoples.

During the period of colonization, African population was forcibly brought to the Latin American territory to work as slaves. Some of the survivors of this practice ran away and created their own settlements where they recreated their culture. Generally, these groups have no rights over the territories they occupy, and are also excluded and marginalized form the development processes of the majority society. These groups contributed a great cultural heritage to Latin American and Caribbean societies.

For the above mentioned reasons, there are currently different international regulatory development which have provided ethnic groups with legal and institutional mechanisms for protection and development based on self-determination. In Latin America, the States have advanced a gradual process to recognize ethic groups and cultural diversity.

Therefore, it is the responsibility of any organization or entity that develops a project or activity that may affect an ethnic group, to develop actions to avoid negative impacts, to include them in decision making processes that may affect them, and provide benefits that are culturally appropriate.

II. DEFINITIONS

Ethnic group,[80] refers to human groups whose social, cultural, and economic conditions distinguish them from other sectors of the national population, and who are totally or partially governed by their own customs or traditions or by a special legislation.

Indigenous people,[81] are descendants from the people who inhabited America before the conquest, totally or partially retaining their own institutions and social, economic, political, linguistic, and cultural institutions and practices, whatever their legal status is, and they define themselves as belonging to indigenous or pre-colonial peoples or cultures.

Culture, refers to the multiple human dimensions expressed, among others, in uses, customs, knowledge, world vision, relation with spirituality, social organization, and forms of interaction, as well as their material and intangible expressions.

Afro-American community, refers to the population with African roots, descendants from people who were enslaved during colonial times and who were able to survive, keeping some of the cultural characteristics from their birth places in Africa, which they have used to adapt to the new ecosystems where they settled, and have contributed to the societies of the countries where they came to live.

Free, prior, and informed consultation, this is a good faith process which is free and voluntary, without manipulation, interference, or coercion. It is prior because it is conducted before the start of any study or work in the project; it is informed because the communities that are consulted must have prior access to the information on the proposed project, its characteristics, scope, activities, responsible parties, expected timeline, their rights and duties during the process, and any relevant information to enable the understanding of the intervention that will take place, and the expected effects, before the execution of the project, and the impacts appear.

The public consultation (free and informed), is a process that is carried out during the preparation and execution of the project and the management plan, which must take into consideration the times and internal procedures for decision making of the consulted ethnic groups. For the consultation to be effective, the information and relationships must be carried out in an appropriate manner form the cultural point of view, and in the community's language. For this public consultation to be informed, the communities must have prior access to the information regarding the project, studies that have been carried out, the environmental impact evaluation process, the environmental management plan, and the plan for the particular ethnic group. The public

[80] The first part of this definition is taken from the definition of tribal groups in Agreement 169 of the ILO.

[81] This definition is taken from Operational Policy 7.65 of the Inter-American Development Bank (IDB).

consultation of the project does not replace the free, prior, and informed consultation that must be advanced with the ethnic groups.

Free, prior, and informed consent, is the result achieved by the consultation process described above, through which ethnic groups give their consent to the intervention of their territory, the measures to manage impacts, and the type of benefit they will receive. It is a collective right of indigenous peoples to adopt decisions through their representatives and traditional institutions.

Differential approach: given the different conditions and characteristics of the ethnic groups of the majority society, a differential approach is necessary for the actions and interactions developed with and for them, so that access to rights, goods, and services may be relevant and respond to their distinctive features.

Self-determination: The international regulatory framework related to ethic groups includes their right to development and self-determination, meaning that they have the right to decide the type and approach of the development they aspire.

III. OBJECTIVES

- Acknowledge and respect ethnic groups, their traditional knowledge, their traditional rights, human rights, rights over their territory and natural resources they use, their culture, social organization, knowledge, practices, uses, and customs.
- Safeguard the physical, territorial, social, cultural, and economic integrity of ethnic groups.
- Ensure a free, prior, and informed consultation process regarding actions that may cause impacts, and the measures for their management, before the start of the detailed studies.
- Ensure a public, free, and informed consultation process during the development of the detail studies, which include the active participation of ethnic groups.
- Anticipate and avoid actions that may negative affect ethnic groups.
- Mitigate or compensate negative aspects when they cannot be avoided, by means of measures designed jointly with the participation of ethnic groups.
- Ensure the access of ethnic groups to the benefits of the project, and ensure they are culturally appropriate and inclusive.
- Support ethnic group development with identity, including strengthening of their management capacities.

IV. SCOPE

This safeguard applies to all projects and operations financed by CAF, in whose direct or indirect area of influence there are ethnic groups, or sacred places of importance for an ethnic group, even if the territories they inhabit or with which they have links have not been legally recognized by the country.
If an operation with these characteristics already started activities and requests CAF financing, an evaluation will be conducted of the actions carried out in said operation in order to determine if it is necessary to formulate and execute remedial plans that guarantee compliance with the objectives proposed in this safeguard.

In case all or a significant part of the beneficiaries of the project belong to an ethnic group, the whole project must be designed and executed under the guidance of this safeguard.

The safeguard applies to all the project's components, independently of the financing source.

In case there are indigenous peoples that have not been contacted, guarantees must be given that the project will not impact these peoples, and that contact with them must be avoided, respecting their right to remain in such condition and live freely according to the culture.[82]

CAF will not finance project that may cause significant negative impacts, and that imply a high risk for the physical, territorial, economic, and cultural integrity of an ethnic groups.

V. REQUIREMENTS

V.1. About regulations and institutions

- Comply with the national legislation on ethnic groups and the international agreements related to the rights of ethnic groups.
- From the early stages of a project's cycle, connect the entities in charge of the affairs of ethnic groups in the country.

V.2. Identification of ethnic groups or important sites for these groups

- With the entities responsible for the affairs of ethnic groups in the country, enquire about the presence of a group in the direct or indirect area of influence of the project.
- Review secondary sources and visit the direct and indirect area of influence of the project, to identify the presence of ethnic groups or important sites for these groups.

V.3. About the evaluation of impacts

- In a participative manner, evaluate the potential positive impacts and benefits that the specific ethnic group may receive from the project, and define whether it is necessary to take measures for these to be accessible to all the members of the community independently of their gender and age, when applicable, and if they are culturally appropriate.
- In a participative manner, evaluate the negative impacts that the specific ethnic group may face as a result of the actions of the project in each technical stage, before the impacts may occur. Special attention must be given to the impacts on the territory, even if it has not been legally recognized, as well as impacts on the natural resources they use, sacred palces, uses, customs, and social and political organization.
- In case of significant negative impacts,[83] other alternatives of the project must be analyzed in order to reduce them much as possible, to develop mitigation or compensation measures that are accepted by the ethnic, and that are culturally appropriate.

[82] Taken and adapted from the IDB's Operational Policy on Indigenous peoples

- Avoid obligatory displacement of ethnic groups from their territories, even if right over these territories have not been legally recognized by the country. A resettlement of these groups can only take place if it can be guaranteed that they will improve their situation compared to the one they had before the resettlement, if their culture is not threatened, and if the communities grant their prior, free, and informed consent. In this cases, the population resettlement safeguard will also apply.

V.4. About consultations and relationships

- Respect traditional authorities and organizational form of ethnic groups in the consultation and building of relationships process, as well as not generating parallel organizations.
- Conduct consultations and interactions with ethic groups in their own language and in their territory to facilitate the understanding of the consulted issues and to achieve wide participation.
- Carry out a free, prior, and informed consultation with the ethnic groups regarding the project that will be executed.
- Carry out a free, prior, and informed consultation with the ethnic groups regarding the characteristics of the project, the potential impacts on the natural and social environment, and the management measures proposed.
- Proved ethnic groups with enough and comprehensible information for an adequate and informed decision making.
- Respect the times of ethnic groups and their decision making systems for the development of the prior, free, and informed consultation.
- Develop the consultation process in an inclusive an participative manner, so that the conclusions and agreements reached are considered legitimate by most members of the community.
- The consultation mechanisms must adapt to the community's social organization, its language, cultural patterns and conditions, and they must be inclusive.
- Document the results of the consultation and the agreements reached with the community.
- Establish and maintain a permanent relationship based on the consultation and participation duly informed through all the stages of the project's cycle.
- Establish mechanisms to guarantee a wide participation of the members of the community, inclusive in terms of gender and age.
- Verify if there is wide support to the project, the for impacts, and the Plan for the Ethnic Group.

V.5. About prior, free, and informed consent

- Prior, free, and informed consent must be obtained when it is necessary to resettle the community and/or when there are impacts on: (i) the territory; (ii) the natural resources used; (iii) cultural heritage; or (iv) sacred places or elements, or with a special value to the community. Both the process and the agreements reached in the dialogs with the community regarding other aspects must be documented.

[83] To determine the level of significance and magnitude of an impact, the evaluation must be conducted in a participative manner taking into consideration the level of vulnerability of the specific group given its characteristics and its relationship with the land and resources.

V.6. About the planning

- In a participative manner and respecting the organizational forms and decision making mechanisms of ethnic groups, design the management measures for the impacts to mitigate or compensate the negative impacts and ensure the existence of positive ones.
- Consult and agree on the measures with the ethnic groups, so that they are culturally appropriate and there is a majority support for these measures.
- Adapt the benefits offered by the project to ethnic groups so that they are culturally appropriate and they can access them easily.
- Organize the management measures in a Plan for the specific ethnic group. Each measures must define the objectives, goals, activities, responsible parties, timeline, and budget.
- The plan's budget must be included in the total cost of the project, and mechanisms must be ensured for the timely availability of these funds

V.7. About the execution

- The entity responsible for the project must have sufficient capacity to adequately execute the Plan. For this, it must have professionals that are experts on ethnic groups, human resources, and sufficient physical and financial resources to conduct all the necessarily studies, the consultation process, and the formulation and execution of the Plan for Ethnic Groups.
- Design participative and culturally appropriate mechanisms to conduct a follow up and evaluation of the impact management plan for the indigenous or Afro-American communities
- Design a system to address petitions, complaints, and claims which is accessible and culturally appropriate
- Define an independent mechanism for the resolution of conflicts, accepted by both parties, in case conflicts emerge, and taking into consideration the traditional uses of the communities conflict resolution methods

V.8. About the dissemination

- Disseminate the impact evaluation study and management plans, and make accesible versions of these documents to the communities.

V.9. Documents

In order to organize and document the actions to comply with the above mentioned requirements, the proponent must prepare three documents: (i) Results of the free, prior, and informed consultation; (ii) Social study and impact evaluation, and (iii) Plan for the Ethnic Group. Following is a description of the content and scope of these documents:

Results of the free, prior, and informed consultation

This document must describe the prior consultation process carried out with the communities regarding the project. This document must present the methodologies used, the events of the

consultations, who and how was the consultation carried out and their results. This must include film and photographic registries and the acts of documents signed with the communities. If there are guarantors and/or participation of government entities, these must also be included.

Social study and impact evaluation

This document must include the following four chapters:

I. Social and ethnographic study. This study must describe the type of ethnic group in detail, its history, demographic, social, economic, cultural, and religious characteristics, the territories they inhabit and those with which they have close links, the use of the territory and its resources, their current situation, their social and political organization, the rights that the State has acknowledged over territories and other types of rights, the projects that have developed over their territory, its consequences, programs or projects that are currently being developed with the communities (objectives, responsible parties, state of execution, results), conflicts that these groups have faced and how they were solved, the existing social liabilities and the adequate manner to conduct the prior, free, and informed consultation so that their organization, cultural patterns, decision making processes, and time management are respected. The main actors that have relationships or influence with the community, their nature, functions, roles, and interests, must be identified.

II. Legal and institutional framework. This document will describe the countries current legal framework for indigenous peoples or specific ethnic groups, relevant international agreements subscribed by the country, compliance with national legislation and agreements in the framework of the proposed project, and the governmental institutions in charge of managing the affairs of these groups, their functions, and responsibilities.

III. Impact evaluation. This is the impact evaluation study for both positive and negative impacts that the project may cause to specific communities. This evaluation must specify the methodology used, the results of the impact evaluation, the participation of the communities in the studies, their opinions and comments to the results of this evaluation, and the documents that support this evaluation.

IV. Public, free, and informed consultation. This document must describe tyhe consultation process carried out with the communities regarding: (i) the project, (ii) the impact evaluation, (iii) the plan for impact management and relationship building with the communities and of the type of benefits that the communities will receive. This document must include the methodology used, the events of the consultations, who will be consulted and how, and the results. This must also include the film and photographic registries and the acts of documents that have been signed with the communities. If there are guarantors and/or participation of government entities, these must also be included.

Plan for the Ethnic Group

This plan can be named with the name of the group or specific ethnic community, or with a name agreed upon with said group. It is made up by the measures to facilitate the existence of positive impacts, to mitigate or compensate the negative impacts, and to ensure that the

benefits received from the project are inclusive and culturally appropriate. Each proposed measure must establish its objectives, goals, activities, responsible parties, the timeline and budget for its implementation, the source for the allocation of resources, and follow-up and evaluation indicators. The timeline for the development of management measures must be connected to the project's timeline, so that the measures may be applied before the impact occurs. It should specify whether the budget to execute the Plan is included within the project's cost structure, and if these resources will come from the credit granted by CAF, from the national counterpart, or from a combination of these two sources. The Plan will also specify the strategy and relationship building and consultation mechanisms during the execution of the project and of the Plan for Ethnic Groups. The Plan must consider mechanisms to produce synergies with programs from other organizations, if possible.

VI. PROCEDURE

VI.1. Origination

In the origination stage, CAF will verify if the Project's area of influence is close to or in indigenous territories, or if it has the potential to affect indigenous communities or ethnic groups.

VI.2. Evaluation

When a project is presented to CAF for financing, the documentation related to the evaluation of impacts, risks, and environmental and social opportunities, and their management plans presented by the project's proponent it must specify if there are indigenous or Afro-American communities in the Project's direct or indirect area, or if any of these communities has links to the territories of said communities. If there are communities or territories with which these communities have links, the documents stated in the above mentioned section must be presented.

If the project's proponent has not completed some of these documents when presenting the project to CAF, the necessary actions will be agreed upon for the development of the necessary studies, and of the Plan for the Ethnic Group. All of this must be prepared and approved by CAF before the start of the execution of the project, an aspect which will be established in the environmental and social conditions of the credit contract. When a project includes several subprojects or annual investments that are not defined at the time of the project's presentation to CAF, when each sub project is defined, an analysis must be carried out to identify if there are ethnic groups in its direct or indirect area of influence in order to apply this safeguard. All these agreements will be reflected in the credit contract, which will include specific clauses for non-compliance by the project's executing agent.

VI.3. Formalization

The formalization phase will ensure that a strict compliance of the Plan for the Ethnic Group is compulsory for the client.

VI.4. Administration

Once the operation has been approved, the client will develop actions to comply with the agreements established in the credit contract regarding this matter and will execute the Plan for the Ethnic Group. The client must also conduct a participative monitoring of the execution of the Plan to determine the degree of advance and the need to take corrective measures if necessary. The client will periodically prepare a follow-up and monitoring report of the Plan, stating the activities carried out and the level of achievement of the proposed objectives. The follow-up and monitoring reports, specific for the Plan for the Ethnic group, will be presented to CAF, to the communities involved, and to interested actors. CAF will review these reports and may propose corrective measures, if necessary.

At the close of the project, the executing agent must evaluate the Plan for the Ethnic Group in a participative manner, in order to determine if the proposed objectives were achieved. The final report of the evaluation must be available for the communities involved and the interested actors. CAF will review the evaluation report of the management measures prepared by the Project's executing agent and may agree on a additional measures for compliance with the objectives established in this safe guard, if necessary.

CAF will prepare a closing report of the project, specifying the level of achievement of the objectives proposed in the Plan for the Ethnic Group, as well as the lessons learned for future projects

S07 POPULATION RESETTLEMENT

I. INTRODUCTION

The projects that require land for their implementation may cause a compulsory displacement of the people who live or work there. These projects include those related to infrastructure, urban renewal, extractive, protection or recovery of the environment, those that reduce the risk of disasters, or those related to reconstruction after disasters. With the exception of the latter two, where the displacement is carried out for the benefit of the displaced population, in the other types it is conducted as a prior condition to the execution of the project.

In some cases, an area is only partially affected and people may rebuild the elements that were found in that location in the same area, if and when the remaining area is viable; but when the entire area is required or the remaining area is not viable, the people or economic activities that take place must be forcefully displaced.

The compulsory displacement of population, is one of the most severe negative socio-economic impacts that may be generated by development projects, as if adequate measures are not taken, displaced people may lose their heritage, their subsistence means and left in poverty.

The compulsory displacement of people, not only affects the people that are displaced, but also the neighbors that continue living in that place, the receiving population, and the territorial units where all this happens. World evidence has shown that economic indemnity alone is not sufficient for people to restart their lives and reestablish their socio-economic conditions

Therefore, it is the responsibility of any organization or entity that develops a project or activity on an activity that causes compulsory displacement to resettle the people to reduce the risk of impoverishment of those displaced and a deterioration in the quality of life of the people that will continue living in the place, as well as the receiving population.

II. DEFINITIONS

Compulsory displacement, occurs when a person must abandon their home or work as a result of a decision imposed by an external agent, and has no option to remain in that place. The external agent may be the State, companies with the authorization of the State, or events such as natural disasters.

Physical displacement, occurs when people must leave their place of residence.

Economic displacement occurs when people must abandon the place where they develop an economic activity from which they derive an income in species or money, but they do not live in that place.

Displaced population, refers to the people who must abandon their homes or places of employment as a result of a decision imposed by an external agent, and they have no option of staying in that place.

Population that continues to live in the place, refers to the people who live close to those who are being displaced, but may continue to live in the place.

Receiving population, are the people who live close to the places where the displaced population is being resettled.

Social unit, refers to family, stores, industries, services, and productive units.

Involved groups, refers to the displaced populations, those who continue to live in the same place, and the receiving population.

Resettlement, refers to a planned process that seeks to improve, or at least reestablish the socio-economic conditions and standards of life of the displaced population in a sustainable manner, without negatively impacting the population that will continue to live in the area or the receiving populations. The resettlement has four stages: before relocation, from the time the people are informed that they must be compulsorily displaced, and the necessary studies are developed to plan their resettlement; the physical relocation which is the time in which the people must abandon their homes or work; the stage of transition from the moment in which people arrive to their new homes or work, until they can develop activities that generate income, and they may constitute social organizations once again; and the consolidation and reestablishment stage which begins when people are incorporated to the new environment, reestablish their means of life, their incomes, and their social organizations.

In-situ relocation, this type of resettlement occurs when only a part of a property is required and the remainder is viable, whether to relocate the home or to develop the economic activity that was being carried out.

Cut-off date, is the date established to close the census of the people who must be compulsorily displaced.

III. OBJECTIVES

- Resettle the displaced population to improve or at least reestablish the socio-economic conditions and standard of life of the displaced population in a sustainable manner, independently of their ownership condition.
- Provide sustainable and inclusive alternatives for resettlement that respond to the different characteristics of the people that must be displaced.
- Prevent, mitigate, and compensate the negative impacts that may be faced by the poeopl who will continue residing in the place where population was displaced, and the receiving populations
- Integrate the resettled population with the receiving population.

IV. SCOPE

This safeguard applies to all the projects and operations financed by CAF that require compulsory displacement of people who live or work in the area where the project is developed, or that cares for displaced populations after the occurrence of a disaster.

If an operation that already started activities applies for CAF financing, and cost compulsory displacement, an evaluation will be prepared of the actions carried out in said operation, in order to determine if it is necessary to formulate and execute a remedial resettlement plan that guarantees compliance with the objective3s proposed in this safeguard.

The safeguard applies to all the components of the project, independently of the source of financing.

V. REQUIREMENTS

V.1. About the regulations and institutions

- Comply with the national legislation and international agreements related to the displacement and resettlement of population.
- Have the constitutional capacity to plan and execute the resettlement which implies having interdisciplinary suitable teams with adequate financial resources, and swift decision making processes.
- From the early stages of a project's cycle, connect the entities which, according to their functions, must participate in the preparation and execution of the resettlement.

V.2. About avoiding or reducing compulsory displacement

- Analyze different alternatives for the design of the project to avoid or reduce the compulsory displacement of population, if it is technically and economically feasible
- Describe the alternatives analyzed for decision making, to avoid or reduce compulsory displacement and its results.

V.3. About the identification of the areas required by the project, and the characterization of the population to be displaced, those will continue living in the place, and the receiving population

- Precisely determine the areas required by the project.
- Carry out cadastral and ownership studies to determine the land included in the required area, identify the people that have rights over them, and the types of ownership.
- Carry out a topographic survey of the properties (land and constructions) existing in the required area.
- Carry out a census and socioeconomic study of the social units (families, homes, industries, services, stores, and other productive units) that reside in the required lands, and the type of ownership they have.
- Establish the cut-off date of the census of the population to be displaced, to define the eligibility criteria of the resettlement solutions.

- Identify the population that will continue living in the place once the population that resides in the area required or intervened by the project is displaced, and analyze the types of relationships they have with the people that must be displaced.
- Identify the population that lives in neighboring areas to where the displaced population will resettle, analyze their socioeconomic characteristics and the supply of public and social services in the area.

V.4. About impact evaluations

- Identify and evaluate the type of loss of the social units and people that must be displaced from the areas that are required or intervened by the project.
- Identify and evaluate the impacts faced by the neighbors of the population to be displaced that will continue living in the place.
- Identify and evaluate the impacts faced by the receiving population as a result of the resettlement of the displaced population.

V.5. About the consultation and relationship building

- Carry out an exclusive consultation process with those affected by resettlement processes.
- Provide clear, reliable, and timely information to the involved people (residents, displaced, receiving) regarding the resettlement process and their options, rights, and obligations.
- Establish bilateral channels of communication during all the stages of the resettlement process so that the people involved may provide and receive information, present their petitions and questions, and receive responses.
- Consult with the population to be displaced about the identification and evaluation of displacement impacts, resettlement options and objectives, scope, and content of the resettlement plan.
- Consult the population that will continue residing in the place about the evaluation of the impacts they will face as a ¿result of the displacement of their neighbors, and about the measure that will be applied to prevent, mitigate, or compensate said impacts
- Consult the receiving population about the evaluation of the impacts they will face as a result of the resettlement of the displaced population, the measures that will be applied to prevent, mitigate or compensate said impacts, and their integration with the resettled populations
- Develop consultation mechanisms that are inclusive in terms of gender and age and which guarantee a wide participation of the people and social units involved.
- Document the results of the consultation and the agreements achieved with the involved groups.

V.6. About the planning

- In a participative manner, design the resettlement plan which must include the measures to prevent, mitigate, and compensate the negative socioeconomic impacts that will be faced by the displaced population, those who will continue residing in the place, and the receiving population. Each measure must define objectives, goals, activities, responsible parties, timeline and budget.

- Include measures to provide special attention to the groups that, as result of their condition, are more vulnerable to displacements, such as single-parent head of household, head of productive units whose sustenance derives from the activities developed in the required lands, and any other group that requires it.
- In a participative manner define the date in which people will be displaced, in agreement with economic, social, educative, cultural cycles of the displaced population, with the purpose of achieving a successful resettlement.
- Coordinate the timeline for the Resettlement Plan with the timelines of the project which is causing the displacement, so that the housing solutions and all the necessary conditions for the reestablishment of the life conditions are available in the Resettlement Place and to ensure that the measures to prevent, mitigate, and compensate the impacts faced by the populations that will continue living in the place, and the recei8ving populations, are applied in a timely manner.
- Include the budget of the Resettlement Plan in the total cost of the project and ensure the timely availability of these funds.

V.7. About the execution

- Have sufficient institutional capacity to adequately execute the Resettlement Plan. For this, the entity responsible for the Project must have all the human, physical, and financial resources that are necessary in a timely manner.
- Design participative mechanisms to conduct the follow-up and evaluation of the resettlement plan.
- Design a system to address petitions, complaints, and claims that is accessible for all the people involved.
- Define a conflict resolution mechanism (intra-family, between social units, and between people and the entities that participate in the resettlement process) that may emerge during the planning and execution of the resettlement.

V.8. About the follow-up, monitoring, and evaluation

- Design a follow-up and monitoring system that provides timely information regarding the life conditions of the groups involved during the resettlement process and regarding the execution Resettlement Plan.
- Design evaluation indicators for each measure included in the Resettlement Plan so that the achievement of the proposed objectives may be determined in an objective and verifiable manner.
- Design participation mechanism for the groups involved to carry out the follow-up and evaluation of the resettlement plan.

V.9. About the dissemination

- Disseminate the census of the social units and people that must be displaced.
- Do not divulge personal and confidential information of the social units to be displaced or of the people of the groups involved.
- Disseminate the results of the socioeconomic, property, and ownership studies; the evaluation of the socioeconomic impacts of the involved groups and the Resettlement Plan,

excluding the measures that may be used by opportunistic people, threatening the development of the Resettlement Plan and the Project.

V.10. Documents

In order to organize and document the actions to comply with the above mentioned requirements, the proponent must prepare a document that includes: (i) Resettlement Plan when there is physical displacement of population; (ii) plan for the reestablishment of socioeconomic conditions when only economic displacement is present; and (iii) In Situ Relocation Plan for the people whose property is partially affected, and they may relocate their homes or activities within the remaining area. Following is a description of the content and scope of these documents:

This document must include two Parts and the following chapters:

Part I. Census, socioeconomic studies, and impact evaluation

I. Description of the Project that will cause compulsory displacement of populations and the measures taken to reduce such displacement.
II. Population to be Displaced. Census and socioeconomic study of the population to be displaced or the population whose property is partially affected, specifying whether it will be totally or partially affected. The methodology used to conduct the census and socioeconomic study must be presented in addition to the dates in which the information was gathered, the instruments used, the results of the census of social units and their socioeconomic characteristics, the mechanisms and results of the validation of the census and socioeconomic study, and the cut-off date of the census.
Identification of the loses and impacts faced by the social units as a consequence of their displacement specifying: loss of house, of income sources, of income, of access to public services, with access to educational and health services, rupture of economic and social networks, social dismantling, and any other impact identified. The existing elements and activities developed in the required areas must be identified, together with the total area of the property, and the remaining area, specifying if this is viable to relocate the elements ore affected activities. Classification of social units by type of loss and impact, and identification of losses and impacts for each social unit. Mechanisms and results of the validation of these impacts, and documentation of these consultations. The methodology used must be presented together with the events of the consultations, who will be consulted and how, and the results. This must be accompanied by film and photographic registries, and the acts or documents that have been signed with the communities.
III. Resident Population. Socioeconomic characterization of the area required or intervened by the project, of the population that will continue residing in the place, and of the type of relationship they have with the population to be displaced.
Identification of the impacts faced by the population that will continue residing in the place, resulting from the displacement of their neighbors. Mechanisms and results of the validation of these impacts and documentation of these consultations.

Part II. Resettlement Plan

IV. Legal framework. Description of the current legal framework in the country regarding the process to acquire the lands for the case of the proposed project, indicating the steps, procedures, valuation method, rights and responsibilities of the persons involved, national or international regulation that support the mitigation and compensation measures for the groups involved included in the Resettlement Plan.

V. Institutional Framework and Organization. Description of the organizational unit in the entity that will execute the project and which will be in charge of planning and implementing the Resettlement Plan and/or the Plan for the Reestablishment of Socioeconomic Conditions, human, physical, and financial resources assigned, and levels of decision making.
List of the entities and government levels that, as a result of their functions, will participate in planning and implementing the Resettlement Plan or the Plan for the Reestablishment of Socioeconomic Conditions, with their respective roles, participation commitments, and coordination mechanisms between them.

VI. Resettlement Plan. This plan may be called by the name assigned by the entity responsible for the project. It is made up by the measures for the acquisition of the lands required by the project, and measures to prevent, mitigate or compensate loses and negative impacts faced by the population to be displaced (housing, incomes, access to education and health services, public services, restructuring of economic and social networks, and social and community reorganization), which will continue residing in the place (that responds to the impacts identi8fied and the receiving population if it was already identified). The Plan must include the timeline and budget for its execution.

VII. Plan for the Reestablishment of Socioeconomic Conditions. This plan may be called by the name assigned by the entity responsible for the project. It includes the measures to prevent, mitigate or compensate the loss of economic activity or income faced by the people who develop subsistence activities or income generation in the areas required or intervened by the Project, but they do not lose their place of residence. The plan must include the timeline and the budget for its execution.

VIII. In Situ Relocation Plan. This plan may be called by the name assigned by the entity responsible for the project. It is aimed at owners or residents of partially affected plots, with whose remaining areas are viable. It includes measures related with the acquisition or indemnity of the partially requested area of each plot; the fragmentation procedures of these areas, and the changes in the deeds or property deeds; and the measures to support the reconstruction of houses and infrastructure, or for the installation of activities in the remaining areas. The plan must include the timeline and budget for its execution.
The measures that make up the previous Plans (Resettlement. Reestablishment of Economic Activity, and In Situ Relocation) must establish their objectives, goals, activities, responsible parties, timeline and budget for their implementation, source of resource allocation, and follow-up and evaluation indicators. The timeline for the development of the measures must be coordinated with the project's timeline, so that the measures are applied before the impact manifests itself. It must also specify if the budget to execute the Plan is included in the cost structure of the project, and if these resources will come from the credit granted by CAF, the national counterpart, or from a combination of both sources. as well as the consultation mechanisms carried out with the population involved regarding the Plan's objectives, scope, and timeline.

VI. PROCEDURE

VI.1. Origination

It must be determined if due to the characteristics of the operation and the location of the project, it is necessary to resettle the population during the implementation of the project.

VI.2. Evaluation

When a project is presented to CAF for financing, the documentation related to the evaluation of impacts, risks, and environmental and social opportunities, and their management plans presented by the project's proponent it must specify if the proposed project requires or will intervene areas that imply the physical or economic displacement of people. If this impact materializes, the related documents in the previous section must be presented.

If the project's proponent has not prepared any of these documents when presenting the project to CAF, the necessary action will be agreed upon to prepare the necessary studies and to develop the respective Plan (Resettlement, Reestablishment of Socioeconomic conditions, In Situ Relocation). All of this must be prepared and approved by CAF before any of the project's activities that generate physical or economic displacement of people are executed. When a project includes several sub-projects or annual investments which are not defined at the moment the project is presented to CAF, when each sub-project is defined, an analysis must be conducted to identify if there will be physical or economic displacement of population to apply this safeguard. All these agreements will be reflected in the credit contract, which will include specific clauses in case of non-compliance by the project's executing agent.

VI.3. Formalization

When resettling the population is necessary for the implementation of the project, it must be verified that the credit contract establishes the obligation _____in the framework of this safeguard.

VI.4. Administration

Once the operation is approved, the client will develop actions to comply with the agreements established in the credit contract regarding the matter, and will execute the Resettlement Plan and/or the Plan for the Reestablishment of Socioeconomic Conditions. The client must also conduct participative monitoring of the Plan's implementation, to determine the degree of advance and the need to take corrective measures, if necessary. The client will periodically prepare a follow-up and monitoring report of the Plan, including the activities carried out and the level of achievement of the proposed objectives. The follow-up and monitoring report will be presented to CAF, to the communities involved, and to interested parties. CAF will review these reports and may propose corrective measures, if necessary.

At the end of the project, the executing agent must conduct a participative evaluation of the Ethnic Group Plan, to determine if the proposed objectives were achieved. The final evaluation report must be available for the communities involved and interest actors. CAF will review the evaluation report of the management measures prepared by the project's executing agent, and may agree on additional measures fr the compliance with the objectives established in this safeguard, if necessary.

CAF will prepare a closing report on the project, specifying the level of achievement of the objectives proposed in the Resettlement Plan and/or the Plan for the Reestablishment of Socioeconomic conditions, as well as the lessons learned for future projects.

SALVAGUARDA S08 WORKING AND TRAINING CONDITIONS

I. INTRODUCTION

The development of projects generates benefits to the communities through the creation of employment and generation of income that contributes to the reduction of poverty. These projects include infrastructure, urban renewal, extractive, manufacturing, and agro-industrial, among others. CAF acknowledges the importance of ensuring that the activities financed guarantee that workers in the projects have a fair and dignified deal, with balanced remunerations, without discrimination, under safe and healthy conditions, through constructive relations between the workers and the administrator, helping to obtain benefits in the development of the project with efficiency and productivity in their operations.

The referential framework is provided by a series of international agreements[84] and instruments that include those of the International Labor Organization (ILO) and the United Nations Organization (UN), to which most of the countries of the region are signatories.

Therefore, it is the responsibility of any organization or entity that develops a project, to offer workers dignified, safe, and healthy working conditions. Based on the nature of each project, occupational risks are identified to design measures to minimize risks, monitor, and promote the workers' health.

In addition, CAF considers that the generation of capacities in its clients in the implementation stage of the projects its finances is important.

II. DEFINITIONS

Forced labor, is defined as "any work or service demanded from an individual under any threat, and for which the individual does not offer himself voluntarily.[85]

Children's working age, the minimum age at which children are authorized to work is 15 years old (14 in developing countries). For light work (just a few hours from time to time) the minimum limit if from 13 to 15 years old (12 to 14 in developing countries). Finally, for arduous works the limit climbs to 18 years old (16 under certain conditions in developing countries).[86]

Dangerous child labor, the term “dangerous child labor” is usually defined as any work that deprives children of their childhood, their potential, and their dignity, and which is detrimental for their physical or psychological development. It refers to work that is dangerous and damaging for their

[84] The agreements are:
ILO's Agreement 29 regarding forced labor
ILO's agreement 100 regarding equality of remunerations
ILO's agreement 105 regarding abolition of forced
ILO's agreement 111 regarding discrimination (employment and occupation)
ILO's agreement 1038 regarding minimum working age
ILO's agreement 100 regarding worker safety and health,
ILO's agreement 182 regarding the worst forms of child labor

[85] ILO's agreement 29 regarding forced labor, art. 2

[86] http://www.humanium.org/es/trabajo-infantil/. Humanium in an international NGO that supports children, committed to end the violations of the Rights of Children worldwide

physical, mental, or moral wellbeing , and which interferes with their schooling because: i) it deprives of the possibility of attending classes; ii) forces them to abandon school prematurely; or (iii) demands that they combine study with heavy work which demands a significant amount of time.

Risk factors,[87] conditions of the environment, instruments, materials, the task or the organization of work that entails a potential damage to the health of workers or a negative effect on the company. They are classified as physical, chemical, biological, mechanical, ergonomic. electric, and psychosocial risks.

Biological risks, are those represented and originated in microorganisms, toxins, biological secretions, tissue and human and animal organs, present in certain working environments which, when contacting an organism, may unleash infectious diseases, allergic reactions, intoxications, or negative effects on the health of the workers.

Physical risks, are those susceptible of being produced by environmental conditions of a physical nature, considering the latter as the energy that moves in the environment, and when getting in contact with people, may have adverse effects on their health depending on its intensity, exposure, and concentration, and are associated to noise, temperatures, vibrations, radiation, illumination etc.

Chemical risks, are those susceptible of being produced by chemical elements and substances which, when entering the body through inhalation, skin absorption, or ingestion, may produce intoxication, burns, irritation or systemic injuries. Depending on the degree of concentration and period of exposure, it may have irritating, asphyxiating, anesthetic, narcotic, toxic, systemic, allergenic, neumoconiotic, carcinogenic, mutagenic, and teratogenic effects..

Mechanical risks, these risk factors refer to everything that is related with objects, machinery, equipment, and tools which, due to their functioning conditions, design, shape, size, and location, have the potential capacity to be in contact with people or materials, provoking injuries or damages.

Electrical risks, refers to the electrical systems of machineries, and installations of locative equipment that lead to or generate dynamic or static energy and which, when in contact, may produce injuries such as: burns, shock, and ventricular fibrillation, depending on the intensity and duration of contact.

Ergonomic risks, refers to all the factors that are inherent to the process or task that include organizational aspects, aspects of the interaction between man-environment-working conditions, and productivity, which have an impact on the physical load, static load, postures, dynamic load, and design of workstations.

Psychosocial Risks,[88] working psychosocial risks are the facts, developments, situations or states that are consequence of the work organization, with a high probability of affecting the workers' health, with significant consequences. In contrast to psychosocial factors, psychosocial risks are

[87] Guia técnica para el análisis de exposición a factores de riesgo ocupacional, Ministry of Social Protection, Republic of Colombia, 2011. (Reference used for: Risk Factors, Biological Risks, Physical Risks, Chemical Risks, Mechanical Risks, Electrical Risks, and Ergonomic Risks).

[88] Factores y Riesgos Psicosociales, formas, consecuencias, medidas y buenas prácticas. Ministry of Labor and Immigration, National Institute for Work Safety and Hygiene, Spain 2010.

not organizational conditions, but rather facts, situations, or states of the body with a high probability of significantly damage the health of the workers. Psychosocial risks are labor contexts that usually cause significant damage in the worker's health, although the effects may be different for each worker. In this respect, the facts, situations, or contexts that are proposed as labor psychosocial risks, need to have a clear probability of damaging the physical, social, or mental health of the worker in a significant manner. For example, violence in the workplace or labor harassment. Psychosocial risks have high probabilities of causing significant damages. Their consequences have greater probabilities of occurring and of being more severe.

Vulnerable workers, are workers or groups of workers that comply with the condition of vulnerability with respect to all the workers, that is, people with handicaps, migrants or foreigners, women, and children of working age.

III. OBJECTIVES

- Promote compliance with the national legislation regarding work, relations, and labor conditions.
- Promote a fair treatment, without discrimination, and with equal opportunities for all workers
- Promote the prevention of occupational risks through the evaluation and control of risks in the activities carried out in the projects
- Avoid the use of dangerous child labor and forced labor.
- Promote safe and healthy working conditions, protect and ensure the health of workers, including vulnerable groups.

IV. SCOPE

This safeguard applies to all the projects and operations financed by CAF that require hiring a workforce.

The application is aimed at all the workers of the projects, including groups of vulnerable workers, that is "direct workers", who are people that work in a relationship of direct dependence with the client, "indirect workers" who are people that work or are linked to the projects through third parties as contractors, sub-contractors, executing agents, suppliers, and community workforce.

V. REQUIREMENTS

Establish and apply human resources, policies and procedures, that are in agreement with the size and workforce required for the project, which will be managed according to the applicable national legislation regarding labor issues. These policies will apply to all the workers of the project.

The workers of the project will have at their disposal clear and comprehensible information regarding their terms and labor conditions, as well as their rights according to the national labor legislation and to applicable collective agreements, including hours of work, salaries, overtime, compensations, benefits and, when necessary, any substantial changes to their working conditions.

Vulnerable workers must be identified, that is, people with special needs migrants or foreigners, women, children of working age. These people must have equal conditions and equivalent terms as non-vulnerable workers.

When housing services are included, they must be offered under conditions of equal opportunities and non-discrimination, with quality policies and the provision of adequate basic services regarding minimum space, sanitary facilities, storage and kitchens, water, electricity and sanitation supply, control of vectors, adequate ventilation and illumination and in relevant cases, medical attention.

The client will establish his working relations, and will ensure that through third parties his employment relations are based on the principle of equal opportunities, non-discrimination, and fair treatment, and will take measures to prevent and address harassment, intimidation, or working exploitation. Employment relations are understood as the comprehensive management of the human talent, that is, the selection, recruiting, hiring, compensation, working conditions and terms, training, development, promotion, firing, retirement, and disciplinary practices. In addition, the client will not make employment decisions based on personal characteristics beyond the requirements of the workpost (gender, race, nationality, ethnic origin, religion, special needs, sexual orientation, or age).

The client will provide a complaints mechanism for the workers of the project to express their doubts, concerns, or complaints. The mechanism must be of easy access for everyone and workers must be informed and protected against retaliations resulting from its use.

The projects and/or operations financed by CAF will not directly or indirectly use dangerous child labor. To this effect, the client will ensure that child labor will not be contracted in any form that may constitute economic exploitation or that may be dangerous for the child's health, or physical, mental, spiritual, moral, or social development, or that interferes with the child's education. The client must identify the presence of minors under 18 years old in the projects, and comply with local legislation regarding the employment of minors, respecting the working age for children, established by the national law, or in the absence of the latter, use the dispositions established in the definitions of this safeguard.

Projects and/or operations financed by CAF will not directly or indirectly use forced labor. To this effect, the client will, directly or through third parties, ensure that forced labor is not contracted, that is, any service or work performed involuntarily, demanded from an individual under threat of force or punishment, including work demanded through contracts, in conditions of servitude or similar contracting agreements. No workers who are victims of human trafficking will be used.

The projects and/or operations financed by CAF will provide workers with a safe and healthy environment for the development of their activities. The necessary measures have to be taken to avoid accidents, injuries, and diseases related to the activities developed in the project, based on a preventive management of labor risks.

To this effect, the risks for safety and occupational health inherent to the operation and/or project must be identified and evaluated. These are physical, chemical, biological, mechanical, ergonomic, electrical, and psychosocial risks to which workers are exposed, and vulnerable groups must be considered. Adequate measures must be taken to prevent, minimize, and control the identified

risks, and this management must be aimed at controls in the source of danger, in the environment, or in the individual, and establish continuous follow-up programs of this management and of the vigilance towards the health of workers through occupational health exams based on the risk factors to which they are exposed.

In the case where security personnel is required for the custody of some inputs or elements to be used in the projects, the definition of this need will obey to: (i) need to protect people from dangerous inputs; (ii) a risk analysis of the presence of this personnel; and (iii) definition of the inputs to be supplied based on the previously mentioned risk analysis. In addition, the communities must be provided with information, through mass media, regarding the presence of such personnel and the reasons for their incorporation.

As part of the preventive management of safety and occupational security risks, a series of measures must be established, which must be incorporated to the activities of the project with exclusive personnel in charge of this management. Prevention management must be strengthened through inspections that help promote a safe behavior during the tasks to be developed and, additionally, provide training to the workers regarding safety and occupational health, with an emphasis on the risk factors to which they are exposed, preventive occupational health, and response to emergencies.

In case of labor accidents, an investigation must be carried out regarding the causes of the accident, incidents, and/or occupational diseases, disseminate the lessons learned, and take the corrective measures necessary to avoid recurrence.

The project must have procedures for prevention, preparation, and response to emergencies. To this effect, it will prepare an emergency plan considering the main risks of the project, create brigades to address them, and conduct drills.

The client will ensure that workers contracted by third parties also comply with the local legislation regarding labor regulations and prevention of safety and occupational health risks

The client will present:

1) the safety and occupational health Plan, which must include at least i) the identification and simplified evaluation of the safety and occupational health risks, that is, physical, chemical, biological, mechanical, ergonomic, electrical, and psychosocial risks to which workers, including vulnerable groups, are exposed during the development of the activities related to the project. ii) The measures to prevent and control the safety and occupational health risks aimed at control in the source of danger, in the environment, and/or in the individual as the case may be. iii) An occupational medical vigilance plan, emphasizing health prevention of workers through occupational exams based on the risks to which they are exposed. iv) A training plan regarding safety and occupational health. v) This document must also verify compliance with the applicable national regulation and relevant international commitments that the country has adopted regarding safety and occupational health.
2) an Emergency Plan of the project must be presented, including at least the organizational chart of the emergency plan, the brigades, a schedule of drills, and the procedures to respond to emergencies, based on the risks identified in the project.

With respect to training, the client must inform the workers about the training plans and programs during the term of the credit operation.

VI. PROCEDURE

VI.1. Origination

In the origination phase of CAF's credit process, the client must provide the necessary information on the project, so that in the preliminary analysis of environmental and social risks, it may be established if it is within the scope of application of this safeguard. The application of the safeguard will be established in the Annex 2 of S01.

VI.2. Evaluation

If the safeguard is applicable the client will be requested to prepare a safety and occupational health Plan for the project and an Emergency Plan that includes detailed relevant analysis based on the identified risks.

If the client has not prepared the plans indicated in the requirements at the time of the presentation of the project to CAF, the necessary actions will be agreed upon so that the client can prepare the safety and occupational health plan and the emergency Plan to present to CAF. When a project includes several sub-projects or annual investments that are not identified when presenting the project to CAF, once each subproject is defined, the safety and occupational plan and emergency plan must be prepared. All these agreements will be reflected in the credit contract which will include specific clauses for cases of non-compliance by the project's executing agency.

When due to the nature or location of the project there is a risk of dangerous child labor or forced labor linked to the project, the client will establish periodic control and vigilance measures that are necessary to correct it.

The client must present the worker training plan or program, established for the operation for which financing is required.

VI.3. Formalization

In the formalization phase, it will be ensured that the conditions associated to security and occupational health and working conditions are included in the contract

VI.4. Administration

In the administration phase (during the implementation of the project) the client will comply with the agreements established in the credit contract, and will implement the security and occupational health plan. The client will present an advanced report of the plan, which will be presented with the frequency established in the contract. The report will be a public document, available to all interested parties. CAF will review the reports, and, if necessary will propose the corrective or complimentary measures that are needed.

SAFEGUARD S09 GENDER EQUITY

I. INTRODUCTION

The search for gender equity is a central element of a sustainability vision in which each member of society respects others and performs a role that allows each one to reach their maximum potential. The wide goal of gender equity is a social goal to which education and the other social institutions must contribute. Gender discrimination is embedded in the weave of societies. In many societies, women have the main burden of food production and raising children. In addition, women are often excluded from community decisions that affect their lives and well-being

Gender issues must be considered a priority in planning, from infrastructures to the development of materials or processes in all the spheres of development. Total and equitable participation of women is essential to ensure a sustainable future because:

- Gender roles are created by society and learned from one generation to another;
- Gender roles are social constructs and may be changed to reach equality and equity between women and men;
- Empowering women is an essential tool to advance on development and reduce poverty;
- Gender inequalities erode the capacity of girls and women to exercise their rights;
- Ensuring gender equality between girls and boys means that both have the same opportunities to access school as well as during their course of studies.

CAF's institutional mission is to promote sustainable development and regional integration in its member countries through social inclusion and gender equity, understood as the same treatment for women and men and same access to the resources and services of CAF's operations.

II. DEFINITIONS

Gender.[89] Refers to the social tributes and opportunities associated to being a man or a woman, and the relationships between both. These attributes, opportunities, and relationships, are socially constructed and learnt through socialization processes, and depend on a time or context, and, therefore, they may change. Gender determines what society expects, allows, and values of men and women in a specific context. In most societies there are differences and inequalities between women and men regarding the responsibilities assigned, activities assumed, access and control of resources, and opportunities to participate in decision making activities. The concept of gender is part of a wider social-cultural context that also includes other criteria such as class, race, age, level of poverty or ethnic group.

Gender equity. Means that men and women enjoy equal conditions in the full exercise of their human rights, in their possibility to contribute to the national political, economic, social, and cultural development, and to benefit from its results.[90]

[89] UN Women. Concepts and definitions. http://www.un.org/womenwatch/osagi/conceptsandefinitions.htm.

[90] UNAM. «Equidad de género». Mexico: UNAM's Secretariat for Comprehensive Development.

Gender equality. Also known as sex equality, implies that men and women must receive the same benefits, same sentences, be treated with the same respect, and that there is no violence between both sexes. This concept is key in the United Nations Universal Declaration of Human Rights, where the final objective is to grant people legal, cultural, and social equality, especially in democratic activities, and ensure equal salaries for equal jobs.[91]

Access. Refers to the opportunity of using a resource.

Control. Refers to the power of deciding how a resource is used and determining who has access to it.

III. OBJECTIVES

- Ensuring that women and men benefit equally from the projects and programs financed by CAF
- Ensure the equitable participation of women and men in the projects and programs financed by CAF, both in their design, as well as in their execution.
- Avoid deepening preexisting gender gaps in the design and execution of projects and programs financed by CAF as well as adverse impacts that affect either gender.

IV. SCOPE

This safeguard applies to all the projects and operations financed by CAF that may generate negative impacts on gender equality. The applicability of the safeguard is determined during all the phases of CAF's credit cycle with special attention provided during the evaluation process of the project's social and environmental impacts. (Safeguard 1).

The safeguard applies to all the components of the project, independently of the source of financing.

V. REQUIREMENTS

In the evaluation process of the social and environmental impact (Safeguard S01) the client will identify and evaluate the risks, threats, and impacts that the project may have on gender equality and women. Possible negative direct, indirect, synergic, and cumulative negative impacts will be identified. In all the projects and programs to be financed by CAF, the client must:

- Identify and evaluate if the social impacts of the project/program are different for women and men, to provide feedback to the project's design;
- Prepare a hierarchical plan of measures aimed at preventing and avoiding, and in the absence of this, minimizing, and when there are residual impacts, compensate the impacts of the project to women and men of the direct area of influence;
- Conduct a timely follow-up of the implementation of the management measures of the impacts related to the projects/program and adjust them based on the evolution of the impacts during the different phases of the project's cycle;

[91] United Nations. Report of the Economic and Social Council for 1997. A/52/3.18. September 1997

- Promote a timely, effective, and transparent participation of women and men in the direct area of influence of the project/program, providing the means to maintain the participation during the whole cycle of the project, and guarantee that all the relevant information to this end is disseminated in a timely manner;
- Have in place, and if necessary develop, institutional, technical and financial capacities to implement and conduct a follow-up of the strategy of hierarchical management measures of the impacts related to the project.

The project will include a monitoring plan, allowing for fast corrective measures to minimize the negative impacts that may generate during the normal operation of the project

If the safeguard is applicable for the evaluation stage of the operation, the client is requested to prepare a specific gender Analysis for the project or program. This document which will evaluate the potential roles, benefits, impacts, and risks for men and women of different ages, ethnic groups, status, and social structure, must include the following chapters:

I. Gender study. This study must provide a detailed description of the social structure of the population residing in the direct area of influence of the project/program, it's history, social-political organization, demographic, social, economic, cultural, and religious characteristics. It must also describe the roles of women and men in the area of influence of the project, regarding the activities of the project/program, and the existing differences in the control, access and use of the land, natural resources, goods and services, and the factors that contribute to these differences. The study must also present the existing inequalities in public decision making (political and institutional representation), and private decision making (existing inequities in the household). Finally, the study must show prior experiences in the design and implementation of projects that are sensitive to gender in the area of influence of the project/program or the country, as well as the vision and opinion of men and women regarding similar projects.

II. Institutional framework. This document will describe the current legal framework in the country regarding gender issues, relevant international agreements subscribed by the country, compliance with this national legislation and agreements in the framework of the proposed project, and the governmental institution in charge of managing gender issues, its functions, and responsibilities. It will also identify other relevant actors of the civil society such as non-governmental organizations, women organizations, or community organizations, and will analyze their institutional capacity and possible connections with the project/program.

III. Impact evaluation. This is the study of both positive and negative impacts that the project/program may have on the existing gender relations. This evaluation must specify the methodology used, the results of the impact evaluation, the participation of women and men in the direct area of influence of the project/program, their opinions and comments to the results of this evaluation, and the documents that support this participation. IN particular, three areas are identified which could present potential risks: (i) economic opportunities such as the existence or incorporation of unequal requirements for access to the benefits and economic opportunities generated by the execution of the project/program such as remunerated work, training, credit, or business opportunities, in addition to requirements

that limit the participation of women and men in the benefits and activities in the project/program, resulting from pregnancy, maternity/paternity leave or marital status.; (ii) property rights, result of ignoring the right of women to inherit and own lands, housing or other assets or natural resources, and (iii) gender violence, which includes sexual exploitation, human trafficking, or sexually transmitted diseases.

IV. Gender Action Plan. If there are adverse impacts on any gender, measures to prevent, mitigate, and/or compensate said impacts will be identified. In particular, it is necessary to ensure that:
   i. The goals, objectives, processes, and activities of the project are gender sensitive and respond to the needs and priorities of the men and women of the projects' area of influence.
   ii. Men and women are involved in the Project's decision making processes, such as choosing the technology, service levels, the operation and maintenance, etc.
   iii. Restrictions to the participation of women and the development of strategies that help to eliminate or minimize them must be identified.
   iv. The necessary personnel and budget provisions are taken so that both men and women can be involved, including plans to hire women (especially if men and women do not share public spaces).
   v. If the project has institutional strengthening components, education and/or training, identify the needs of the population of the area of influence of the project and incorporate women.
   vi. If the project uses community committees, ensure that they are constituted in a gender sensitive manner, including the creation of women's committees (in case men and women do not share public spaces).

VI. PROCEDURE

VI.1. Origination

In the origination phase (when applying for the credit), the client will provide information to identify if the project is within the scope of application of this safeguard. The corresponding Environmental Executive will analyze the information and indicate in the preliminary analysis of environmental and social risks, if this safeguard is applicable. The application of the safeguard will be based on the questions established in annex 2 of S01.

VI.2. Evaluation

In the evaluation phase, once it has been included in the inventory of operations, the client will present the social and environmental studies of the project, including the Gender Analysis.

VI.3. Formalization

In the formalization phase (before signing the credit contract), the DACC Executive will ensure that the credit contract includes, when necessary, the specific commitments resulting from the Gender Action Plan.

VI.4. Administration

In the administration and disbursements phase (during the implementation of the project), the client will implement the agreed upon measures, including compliance and performance indicators. The client will present advance reports with a frequency established in the contract. The report will be a public document available to all interested parties. CAF will review the reports and, if necessary will propose corrective or complimentary measures as needed.

The Gender Equity Executive will support the Environmental Executive during all the phases of the procedure. Specifically, he will make a declaration regarding the activation of the safeguard.