



ADAPTATION FUND

AFB/PPRC.21/22
27 September 2017

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

Agenda Item 6 r)

PROPOSAL FOR ECUADOR

Background

1. The Operational Policies and Guidelines (OPG) for Parties to Access Resources from the Adaptation Fund (the Fund), adopted by the Adaptation Fund Board (the Board), state in paragraph 45 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US\$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the endorsement of the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would ultimately require the Board's approval.

2. The Templates approved by the Board (OPG, Annex 4) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.

3. The first four criteria mentioned above are:

1. Country Eligibility,
2. Project Eligibility,
3. Resource Availability, and
4. Eligibility of NIE/MIE.

4. The fifth criterion, applied when reviewing a fully-developed project document, is:
5. Implementation Arrangements.

5. It is worth noting that since the twenty-second Board meeting, the Environmental and Social (E&S) Policy of the Fund was approved and consequently compliance with the Policy has been included in the review criteria both for concept documents and fully-developed project documents. The proposals template was revised as well, to include sections requesting demonstration of compliance of the project/programme with the E&S Policy.

6. In its seventeenth meeting, the Board decided (Decision B.17/7) to approve "Instructions for preparing a request for project or programme funding from the Adaptation Fund", contained in the Annex to document AFB/PPRC.8/4, which further outlines applicable review criteria for both concepts and fully-developed proposals. The latest version of this document was launched in conjunction with the revision of the Operational Policies and Guidelines in November 2013 and amended in October 2016 following an update of the Operational Policies and Guidelines in March 2016.

7. Based on the Board Decision B.9/2, the first call for 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 April 8, 2010.

8. 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.

9. The following fully-developed project document titled "Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Toachi – Pilatón watershed

with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management” was submitted by the Corporación Andina de Fomento (CAF), which is a Regional Implementing Entity of the Adaptation Fund.

10. This is the fourth submission of the proposal. It was submitted twice as a concept at the twenty-sixth and twenty-eighth meetings of the Board and was not endorsed. It was re-submitted at the twenty-ninth meeting of the Board, and the Board decided:

(a) *To endorse the project concept, as supplemented by the clarification response provided by Banco de Desarrollo de America Latina (CAF; Development Bank of Latin America) to the request made by the technical review;*

(b) *To request the secretariat to transmit to CAF the observations in the review sheet annexed to the notification of the Board’s decision, as well as the following issues:*

(i) *The fully-developed proposal should include more details on how outputs will be achieved and linked together during project implementation;*

(ii) *The fully-developed proposal should more extensively outline, detail, and quantify the benefits of the project, including a more thorough plan of how women and marginalized groups will be involved and will benefit from the project;*

(iii) *The fully-developed proposal should provide a more detailed analysis of the project’s cost effectiveness, adaptation reasoning and how the sustainability of the project outcomes has been taken into account when designing the project;*

(iv) *The fully-developed proposal should include a brief plan for how gender considerations will be taken into account in the project;*

(c) *To request CAF to transmit the observations under sub-paragraph (b) to the Government of Ecuador; and*

(d) *To encourage the Government of Ecuador to submit through CAF a fully-developed project proposal that would address the observations under sub-paragraph (b) above.*

(Decision B.29/9)

11. The current 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, assigned it the diary number ECU/RIE/Rural/2016/1, and completed a review sheet.

12. 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.

13. 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. In accordance with decision B.25.15, the proposal is also submitted with changes between the initial submission and the revised version highlighted.

Project Summary

Ecuador – Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Toachi – Pilatón watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management

Implementing Entity: CAF

Project/Programme Execution Cost: USD 180,000

Total Project/Programme Cost: USD 2,370,000

Implementing Fee: USD 119,373

Financing Requested: USD 2,489,373

Project Background and Context:

The project objective is to strengthen the adaptive capacity of the local population in the Toachi – Pilatón water system. The project focus on key drivers that will worsen the probable impact from climate change. The expected mid-term impacts are improved enabling conditions to sustain forest cover and sustainable small-scale farming in the area. 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 parts of Ecuador and other Andean countries.

Component 1: Conserve vegetative cover (USD 950,000)

The component includes activities that support the conservation of forests to secure key ecosystem services. Three outcomes will be generated by (i) expanding protection of existing forests under mechanisms of conservation and sustainable forest management, (ii) strengthening the management of existing protected forests and private reserves, and (iii) building artisanal sediment retention dams in key risk areas.

Component 2: Adapt farming practices to new climate change conditions (USD 900,000)

This component will generate the conversion to crop management in an environmentally sustainable and climate-smart way for at least 500 ha. The approach of adaptation will be introduced with at least 250 local smallholder farmers, to reduce the pressure of farming and livestock activities on native forests and ecosystems. The Project will build upon existing infrastructure and processes of partner institutions to generate sustainable mechanisms targeting investments into adaptation measures. Local input providers and financial institutions will be engaged to improve their respective knowledge and awareness to engage them to participate in the activities of the project in a more proactive way. Capacity building will be implemented and reinforce such stakeholders' understanding of the risks and opportunities to include adaptation solutions in their operations. In addition, an investment fund will be built to support the respective finance of adaptation investments. This financial instrument offers a mean to involve different actors on a long-term basis.

Component 3: Strengthen local capacities and share lessons (USD 400,000)

The component will strengthen private and public local capacities to implement adaptation measures. Three outcomes will be generated by (i) strengthening climate-monitoring, (ii) introducing adaptation to climate change into parish development and land use plans, and (iii) implementing public communication and education plans.



ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular-sized Project

Country/Region: **Ecuador**

Project Title: **Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management**

AF Project ID: **ECU/RIE/Rural/2016/1**

IE Project ID:

Reviewer and contact person: **Daouda Ndiaye**

IE Contact Person: **Carolina Cortés Cardona, CAF**

Requested Financing from Adaptation Fund (US Dollars): **2,489,373**

Co-reviewer(s): **Martina Dorigo**

| Review Criteria | Questions | Comments on 23/8/17 | Comments on 13/9/17 |
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| Country Eligibility | 1. Is the country party to the Kyoto Protocol? | Yes | |
| | 2. Is the country a developing country particularly vulnerable to the adverse effects of climate change? | Yes. Ecuador is a country that is particularly vulnerable to the impacts of climate change, largely felt through impacts related to water. | |
| Project Eligibility | 1. Has the designated government authority for the Adaptation Fund endorsed the project/programme? | Yes. | |

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| | <p>2. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?</p> | <p>Yes, the proponent has clearly outlined the climate change impacts that have been documented and that are projected. However, the proposal seems to have many overlapping and inconsistent objectives and activities. For example, the proposal describes the impacts on the hydropower station but none of the activities are linked or related to hydropower. It is unclear if the project is designed and implemented in areas to benefit communities, with the reduced sedimentation impacting the hydropower station as a co-benefit, or vice versa. Further, output 1 of Outcome 1 has a target of conserving native forest but describes various activities ranging from restoration to addressing the drivers of deforestation, and often repeats the same information in different formats. Additionally, component 2 and 3 both have elements of the investment fund but don't directly link them to the project rationale in a logical manner.</p> <p>CR1: Please focus the descriptions of each outcome and output to clearly describe the specific activities that are being proposed in a coherent manner that consolidates the components around clear objectives and</p> | <p>CR1: Mostly addressed, a new table has been provided that structures activities more clearly.</p> |
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| | | <p>activities that contribute directly to those objectives.</p> <p>CR2: Please provide additional technical details across all components including selection process and criteria as appropriate. For example, on the types of agricultural practices that will be considered for deployment in the target areas, on the means of identification and restoration of key areas, etc.</p> <p>CR3: Please clarify if the hydroelectric companies will have any role in the investment fund and long-term financing focus of the project, as they will also indirectly benefit from the project.</p> | <p>CR2: Somewhat addressed, some detail has been provided across the description of the components.</p> <p>CR3: Somewhat addressed, the role of the power plant in supporting the investment fund should be elaborated further.</p> |
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| | <p>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?</p> | <p>Mostly, however the section makes broad generalizations about the benefits of the project without supplying any supporting evidence or analysis. CR4: Please clarify if issues related to land tenure have been analysed in the development of this proposal given the significant focus on activities in the forestry and agriculture sectors. CR5: Please justify the social, environmental, and economic claims with evidence, analysis, or other means of substantiation. CR6: Please clarify how the project will benefit women and other marginalized groups.</p> | <p>CR4: Somewhat addressed.</p> <p>CR5: Not addressed.</p> <p>CR6: Addressed.</p> |
| | <p>4. Is the project / programme cost effective?</p> | <p>Not addressed. The section only includes a brief table of cost/unit but does not provide any analysis of why the selected approach and activities compare in cost-effectiveness relative to alternative approaches, nor does it explain why the cost/unit achieved by this project is an efficient way of achieving an outcome. CR7: Please elaborate this section significantly in line with the requirements of the Adaptation Fund to compare the proposed activities to viable alternatives in terms of cost-effectiveness.</p> | <p>CR7: Mostly addressed, however economic evidence would be needed to strengthen the argument.</p> |

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| | <p>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?</p> | <p>Yes, however the description of relevant plans and strategies is brief and leaves many potentially important strategies out. CR8: Please more comprehensively cover the country's NDC among other documents.</p> | <p>CR8: Addressed.</p> |
| | <p>6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund??</p> | <p>Yes, however, the section is not comprehensive and provides only a superficial analysis of relevant standards. CR9: Please more comprehensively cover relevant standards and laws that apply in the context of this project.</p> | <p>CR9: Somewhat addressed, the project document should be updated in the relevant section.</p> |
| | <p>7. Is there duplication of project / programme with other funding sources?</p> | <p>No, however, as with other sections, the review only includes a handful of projects at a very general level. CR10: Please assess the portfolios of other multilateral and bilateral funding sources to provide a more robust assessment of completed or ongoing projects. The proponent may also wish to describe relevant outcomes from the Socio Bosque program.</p> | <p>CR10: Not addressed.</p> |

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| | <p>8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?</p> | <p>Yes, there is a component targeting knowledge management and learning. However, again, the description is very brief. CR11: Please describe how outputs of the project contributing to learning and knowledge management will fit together and be leveraged to capture and feedback lessons in the most effective way to reach the target communities.</p> | <p>CR11: Addressed, but not in the relevant section of the project document.</p> |
| | <p>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?</p> | <p>Yes, consultations were held and a report was provided in the Annex. However, it is not clear how the design of the project was shaped by the outcomes of the consultations. CR12: Please explain how the outcomes of the consultations have informed the design of the project, in particular, the ways in which the project will engage women, vulnerable groups, the private sector, and other relevant stakeholders to ensure sustainability and lasting impact of the project as a result of the consultations.</p> | <p>CR12: Not sufficiently addressed in the relevant section of the project document.</p> |
| | <p>10. Is the requested financing justified on the basis of full cost of adaptation reasoning?</p> | <p>Yes, however pending the resolution of other CRs.</p> | |
| | <p>11. Is the project / program aligned with AF's results framework?</p> | <p>Yes.</p> | |
| | <p>12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?</p> | <p>Yes, however, the description should reference specific outputs and activities of the project that will contribute to the long-term sustainability of the project.</p> | |

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| | | <p>CR13: Please describe specifically how the project will ensure sustainability through community engagement platforms, government processes, the investment fund, among other measures.</p> | <p>CR13: Somewhat addressed.</p> |
| | <p>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?</p> | <p>Not clear. Annex 16 describes an internal document to CAF that is not directly relevant to demonstrating compliance with the ESP and is not taken into consideration in the review of the proposal. Further, the narrative description in the proposal of the activities is confusingly structured in Components, Outputs and Outcomes, most of which consist of just one or two sub-level elements. A significant portion of the project is intended to finance activities (including a 'repertoire of measures', Annex 18) that are yet to be identified to a level where adequate ESP risk identification is possible. At the time of submission, the ESP requires that all the environmental and social risks associated with a project or programme are identified or, in exceptional and justified cases, that there is a mechanism included that will ensure compliance during implementation. The use of such Unidentified Sub-Projects (USPs) may be justified here as part of the micro-credit structures but requires a project-wide Environmental and</p> | |

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| | | <p>Social Management Plan (ESMP) that will ensure that all these USPs at the time of their adoption have been subjected to the same ESP risks identification and the formulation of any subsequent mitigation or management actions. The proposal does not contain such an ESMP.</p> <p>CR14: Please clarify how the USPs in the proposal will comply with the ESP.</p> <p>The section II.K is internally contradicting (e.g. para 291 states that Compliance with the law will require attention during project implementation but the table under para 319 states for the same principle 'No risk or adverse impacts. The project is in compliance with domestic and international law'). The table in para 319 states for all ESP principles that there is no risk or adverse impacts. The risk finding is not substantiated; the justifications provided (paras 295-319) are generic and not evidence-based as required by the ESP.</p> <p>CR15: Please identify the environmental and social risks of the proposed project in line with the ESP.</p> | <p>CR14: Not addressed. The Investment Fund ESP guidelines (Annex 19 (20?)) do not have the required elements of an ESP-compliant ESMP.</p> |
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| | | <p>Para graph81 describes a paradigm shift that the project will support for the management of the protected areas system.</p> <p>CR16: Please explain what the implications of this paradigm shift will be for each of the protected areas affected by the project. Explain what the concrete changes will be for each PA and how this will not have a negative impact on biodiversity or the achievement of the conservation objectives of the PAs.</p> <p>The project will be implemented in the vicinity of the Toachi-Pilaton Hydroelectric project that is nearing completion. The ESP risks of the project must be identified in conjunction with the ESP risks associated with the construction, operationalisation and operation of the Toachi-Pilaton Hydroelectric project. In particular secondary, cumulative and indirect risks and impacts need to be considered.</p> <p>CR17: Please clarify how the ESP risks identification and impact assessments were done in conjunction with those of the Toachi-Pilaton Hydroelectric project.</p> | <p>CR15: Partially addressed. The risks identification table is updated but the substantiations for the risks findings remain generic and not evidence-based.</p> <p>CR16: Partially addressed. The paradigm shift is further clarified but there is no information on the specific impact or risks for the protected areas affected by the project.</p> |
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| | | CR18: Please clarify how the management of ESP risks and impacts during project implementation will be coordinated with environmental and social safeguards activities of the Toachi-Pilaton Hydroelectric project. | CR17: Not addressed. CR18: Not addressed. |
| Resource Availability | 1. Is the requested project / programme funding within the cap of the country? | Yes. The requested budget is \$2,489,373. Another project was approved by the Board and is currently implemented by the World Food Programme for a budget of \$7,449,468. Combined, the two projects will amount \$9,938,841 which is below the cap of \$10 million. | |
| | 2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee? | Yes, 5% | |
| | 3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)? | Yes, 7.6% | |
| Eligibility of IE | 4. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board? | Yes, the proposal has been submitted by an accredited RIE. | |

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| Implementation Arrangements | 1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund? | Yes, however the proposal splits implementation arrangements across Sections I and Section II. CR19: Please consolidate information on management of the project in Section II. | CR19: Not addressed. |
| | 2. Are there measures for financial and project/programme risk management? | No, the project only identifies three risks despite having many partners, governance bodies, an investment fund component, and requisite enabling conditions. CR20: Please expand this section to demonstrate a thorough identification of risks and mitigation measures. | CR20: 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? | Not clear. Section III.C should describe the measures for environmental and social risk management, in line with the ESP, and in line with the risk findings presented in section II.K. CR21: Please complete section III.C with the required risk management measures, commensurate, evidence-based and comprehensively, in compliance with the ESP, taking into account the other relevant CRs. Please ensure that there is internal coherence with the other sections of the proposal. | CR21: Not addressed |
| | 4. Is a budget on the Implementing Entity Management Fee use included? | No. CR22: Please provide a budget on the Implementing Entity Management Fee. | CR22: Not addressed, a breakdown has not been provided. |

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| | 5. Is an explanation and a breakdown of the execution costs included? | No. CR23: Please provide an explanation and a breakdown of the execution costs. | CR23: Not addressed, a breakdown has not been provided. |
| | 6. Is a detailed budget including budget notes included? | Yes, however, the structure of the table with the detailed budget is not user-friendly as the table itself provides no detail on any of the budget items. CR24: Please improve the detailed budget table, include budget notes describing what the budget line item will fund. | CR24: Addressed. |
| | 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 Gender Policy of the Fund? | No, table 10 includes the workplan, however only indicative costs are included. CR25: Please provide a full budget and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund. | CR25: Not addressed, full outlined budget not provided. |
| | 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? | No. CR26: Please provide a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function. | CR26: Not addressed. |
| | 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 proposed project aims to address main drivers of deforestation and degradation in four sub-basins in Toachi-Pilatón and enhance local communities' adaptive capacity to the adverse effects of climate change. The project is combines policy, training, and ecosystem-based measures to address acute climate stressors in the region. However, the proposal does not have the level of detail and substantiation expected at the fully-developed proposal stage, is incoherent, and leaves several foundational requirements of AF funding unresolved or unaddressed.

The following clarification requests (CRs) are made:

CR1: Please focus the descriptions of each outcome and output to clearly describe the specific activities that are being proposed in a coherent manner that consolidates the components around clear objectives and activities that contribute directly to those objectives.

CR2: Please provide additional technical details across all components including selection process and criteria as appropriate. For example, on the types of agricultural practices that will be considered for deployment in the target areas, on the means of identification and restoration of key areas, etc.

CR3: Please clarify if the hydroelectric companies will have any role in the investment fund and long-term financing focus of the project, as they will also indirectly benefit from the project.

CR4: Please clarify if issues related to land tenure have been analysed in the development of this proposal given the significant focus on activities in the forestry and agriculture sectors.

CR5: Please justify the social, environmental, and economic claims with evidence, analysis, or other means of substantiation.

CR6: Please clarify how the project will benefit women and other marginalized groups.

CR7: Please elaborate this section significantly in line with the requirements of the Adaptation Fund to compare the proposed activities to viable alternatives in terms of cost-effectiveness.

CR8: Please more comprehensively cover the country's NDC among other documents.

CR9: Please more comprehensively cover relevant standards and laws that apply in the context of this project.

CR10: Please assess the portfolios of other multilateral and bilateral funding sources to provide a more robust assessment of completed or ongoing projects. The proponent may also wish to describe relevant outcomes from the Socio Bosque program.

CR11: Please describe how outputs of the project contributing to learning and knowledge management will fit together and be leveraged to capture and feedback lessons in the most effective way to reach the target communities.

CR12: Please explain how the outcomes of the consultations have informed the design of the project, in particular, the ways in which the project will engage women, vulnerable groups, the private sector, and other relevant stakeholders to ensure sustainability and lasting impact of the project as a result of the consultations.

CR13: Please describe specifically how the project will ensure sustainability through community engagement platforms, government processes, the investment fund, among other measures.

- CR14:** Please clarify how the USPs in the proposal will comply with the ESP.
- CR15:** Please identify the environmental and social risks of the proposed project in line with the ESP.
- CR16:** Please explain what the implications of this paradigm shift will be for each of the protected areas affected by the project. Explain what the concrete changes will be for each PA and how this will not have a negative impact on biodiversity or the achievement of the conservation objectives of the PAs.
- CR17:** Please clarify how the ESP risks identification and impact assessments were done in conjunction with those of the Toachi-Pilaton Hydroelectric project.
- CR18:** Please clarify how the management of ESP risks and impacts during project implementation will be coordinated with environmental and social safeguards activities of the Toachi-Pilaton Hydroelectric project.
- CR19:** Please consolidate information on management of the project in Section II.
- CR20:** Please expand this section to demonstrate a thorough identification of risks and mitigation measures.
- CR21:** Please complete section III.C with the required risk management measures, commensurate, evidence-based and comprehensively, in compliance with the ESP, taking into account the other relevant CRs. Please ensure that there is internal coherence with the other sections of the proposal.
- CR22:** Please provide a budget on the Implementing Entity Management Fee.
- CR23:** Please provide an explanation and a breakdown of the execution costs.
- CR24:** Please improve the detailed budget table, include budget notes describing what the budget line item will fund.
- CR25:** Please provide a full budget and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund.
- CR26:** Please provide a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function.

The final technical review finds that the revised proposal does not sufficiently address the bulk of the clarification requests made, particularly on ensuring compliance with the ESP policy of the Adaptation Fund and other funding requirements. In particular, in addition to fully addressing all of the clarification requests made during the initial technical review, the following observations are made:

- (i) The proposal should provide evidence and analysis to support the claims project rationale and justification for why the proposed project is cost-effective, sustainable in the long-term, and delivers benefits across social, economic, and environmental parameters;
- (ii) The proposal should ensure full compliance with the ESP of the Adaptation Fund, and
- (iii) The proposal should provide clearer budgets and breakdowns of the implementing entity management fee and execution costs.

Date:

13 September 2017



ADAPTATION FUND

REQUEST FOR PROJECT/PROGRAMME FUNDING FROM THE ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN P4-400
Washington, D.C., 20433
U.S.A
Fax: +1 (202) 522-3240/5
Email: afbsec@adaptation-fund.org



ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT/PROGRAMME INFORMATION

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|--------------------------------|---|
| Project/Programme Category: | Regular Project/Programme |
| Country/ies: | Ecuador |
| Title of Project/Programme: | Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed (Toachi-Pilatón watershed) with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management. |
| Type of Implementing Entity: | Regional Implementing Entity (RIE) |
| Implementing Entity: | CAF Latin America Development Bank |
| Executing Entity/ies: | Ministry of Environment of Ecuador (MAE) |
| Amount of Financing Requested: | 2,489,373.00 (in U.S Dollars Equivalent) |

Project / Programme Background and Context:

1. The proposed project aims at strengthening the adaptive capacity of vulnerable populations in the Río Blanco upper watershed and develop a model of adaptation to climate change that can be replicated in similar **context** in the country and in the region.

Overview Río Blanco upper watershed

2. The Toachi-Pilatón (Río Blanco upper watershed) water system, a 2,154.42 km² drainage basin with a total population of approximately 74,000 people (Table 1), is a system of two drainage units that originate in the steep western slope of the Andes, and flows downhill to merge in the Blanco river. It is the southernmost sub-basin of the Esmeraldas river watershed (Ecuador´s fourth largest watershed), covering 10% of the Esmeraldas drainage basin.

3. The Toachi drainage unit has four sub-basins (Map 1 in Annex 3). The Toachi river is formed by several tributaries, most of them originating in the paramos (> 3,000 meters above sea level) within the Ilinizas Ecological Reserve (e.g., river Las Juntas, river Negro, river Sarapullo). The Pilatón drainage unit is about a fourth of the size of the entire system. The Pilatón river is also formed by high altitude tributaries, some of them also originate in the Ilinizas reserve (e.g., river Negro). However, both the Toachi and Pilatón rivers have a large contribution from tributaries that accumulate and channel water from the forests located on the steep hills.

| Drainage unit | Province | Canton | Parrish | Total population in the Parrish | Population within the drainage unit | |
|----------------------------------|--------------------------------|---------------|--------------|---------------------------------|-------------------------------------|-------|
| Toachi | Cotopaxi | Latacunga | Toacaso | 7,685 | 7,685 | |
| | | | Pujili | Guangaje | 8,026 | 8,026 |
| | | Sigchos | Zumbahua | 12,643 | 12,643 | |
| | | | Chugchilan | 7,811 | 7,811 | |
| | | | Isinlivi | 3,227 | 3,227 | |
| | | | Las Pampas | 1,943 | 1,943 | |
| | | | Palo Quemado | 1,030 | 1,030 | |
| | | | Sigchos | 7,933 | 7,933 | |
| | | Pichincha | Mejía | El Chaupi | 1,456 | NA |
| | | Pichincha | Mejia | Aloag | 9,237 | NA |
| Manuel Cornejo Astorga (Tandapi) | 3,661 | | | 3,661 | | |
| Pilatón | Santo Domingo de los Tsachilas | Santo Domingo | Alluriquin | 9,725 | 9,725 | |
| Total population in 2010 | | | | 74.377 | 53.959 | |

NA = Not available, but it is known to be very small

Table 1: Population in the Río Blanco system (Source: Ecuador Population and Housing Census 2010.)

4. The lower part of the system is humid with annual precipitation above 2,000 mm/year (Table 2). In contrast, the upper part of the Toachi drainage unit is much drier. In Sigchos, the annual rainfall in 2012 was about 1,130 mm. There are two marked seasons, a rainy season between December and May, and a dry season between June and October (Figure 1).

| Station | Data series (years) | Annual precipitation (mm/year) | Monthly minimum (mm/month) | Monthly maximum (mm/month) |
|-------------------|---------------------|--------------------------------|----------------------------|----------------------------|
| Toachi AJ Pilatón | 1967-1985 | 2,745.8 | 64.8 | 451.7 |
| Palo Quemado | 1965-1995 | 2,126.8 | 55.5 | 326.4 |
| Las Pampas | 1985-2006 | 2,126.8 | 33.9 | 353.0 |
| Sigchos | 2012 | 1,130.4 | 5.2 | 247.60 |

Table 2: Precipitation in four meteorological stations of the Río Blanco (Toachi-Pilatón watershed) system (Source: INAMHI meteorological yearbooks)

5. Two provinces and six cantons share the elements of the Río Blanco upper watershed water system. Local communities depend mostly on extensive farming characterized by low productivity, sub-optimal use of economic resources and ecosystems, and negative impact on ecosystems and community vulnerability to climate change. Extensive practices are indeed not only inefficient but they also contribute to deforestation, overexploitation of water sources, reduction of soil quality and further exposing smallholders to climate hazards. Indeed due to ecosystems degradation and

low economic return, smallholders have lower adaptive capacities resulting in higher climate vulnerability. Vulnerability is not even among groups: women, with higher poverty level and lower access to income generating activities, have fewer coping mechanism and hence they are more exposed to climate change.

6. On the Toachi side, the main activities are subsistence agriculture and extensive livestock farming. In the area of Palo Quemado, farmers cultivate sugarcane to produce panela (unrefined whole cane sugar); there are about 450 ha of sugarcane plantations, 98% of the harvest is used to produce panela (GADPRPQ, 2013). 28% of population is engaged in the production of panela. According to primary data collection there are two associations in the area composed of women in their entirety. Those are San Pablo Association with 6 women, Marianita de Jesús en Las Pampas composed by 18 women and Flor de Caña Association with 47 women. Panela is more profitable than other cultures, but its artisanal production is based on the use of local trees for firewood. Each farmer uses about three trees per week to cook and reduce the sugarcane juice, contributing to deforestation, soil erosion and increasing climate vulnerability. Moreover traditional production of panela can contribute to negative health impact, due to the respiration of inorganic compounds, and local air pollution.

7. The project will focus on but not be limited to work with women associations, aiming to improve production, supporting sustainable management of ecosystems and reducing women’s vulnerability. Moreover, the project will seek replication in other communities where adequate.

8. On the Pilatón side, extensive livestock farming and subsistence agriculture is

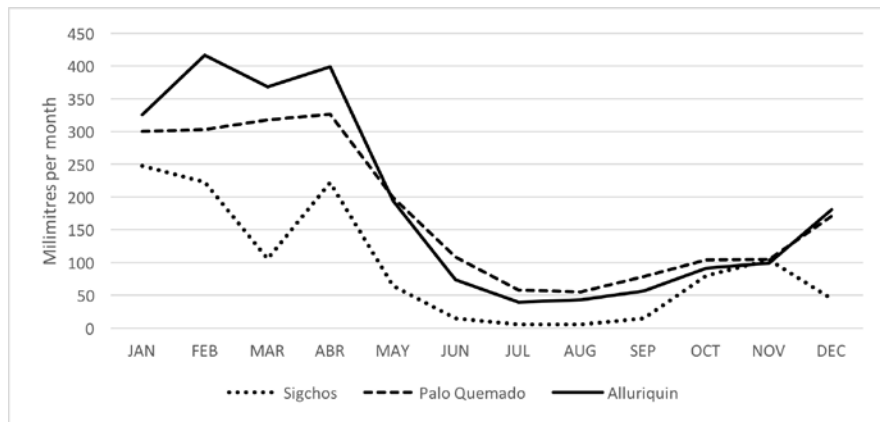


Figure 1: Monthly precipitation in three stations of the Toachi – Pilatón system (Río Blanco upper basin). Sigchos is located in the upper part of the Toachi unit (2,880 masl) (precipitation data from 2012). Palo Quemado is in the lower part of the Toachi unit (ca., 1,100 masl).

common. Commerce and small family restaurants predominate along the Aloag – Santo Domingo road (part of route E20). This is the main road which connects the country’s highlands and the coast; it runs along the west bank of the Pilatón river. Extensive livestock farming contributes to deforestation, increasing climate

vulnerability, and reducing soil quality. Moreover extensive livestock farming is economically inefficient, becoming profitable for larger properties, and hence contributing to support socio-economic inequality. The project aims to support intensification of livestock production, integration of livestock production with ecosystem conservation, e.g silvopasture production, fodder plants; resulting in economic inclusion of smaller farmers and the reduction of their climate vulnerability.

The Toachi-Pilatón hydropower station¹

9. Rural communities, agriculture practices and ecosystems strongly depend on water access and use. To understand present and forecasted water availability is hence of major importance.

10. A hydropower plant is being built in the lower part of the Toachi-Pilatón system (i.e., HIDROTOAPI), and it is expected to initiate operation during 2018. It has two turbine systems, one based on the Toachi – Alluriquin confluence planned to produce ca. 204 MW, and the other based on the Pilatón – Sarapullo confluence planned to produce ca. 49 MW (Map 1). The total energy production will be 254.4 MW.

11. The Toachi Pilatón Hydroelectric Project in its initial studies dates back to 1963 when the National Institute of Electrification (INECEL) began an aggressive policy of evaluating hydroelectric projects at various scales throughout the national territory. At the time the economic feasibility of the project was already demonstrated, however for decades it remained in plans.

12. In 1965, experts from the National Electricity Company of Chile (Endesa), proposed a development of a 108 megawatts (MW) installation. Later, in 1973 and 1974, the Swiss Consultant Motor Columbus revised the scheme and recommended to transfer the waters of the Pilatón River to the Toachi basin and install a 225 MW system, building a dam at 180 m downstream of the confluence of the Sarapullo and Toachi rivers. At the end of the 1980s with technical and financial assistance from the Canadian Government, studies were reviewed recommending a 190 MW installation. The last study in 1996 of the Egesco Consortium under the supervision of Harza Engineering confirmed the characteristics of the project.

13. In 1997, through Executive Decree No. 18, the Provincial Council of Pichincha was granted the authority to carry out the 190 MW Toyo Pilatón Hydroelectric Project. The Provincial Council initiated a series of validations and requirements to be able to start the construction process, which ended with a neutral assessment that did not support the start of the project.

14. In 2002, the Pichincha Province Assembly resumed updating the feasibility studies in order to carry out the project, and equally carried out studies on legal, operational, administrative and technical issues of the project.

15. On August 25, 2005, the Honorable Provincial Council of Pichincha, by means of a public deed and with full powers for the formation of a corporation, subscribed the document of constitution of the denominated Hidrotoapi SA, whose main object consists in the design, construction, installation, operation and maintenance of power generation plants.

16. According to the latest Electrification Master Plan of the Ministry of Electricity and Renewable Energies (MEER) for 2016-2025, the plant will start production in 2018.

¹ Information from the Hidrotoapi website at <https://www.celec.gob.ec/hidrotoapi/>

17. While the power plant will certainly have a direct impact on the socio-economic situation in the project's area of operation, and upon start of production will benefit directly from a sustainable and integrated watershed management as proposed, it is considered a co-beneficiary of the projects intended outcomes and outputs and is not expressly targeted by the project's activities. This is due to the current situation of progress of its construction and delays in recent years which led to delays in its start of operations.

18. Nevertheless, given its expected benefit generated through the implementation of the proposed project, the Hidrotopai is identified as potential contributor to the planned establishment of an Investment Fund. The fund targets the development of the adaptive capacity of vulnerable populations as well as the restoration and conservation of vegetational cover in the watershed and would – once the Hidrotopai started its production – hence benefit the power plant directly.

19. In annex 15, potential impacts of the operation of the hydrological station are presented, that will affect the ecosystems adversely and will have to be monitored closely, as suggested on a monthly basis, among others:

- Determination of the recommended minimum ecological flow rates, i.e. the minimum flow rate recommended by the old regulation has been adopted, as 10% of the average annual flow rate through the Toachi and Pilatón rivers at the dam sites. This study will need to be updated and respective ecological flow rate regimes need to be established.
- While only briefly mentioned in the Environmental Impact Assessment (EIA) of the hydrological power station, the need for the installation of fish steps or ladders to preserve the existing fish populations and other trophic elements such as otters should be assessed and such ladders should be designed and constructed in the framework of the power plants Environmental and Social Management Plan.

20. The actual implementation of management systems of the hydrological power station is out of the direct scope of the project, but will nevertheless be considered in the implementation of the project and resulting activities, primarily by the establishment of an investment fund, where the Hidrotopai is expected to play a vital role by contributing to its establishment as part of the power plant's ESMP.

The socio-economic situation of local communities

21. The population has very high levels of poverty in terms of unsatisfied basic needs. In 2010, four parishes located in the upper part of the Toachi unit had poverty levels above 98% (the capacity development of women as household leaders to disseminate a deep understanding of adaptation economics anf.

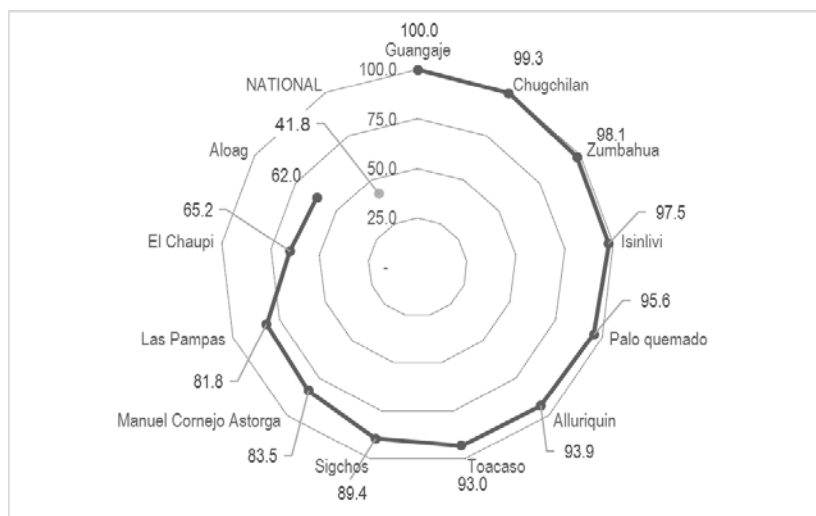


Figure 2: Poverty by unsatisfied basic needs in the parishes of Río Blanco water system (2010 census).

22. This is especially important, as women play a vital role in ensuring and managing access to water and the household's food security (see annex 13). Even parishes with more developed economic activities like Palo Quemado, Manuel Cornejo Astorga and Aloag had poverty levels well above the national average. Poverty is a gender uneven reality, affecting more women than men. In 2013, number of females, from the age of 20

to 59 years, living in poor households was higher than that of men, leading to a femininity index in poor households of 117.6 (CEPAL, 2013)². Lack of personal income is one of the main reasons behind high poverty ratios among women, since more than one out of every three women (35.1% from age 15 and above) do not have any sort of personal income (and no access to education beyond primary), compared to 9.1% of men (CEPAL, 2014)³.

23. In the same line, the levels of illiteracy are above the national level (see figure 2). The highest levels of illiteracy are also concentrated in the upper part of the Toachi unit.

24. Women have higher illiteracy rates, compared to men, 21.6% compared to 19.2% respectively⁴. Moreover, in these communities, men have more years of schooling: with on average 4.7 years of schooling for men and 4.4 years for women. This gendered bias in literacy is also present at the national level, with a wider gap in rural areas (Table 3).

| | Illiteracy rates | | Functional illiteracy rates | | Digital illiteracy rates | |
|--|------------------|-------|-----------------------------|-------|--------------------------|-------|
| | Urban | Rural | Urban | Rural | Urban | Rural |
| | | | | | | |

² The femininity index in poor households compares the percentage of poor women and men from the age of 20 to 59 years. Poor households typically gather a higher proportion of women in an age of a bigger productive and reproductive demand. The index shows how many times the incidence of poverty (indigence) is greater among women than among men. A figure greater than 100 means that poverty (indigence) is higher among women; a figure less than 100, the inverse situation.

³ CEPALSTAT, Gender indicators.

⁴ Resumen ejecutivo, Estudio Impacto Ambiental Definitivo, proyecto hidroeléctrico Toachi – Pilatón

| | | | | | | |
|-------|-------|-------|------|-------|-------|-------|
| 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% |

Table 3: Illiteracy rates, Functional illiteracy rates and digital illiteracy rates (Source: Women and Gender Equality National Agenda, 2014 – 2017, based upon data from INEC (2013))

25. As per different parishes, the following figure provides an overview in the area of

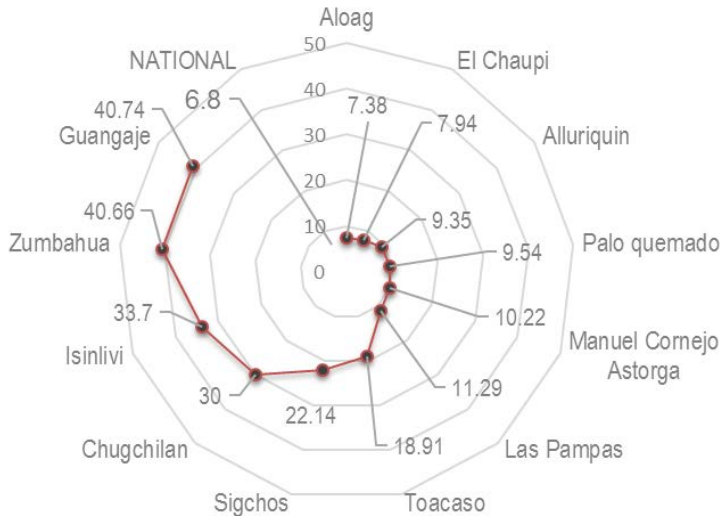


Figure 3: Percentage of illiteracy in the parishes of the Río Blanco water system (2010 census).

the project, showing the great differences and educational heterogeneity between the different parishes. This great dispersity will be taken into account when developing the awareness raising, information sharing as well as capacity building solutions within the project.

26. Illiteracy also affect the level of financial literacy of vulnerable populations, usually limiting the capacity to embrace the basics of investment decision, especially with respect to the decision of investing in new

technologies. Therefore, the project will also address basic components of economic analysis of suitable adaptation measures.

27. A major focus will be laid on the capacity development of women as household leaders to disseminate a deep **understanding of** adaptation economics and.

28. This is especially important, as women play a vital role in ensuring and managing access to water and the household's food security (see annex 12).

Climate change effects

29. Climate change will affect local communities in the Río Blanco water system by reducing water provision for human consumption, farming production and hydroelectric energy production. Women are forecasted to be more vulnerable to these changes. They are usually indeed in charge of domestic chores, such as harvesting water and food safety, and most of the times they also do most of agricultural work. This uneven allocation of water dependent activities between men and women, exposes women to higher risks concerning lack of water provision (UNEP, 2011)⁵. Figure 4 summarise the situation and the interaction with human pressures.

⁵ Women at the frontline of climate change. Gender risks and hopes. UNEP, 2011.

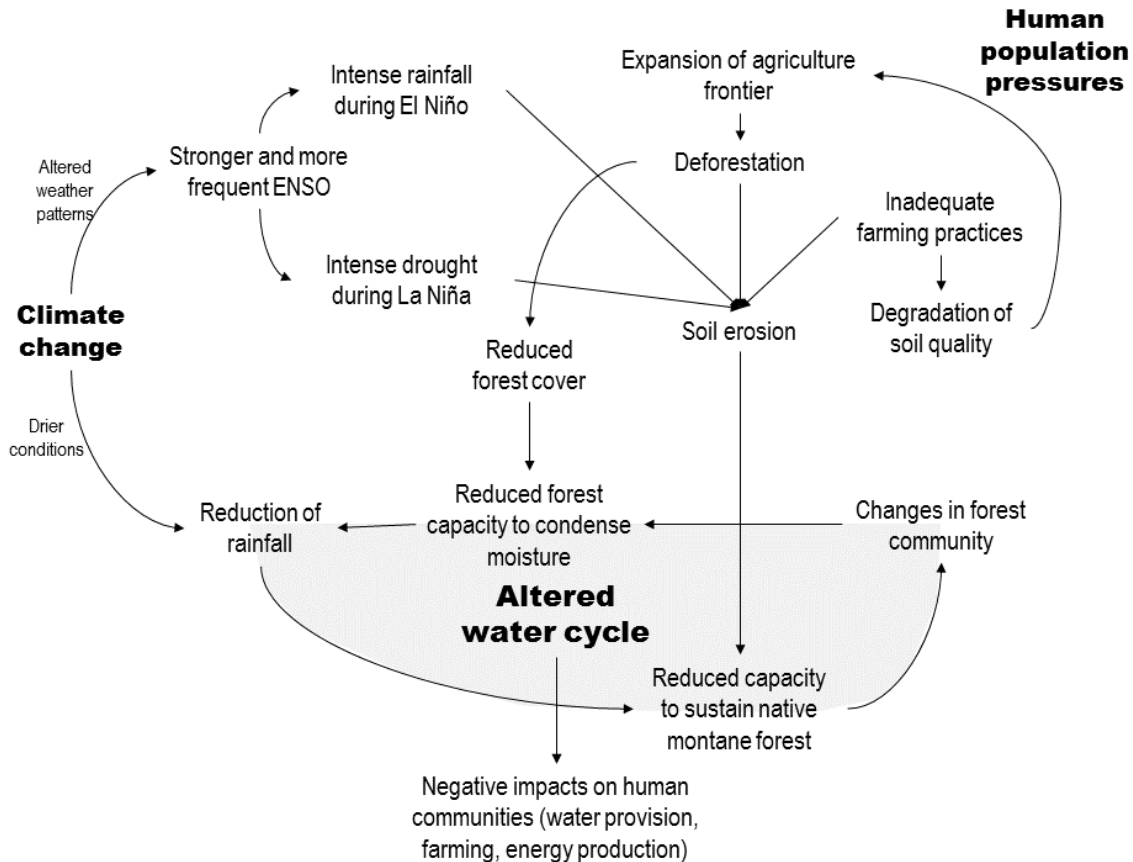


Figure 4. Conceptual diagram of climate change impacts on the water cycle of the Río Blanco water system.

Climate vulnerability of local communities

30. In the lower part of the drainage system, mainly along the hillsides, it is common to have frequent landslides mainly during the rainy season. The area along the Pilatón river has high risk of both landslides and flooding (Jiménez, 2013; Proaño, 2015). Landslides are frequent along the Aloag – Santo Domingo road. Younes & Erazo (2016) found that landslide susceptibility along this road is related to active erosive processes, soil condition and rainfall between 1,500 and 1,750 mm. Road closures and traffic restrictions produce important economic losses and access problems to local communities. On April 2015, the road was closed for 20 days and isolated the locality of Tandapi. Landslides and flooding are aggravated during El Niño conditions.

31. During the 2015 / 2016 El Niño, there were frequent and large landslides along the Aloag – Santo Domingo road. Only in April 2016, there were about 25 landslides.

32. The hillsides in the lower part of the drainage system maintain large areas of natural and intervened montane cloud forest, which are important for the water cycle and biodiversity (Map 2). The rest of the system is mostly used for agriculture and extensive livestock farming.

33. The forest cover is mostly included in two Protected Forests⁶: (1) Toachi – Pilatón (BP156) and (2) Sarapullo (BP165). The Toachi – Pilatón Protected Forest was created in 1987, and is a large area of about 212,000 ha. The Sarapullo Protected Forest (BP165) was created in 1986, it covers 21,585 ha. In addition, there are several private reserves that are trying to develop services like trail hiking and bird watching. The forest area has a high biodiversity conservation value. There are populations of puma (*Puma concolor*) and the spectacled bear (*Tremarctos ornatus*), which are classified, respectively, as vulnerable and endangered in Ecuador’s IUCN red list of threatened species. The main threat to these species are habitat loss caused by deforestation, and hunting by farmers. In addition, a major part of the drainage system is an Important Bird and Biodiversity Area⁷ (IBA).

Climate change effects on the Hydropower station

34. The Ministry of Environment (MAE) has found that the Río Blanco water system will be strongly affected by climate change, it is foreseen that future changes in climate conditions will result in an overall marked reduction of rainfall. In addition, it is anticipated that climate change will produce stronger and more frequent El Niño–Southern Oscillation (ENSO)⁸ events (Cai et al., 2014; Cai et al., 2015). Therefore, during El Niño conditions heavy rainfall will exacerbate landslides, erosion, river sedimentation and floods. But, during La Niña conditions, there will be severe drought. These changes, alone, will be sufficient to alter the structure of the native montane cloud forests, which capture cloud moisture and feed streamflows. However, ongoing human pressures will exacerbate the impacts of climate change. The two main drivers are deforestation and soil erosion.

35. In 2014, MAE analysed the climate change risk in the watersheds where major hydroelectric plants are based⁹. In the Río Blanco system it was found that:

- I. The change in rainfall patterns projected into future scenarios under the effects of climate change in the watershed’s recharge zone has a clear downward trend, indicating and resulting in a clear reduction of water volumes (Map 3).
- II. Today, the main drivers of deforestation and degradation in the basin are the expansion of pastures for livestock and small-scale agriculture. The changing trends in land use and land cover in the watershed due to human pressures

⁶ Protected Forest are areas established by the Ministry of Environment with the main purpose to conserve watersheds and water sources and to contribute to protect wildlife. These can be public or private land, and managed by public entities or private landowners. The protected forests are not considered a protected area, and do not integrate the national system of protected areas.

⁷ The Pilatón drainage unit is part of the Rio Toachi – Chiriboga IBA (EC044) which cover 68,000 ha (Birdlife International, 2016). The area houses about 450 bird species, including *Pachyramphus spodiurus* which is endangered. The lower part of the Toachi drainage system is part of the Reserva Ecológica Los Ilinizas y alrededores IBA (EC045) which cover 150,900 ha (Birdlife International, 2016a). This IBA house about 257 bird species.

⁸ Irregularly periodical variation in winds and sea surface temperatures over the tropical eastern Pacific Ocean, affecting much of the tropics and subtropics. The warming phase is known as El Niño and the cooling phase as La Niña.

⁹ Project “analysis of the vulnerability of flagship hydropower plants to the effects of climate change” (CHECC). The project was executed by MAE in collaboration with Ministry for Coordination of Strategic Sectors (MICSE), Ministry of Electricity and Renewable Energy (MEER), National Water Secretariat (SENAGUA), National Meteorological and Hydrological Institute (INAMHI), and the Electric Corporation of Ecuador (CELEC).

such as deforestation and expansion of the agricultural frontier scenarios point toward soil degradation in the basin, which produces, under the effects of climate change, an altered hydrological cycle with its resulting lower retention of sediments under extreme weather events, as well as a clear and observable increase of sediments in the basin in future periods (Map 4).

36. For the previously mentioned diagnostic and projection of climate change study in the areas of interest, MAE used two lines of climate modelling:

- An assemblage of about 23 global models provided under the CMIP5 project (MAE, 2015), and
- The regional model REMO adjusted by the CIIFEN-MAE 2014.

37. In order to capture smaller-scale processes, limited area climate models, nested within global models ("downscaling"), were used in such a way that it is assumed that local phenomena are based on large-scale patterns resolved in global models. This work employs the regional high resolution climate model REMO-RCM (Max Planck Institute for Meteorology in Hamburg) under the framework of the CORDEX project. The modelling was carried out within three analysis periods (2016-2035; 2046-2065; 2081-2100). The climate scenarios analysed with the REMO model are the three representative pathways of concentration which, in order of emissions levels, are: CPR2.6, RCP4.5, and RCP8.5.

38. The periods and scenarios studied pointed towards a marked reduction in rainfall, which will result in a significant reduction in the flow available at the intake points of the hydroelectric plant.

39. The results obtained for temperature and precipitation readings in the feeder watershed were used as inputs for modelling flow and sediment through the Soil and Water Assessment Tool (SWAT) model. The modelling indicates that the sediments, under the effects of future climate change scenarios, will increase to about twice the current level in the hydropower station's water intakes.

40. Reduction of water availability, soil and ecosystems degradation, and extensive farming practices requiring higher volume of water, further expose local communities to food insecurity and poverty traps.

41. Climate change will hence contribute to worsen the already fragile conditions of communities living in the area.

42. Moreover monitoring capacity for weather or climate is poor in watersheds. The Toachi basin has indeed a bad monitoring system: with few meteorological stations, minimum gauging stations and no sediment stations. Therefore, it is not possible to track the flow and sediment and it is not possible easily anticipate with certainty the events.

43. In the lower part of the water system, deforestation is caused by expansion of extensive agriculture and livestock farming. Farmers invade the forests and riversides¹⁰ mainly to expand grazing areas for livestock and subsistence agriculture. Another factor

¹⁰ According to the Ecuadorian legislation, riversides are public domain and cannot be used in order to protect the water sources.

which contributes to deforestation is that sugarcane farmers depend on firewood for artisanal panela production.

44. In general, farmers use inadequate agriculture practices which produces soil depletion, this reduces production and motivates further expansion of the agriculture frontier. All this contributes to soil degradation, soil erosion, and a reduction of vegetated areas.

45. As observed in other regional contexts, economic poverty regularly induces ecosystem degradation, while ecosystem degradation generates and maintains poverty traps. For example, low technification of agriculture practices leads to over-exploitation of agriculture frontier lands, while soil degradation reduces agriculture yields (leading to expansion), reduces soil cover and hence exposes plots to higher vulnerability to temperature and rain variability.

46. The foreseen reduction in runoff and the increase in sediments (from hillside erosion) will also affect HIDROTOAPI. MAE has estimated that its susceptibility may lead to a decrease of > 25% of its current annual projected generation capacity, and it may be exposed to greater risk due to reduced water flow and increased sediments.

Effects on local communities

47. Adaptation to climate change is a major challenge for local communities. The main barriers that limit adaptation in the lower basin of the Río Blanco water system are:

- Local population are not fully aware of climate-related impacts. The interviews with local stakeholders revealed that there is no clear understanding of the probable impacts to be generated by the climate change. The future climate scenarios and the probable worsening of existing risks are not in the common dialogue. This contributes to the fact that local population does not demand that elected authorities address adaptation as a priority matter.
- Local development plans do not incorporate adaptation measures. Local plans (i.e., parishes and municipalities) mention climate change, but do not have specific actions to adapt living conditions to the future scenarios nor to take action to address key drivers like deforestation, land use change and invasion of riversides. Regularly, these plans do not take a gender perspective into consideration, leaving women more exposed to climate change.
- Local production is based on extensive farming practices. Most farmers have small plots (<20 ha per plot) with very low yields and, in general, apply inadequate agriculture practices. Primary data collection allowed to identify relevant associations in the project area, developing economic activities in agriculture and animal husbandry (mainly livestock farming). These associations are currently involving groups of women, due to their active role in subsistence agriculture activities, their sensitivity for changes observed in the ecosystems, and also for their leadership role in their families.

48. The data in Table 4 shows the important role of women in the project area, as well as their influence to develop activities related to climate change adaptation in the watershed.

| Parish | Association | Number of women respondents | Number of women owning land | Main economic activities | Type of crops produced |
|--------------|---------------------|-----------------------------|-----------------------------|---------------------------------------|---------------------------------|
| Palo Quemado | San Pablo | 6 | 6 | Panela production | sugarcane |
| Palo Quemado | Flor de Caña | 47 | NA | Panela production | sugarcane |
| Palo Quemado | Marianita de Jesús | 18 | 18 | Agriculture | sugarcane |
| Las Pampas | Las Marianitas | 19 | 19 | Livestock silage | pastures |
| Las Pampas | Naranjito | 7 | 7 | Livestock farming for meat production | sugarcane, pastures |
| Las Pampas | Aso Ganaderos | 12 | 12 | Livestock farming for meat production | sugarcane, pastures, naranjilla |
| Las Pampas | Asopam | 15 | 15 | Panela production | sugarcane, pastures |
| Las Pampas | Sembrando un futuro | 5 | 5 | Livestock farming for meat production | sugarcane, pastures, naranjilla |
| Las Pampas | Campo Verde | 6 | 6 | Livestock farming for meat production | sugarcane, pastures |

Table 4: data collected during group discussions in workshops presentation and discussion of final project proposal (see Annex 10))

49. In Palo Quemado ca. 50% of the farmers only have subsistence production. Livestock farmers use extensive grazing; livestock produce about 7 litres of milk / day. It is common to clear forests to expand the grazing and agriculture areas. Sugarcane farmers clear forests to obtain firewood for panela production. At the same time these producers indicate, that the availability of the required firewood is increasingly limited, hence a more efficient and sustainable production of panela is welcome by the target co-executors of the project.

- Forest areas are not protected. The large protected forests, that are public property, are not managed and guarded. Therefore, extensive areas have been invaded and cleared to establish farms. Land tenure is an additional related issue, because

invaders claim possession rights to the municipal and central governments. Private landowners of forest areas also face pressure from illegal farmers. The extent of the invaded area is unknown. Conservation Bio-corridor¹¹ will be implemented as a strategy for conservation of biodiversity, land management and sustainable development in the project area. Part of the project includes watershed population training with at least 50% of women participation. Evidence shows that women participation in forest protection mechanisms (committees, meetings, forest management and guards) leads to higher control rates. Hence, it is important to train women to be part of forest protection personnel, to assure forest protection.

- Limited climate-related information. The monitoring of hydro-meteorological variables within the watershed has limitations in terms of quality and availability, generating less understanding of the behaviour of water flows and sediments in the basin. The National Meteorological and Hydrological Institute (INAMHI) has eight meteorological stations in the Río Blanco water system (Map 5), but only two (i.e., M0362 Las Pampas, M0363 Sigchos) are operational.

Project design

50. The present project will contribute to address these barriers by developing practical adaptation actions to strengthen the resilience of local communities in the upper and middle basin of the Toachi – Pilatón water system located at the Río Blanco upper watershed (i.e., subbasins 1, 2 and 3 indicated in Annex 3). Key lines of action will be:

1. To conserve forest cover, to sustain the hydrological cycle and prevent as much as possible a reduction of rainfall, and to protect hillsides from erosion.
2. To introduce sustainable farming practices to increase the yield per hectare, in order to **introduce** land use efficiency and sustainability and in **consequence** reduce the expansion of the agriculture frontier, as well as to limit soil erosion and deforestation. These activities can be a useful mean to empower women or women's groups within their communities, and to serve as development model for sustainable community development.
3. To mainstream adaptation into local development plans and engage the local population by increasing awareness of the impacts derived from climate change as well as for potential adaptation strategies.

51. Table 5 summarises specific actions to address the key barriers that have been identified.

¹¹ Bio Corredores are the main strategy of the Ministry of Environment of Ecuador's approach to landscape management, biodiversity and sustainable development.

| Main barriers that limit adaptation | Project actions to address the main barriers |
|--|--|
| Local population are not fully aware of climate-related impacts. | To implement a public communication and education plan on the six parishes of the upper and middle basin of the Toachi – Pilatón water systems (Río Blanco upper basin) (output 7). |
| Local development plans do not incorporate adaptation measures. | To work with parish councils to mainstream climate change adaptation, with a gender perspective, into the parish development plans of the six parishes of the upper and middle basin of the Río Blanco water systems (output 6). The six parishes are: (1) Manuel Cornejo Astorga, (2) Aloag, (3) El Chaupi, (4) Palo Quemado, and (5) Las Pampas (6) Sigchos |
| Local production is based on extensive farming practices. | To work with local farmers, women and men, to introduce best practices to reduce deforestation, land degradation and improve adaptive capacities (outputs 1 and 3). The key groups to work with are livestock and sugarcane producers. Female farmers will be specifically targeted. |
| Forest areas are not protected. | To strengthen the means to conserve forest and vegetation cover in the watershed. Act on two fronts: <ol style="list-style-type: none"> 1. To work with local landowners to incentive the conservation of ca., 1000 ha of native vegetation (output 1). It will be necessary to provide incentives; the idea of establishing an investment fund (output 5) to support investment in adaptive capacities for the communities. 2. To strengthen the means to conserve the vegetation of the two existing protected forests and new areas under the Bio-corridor and ACUS categories (Toachi – Pilatón and Sarapullo, about 230,000 ha in total) (output 2). |
| Limited climate-related information. | To generate and disseminate hydro-meteorological information by potentiating and expanding INAMHI's hydro-meteorological network (output 6) Diffusion of best adaptive practices thanks to appropriate training (output 8), institutional learning (output 4), and diffusion of best practices through education, knowledge transfer (output 8) and lessons learnt in the project thanks to knowledge management platforms (output 9). |
| Difficulty of access to credit for sustainable productive activities | To work with at least 2 financial institutions supporting them to introduce specific solutions to finance adaptation (output 4). Systematically include in the credit assessment the evaluation of climate and environmental risks, aiming to integrate sustainable and climate adapted practices in the whole operations of financial institutions. Development smart incentives for finance adaptation. |

Table 5: Proposed actions to address the key barriers that limit adaptation in the lower basin of the Toachi – Pilatón water system (Río Blanco upper basin)

52. The project targets to develop, test and implement solutions which will be established beyond the duration of the proposed project to ensure a sustainable approach to community- and ecosystem-based adaptation to climate change. To that end, it will incorporate successful solutions tested in comparable projects or programs in the region and elaborate solutions which can be replicated within Ecuador and beyond.

Project / Programme Objectives:

53. The proposed project aims to develop multi-stakeholder coordination and implementation mechanisms to foster ecosystem- and community-based adaptation of vulnerable communities in the Río Blanco upper watershed.

54. The project focuses on key drivers that will create adverse impacts from climate change or generate opportunities that concern the most vulnerable populations. The expected mid-term impacts are improved enabling conditions to sustain forest cover and sustainable small-scale farming in the area, with a gender perspective. In the long-term, it is expected that the project’s activities will result in improved adaptive capacity of the target farmers, ecosystems and hydroelectric systems. The farmers, as well as their communities, are understood as co-executors of the project and its key target.

55. Learning generated in the proposed project will be structured to be replicable and provide marketable solutions that can be applied in other watersheds or regions in the country and even beyond.

56. It is the explicit aim of both implementing as well as executing agency to integrate lessons learned from similar initiatives in the region and globally and combine proven solutions in a new set-up to strengthen the global learning process on successful ecosystem-based adaptation to climate change.

Project / Programme Components and Financing:

| Project/Programme Components | Expected Outcomes | Expected Concrete Outputs | Amount (US\$) |
|-------------------------------------|---|---|----------------------|
| 1. Conserve vegetation cover | 1. At least 230,000 ha of native vegetation is conserved to reduce the impact of climate change on the hydrological cycle under integrated watershed management | 1. 1,000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms. | 475,000 |
| | | 2. Improved management of existing protected forests and private conservation areas (ca. 230,000 ha) | 475,000 |

| | | | |
|--|---|--|------------------|
| 2. Adapt farming practices to new climate change conditions and enable their sustainable climate smart financing | 2. Sustainable farming practices and livestock adjusted to local realities are being introduced and implemented with assistance of financing mechanisms for adaptation measures | 3. 250 ha of pasture and 250 ha of crops apply sustainable farming practices | 220,000 |
| | | 4. At least 2 institutions have introduced specific solutions and credit assessments to support the disbursement of credits for adaptation, integrating environmental and climate risks in their operations. | 120,000 |
| | 3. At least 1 long term financing mechanisms has been piloted or introduced | 5. One investment fund to promote sustainable development is set up and operational | 500,000 |
| 3. Strengthen local capacities and share lessons | 4. Local population and parish governments with increased capacity to implement climate change adaptation measures. | 6. At least 6 parishes being built capacities and prepared to manage and use meteorological information. | 160,000 |
| | | 7. Six development plans of local parishes incorporate measures for ecosystem-based adaptation to climate change. | 80,000 |
| | | 8. Strategic plan of communication, education, knowledge transference and scheme of replica, including demonstration farms. Plus training on adaptation finance to financial institutions. | 120,000 |
| | | 9. Systematisation of information gathered during the whole project design and implementation using existing informatics platforms | 40,000 |
| Total Component Cost | | | 2,190,000 |
| Project/Programme Execution cost | | | 180,000 |
| Total Project/Programme Cost | | | 2,370,000 |
| Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable) | | | 119,373 |
| Amount of Financing Requested | | | 2,489,373 |

Projected Calendar:

| Milestones | Expected Dates |
|---|----------------|
| Start of Project/Programme Implementation | 03/2018 |
| Mid-term Review (if planned) | 02/2020 |
| Project/Programme Closing | 02/2022 |
| Terminal Evaluation | 01/2022 |

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Project components

57. The project strategy focuses on implementing actions that will minimize, as much as possible, the foreseen impacts of climate change in the Río Blanco water system as presented in Part I. The main conceptual frameworks will be a sustainable livelihoods approach (Chambers & Conway, 1991; Scoones, 1998), Ecosystem-based Adaptation¹² (EbA), Community based Adaptation¹³ (CbA), and watershed management approach for climate change adaptation with a gender perspective.

58. The main rationality to base the intervention on ecosystem and community based strategies is that: ecosystems have strong influence on the vulnerability of (especially poor rural) communities, while communities naturally use to develop coping strategies to reduce their vulnerability. Rural communities depend on the conservation of ecosystem and the direct participation of communities to adaptation strategies is key to support sustainable intervention in the realm of climate change adaptation. Hence this project aims to support adaptation through conservation of ecosystem and capitalizing on local knowledge and participation of local communities.

59. The project is organized into three components and four outcomes. 9 concrete outputs will be produced. The multiyear work plan will be developed during project preparation.

60. Conservation practices that reduce the impacts of climate change on the Río Blanco upper basin flows are based on the maintenance and management of public and private conservation areas, as well as the increase of 1,000 ha of native vegetation. The private conservation categories must comply with the technical studies and a management plan and it will not necessary be formally part of the SNAP (National System

¹² Ecosystem-based adaptation uses biodiversity and ecosystem services in an overall adaptation strategy. It includes the sustainable management, conservation and restoration of ecosystems to provide services that help people adapt to the adverse effects of climate change (CBD, 2009).

¹³ Community-based adaptation (CbA) "is a form of adaptation that aims to reduce the risks of climate change to the world's poorest people by involving them in the practices and planning of adaptation" - Tim Forsyth, LSE - (see for example UNDP, GEF

of Protected Areas) meanwhile the public declarations¹⁴, in addition to the management plan and technical studies, it must be formalized through a declaratory from the local governments, this can be part of the SNAP. As a basis, the, Bio-corridors and ACUS scheme¹⁵ and the exclusive competences of land use granted to the municipal governments (GAD, for its Spanish abbreviation of “Gobiernos Autonomos Decentralizados, “autonomous decentralized governments”) will guide adaptation activities in respect to the conservation of the vegetation cover.

61. The following chart and subsequent paragraphs provide an overview on the main adaptation categories and strategies that will guide the project’s activities:

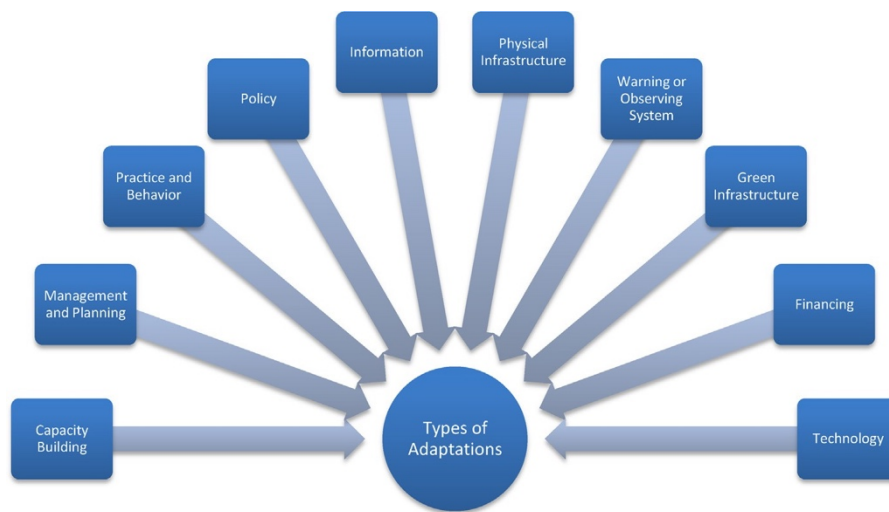


Figure 5: Adaptation to Climate Change categories, adapted from GEF, (2014).

62. The above presented adaptation categories can be specified as presented in the following table:

| Adaptation category | Description | Examples of actions in category | Similar classification in literature |
|---------------------|--|--|---|
| Capacity Building | Developing human resources, institutions, and communities, equipping them with the capability to adapt to climate change | Training/workshops for knowledge/ skills development, public outreach and education, dissemination of info to decision makers/stakeholders, Identification of best practices, training materials | Educational/informational (Smit and Skinner, 2002; Wilbanks and Kates, 1999; Huq et al., 2003; Smit et al., 2000; Carter et al., 1994; Tompkins et al., 2010) |

¹⁴ Legal instrument of territorial planning

¹⁵ ACUS – Areas de Conservación y Uso Sostenible, areas of conservation and sustainable development, a main instrument of the Ministry of Environment of Ecuador to landscape management.

| | | | |
|------------------------------|--|--|---|
| Management and Planning | Incorporating understanding of climate science, impacts, vulnerability and risk into government and institutional planning and management | Developing an adaptation plan, livelihood diversification, drought planning, coastal planning, ecosystem-based planning, changing natural resource management | Administrative/institutional/organizational (Smit and Skinner, 2002; Wilbanks and Kates, 1999; Huq et al., 2003; Smit et al., 2000; Carter et al., 1994; Tompkins et al., 2010) Behavioral (Smit and Skinner, 2002; Wilbanks and Kates, 1999; Huq et al., 2003) |
| Practice and Behavior | Revisions or expansion of practices and on the ground behavior that are directly related to building resilience | Soil/land management techniques; climate-resilient crops or livestock practices, post-harvest storage, rainwater collection, expanding integrated pest management | Behavioral (Smit and Skinner, 2002; Wilbanks and Kates, 1999; Huq et al., 2003) |
| Policy | The creation of new policies or revisions of policies or regulations to allow flexibility to adapt to changing climate | Mainstreaming adaptation into development policies, land-use specific policies, improvement of water resource governance, revised design parameters, ensuring compliance with existing regulations | Legislative/Legal (Smit et al., 2000; Carter et |
| Information | Systems for communicating climate information to help build resilience towards climate impacts (other than communication for early warning systems) | Decision support tools, communication tools, data acquisition efforts, digital databases, remote communication technologies | Infrastructural/structural (Smit et al., 2000; Carter et al., 1994) Educational/informational (Smit and Skinner, 2002; Wilbanks and Kates, 1999; Huq et al., 2003; Smit et al., 2000; Carter et al., 1994) |
| Physical infrastructure | Any new or improved hard physical infrastructure aimed at providing direct or indirect protection from climate hazards | Climate-resilient buildings, reservoirs for water storage, irrigation systems, canal infrastructure, sea walls | Infrastructural/structural (Smit et al., 2000; Carter et al., 1994) |
| Warning or observing systems | Implementation of new or enhanced tools and technologies for communicating weather and climate risks, and for monitoring changes in the climate system | Developing, testing and deploying monitoring systems, upgrade weather or hydro-meteorological services | Research and development (Smit et al., 2000; Carter et al., 1994) |

| | | | |
|------------------------|--|---|--|
| “Green” infrastructure | Any new or improved soft, natural infrastructure aimed at providing direct or indirect protection from climate hazards | Revegetation, afforestation, woodland management, increased landscape cover | Infrastructural/structural (Smit et al., 2000; Carter et al., 1994) |
| Financing | New financing or insurance strategies to prepare for future climate disturbances | Insurance schemes, microfinance, contingency funds for disasters | Financial (Smit and Skinner, 2002; Wilbanks and Kates, 1999; Huq et al., 2003; Smit et al., 2000; Carter et al., 1994); Market mechanisms (Smit et al., 2000; Carter et al., 1994) |
| Technology | Develop or expand climate-resilient technologies | Technologies to improve water use or water access, solar energy capacity, biogas, water purification, solar salt production | Technological (Smit and Skinner, 2002; Wilbanks and Kates, 1999; Huq et al., 2003; Smit et al., 2000; Carter et al., 1994) |

Table 6: Overview adaptation categories

63. The proposed project intends to address all these relevant adaptation dimensions, though to differing extents in the actual implementation.

Adaptation concept and indicators for Adaptive Capacity

64. The adaptive capacity of vulnerable populations defines their vulnerability against adverse climate change impacts as a function of their exposure and sensitivity to such impacts. Figure 6 visualizes the dynamics between these components. Vulnerability results as the sum of Exposure plus Sensitivity minus Adaptive Capacity¹⁶. By “vulnerability”, we mean the propensity or predisposition to be adversely affected; by “exposure” we mean a “fixed” reality consisting in climate hazards, temperature, precipitation, soil type, etc.; by “sensitivity” we mean a “variable” reality consisting of the inherent sensitivity of the economic activity to specific exposure, as for crop sensitivity to temperature oscillations; by “adaptive capacity”, we refer instead to the ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences, namely how are exposure and sensitivity managed.

65. Being exposure external and sensitivity inherent to the economic practice, ecosystem based adaptation **works** on increasing adaptive capacities to decrease community and ecosystem vulnerability as presented in Figure 6.

¹⁶ Partially taken from Christoph Jungfleisch’s presentation “MEbA – Understanding Climate (Change) Risks, Financing Adaptation”.

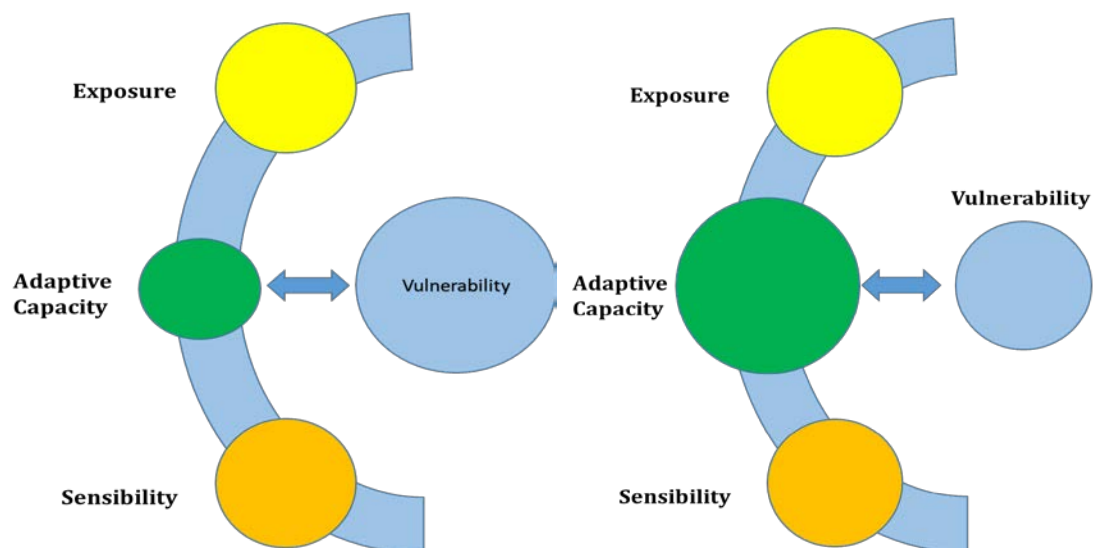


Figure 6: Influence of adaptive capacity on climate change vulnerability. Source: Engle (2011). Adapted from: Aguirre et. al. (2015).

66. The project will integrate the measurement of the adaptive capacity via established indicators that will be developed or drawn from similar approaches in the region and the national vision (MAE), mainly The National Adaptation Plan and current projects in Ecuador. Set of tools that promote the Evaluation & Monitoring and Measuring, Reporting and Verification (MRV). The present project will capitalize on such experience and define the adaptations indicators tailored to the target population and ecosystem for the project.

67. In the framework of its National Adaptation Plan, the country is developing a proprietary system for Monitoring and Evaluation of adaptation measures which will be taken into consideration, and if applicable, form the basis for the project's monitoring and evaluation activities.

68. These indicators will assess the evolution of the adaptive capacity of smallholder farmers over time. The project will promote their inclusion into day-to-day operations of project stakeholders and promote the creation of crowd-sourced insights into the target communities' adaptive capacity.

69. If applicable, and depending on subsequent coordination, the project will coordinate and include in its field activities the application and integration into operational processes of international best practices to measure the adaptive capacity of vulnerable populations, especially small farmers and cattle ranchers.

70. An example is the EbA capacity index developed by the UN Environment's MEbA project¹⁷, that allows institutions addressing the target populations as mentioned above to gather relevant data in three dimensions to generate an index that expresses a given unit's (productive unit, household) capacity to confront climate change based on Ecosystem-based Adaptation principles in three dimensions:

¹⁷ See here an overview: http://unepmeba.org/fileadmin/user_upload/english/EbA_capacity_indexeng.pdf

- Socio-economic dimension: assessing available infrastructure and services, financial situation and social or community integration
- Productive dimension: assessing the productive reality of the agricultural production with respect to soil quality, farming practices and integration into agricultural value chains
- Environmental dimension: assessing the farm's or household's management of water, waste and pests among others

71. The gathering of relevant data will be integrated into field operations and processes wherever the project interferes with the target populations via

- Financing activities and credit assessment
- Provision of technical assistance to strengthen productive processes
- Monitoring and Evaluation activities

72. Based on this data analysis process, the project will not only be able to systemize and quantify its Monitoring and Evaluation activities across all field operations, but establish a system that allows for a monitoring of the evolution of farming practices in the area of the project over time, during and after the project implementation phase.

73. Resulting insights will be used to inform the communities in the area of the project via the channels and media presented in Component 3, and hence contribute to generate relevant knowledge to be shared with the communities in the upper Rio Blanco watersheds.

74. The capacity building resulting from such knowledge sharing will be focusing on informing target populations on:

- EbA conform and efficient agricultural practices that strengthen the health of ecosystems as the basis for sustainable agricultural production systems
- Statistical analysis of effective agricultural practices under adverse climate change impact influence by combining data from weather stations in the watershed and data on applied agricultural practices resulting from field data gathering activities described above
- Cost-benefit analysis resulting from a close monitoring of yield levels as a function of implemented farm practices
- Perceptions within the community on adverse climate change impacts as well as preferred adaptation measures being implemented or carried out following the generation of crowd-sourced insights

Component 1: Conserve vegetation cover

75. Component 1 focuses on the conservation of vegetation cover on an area of 230,000 ha, supported by the introduction of the active sustainable forest management and conservation technologies.

76. The identification of areas of intervention will be defined following methodologies which the Ministry of the Environment has developed in recent years and are formally disseminated through the ministerial agreements detailed below

- 115 on 12 November 2009
- 042 on 26 March 2010
- 07 on 26 January 2011
- 130 on 28 June 2011

77. The agreements define criteria for threats, eco-system services and socio-economic characteristics of the area, in the present case the previously established threats will incorporate the climatic threats arising from the effects of climate change, the criteria for component 1 are described below:

1. Threat levels defined through the proximity to access roads
2. Historical patterns of deforestation;
3. Climate threats to the biophysical components of the basin (droughts, floods)
4. Environmental services: biodiversity refuge, hydrological regulation, carbon storage
5. Poverty level

78. In addition, information and similar interventions in the territory will be identified as they emerge to complement project activities as well as not to duplicate efforts. There is evidence of previous work by Socio Bosque (Table 7) and interventions of the GADs within the scope of their competencies that will be complemented with the proposal of Biocorredor and ACUS of this proposal.

| Surface (ha) under Socio Bosque Mechanism | Characteristics | Number of beneficiaries in the zone with SB | Average surface per beneficiary |
|--|--------------------------|--|--|
| 10959,83 | Individual beneficiaries | 93 | 117 ha/beneficiary |

Table 7: SocioBosque interventions in the Rio Blanco watershed

79. The proposed project will coordinate with the following key stakeholders the execution of component 1, that have been identified and engaged in the project planning and preparation phase (see Annex 10 on the workshops executed).

| Stakeholders | Functions | Project Implementation Role |
|---------------------|------------------|------------------------------------|
|---------------------|------------------|------------------------------------|

| | | |
|--|---|--|
| Ministry of Environment (MAE) | Lead institution of the environment sector. Local staff of the PAs Unit are responsible for planning, management, vigilance and control within PAs. | Project executing agency. Will lead project activities in relation to the formulation of norms and strategies, the clarification of institutional roles for forest and APe management and conservation, support to GADs in processes of territorial land use planning, and support to incentive systems. |
| Ministry of Agriculture and Livestock (MAG) | Regulation, facilitation, control and evaluation of management of agriculture, livestock, promotion of actions which allow rural development and further the sustainable growth of the production and productivity of the sector. | Provision of training, technical assistance and monitoring of sustainable agriculture and livestock production |
| National Planning Ministry (SENPLADES) | Coordination of National Decentralized System for Participatory Planning, promotion of integrated development. | Coordination and consultation regarding the project's support to territorial land use planning processes and the GADs. |
| GADs | Generation of development and land use plans, for environmental management, declaration of parish and municipal protected areas, formulation of local environmental norms and the implementation of sustainable natural resource management projects. | Key targets for strengthening due to their responsibilities for environmental management at parish and municipal levels. Promote and support the investment fund as constituents |
| National Police Environmental Unit | Control of compliance with environmental norms in order to avoid its degradation or disappearance. | Guidance on application of legislation: involvement in multi-stakeholder strengthening of governance conditions. |
| SENAGUA | Water management authority, is an essential partner for the basin committees conformation and the investment fund . | Promoter on the River basin council. |
| Local communities and associations. | River basin management and zoning plans under an Integrated Watershed Management | River basin planning and implementation of Project activities. |
| INAMHI | Authority in the climate information generation. | Hydro-meteorological and decentralized monitoring system development. |

80. **Component 1** will focus on two outputs according to a single outcome targeted.

Outcome 1. At least 230,000 ha of native vegetation is conserved to reduce the impact of climate change on the hydrological cycle under integrated watershed management

81. This component will generate one outcome to be built from two outputs.

82. The **objective** of this outcome is to encourage conservation of the existing forest cover by promoting the conservation of 1,000 ha of native vegetation (output 1) and strengthening the management of the existing protected forests (ca., 230,000 ha) (output 2) based on two existing and proven mechanisms **developed in the country**: ACUS and Socio Bosque (Annex 16).

Output 1: 1,000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms.

83. The activities targeting this output will promote the conservation of 1,000 ha of native vegetation that contribute to the regulation of the hydrological cycle, and which are not currently guarded by any protective measure. An initial governance analysis will be performed in order to include all relevant stakeholders within the relevant activities of this component, promote cooperation and facilitate dialogue among each other. Strengthening governance among different actors and within the area of intervention is a key factor to firstly promote sustainability and secondly to empower the local communities. At the beginning of the project, they will play a role as beneficiaries, but the long-term intention is that they become active participants and lead the conservation process by themselves.

84. This component is based on the advancing and holistic landscape approaches implemented by the Ministry of Environment in Protect Areas (PA), nowadays called Areas of Conservation and Sustainable Use (ACUS) under the Bio-corridor category. The concept will be widely applied in the proposed concept with the active participation of local stakeholders. These local stakeholders will mainly be the municipal governments (GAD) that execute the exclusive competence with regards to land use and communities.

85. The areas proposed (1,000 ha) according to the Territorial Organization Plans (PDOT for its Spanish abbreviation) are:

| Protected area name | Area in the Project (ha) | PDOT | Main Activities | Indicator |
|---|--------------------------|-------------------|--|--------------------------|
| GAD Sigchos-Las Palmas Conlindaciones ¹⁸ de Sarapullo, Triunfo Bajo, Monte El Triunfo secondary Forest | 356 | Non-available | Updating of several Plans in the area according the National Laws (ACUS) -Execution-Management Plan -Management Model -Finance strategy | Management Plan and ACUS |
| GAD Sigchos Restoration in Palo Quemado | 117 | ACUS proposed | restoration | ACUS |
| GAD Sigchos rural areas | 127 | Recuperation Area | restoration | restoration |
| GAD Mejia –Tandapi | 200 | ACUS | restoration | Laws and ACUS |
| GAD Mejia –El Chaupi | 75 | ACUS | restoration | Laws and ACUS |
| GAD Mejia –Aloag | 125 | ACUS | restoration | Laws and ACUS |

86. In general, the zones proposed have had an important deforestation process. Thus, in the period 2008 - 2014 the deforestation surface was 5891,33 ha., and the following period 2014 - 2016 the deforestation **increased by** 2200,14 ha. In total 8091 ha (2008 – 2016) have been affected in the watershed (Figure 6), the project will promote the restoration and recuperation of importance areas thought the component 1.

¹⁸ PDOT GAD Las Palmas

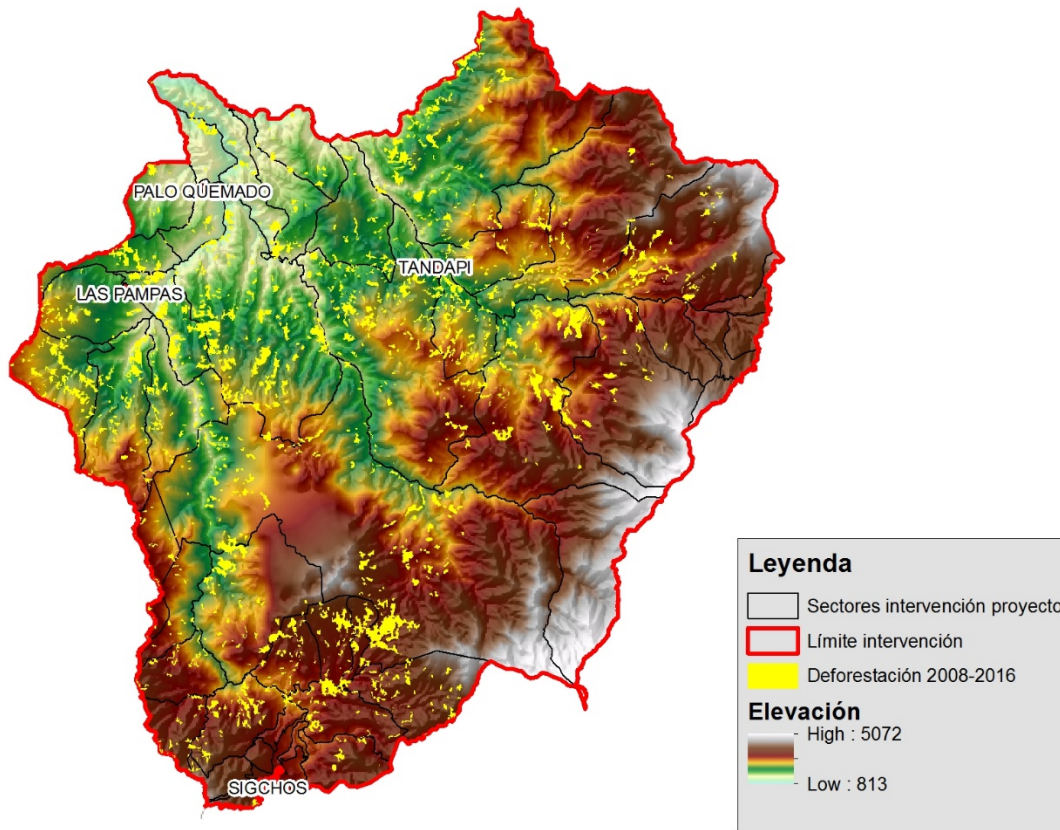


Figure 6: Accumulated Deforestation 2006 y 2016 in the Río Blanco upper watershed

87. The main way forward the output is the Municipal – Parish PAs, covering 1,000ha, in buffer zones and corridors identified as critical for reducing the impact of climate change on the watershed’s hydrological cycle. The new areas for conservation will be identified in order to develop protector forest management plans and formalize through signed agreements. The plan will include ravine and shore protection activities. The intention besides protecting some areas is to recover some degraded areas where necessary.

88. The project team, working closely with MAE representatives at central and local levels, will provide local authorities (GADs) with guidance on the establishment of such reserves, in accordance with the Norm on the Subsystem of Decentralized Autonomous Governments (GADs) – Municipal Protected Areas¹⁹. This guidance will cover aspects of location and design, in order to maximize the potential of these reserves to contribute to the connectivity and habitat value of the areas located by exploring and highlighting commonalities between local interests and conservation objectives, such as the potential benefits for local water supply and the avoidance of environmental risk that may be generated through the establishment of municipal reserves to protect riparian forests and those around water sources.

¹⁹ Agreement No. 168, MAE, Official Register 319 of 12th November 2010 (Norm on the Subsystem of Decentralized Autonomous Governments (GADs) – Municipal Protected Areas).

89. The control capacities in wildlife and forest traffic will be strengthened in the Tandapi point of control and another point of control will be included in accordance with the National Police and Protected Areas MAE. The ratings of management effectiveness tracking tool and PGOA will be increased by applying some planning instruments such are Management Effectiveness Tracking Tools (METT)²⁰ evaluation and Annual Operational and Management Plan in Protected Areas (PGOA)²¹.

90. The Management Effectiveness Tracking Tool (METT) has been developed by a cooperative effort of the WorldBank and the World Wildlife Fund (WWF) and is a simple, cost-efficient and flexible tool that can give a quick overview of the effectiveness of protected area management without requiring expensive consultants or taking up too much time for managers, rangers or others responsables for governance. In Ecuador the application was introduced in 2008. The METT is usually run as a qualitative assessment and relies to a large extent on the judgment and honesty of the assessors, for ecuadorian reports the areas: Planning, Control, Public Use, Tourism and Biodiversity management are widely used²². Nowadays, the METT system is institutionalized and reported - updated every year, being accessible to the public users through the Mae website link System of Biodiversity SIB.

91. This component will be complementary to Socio Bosque program which at the moment is focused on conservation, but it does not intend to finance SB program. Instead, given the holistic and participatory approach applied in the ACUS and Bio-Corridors, it is expected that it can be useful to demonstrate and exemplify the benefits of applying a sustainable land management approach, so that it can motivate the current beneficiaries of Socio Bosque to gradually adopt or replicate this approach in the near future.

92. The use of wood to produce “panela” at the moment represents the main driver of deforestation in the area. In this component, the approach about alternative forest energy to reduce pressures on native forest resulting from sugarcane production will be carried, for this purpose the governance mechanisms were addressed with the aim of reducing local peoples’ motivations to destroy the forest in unsustainable manners. Instead, through the ACUS approach, it will focus on the improvement of sustainable forest use, introduce alternative and innovative technologies, e.g. equipment such as efficient sugar mills and ovens, in order to demonstrate their technical viability, financial sustainability; including supporting the access to markets to commercialize their production and ecofriendly characteristics, set of activities that have interaction with the other components supporting the strategy of improvement: the forest management, the livelihoods and sustainable production activities to climate change effects.

93. Farm plans will be developed, promoting always at least 50% of women’s active participation. It is necessary within this component to strengthen local communities’ capacities on planning strategies, conservation practices and climate change, for this

²⁰ Management Effectiveness Tracking Tools Matrix developed for Protected Areas by The United Nations Development Programme GEF adopted by Ecuador Government for AP management: <http://suia.ambiente.gob.ec/documents/10179/346525/Gu%C3%ADa-Metodol%C3%B3gica-Evaluaci%C3%B3n-de-EfectividadManejoPatrimonio%C3%81reas-PG.pdf/8cd4223b-954a-42df-8b73-3490831a61c2>

²¹ Acronym in Spanish for Annual Operational and Management Plan in Protected Areas

²² METT tracking tools for Ecuador system: <http://suia.ambiente.gob.ec/documents/10179/346525/Gu%C3%ADa-Metodol%C3%B3gica-Evaluaci%C3%B3n-de-EfectividadManejoPatrimonio%C3%81reas-PG.pdf/8cd4223b-954a-42df-8b73-3490831a61c2>

purpose a cross-sector program for awareness raising and communication is considered as detailed under component 3.

94. This component will work also on strengthening the hydro-meteorological system of the Río Blanco upper basin. At the moment there are 11 hydro-meteorological stations, from which, only 2 are working properly. The intention will be to **strengthen** and improve the existing equipment determining its priorities and the purchase of four automatic hydro meteorological new equipment. will be considered under technical criteria in coordination with INAMHI and CELEC; the strategic localization will be responding the final design of the integral climate monitoring system. The managing of the hydro-meteorological system and use of the information generated, form part of output 6.

Output 2: Improved management of existing protected forests and private conservation areas (ca. 230,000 ha)

95. This output will strengthen the institutional and legal frameworks to manage the Toachi – Pilatón (ca., 212,000 ha) and Sarapullo (ca., 21,000 ha) protected forests, as well as existing private reserves²³. Currently these areas do not have management strategies and are under pressure to be converted into extensive farming lands. Due to their particular natural conditions and location, the mentioned forests are vulnerable to adverse climate change effects, resulting in possible desertification and water caudal reduction.

96. To protect these areas, the status of the protected forests will be assessed, and safeguarding strategies will be designed with local partners interested in supporting the conservation of the standing forests. It is expected that interested parties contribute to the long-term conservation of these areas. This point will be complemented, where considered appropriate with other existing programs such as Socio Bosque and its different components trying to change the paradigm of conservation though concepts and tools such as inversion watershed fund, replications and finance. Possible partners may include parish governments, municipalities, provincial governments, HIDROTOAPI, water companies, SENAGUA and the Ministry of Environment. As mentioned before, the feasibility of establishing an investment fund was analysed during project preparation.

97. From the perspective of ecosystem and communities based adaptation, it is necessary to strengthen the conservation of areas that remain in good condition as an adaptation measure with a lower long-term cost. The conservation of protected forests and private reserves contribute to maintaining connectivity between local and national conservation areas, both public and private, and all related climate and hydrological regulation services, such as sediment retention, infiltration and interception of horizontal rain, ravine and shore protection, very important in these mountainous areas.

²³ On the first screening three private reserves were identified: [1] Reserva de Bosque Integral Otonga (1,000 ha), [2] La Hesperia Reserva Natural (814 ha), and [3] Reserva Florística Río Guajalito (1,000 ha). During project preparation an in-depth analysis will be done, because it is very likely that more private protected areas exist.

98. In this activity, the project will support a paradigm shift in the management of the Protected Areas system from the existing site-focus to one that adopts an integrated landscape-watershed integrate management approaches under the bio-corridor concept, that improves habitat and conservation of natural heritage in benefit of the caudal in the Toachi-Pilaton Hydroelectric project, trying to improve the internally fragmented and disconnected across the broader landscape, with negative implications for water resources.

99. This paradigm shift will be expressed in the application of two key concepts in the management of protected áreas the Ecuadorian government is currently promoting:

1. The integration of the “advancing landscape approaches” for the conservation of biodiversity in protected areas, promoting the conservation of biodiversity through the generation of normative instruments, capacity building and monitoring, biological monitoring of flora and fauna, creation of conservation areas and generation of sustainable productive activities. The approach was recently introduced with support of the Global Environment Facility (GEF) in the project “Advancing Landscape Approaches in Ecuador's National Protected Area System to Improve Conservation of Globally Endangered Wildlife”. In addition, the Socio Bosque National Program in its new vision for the 2017-2022 period, changes the conventional concept of conservation for the landscape management approaches, focusing on three main drivers such as: a) Conservation b) Governance and c) Community landscape management.
2. The processes of decentralization in the creation of protected areas and their management (ACUS) through local governments, allows to standardize mainstream the criterion of landscape management, the strengthening of local capacities and the deconcentration of competences in the environmental management while ensuring a more efficient way to create the respective protected areas. Especially for the for the Ecuadorian state entities the concept supports the efficient use of available resources. It changes the centralized approach to protected area management by a territorial approach, a process that is ratified in ministerial agreement No. 083 of August 30, 2016 on "Procedures for declaration and management of protected areas in Ecuador ".

100. By transferring more competencies to the local GADs in determining protected areas and ensuring capacity building of respective management, the project is aligned with the general orientation of the government while building its activities upon tested and proven methodologies and activities.

101. The component will further strengthen the capacities of PA institutions and local governments to apply an integrated the landscape and watershed management approach for forest conservation into their management procedures and planning processes focusing in the formal conservation categories. The project will work with the existing programs and categories of the law on bio-corridors and ACUS, with the aim of promoting the channeling of additional resources to private land owners for the creation, restoration and/or protection in areas of importance for biological, productive and water regulation importan

102. According with the **Territorial Land Use Plans** (PDOT) of the local governments the areas proposed are:

| Protected area name | Area in the River Basins (ha) | Areas in the project (ha) | Date of creation (dd-mm-yyyy) | Management plan date | Main Activities | Indicator |
|---|-------------------------------|---------------------------|-------------------------------|----------------------|----------------------------------|-------------|
| Los Ilinizas ²⁴ Ecological Reserve | 29,672 | 8,901 | 11-12-1996 | 2008 | Implementing Management Plan | METT 70/100 |
| | 12,234 | 3,670 | | | | |
| Bosque ²⁵ protector Sarapullo | 21,585 | 17,268 | 30-07-1986 | N/D | Actualization of Management Plan | METT 70/100 |
| Bosque protector Toachi Pilatón | 212,000 | 169,600 | 14-09-1987 | N/D | Actualization of MP | METT 70/100 |
| GAD Sigchos | 16,307 | 16,307 | Degraded | ND | restoration | # of ha |
| GAD Mejia | 5,021 | 5,021 | Moderate forest intervention | ND | conservation priority | # of ha |
| GAD Tandapi | 2,5042 | 9,232 | Conservation priority area | ND | conservation priority | # of ha |

103. The component 1 hence has a direct relationship between conservation and forest management in priority areas, mainly the areas with a high natural forest and low inhabitants index, under an integral concept of Bio-corridor and watershed management. The priority areas are shown in the following map:

²⁴ <http://www.undp.org.ec/licitaciones/2014/001/Anexo1-PM%20ILINIZAS.pdf>

²⁵ PDOT GAD Sigchos 2015.

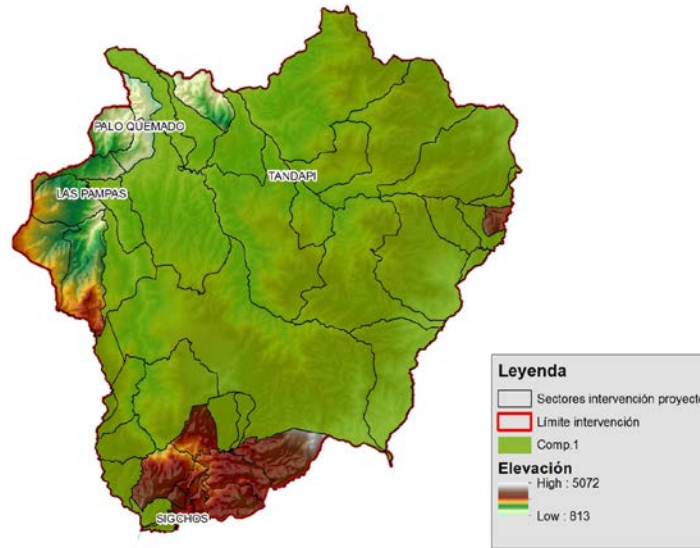


Figure 7: Priorities areas for the component 1, conservation and forest management in the Río Blanco upper watershed.

104. The Environmental Protection Unit (UPMA) of the National Police has undertaken a review of the focuses on control and regulation of the forest management and use: the entities of the central government that are involved in the control of illegal hunting and logging are the Ministry of Environment (MAE) through the Forestry Control and Wildlife Unit and the Interior Ministry (National Police) about illegal sales and use of woods in markets are further controlled through the forest control point located in Tandapi in coordination between MAE and UPMA. Despite these investments and efforts, the effectiveness of control and regulation is still severely limited, due to -in part- gaps and contradictions in the legal framework and in part due to limited cooperation between different institutions.

105. The installation of new specialized equipment (control point) and the strengthening of the Tantapi control allow the reduction of illegal wood and wildlife traffic. The project will work to achieve “automatization, control point strengthening and community participation” to conservation and sustainable forest and wildlife management through a combination of awareness-raising and community-level governance.

106. These actions will directly reduce pressures on forest from unsustainable and illegal cutting, thereby reducing the need for control and vigilance; they will also lead to increased willingness by community members to collaborate with institutions of central and regional governments mainly CELEC Hidrotopi, UPMA and MAE provincial directions thereby reducing the need to invest in “vertical” control and vigilance.

107. The project will implement a verification system to verify the proper conservation of the designated areas and the river basin management every three months through satellite images of high resolution, which will be useful to monitor and avoid future deforestation.

108. Through the preservation mechanisms ACUS, the private and public protected areas will develop and/or to update a management plan which must include a sustainable

financial strategy with time horizon of 20 years similar Socio Bosque mechanism and for ACUS. This strategy must be in line to the investment fund (see Annex 12) proposed in output 5 of component 2. Part of the financial resources generated by the mechanisms of the fund will be dedicated to support forest conservation in the present outcome. The fund will also support the maintenance and operation of the control and vigilance infrastructure.

109. Regarding the number of co-executors, given that this is a component of conservation and forest management, the sectors selected are those with a higher remoteness, low population density and high pressure for deforestation. The reference coverage used in this case was the so-called "Priority Zones" defined by best-known process develop for Socio Bosque and MAE such as: a) threat levels defined through the proximity to access roads; b) historical patterns of deforestation; c) climate threats to the biophysical components of the basin (droughts, floods); d) environmental services: biodiversity refuge, hydrological regulation, carbon storage; and e) poverty level. As result, a total of 33 sectors were selected from a total of 61 existing in the project intervention area (see Table here below). In the selected areas a total of 5,620 inhabitants are living. It is estimated that a total of 840 people will benefit directly from the activities of this component.

| Component | Men | Women | Total indirect co-executors | Elderly | Total direct co-executors |
|---------------------------|------|-------|-----------------------------|---------|---------------------------|
| Conserve vegetation cover | 2987 | 2633 | 5620 | 515 | 840 |

Summary Component 1: Objectives and activities

110. The following table shows the priority areas for intervention under the component 1, the **objectives of the two outcomes as well as activities carried out under each** .

| Objective | Activity |
|---|---|
| 1. 1,000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms | In the context of the river basin conservation corridor, at least 1,000 priority conservation acres will be declared as conservation areas and sustainable use ACUS through formal agreements with the local governments (GAD). As part of the bio-corridor they will count on management plans, financial sustainability strategy and a management model to be operative by the end of the project. The core of the component will be the sustainable forest management, shore river protection, water sources conservation, set of activities under the adaptation to climate change and integrated watershed management. |
| 1.1 Functional conservation areas as part of the Toachi Pilaton (Río Blanco upper basin) basin bio-corridor have been established | The sustainable management of created conservation areas will be strengthen, such as the Bombolí, Hesperia, Otonga, Sarapullo, Toachi - Pilaton reserves with a landscape, integrated watershed management and biological connectivity approaches |

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| <p>1.1.1 Technical, biological and zoning file analysis has been carried out</p> | <p>Accordinging with ministerial agreement No. 083 of August "Procedures for declaration and management of protected areas in Ecuador ", as first phase the project will develop the Management Plan that includes planning, tenure land and zoning of ACUS-Biocorridors.</p> |
| <p>1.1.2 ACUS management plan- conservation bio-corridor have been developed</p> | <p>Second phase includes in accordance with the Art.13 (agreement 083 AP), the GADs and project will</p> <p>carry out the administration and management of the protected area in order to ensure its conservation; implement the mechanisms established in the national law; Comply with the Management Plan of the ACUS, especially with the conservation conditions established there; ensure compliance with the land use (zoning) established in the Management Plan of the protected area</p> |
| <p>1.1.3 Financial and operational sustainability strategy has been developed</p> | <p>As a chapter of Management Plan, the Financial strategy will be develop together with the initial consultancy (PM), the resources in this activities will guarantee the financing and sustainability of the protected area through the respective budget or the resource management mechanisms provided by the respective Government Autonomous Decentralized and the Investment fund from the project with a time horizon 20 years.</p> |
| <p>1.1.4 Management and operation model has been developed</p> | <p>Through the Unit Project, day-day work will be systematized (UP); compliance of the Management Plan of the protected will be shared with the Environmental Authority National, in the terms to reports the achievements and barriers; in addition, the UP provides information required by the National Environmental Authority on protected areas for monitoring and evaluation; furthermore, implement coordination mechanisms and instruments of management will be develop between MAE, UP and GAD.</p> |
| <p>1.2 Increase in # of Decentralized Autonomous Governments (GAD) with planning, regulatory and normative instruments for ACUS</p> | <p>The Project will promote the creation of new conservation areas and strengthen the local governments' capacities regarding the implementation of an integrated water and landscape management approach as means to adapt to climate change. Through local ordinances and planning instruments the indexes of Good local governance on conservation and climate change issues will be evaluated.</p> |
| <p>1.2.1 Key habitats, restrictions and monitoring programs, and agreements for their implementation have been identified by PA authorities and GADs</p> | <p>The technical unit in coordination with the project stakeholders (GAD) will define areas of importance for conservation, using the tools defined by the MAE in participatory process.</p> |

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| 1.2.2 Standards and practices for protecting forest and implement integrated watershed management have been included in land-use planning processes | Strengthen local capacities through the generation of tools for the creation of ACUS, climate change adaptation measures and GAD administrative-environment management; the project unit will transfer knowledge to the communities involved in the project. The progress of this component will be evaluated through Good Local Governance Index |
| 1.2.3 Municipal ordinances on conservation, land use practices, and ACUS have been agreed and published | Formalize (ordinances) and communicate the declaration of ACUS protected areas to the corresponding levels of government of the corresponding jurisdiction, for supporting the national order and planning the territory (Bottom-up); |
| 1.3 Increase sustainable livelihoods alternatives that reduce pressure on forests. | The provision of adequate and sustainable livelihoods that count on the support and follow-up of the academy and the project management unit, will diversify the family income and increase resilience to the effects of climate change. These elements improve the Basin management in general and the adaptation to climate change |
| 1.3.1 Incentive systems for set-asides on private and community lands based on ACUS have been strengthened | In this component, the sustainable production actions will be implemented according to the reality of each part of the Basin. For the "Pilatón" area, a change of technology with efficient kilns in the panela production process will be promoted, as well as the reduction in the use of forest in at least 30%. For the lower part, the creation of urban gardens will be promoted, sustainable productive alternatives and actions that include the participation of women and vulnerable groups. |
| 1.3.2 Municipal PAs have been gazetted, covering 1,000ha, in buffer-zones and corridors identified as critical for the hydrological cycle | This activity will allow monitoring of the protected areas (ACUS) and to produce reports to different levels of government. Priority will be given to determine the high importance areas for regulation of the hydrological cycle and sediments reduction. |
| 1.3.3 Promotion of habitat and connectivity-friendly production options has started | This component is aimed at the realization of sustainable livestock production activities, in coordination with the Ministry of Agriculture, with the objective of diversifying the family income and managing the livestock conflict which is the fact that wildlife species appear in the project intervention area. These actions will allow to improve wildlife conservation and to improve the living conditions of the communities, which translates into the implementation of the landscape approach for conservation. |
| 1.3.4 Programs for reduction of human/wildlife conflicts in association with the Ministry of Agriculture have been introduced | This activity complements the productive actions that will promote income diversification and conservation of the wild fauna described in the c.1 item. |

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| <p>1.4 Increase in # of families in communities adjoining conservation areas in target ACUS, participating in productive activities demonstrated to reduce pressures on forest with at least 50% of women participate</p> | <p>The effective participation of women in decision making, farm planning and sustainability strategies process within their productive activities will generate autonomous processes of adaptation to climate change. This activity is complemented by component 1 and will be evaluated with the number of farms plans that have at least 50% of participation of women and vulnerable groups.</p> |
| <p>1.4.1 Planning and zoning of the river basin with a participatory and inclusive approach has been introduced</p> | <p>At both, the farm within the biocorredor level and ACUS of conservation level, it will be carried out planning and zoning, which will allow the access to credits and the strengthening of the local capacities. This activity will be mainly promoted by women.</p> <p>Promote dialogue, coordination and technical support at local level</p> |
| <p>1.4.2 Inclusion of governance activities with active women participation has started</p> | <p>The governance mechanisms of the productive activities, the declaration of protected areas and the functionality of the investment fund will count on the active participation of women.</p> |
| <p>1.4.3 Technology transfer agreements for sustainable practices and environmental conservation has been established with national universities.</p> | <p>It requires the support of a specialized legal team in order to formalize the agreements and follow up on them.</p> |
| <p>1.5 Strengthening of the hydro-meteorological system of the Río Blanco upper basin.</p> | <p>The purchase of climate monitoring equipment will be done in case of determining it is necessary. Given that at the moment, from the 11 existing meteorological stations in the area, only 4 are working, the purpose will be to strengthen and improve the existing ones under the integrated monitoring system, being the core of the purpose to transfer the technology and knowledge to municipal government and the administrative management to CELEC; all these elements with the support of INMAHI</p> |
| <p>1.5.1 Monitoring and evaluation as well as analysis capacities has been strengthened</p> | <p>This activity intends to improve the knowledge on climate topics, prevention of disasters and the use of information. The support of INAMHI is considered transversal for this component. The ultimate goal is to have an integrated climate monitoring system to be used by the co-beneficiaries; CELEC, local governments and the communities.</p> |

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| <p>2. At least 230,000 ha of native vegetation is conserved to reduce the impact of climate change on the hydrological cycle under integrated watershed management</p> | <p>The component will strengthen the capacities of PA institutions and local governments to integrate the landscape, watershed integrated management approaches for forest conservation. The project will work with the existing Bio-corridor and ACUS modalities, with the aim of promoting the channeling of additional resources to private land owners for the creation, restoration and/or protection of set-asides in areas of importance for connectivity. And water cycle.</p> |
| <p>2.1 Reduction in the use of forest wood for productive activities in the Upper and Middle Basin of the Toachi River (Landscape Las Pampas and Palo Quemado), through promoting technology change and improvement of the production process of the panela production.</p> | <p>During workshops with communities it was identified that the main source of income over 50 years has been the cultivation of sugar cane and its use as “panela”, this has implied the use of the forest, an average of 3 trees per month, which has resulted in deforestation processes.</p> <p>To avoid this problem, it is considered appropriate to change the technology in the productive process with the improvement of ovens and Cooking Systems to reduce at least 30% the use of wood.</p> <p>The farms plans allowed a change of paradigm about the conservation and sustainable forest use. In particular for the productive alternative (panela) the wood required for this process will be obtained from energy forest banks (zoning) created for sustainable use purposes and will be complemented by the program use one tree and plant another with 89 families integrated in the proposed from the Palo Quemado and las Pampas communities and 89 families from Tandapi in sustainable alternative production under a global scheme of Bio corridor</p> |
| <p>2.1.1 Farm’s zoning and plan elaboration.</p> | <p>This activity has a close relationship with item 1.4, because it requires the improvement of planning at a farm level with the active participation of women. These components and their interaction intend to benefit at least 840 people.</p> |
| <p>2.1.2 Financial strategy for the implementation of the framework (in coordination with the PA financing project)</p> | <p>Once that the financial strategy and the sustainability mechanisms in component one have been defined, replication tools for other localities, such as publications, will be developed within this activity.</p> |
| <p>2.1.3 Information management and decision support system based on updated and reliable data and traditional knowledge about the panela process</p> | <p>This component will allow the dissemination of the results and the communication of goals, mainly considering the communication strategy of the project.</p> |

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| <p>2.1.4 Technology change (ovens change to promote efficiency in the production of panela)</p> | <p>This activity complements the investment component of the project, for the sustainable production actions will be implemented according to the reality of each part of the Basin. For the “Pilaton” area, a change of technology with efficient kilns in the panela production process will be promoted, as well as the reduction in the use of forest in at least 30%. For the lower part, the creation of urban gardens will be promoted, sustainable productive alternatives and actions that include the participation of women and vulnerable groups.</p> |
| <p>2.1.5 Definition of permitted uses and activities in different management categories, in relation to conservation.</p> | <p>This activity allows to hire technical staff that will be in charge of evaluating in the day to day the most suitable actions in the conservation biocorridor.</p> |
| <p>2.1.6 Strengthen capacities</p> | <p>This activity is related to the financing of the different workshops that will be carried out in the execution of the project which are related to the M&E plan, inception workshop and report.</p> |
| <p>2.1.7 Governance analysis performed to provide recommendations. Governance and dialogue to provide alternatives to existing barriers.</p> | <p>This activity pretends to provide recommendations of improvement in regard to the governance dynamic existing in the area and the possible existing conflicts related to the use of water among the different stakeholders and to promote dialogue and coordination among them. In this activity also the existing governance tools will be updated, taking into account any possible change that the declaratory of protected areas could happen in complement to the M&E plan.</p> |
| <p>2.1.8 Assessment, monitoring and evaluation of farms to perform and provide technology transfer</p> | <p>This activity is related to the monitoring of the project both internally, as well as by external evaluators according to the M&E plan and the measurement of means of verification of project results.</p> |
| <p>2.2 Priority conservation areas maintenance through the creation of the Toachi Pilaton Bio-corridor.</p> | <p>The conservation bio-corridor is an instrument approved by the Ecuadorian laws. An update will be performed to the existing lands, its use, planning, and zoning and to the Bio-corridor Management Plan.</p> |
| | <p>Equally, a financial sustainability strategy of the conservation area will be developed. It will have resources for strengthening the protected area.</p> |
| | <p>As a final product, a management model will be developed to operate within the framework of the basin's conservation bio-corridor and supported by formal agreements with the local governments (GAD).</p> |
| <p>2.2.1 Monitoring and evaluation arrangements (table 10)</p> | <p>Activities that allow to have a team that is in charge of the review of progress in the framework of the M & E / Mid-term Evaluation / Final Evaluation.</p> |

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| <p>2.2.2 Apply and holistic landscape approach to define new Areas of Conservation and Sustainable Use (ACUS). Expanded PA management plans to include forest conservation, landscape approaches, watershed management and new zoning for dispersal corridors within Pas</p> | <p>This activity is related to the implementation of activities in charge of the project unit, as well as the day-to-day work within the framework of the monitoring arrangements. M & E / Mid-term Evaluation / Final Evaluation</p> |
| <p>2.2.3 Planning and zoning of the river basin with a participatory and inclusive approach. Promote dialogue, coordination and technical support at local level</p> | <p>This activity complements the Inception Workshop and the M&E Report, and allows the incorporation of the actor's perspectives in relation to the initiation of the project. It must be done two months after the start of the Project.</p> |
| <p>2.2.4 Management plan of the protector forest, including ravine and shore protection activities.</p> | <p>This activity finances the important monitoring milestones; Mid-term Evaluation / Final Evaluation.</p> |
| <p>2.2.5 Cross-sector program for awareness raising and communication</p> | <p>This activity will finance several workshops that allow the dissemination of results and to consolidate political and strategic alliances that contribute to the sustainability of the project.</p> |
| <p>2.3 Increase in the process of planning and zoning of farms in which at least 50% of women participate</p> | <p>The Project will start a territory planning process at a farm level to achieve protection, adaptation to climate change and sustainable use of resources, activities that are strongly linked to women's participation.</p> |
| <p>2.3.1 develop farm and management plans including adaptation to climate change criteria</p> | <p>A unit team that will carry out different activities that allow the transfer of knowledge, as well as the development of local capacities.</p> |
| <p>2.3.2 Train farmers in conservation practices and climate change</p> | <p>Workshops to be held during the implementation of the project.</p> |
| <p>2.3.3 Training to farmers in planning techniques and considerations</p> | <p>Field visits to strengthen capacities.</p> |
| <p>2.4 Increases in ratings of Management Effectiveness Tracking Tool and PGOA</p> | <p>The management of Protected Areas will be evaluated through the application of the METT effectiveness management assessments and the application of the Operational Management Plans of Protected Areas of Ecuador PGOA. The revision will be annual. Strengthening and replication mechanisms of the improved and protective cover management will be established in the Toachi River basin.</p> |

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| 2.4.1 Improve practices to manage Protected areas and METT evaluation | Strengthening of the monitoring system from the PA planning tools, activities for the annual update of the METT and investments for the improvement of the protected areas management. |
| 2.4.2 Application of PGOA and evaluation | Investments for the improvement of the PAs and ACUS management, financing of different reporting activities of PGOAs |
| 2.5 Increases in control capacities in wildlife and forest traffic | Through the strengthening and functionality of the Tandapi control point and the creation of a mobile control post in “Las Palmas”, the control process of natural resources in the area will be improved. In the same way, this activity will be complemented with training processes for the population. The National Police has an important role in this activity. |
| 2.5.1 Equipment for environmental control mainly forest and wildlife with supporting UPMA | Strengthening of the monitoring system, investments in studies and preliminary agreements |
| 2.5.2 Strengthen Tandapi control point | Purchase of equipment for the retention of wood and Wildlife, improvement of existing infrastructure. |
| 2.5.3 Install a control point in las Pampas, equipment in coordination with the Police | Purchase of equipment for the fixed control post in the Pampas, which includes; control camper, registration computers, wood and wildlife retention equipment, office furniture, fuel. |
| 2.5.4 Monitoring system, newsletter and decentralization of information. | Work equipment for capacity building on climate change and risk management, prevention of wood and wildlife traffic. |

Component 2. Adapt farming practices to new climate change conditions and enable their climate smart financing

111. To assure the sustainability of ecosystem conservation it is of major importance that communities are aware of the importance of ecosystems for their livelihood agricultural productive systems and that they develop income generating activities through ecosystem conservation, particularly in face of climate change. Component 2 is intended to provide the basis for this objective.

112. This component will generate the conversion to crop management in an environmentally sustainable and climate-smart way for at least 500 ha. Traditional forms of cultivation are rooted in conventional agricultural practices. Although there are some isolated efforts to apply cultivation methods in a different way, either by applying live fences (such as "quiebrabarriga and yucaraton"), or the implementation of silvopastoral systems, these have not been widespread or considered interesting alternatives for conventional agriculture. Those who have implemented these practices have done so, motivated by a personal attachment to the conservation of their environment, the ecosystems on which they depend, rather than economic motivations. Although many farmers in the project's areas of influence consider it appropriate and important to implement measures to adapt to climate change in their crop management activities, their intentions are not put into practice due to the lack of knowledge on their implementation and the fear of assuming a risk that would affect their income and overall spending and payment capacity.

113. The importance of the economic viability of sustainable crop management and the implementation of adequate adaptation measures hence cannot be underestimated. Farmers need to be convinced that the implementation of such measures translates into concrete and tangible benefits, especially economically. If smallholder farmers are not informed and convinced that adaptation to climate change is possible, they are not likely to decide for investments for their adaptation and productivity enhancement. Such limitation in awareness and capacity increases the reluctance of small landholders to embark on the path to increased climate resilience and adaptive capacity.

114. For the selection of suitable adaptation measures to be promoted and implemented with target populations, the project will apply the Ministry of Environment's (MAE) methodology for Cost Benefit Analysis, Cost Effectiveness Analysis and Multi-criteria Analysis for adaptation measures recently developed in cooperation with the German Development Cooperation (GIZ) as well as methodologies developed in the UN Environment's MEbA project (see Annex 17). Findings will be applied for prioritized adaptation measures suitable for the area and included in the respective awareness raising campaigns and monitoring and evaluation mechanisms for their verification over time.

115. For example, the implementation of irrigation systems, either by sprinkling or dripping, the construction of water reservoirs or introduction of crop rotation and

intercropping systems, are generally not identified by the farmers when discussing possible sustainable and resilient agricultural practices. Though, the increase in productivity of crops and livestock per hectare, are considered essential elements of sustainability by local communities. This fact motivates the merging of local adaptation knowledge and practices according to international best practices and methodologies. The project's objective is to capitalize on the communities' experience, combine it with proven solutions and empower vulnerable populations with sound adaptation practices. Instead of focusing on specific adaptation practices, the project will introduce methodologies that enable the different stakeholders to promote adaptation and sustainable agricultural and livestock practices on an ongoing basis: adaptation to climate change will always be a process rather than a punctual activity and hence requires the change in agricultural practices on an ongoing basis.

116. Many farmers and ranchers agree that ecosystems in the areas of the Río Blanco upper basin are being permanently threatened by logging, in part by the constant expansion of the agricultural frontier and livestock ranches. They argue to ignore the feasibility alternatives to apply them. If communities, highly dependent on these economic activities, have convincing alternatives to sustainable agriculture and livestock, there will be a gradual migration towards these farming methods.

117. At the same time, artisanal forms of panela production, prevalent in the project's area, that are intensive in the use of wood for the combustion of their boilers, will be included in the effort to obtain means of subsistence that do not degrade the ecosystems of the zone. Promoting a technological leap, integrating boilers that use alternative energy sources (such as bagasse) and increase overall energy efficiency, under the "Best Available Technology" (BAT) approach, will relieve the pressure on surrounding forests, harmonizing with other measures to protect the ecosystems and forests of the project's areas of influence. This industrial upgrade aspect will be considered as an integral part to change the paradigm of current artisanal production, matching and complementing sustainable agriculture and livestock practices. These activities are directly related with forest preservation efforts of component 1 of the present project due to the extensive use of firewood.

118. Hence, selection criteria for the identification of suitable adaptation measures for individual farmers need to be flexible and take into account each farmer's specific situation, such as:

- Access to important infrastructure such as roads
- Inclination of plots or grazing grounds
- Soil texture and quality
- Actual crops cultivated or livestock bred, including varieties and types
- Availability of critical inputs
- Pricing of inputs in each area

119. The combination of these critical productivity drivers will not only determine the productivity of farmers under business-as-usual scenarios in face of adverse climate impacts, but also define what actual adaptation measures promise not only the optimum results but also if their implementation is feasible at all. For example, if certain inputs for the implementation of adaptation measures are not available, cannot be transported to the farm due to the lack of access roads or are prohibitively priced, must be analyzed on a case by case basis.

120. The project will seek the cooperation with the UN Environment's Microfinance for Ecosystem-based Adaptation project, which has identified a set of 40 EbA measures specifically suitable for the implementation by smallholder farmers. The MEbA project has so far implemented almost 10,000 EbA measures (for a total financing of over USD 12 million, exclusively provided by the microfinance institutions' own funds and paid by the farmers) in cooperation with 5 microfinance institutions in Colombia and Peru and is assessing the implementation of its solutions in Ecuador. The MEbA project is funded by the German Federal Ministry of Environment via its International Climate Initiative.

121. The MEbA project has developed tools that support the individual assessment and prioritization of EbA measures to be applied with small farmers as part of operational processes of institutions interacting with small farmers as input or service (such as technical assistance or finance) providers.

122. The project will hence promote with the communities the application of proven interventions able to:

- Improve agricultural productivity and in consequence socio-economic resilience,
- Conserve ecosystems and hence sustainably support agricultural production systems,
- Increase climate resilience of vulnerable populations and the ecosystems they depend on.

123. The approach of adaptation will be introduced with at least 250 local smallholder farmers, to reduce the pressure of farming and livestock activities on native forests and ecosystems.

124. Working with farmers' organizations and other potential multipliers such as input and finance providers, best practices will be introduced to increase production using a reduced area of agricultural land. The main lines of work will be (i) cattle and pasture management, and (ii) sugarcane production. Nonetheless, other crops will also be addressed (e.g., mortiño, naranjilla,), also against the background of crop diversification as an ecosystem-based adaptation to climate change via the diversification of agricultural activities to mitigate resulting productive and economic risks. Agricultural intensification, i.e. the technologies to produce more (and of better quality) on less land, is of fundamental importance to stop deforestation and resources over-exploitation.

125. The Project will build upon existing infrastructure and processes of partner institutions to generate sustainable mechanisms targeting investments into adaptation

measures. Local input providers and financial institutions will be engaged to improve their respective knowledge and awareness to engage them to participate in the activities of the project in a more proactive way. Capacity building will be implemented and reinforce such stakeholders' understanding of the risks and opportunities to include adaptation solutions in their operations.

126. In addition, an investment fund will be built to support the respective finance of adaptation investments. This financial instrument offers a mean to involve different actors on a long-term basis.

Outcome 2: Sustainable farming practices adjusted to local realities are being introduced and implemented with technical assistance of innovative financing mechanisms for adaptation measures.

127. The geographical scope of the project is broad, the participation of different cantons and parishes is confirmed. The project area of operation comprises high Andean parts with paramo ecosystems and Andean cloud forests, down to zones with sub-tropical climate. In the same way, the topography in which the activities of agriculture and livestock are being executed is varied, comprising farms located in sites with pronounced slopes as well as farms in places with reduced slope and close to the rivers.

128. Consequently, it is not possible to define an established set of sustainable agriculture and livestock adaptation measures ex-ante. Instead, adaptation and ecosystem conservation strategies will be defined and designed during early stages of the project, considering the particularities of the different types of crops managed in the area (sugar cane, naranjilla, mortiño, among others), topographic and (micro)climate conditions, local climate change perceptions of vulnerable populations, agricultural practices implemented as well as existing experiences in the different parishes. Furthermore, the cultivation of native species (e.g. mortiño, naranjilla) in a sustainable way will fit within the biotrade (Biocomercio) initiatives that have been developed in the country and are of interest to the Ministry of Environment under the bio-economics approach.

Definition of adequate adaptation measures

129. To facilitate acceptance of proposed adaptation strategies, it is suggested to identify existing experiences with adaptation practices in the Río Blanco upper watershed and surrounding areas. Initiatives focusing on climate resilience of small landholders will be identified and evaluated, targeting the identification of already adopted adaptation strategies in local areas. Based on a set methodology, these strategies will be standardized and adjustment criteria (e.g. for different crops or climate regions) be identified. Lessons learned from other initiatives will be documented, systemized and integrated into the strategy formulation for their replication in the project. The objective is to increase acceptance in production changes by the farmers and their communities.

130. Insights drawn from such an exercise will help to develop quick wins for participating key stakeholder, i.e. defining products which can be quickly introduced by replicating existing strategies already adopted.

Furthermore, the selection methodology as presented in Annex 17 from the UN Environment's MEbA project will be applied for the customized prioritization of suitable EbA measures at an individual farmer's level in this context.

131. Powerful means to further support the introduction of adaptation measures will be the promotion of trial or partial introduction, where possible with leading producer within the community. Trial or partial introduction of innovative adaptation solutions allows the farmers to limit their investment on one hand, while enabling them to observe concrete benefits with their own eyes in the other hand. In such a set-up, only a minor part of a farmer's plot is managed using the new practice, while the remainder is managed in a traditional way. During harvest, and of course over the development of the crop, the performance is being monitored and documented, especially with respect to yield levels. Such implementation approaches have been shown to increase acceptance especially in remote communities.

Financing of adequate adaptation measures

132. A major limitation for successful adaptation is the availability of financial resources for adaptation investments. Traditional financial service providers limit their exposure to the most vulnerable populations and focus on traditional agricultural practices for those farmers eligible for financing. Furthermore, in many cases no reliable agricultural service providers provide the required inputs (agricultural inputs as well as capacity building) and consequently do not limit the technological risks of innovative adaptation methodologies. Hence many of the smallholder farmers in the project area are trapped in a poverty cycle they are unable to solve by own means. Hence, the project will also be working with the service ecosystem focusing on smallholder farmers and apply a twofold strategy to support investments into adaptation as described below.

133. Where appropriate, technical assistance will be accompanied by temporary economic assistance and capacity building to convert financially excluded target populations into credit worthy clients. Being more resilient, having implemented adaptation measures, will enable these populations to receive credits and in consequence enable them to finance more important investments, with higher opportunities for increased economic return and climate resilience.

134. Communities in the target area have a certain access to credit. Nevertheless, credits do not target investments in adaptation practices, but credit is provided to traditional practices, which regularly contribute to ecosystems degradation and climate vulnerability.

135. The volume of credits, the number of beneficiaries, and the degree of financial inclusion, vary among the geographical areas targeted by the project. For example, in Las Pampas, in December 2014, USD 3,239,340 were granted in 534 lending operations, resulting in an average loan of USD 6,000. In Mejía, in 2013, USD 30,470,353 were

invested in microcredit, delivered mainly by banks (61.09%) followed by cooperatives (38.91%). In Palo Quemado, 44% of the population has access to credit.

136. The intervention of the project will hence take into account the level and scope of financial inclusion among the various communities, with the aim to propose adapted solutions for each of them. While access to finance is a reality, however, expanding the credit supply is one of the elements of development that forms part of the planning of GAD's. The project hence will promote to channel the existing credit supply towards adaptation investments assuring economic return for farmers, conservation for ecosystems, reduction of climate vulnerability for the communities, and financial return for financial institutions. This strategy will therefore support a triple bottom line of economic, social, and environmental return for all involved stakeholders.

137. To realize such achievement the project will take into consideration the lessons learnt in two of the most innovative projects in the area of smallholder adaptation finance, that have been operated in LAC: the MebA (see reference 1 of annex 18) and CAMBio (see reference 2 of annex 18) projects.

138. Strategies are proposed to allow a holistic approach to promote investments oriented to adaptation to climate change by providing technical and economic assistance (where needed) and financial resources directly to the farmers (via credits) on the one hand, and on the other, by creating the conditions for the development of financial mechanisms that work in the project area in the long term.

139. Financial institutions assisting farmers and ranchers in the area, do not yet have lending tools to facilitate, nor promote, a transition to sustainable agriculture and livestock management models.

140. Capacity building through the intensive training of its commercial staff at the operational and management levels, as well as the appropriate tools to facilitate the assimilation of new concepts into their credit risk assessment, are crucial to generate the interest and expectations alienated from adaptation to climate change within the financial institutions.

Output 3. 250 ha of pasture and 250 ha of crops apply sustainable farming practices

141. As previously explained, communities living in geographical zones targeted by the project, are threatened by a multitude of challenges, including poverty traps, low agricultural productivity, lack of access to water, adverse climate impacts, and environmental degradation. To foster community adaptation capacities, it is of main importance to define, develop and implement agricultural practices that can at once generate higher income, reduce climate vulnerability and conserve ecosystems.

142. Introducing best adaptation practices in agriculture and livestock management, will be one step forward from the conventional farming towards resilient and sustainable agriculture. The approach of (ecosystem-based) adaptation will be introduced on at least 250 local smallholder farms, to reduce the impacts of farming and livestock raising on

native forests, ecosystems and land degradation. Working with farmers' organizations and other potential multipliers such as input providers or financial service providers, best practices will be introduced to increase production using a smaller area of agricultural land.

143. As examples the following practices have been identified based on the initial analysis executed, further suitable adaptations strategies will be identified according to local realities, **following the methodology presented in Annex 17:**

- The establishment of family gardens, which helps especially women as head of household to enhance the daily diet of family members and even generate additional family income by selling surplus on local markets.
- Crop diversification, which not only helps to increase biodiversity but also promotes risk mitigation of family income, where applicable relying on native varieties.
- Local native varieties will be promoted such as mortiño (*Vaccinium floribundum*) and naranjilla (*Solanum quitoense*).
- Live fences and windbreaks
- Silvopastoral and Agrosilvopastoral systems, among others eligible.
- Drip irrigation systems and water reservoirs

144. The application of sustainability measures in agriculture and livestock is not new in the country, there are projects in which comprehensive management of farms, as a way to improve the productivity of farmers while reducing the impacts on the ecosystem.

145. In Annex 17 are some measures that can be considered part of the repertoire of actions to be implemented within a comprehensive farm managed in a sustainable way. These EbA practices were drawn from the catalogue for EbA practices developed in the project ("MEbA Options, costs and benefits", UN Environment, 2013), and will be combined with ongoing initiatives in Ecuador such as the Ministry of Agriculture's Planification of Integrated Farm Management in the framework of the program Productive Transformation Agenda of the Amazonas.²⁶

Implementation strategy

146. The activities, as presented in Annex 17 only provide a framework and not a final solution. In particular, the possibility to include existing local agriculture practices into Ecosystem based Adaptation practices, will be assessed in detail during the first phase of the project. These will promote local practices that have already proven more resilient, and support the introduction of Community based Adaptation strategy into the overall strategy of the project.

²⁶ Planificación del Manejo Integral de Finca del programa de Agenda de Transformación Productiva Amazónica del Ministerio de Agricultura, <http://www.agricultura.gob.ec/agenda-de-transformacion-productiva-amazonica-reconversion-agroproductiva-sostenible-en-la-amazonia-ecuatoriana/>

147. As previously mentioned, a two step strategy will be implemented to introduce adaptation measures with local communities. The underlying principal is to focus on gradually upgrading vulnerable populations that are currently not having access to market-based solutions for inputs, capacity building or finance **via direct and subsidized support**. Once these farmers have reached a certain development level, they will become eligible clients for service providers and hence will receive

148. Under the first approach, the construction of sustainable management solutions in farming will focus on but not be limited to the most vulnerable populations, with specific target on women individually, or women associations where applicable. Specific vulnerability criteria for **their** proper selection will be defined in the early phase of the project. Such vulnerable population will be supported only for adaptation investments that can be reached with low investment and limited capacity building effort, but allowing for interesting economic return. The project will identify suitable adaptation measures to that end **following the details presented in Annex 17**.

149. Moreover, the economic and technical assistance provided to build the farms in a sustainable way, at this segment, will go together with a plan to strengthen their financial literacy. So that, once the farm is reaching a state of greater resilience and hence becoming credit eligible, the respective farmers are empowered to take sound financial and investment decisions, expenses and revenues and net profits. The intention is to prepare them for managing some basic points to take care in order to get a suitable and timely loan. For vulnerable groups this step by step proposal will be the best chance to gradually become creditworthy and go on with their business in an individual way.

150. The second approach is addressed to those farmers who already have access to micro loans. For these farmers, the project will facilitate the link with financial institution that have been previously trained to disburse credit for adaptation. Such credit worthy population will take advantage of the possibility to establish more profitable EbA investments but that at the same time required more upfront capital, in this case provided by a tailored microcredit, and longer return time. Moreover, credit worthy farmers will also have the advantage to have access to more extensive training on EbA, and the training on more involved adaptive practices, tailored to their ability.

151. In the case of vulnerable groups economic resources for implementation will not have any cost and will be transferred to the suppliers in benefits of the farmers and livestock ranchers immersed in this activity. In addition, a performance bonus will be granted to those participants who, within a period of 6 months, maintain the crops according to the established sustainability model previously defined. This performance bonus will be delivered on two occasions, six months after implementation and at 12 months. Other disbursement time can be defined after a first assessment at the beginning of the project.

152. Regarding **the selection of suppliers, the availability of their services to the target populations must be assessed as a lack of access to such inputs could increase farms' vulnerability if the provision of new inputs to maintain the sustainable farms, are not available**.

153. Regarding the intervention of Financial Institutions in Ecuador through micro lending approach this includes all credit operations addressed to small business coming from different sectors: service, production, commercial and agriculture, whose maximum consolidated debts is not larger than USD 50,000 and annually sells not over USD 100,000. Personal guarantees are the most common collateral.

154. For a better understanding of the current situation, a short survey with the **participants** of the socialization workshops was done, **where** 46% of the attendees have credit with a broad range of amounts going from USD 1,500 the minimum to USD 15,000 the maximum. Which means that the different financial institutions (mentioned more forward) are reaching these zones and disbursing credits. For now and with high confidence, these loans are addressed to reinforce farming activities in an unsustainable way.

155. The monitoring and supervision of the fulfillment of investment plan, is a crucial stage in both cases to ensure the implementation of measures and avoid diversion of funds resources, for that reason the money will go directly to the suppliers of the technology applied, using traditional means such as: transfers or certified checks. For this end, suppliers will be selected regarding the experience, reputation, prices and diversified stock of the inputs required for implementation.

156. In the areas for intervention the associations to be included in the project will be selected including criteria of gender equity and vulnerable groups **mainly** and under the responsibility of autonomous governments representatives. Land **tenure** and **child** labour avoidance are social aspects to be **included** in the selection criteria.

157. Assuming common agricultural areas of 2 hectares per crop, and an investment in adaptation practices of around 50% of the plot, the project will reach till 250 have farmers to reach 250 ha, while for livestock an average of 20 hectares is estimated, considering that only small part of the plot will be invested at first for EbA activities, this allows the inclusion of 125 farmers for this activity, considering that only 10% of the farm will be invested in EbA practices. 50% of women both agriculture and livestock farmers chosen for this stage. The openness to show the results and the close dispersion of the farms are aspects to be deeply valued before the farms' selection.

158. Finally, it is worth to take into consideration that the given figure of 2 hectares **does not** mean that farms which have more extension will be automatically rejected. A case by case analysis will be **applied**.

159. The direct beneficiaries of the intervention are estimated to be between 250 and 375 according to acceptance rate and plot size. Including the rural fertility rate of 2.7 per women²⁷ that means 4.7 members per family, it is estimated that the project will **reach** between 1,175 and 1,763 indirect beneficiaries.

160. Due to the development of a two-step strategy presented above, that consists in distinguishing between the most vulnerable people and the ones that are credit worthy, it is of major importance to establish clear criteria for this.

²⁷ Hombres y Mujeres del Ecuador en cifras III, INEC y ONU Mujeres. 2010

161. To avoid this the community will be mobilize to commonly define the criteria. Moreover, as presented above, both group will have different benefits not provided to the other group and tailored to its own capacity.

162. This strategy aim at once to include the most vulnerable of the community, and on the other side support less vulnerable farmers with adapted interventions allowing them to capitalize on their experience. This strategy will assure social inclusion and financial sustainability at long term.

163. Figure 8 provides a schematic presentation of the intended implementation approach:

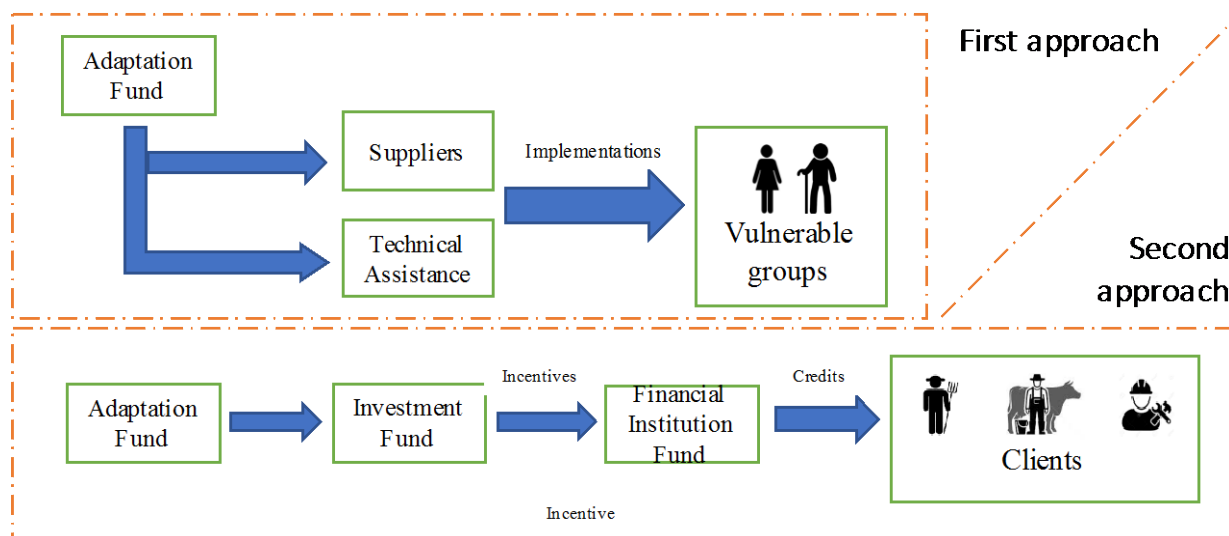


Figure 8: implementation approach

164. Details on activities to be carried out with financial institutions to support the second approach presented above, will be detailed in the next section.

Output 4. At least 2 institutions have introduced specific solutions and risk assessment methodology to support the disbursement of credits for adaptation, integrate sustainable and climate smart criteria in their whole operations.

165. The participation of the financial institutions, which have infrastructure and client portfolio in the areas of project design, can become catalysts of adequate financial resources to promote a gradual migration towards sustainable agriculture models.

166. However, the creation of appropriate financial mechanisms and products, which are attractive to both farmers (and final customers) and to the business model of the financial institution, requires prior and detailed work. Financial solutions appropriate to the credit methodology of each institution, appropriate for the segment of clients they attend and harmonic with the institutional objectives are important aspects to consider.

167. The introduction of such lending products, drawing from lessons learned in projects such as CAMBio or MEbA, regularly requires broad internal awareness raising and

training campaigns and a strong support in strengthening lending processes. Nevertheless, it holds the promise to find strong partners that are serving the last mile in rural areas, and channel critical financial resources targeting adaptation directly to end beneficiaries. Furthermore, these institutions usually collect data on the socio-economic and productive reality from these clients and can hence be key partners in increasing the understanding of the most vulnerable populations.

168. This project will support financial institution thanks to training provision and tools development. In particular the project aim to train financial institutions active in the region to understand, recognize, manage and offset when possible the climate and environmental risks of their portfolio. Specific climate smart lending methodology will be developed that will allow to include climate and environmental risk in credit assessment and disbursement. Risk management tool at client and portfolio level will be developed. Such innovative solutions will allow the financial institutions to increase their institutional knowledge of potential clients, and develop the correct price-risk policy for the EbA activities promoted by the project.

169. The development of investment catalogues that include EbA measures through information collection in the areas that would participate in the project would be an additional incentive for the financial institutions especially if they are not in charge for it. Intervention will include the detail of measures to be financed, the incorporation of software that facilitates the process of evaluation, qualification and monitoring, the construction of the reporting processes, the training of its commercial staff, and its clients, are the potential benefits for institutions that are encouraged to participate in the project.

170. The acquisition of long-term investments and a suitable interest rate for the financial institutions may also be considered as the incentive to request, in return, the placement in adaptation credits to the agricultural sector identified in the previously mentioned catalogs. The delivery of these resources will be through the Investment Fund for the Sustainable Development of the Río Blanco upper basin. This fund, once its equity has reached a suitable amount, will have the administrative and economic capacity to address these resources efficiently and well defined. So, this approach is linked with the output 5.

171. The strategy to encourage investments to consolidate more sustainable agriculture and livestock and to boost technological leaps that reduce the pressure on forests (panela producers) will go in two directions: one oriented towards the financial institutions to promote the disbursements of credits, and the other one, towards the client that the investment is concrete. For the latter case mechanisms will be structured to provide economic incentives through concessional credits including differential characteristics in the term and guarantees. As know-how on the concrete EbA actions increases via innovative and data-based information management, and productivity enhancement become more obvious, the project will gradually reduce the provision of economic incentives. In future financing, after the project's end, economic incentives will be provided to the clients in the following way:

1. Farmers can invest into EbA via specific credit lines

2. By investing into productivity enhancing EbA options and obtaining better economics, accompanied with a proper communication strategy (see output 8), sceptical actors will be guided to understand the investment logic via adjusted financing.
3. Financing institutions will be incentivized and enabled to introduce risk-adjusted pricing, which will favour better adapted smallholder farmers further decreasing interest rates and hence providing economic incentives.
4. Financial institutions expand their range of financial products for adaptation and mitigation of climate change.

172. The application of benefits in the granting of credits, must be clearly explained to the clients. Its application would be temporary and unique since, once the farmers have reached a good level of knowledge of crop management with EbA measures and their yields are sufficient to maintain the continuity of agricultural production itself, access to credit would be in a conventional way onwards.

173. From the financial institution point of view the positive aspects to implement specific credit liens for adaptation will be:

1. The verification and documentation of the use of funds is vital to generate trust of interested investors as well as satisfy their “Know Your Client (KYC)” requirements. There exists an increasing appetite in international financial markets for triple-bottom line investments, i.e. providing financial, social and environmental returns that can be strongly addressed via the financing of adaptation activities, if these are documented.
2. Reducing overall operational costs and risk, and improving beneficiaries’ knowledge will result in an overall gain for the participating institutions and communities. The project will identify and engage a software solution provider capable of providing solutions that are especially designed to reduce cost and capitalize institutional understanding and strategies on monitoring.

174. To assure the financial sustainability of the project financial institutions will be included and incentivized to provide financial support to smallholders.

175. During the project two financial institutions will be involved: one public and the other private. The present project does not aim *per se* to provide the credit lines to the financial institutions, while it will work with the financial institutions to channel part of their existing funds, or to have access to international funds such as GCF, towards smallholders. The incentive of the present project would be:

1. Provision of climate risk management methodologies and tools to the financial institutions able to reduce their risk in agriculture lending and reduce their operational cost to assess and monitor agriculture credits
2. Provision of tailored technical assistance to financial institutions aiming to train them on environmental and climate risk, and the implementation of dedicated

credits for smallholders, based on best and proved international standards for green lending.

176. Currently, there are few financial institutions that include aspects of sustainability in their operations. 10 private banks in Ecuador adhered to the Sustainable Finance Protocol promoted by the Association of Banks (ASOBANCA), in the area of cooperatives, there is still no such initiative.

177. The proposal at the national level for the management of financial sustainability approach rests on three specific aspects:

1. Internal environmental management: measurement of the consumption of resources inside the financial institutions to elaborate baseline, establish actions of mitigation and compensation. It involves the training of all the staff of the institution and the creation of internal mechanisms to identify the main direct and indirect environmental impacts and the way in which they must be managed. The launching of internal committees and environmental management policies are part of this process.
2. Environmental and Social Risks Assessment (ESRA): It consists of the implementation of mechanisms to identify environmental risk in the economic activities that are financed. Manage them by requesting additional requirements or even rejecting the loan if proper corrective measures are not taken to mitigate the environmental impact. This mechanism and its evaluation processes will be harmonized, as far as possible, with financial institution's credit methodology, and will be incorporated into screening process and decision-making activities (credit committee).
3. Green lending: this is a new element in the financial mechanisms of the country, very few financial institutions have specific tools to address issues of environmental protection, energy efficiency and renewable energy. The main obstacle is the lack of awareness of the opportunities of this market.

178. In addition, another effort in the same direction has been devopled in the **country, the Environmental and Social Management Programme for Financial Institutions** ("Programa de Gestión Abiental y Social para Instituciones Financieras" - PGASIF), an inititive headed by the CAF since 2012 and manily oriented to share lessons and provide technical assistance to improve the environmental aspects inside the whole financial operations. Important steps have been taken in Ecuador with the PGASIF support, **such as the Financial Sustainability Protocol, an initiative promoted and implemented by CAF together with with the National Banking Association ASOBANCA. So far, 10 leading banks have ratified the protocol.**

179. To assure the environmental impact of the project, smart incentives will be implemented. A possible scheme will be: the farmers are required to invest in their farms through a credit, after a defined period of time the sustainable agriculture investments will be verified by an external party. If it is confirmed that investment have been realized appropriately and that the agricultural practices are being implemented properly as well as in line with environmental sustainability criteria, a percentage of the investment will be

returned to the farmers as ecosystem incentive. This allows to align incentives between farmers and financial institutions and to provide a financial subsidy of the credit only for successful implementation of the adaptive practice.

180. Proyecto CAMBio, as presented in the Reference 2 in Annex 18, has first developed such incentives in the region and it will be used as framework to establish consistent and adapted ecosystem incentives for the present project.

The financial institutions' environment

181. In Ecuador 696 cooperatives are active and 26 commercial banks. With about 22% market coverage Ecuador is far above international benchmarks in financing smallholder farmers. The cooperatives are divided into segments, and distributed accordingly, as follows:

| Segment | Total assets (USD) | # |
|----------------|---|----------|
| 1 | Greater than 80,000,000 | 26 |
| 2 | From 20,000,000 to 80,000,000 | 33 |
| 3 | From 5,000,000 to 20,000,000 | 84 |
| 4 | From 1,000,000 to 5,000,000 | 183 |
| 5 | Up to 1,000,000 | 370 |
| | Savings bank and associations, communal banks | unknown |

182. The project has identified the following institutions as being active in or around the Río Blanco upper watershed. Potential partners in that activity already identified therefore could be:

1. Cooperativa CACPECO: Segment 1 cooperative
2. Cooperativa Manantial de Oro: Segment 3 cooperative
3. Cooperativa Maquita Cushunchig Ltda.: Segment 2 cooperative
4. Cooperativa San Miguel de Sigchos: Segment 4 cooperative
5. Cooperativa Unidad y Progreso: Segment 3 cooperative
6. BanEcuador: state-owned rural development bank
7. Banco Pichincha: market-leading commercial bank with a microfinance subsidiary ("Credife")

183. In Manuel Cornejo Astorga there also are present:

1. Banco Solidario, specialised in microlending
2. Cooprogreso, segment 1 cooperative

184. Further institutions identified are:

1. Las Pampas livestock ranchers' association to introduce improved livestock and pasture management practices in 250 ha.
2. Flor de Caña Association (sugarcane producers) to introduce improved practices for sugarcane production in 250 ha and to explore forms to improve panela production units to reduce the use of firewood.
3. The association of producers from Quinticusig who grow and process mortiño (Vaccinium meridionale Swartz).
4. The Women association Marianita de Jesús en Las Pampas composed by 18 women

185. The project will foster data-smart process management (provision and financing) to create a multi-stakeholder support ecosystem that will be attractive to financing from market players. **Details on respective activities are being presented below.**

186. **Direct beneficiaries of the respective activities will be two financial institutions with established presence** of operations in the area.

Mechanism for lending approach:

| Beneficiaries | Type | Units (hectares / producers) | Investment (per hectares or units). Average | Mechanism | | | Technical Assistance (15% o 10%) | Charge to Adaptation Fund |
|-------------------------|------------------|------------------------------|---|----------------------|---|---------------------------|----------------------------------|---------------------------|
| | | | | Credit | Grant (70%) | Bonus 15% farmers + 5% MF | | |
| 100 | Crops | 100 ha | \$ 1.000,00 | \$ 100.000,00 | 0 | \$ 20.000,00 | \$ 15.000,00 | \$ 35.000,00 |
| 150 (vulnerable groups) | Crops | 150 ha | \$ 1.000,00 | | \$ 105.000 + (\$ 45.000 farmers contribution) | | \$ 22.500,00 | \$ 127.500,00 |
| 125 | Livestock | 250 ha | \$ 500,00 | \$ 125.000,00 | 0 | \$ 25.000,00 | \$ 18.750,00 | \$ 43.750,00 |
| 10 | Panela producers | 10 units | \$ 10.000,00 | \$ 100.000,00 | 0 | \$ 20.000,00 | \$ 10.000,00 | \$ 30.000,00 |
| | | | | \$ 325.000,00 | \$ 105.000,00 | \$ 65.000,00 | \$ 66.250,00 | \$ 236.250,00 |

| | |
|-------------------------|----------------------|
| Resources from output 3 | \$ 105.000,00 |
| Resources from output 3 | \$ 66.250,00 |
| Resources from output 4 | \$ 65.000,00 |
| | \$ 236.250,00 |

187. In order to achieve the goal of 500 hectares managed sustainably for agriculture and livestock and including the production of panela, we have the expected number of hectares (in the case of agriculture / livestock) and units (in the case of manufacturers). The average investment for sustainability measures per hectare is estimated at around USD 1,000 per crop, USD 500 for livestock ranches. It is assumed, that only 10% of the cattle ranch area will be dedicated to new measures; and that USD 10,000 of average amount of investment for the artisanal manufacture of panela will be necessary. For farmers with access to credit, a 20% incentive is proposed, 15% over the capital borrowed and 5% for the capital lent by financial institution. For the case of sustainable crops of

vulnerable groups (including entrepreneurs of this group) the grant mechanism is used in a much focused way, the investment in sustainable measures will be addressed 70% assumed by the grant as incentive and the remaining 30% as beneficiary contribution (workforce).

188. In the case of livestock and the manufacture of panela is not contemplated granting donations because the nature of their business shows that the entrepreneurship itself would be costly without applying even sustainable measures. On average, the cattle ranch requires 20 hectares, which leaves little room for entrepreneurs. Therefore in this case we will apply a similar 15% performance bonus (105 livestock rancher and 5% MFI) on the principal of the credit as a unique mean of incentive.

189. The case of the panela producers is similar, usually these businesses are already constituted and with a certain trajectory. For them, investments of USD 10,000 are estimated, to invest in the most efficient furnaces (which use another source of fuel like bagasse) and if the investment plan is fulfilled a 20% bonus is applied with similar structure mentioned above.

190. In all cases technical assistance amount is estimated and added to the resources needed, however, this aspect is part of output 3 budget together with amount for grants. The resources of credit implementation under the figure of bonus is part of the budget of **output 5 realized by the establishment of an investment fund.**

191. The figures estimated are conservative and leave a room for the inclusion of more participants, as the intention is at least to reach 500 hectares with sustainable management but if possible even more areas could be introduced.

192. The methodology to manage climate lending risk and to develop financial instruments like green lending expected to be introduced in the two financial institutions is not intended only to be used in the scope of the current adaptation project, but in all operations at national level.

193. Two institutions will be supported via specific consultancy as well as training measures. Where possible, the project will seek the coordination and the cooperation with the UN Environment project microfinance for Ecosystem-based Adaptation to climate change (MEbA) and participate in workshops and knowledge sharing lessons organized by CAF's PPGASIF project.

Implementation with financial institutions

194. The component will be outsourced to a specialized consulting company for microfinance, where possible in coordination with the UN Environment's MEbA project. UN Environment's office in Panama is currently assessing to replicate the MEbA project in Ecuador, where several institutions have expressed their interest to gain access to the project's developed solutions (see Annex 17 for more details on these solutions).

195. The following details as well as implementation plan for these activities over time is presented below. The implementation of climate-smart lending and EbA financing product development will be organized in different phases with their own activities which are laid out below and summarized with different activities in the work plan.

- **Phase 1 - Initial screening**

The initial screening serves as starting point and targets the review of a partner institution's existing data available, experience in green inclusive finance as well as existing lending products and processes.

Based on these findings, a project framework or strategy is defined and a detailed work plan elaborated.

- **Phase 2 - Framework definition**

During phase 2 the general framework is developed, with a specific focus on the identification and engagement of strategic partners such as training or input providers, if applicable. Term sheets to guide a future cooperation agreements are elaborated together with the partner institutions and then discussed and negotiated with identified prospect strategic partners.

Once the partnership set-up is agreed upon with one or several partners, respective cooperation agreements are drafted and finally signed.

- **Phase 3a - Implementation awareness and capacity**

During this phase, suitable EbA options are being identified according to available information and experience in the local markets and based on the EbA options and methodologies presented in Annex 17, among others. The selection of suitable EbA options follows the Cost-Benefit Analysis and prioritization methodology presented in that same Annex 17. Other criteria to be considered are previous experiences with EbA activities in the area of the proposed project, the Rio Blanco upper watershed.

Based on the defined options, training materials are being developed as well as internal employees and external agents trained in the overall set-up as well as the promotion and capacity building offers of specific EbA options.

- **Phase 3b - Implementation lending support**

Lending support will be promoted via specific lending software. The consulting firm to be selected will ensure the versatility of such lending software to incorporate future developments in best practices in lending and EbA. The software solution will work on mobile devices in order to allow for on-site data gathering in a structured way.

Resulting crowd-sourced insights, i.e. insights gained by a multitude of co-executors (farmers) based on data gathered via different channels, will feed into the

- **Phase 3c - Implementation financial products**

Once the initial EbA options to be promoted are defined, the product design is to be developed. It is assumed that MEbA products (i.e. the financial product financing EbA options) will follow the same rules than "traditional" generic agricultural lending products, focusing on either input finance or asset investments.

Hence most focus around the product design will be on the development of marketing materials and adjusted manuals and procedures.

- **Phase 4 - Pilot review and adjustments**

Based on a predefined pilot protocol, including key performance indicators to monitor targeted outcomes such as handling and processing times as well as data quality, the pilot is started in dedicated pilot branches. Pilot assessments will be monitored and observation documented to enable ex-post assessment and adjustments if needed.

- **Phase 5 - Roll-out**

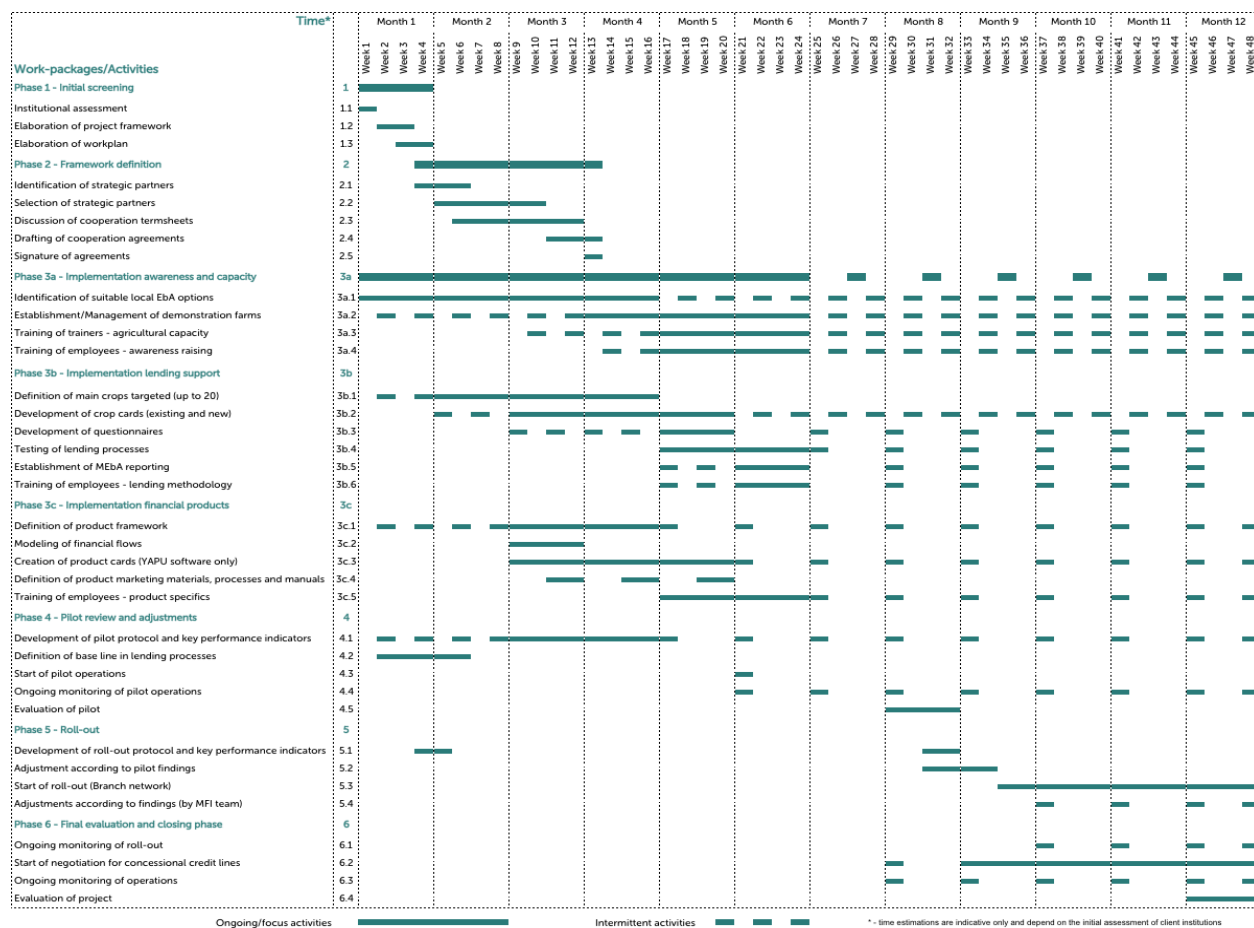
Once the pilot has been concluded necessary adjustments are worked into the standard documentation as well as the lending support software are being worked in.

- **Phase 6 - Final evaluation and closing phase**

After project activities have terminated, a final evaluation of the project will be performed. Results will be shared with UNEP ROLAC, potential donors providing financing, the client institution as well as YAPU solutions.

The project activities to introduce climate-smart lending and EbA oriented financial products will take 12 months with each institution as presented in the below workplan. The total cost per institution is assumed to be at USD 60,000.

- **Workplan**



Outcome 3. At least 1 long term financing mechanisms has been piloted or introduced

196. A sustainable development fund will be a useful mechanism to integrate contributions from public and private stakeholders and ensure long-term management. Ecuador has a strong experience developing and using similar schemes such as water funds and is hence in a good position to introduce such mechanisms. For instance, a leading experience is the “Fondo de agua para la conservación de la cuenca del río Paute (FONAPA)”. This fund is related to the Paute hydroelectric power station. The constituents include Cuenca’s water company (ETAPA), HIDROPAUTE (a state-owned hydroelectric company), ELECAUSTRO (the electric company that provides service to Cuenca and surrounding areas) and the national company in charge of providing electricity along the country (CELEC). In addition, CORPEI CAPITAL is an investment fund that only operates to assist the financial needs of micro and small and medium enterprises. An interesting set of financial tools are used to this end, such as: factoring, grants, investment in equity and conventional lending

197. The fund for sustainable development (FODES) of the Río Blanco upper watershed will operate under the securities market laws, since it will work through the

constitution of a trust, and will be a long-term financial scheme. The resources contributed by the project will be seed capital so that more adherents join the fund. The interaction between FODES and financial institutions operating in the area will be desirable and complementary in order to underpin the financing of initiatives aimed at improving the resilience of agricultural and livestock farms and also to promote dual mitigation / adaptation projects.

198. It is worth emphasizing, in line with the consolidation of FODES, and in accordance with what is proposed in output 4, the financial institutions will build their integral environmental management systems, strengthening their institutional capacities, and becoming the ideal partners in the fund for the channeling of resources through the offer of adaptation and mitigation credit lines. In this way, resources are used efficiently, since the financial institutions operating in this place already have the necessary infrastructure (premises, staff and methodology) for the successful placement of this type of green loans.

199. Another important fact to take into consideration is that several GADs have stated in their development planning, the importance of promoting financing tools according to the needs of the inhabitants of the area, so it is very likely to have their involvement, commitment and support.

Output 5. One investment fund to promote sustainable development is set up and operational

200. The creation of an investment fund to promote the sustainable development of the area of influence of the Río Blanco upper basin will use the best-known structure in the national context, such as water funds to project its operation. The intention is that, using seed money from USD 500,000 coming from the project, the first year USD 92,400 will be used to set up the fund with the initial contribution of two people (a specialist and an assistant), with the infrastructure and basic equipment to do their job. USD 80,000 will be kept in very liquid financial instruments to be used for the lending incentive mentioned before. The remaining USD 327,600 will be used as assets for investments that will strengthen its capital over time.

201. This initial capital USD 500,000 will be invested in financial instruments available in the market with an interest rate of not less than 7.76%. It is worth mentioning that the “Fondo de Manejo de Páramos y Lucha contra la Pobreza (FMPLPT)” is currently invested in 20-year State Bonds with an interest rate of 8.45% per annum. The financial instruments, in which the equity is going to be invested, the interest rate, the term and the frequency of payment of interest will be the main responsibility of the director who will act under the strict supervision and authorization of the Board of Directors of the sustainable development investment fund.

202. In addition, the door will be open in the medium term to work in conjunction with financial institutions operating in the area covered by the project for investments in certificates of deposit or other financial investment mechanisms. Although the interest of

these investments is important to the fund, an important component of such investments will be the counterpart's commitment to direct resources to the same extent towards adaptation credits in the agricultural sector.

203. This mechanism has already been used in the country. For example, in 2013 CORPEI CAPITAL (a known investment fund) made a long term deposit in a private bank in the country for around of USD 500,000, under the condition to address these resources exclusively to the promotion of Bio-trade (Biocomercio) through microloans

204. Even though there are many similitudes between water funds and this proposed mechanism, we must leave clear that the scope and boundaries for action of the investment fund is broader than conventional water funds. So that, the range of potential investments to allocate the equity will include those that, even if they are not so profitable than other options, have a significant impact in the protection of the ecosystems and the rivers basin.

205. An important aspect to consider before implementation is that the contributions of constituents or adherents to the fund will be as important as the returns on their investments. The involvement of provincial, municipal and parochial governments through the regular allocation of resources is a task of political and commercial management. If there is no certainty that the contributions will materialize, the profitability of the fund will not be able to support its structure of expenses generating a gradual weakening. As equity strengthens, its economic sustainability will be more assured as will its investments in projects related to ecosystem and community-based adaptation.

206. The resources for the payment of the economic incentives addressed to the farmers who have acceded to credit, and to the IFIs that have disbursed it, will be handled through the fund of sustainable development. These resources are not a contribution to capital but rather short-term and will be transferred to the beneficiaries in the time that the project goes on with farmers. In a conservative scenario, the fund will be capable to address USD 30,000 for protection projects since the begging of the third year increasing to USD 35,000 for the fourth year and so on. In the case of that interest rates obtained are higher than expected in the current feasibility analysis, the incentives will be adjusted accordingly.

207. A diagram is presented in Figure 9 to illustrate the financial dynamics and flows of the investment fund:

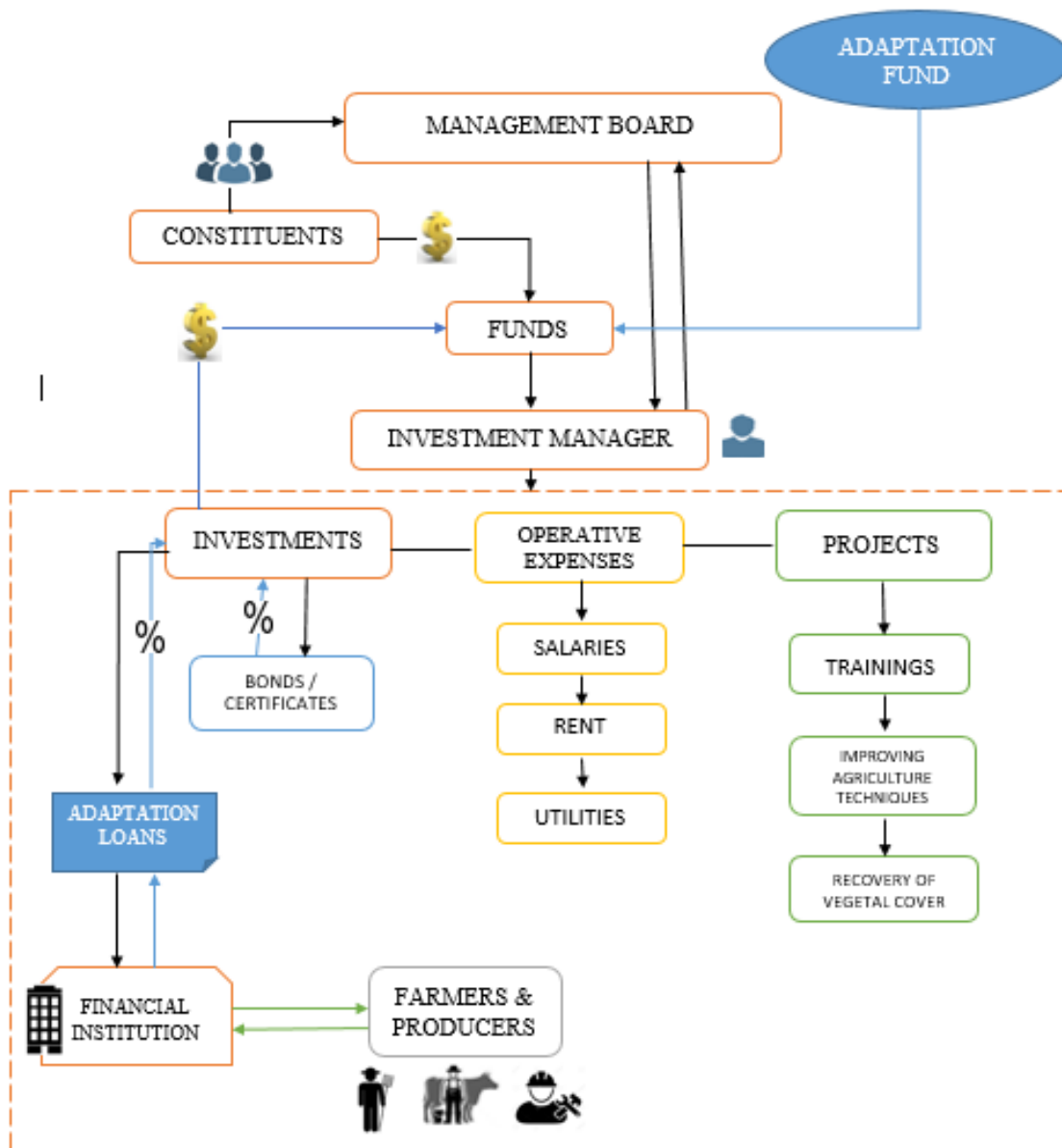


Figure 9: Financial dynamics and flows of the investment fund

208. In Annex 12 a deeper analysis is shown, an analysis of the feasibility of the fund is indicated.

209. Direct beneficiaries: Parroquial and municipal parrishes of Las Pampas, Palo Quemado, Manuel Cornejo Astorga, Alog, El Chaupi y los GAD Municipales de Sigchos y Mejia. 49,367 total population of the basin.

Summary Component 2: Objectives and activities

210. The following table shows the priority areas for intervention under the component 1, the objectives of the two outcomes as well as activities carried out under each .

| Objective | Activity |
|--|--|
| 3. 250 ha of pasture and 250 ha of crops apply sustainable farming practices | Selection of farmers to reach at least 500 ha of sustainable cropping and livestock. Inside the group selected will be include vulnerable and women groups splited in groups to be assistance by grants and to be beneficiaries by credit lines. |
| 3.1 Identification of adequate adaptation measures in the project area | Selection of the technical team to be in charge of identifying and defining the most suitable sustainable measures for farming and livestock; regarding micro climate, types of crops and availability of inputs to construct sustainable farms for the two main target populations. |
| 3.2 Selection of eligible co-executors for subsidized implementation of adaptation measures | Notification of the selection process to select the participants to be part of the 500 ha of sustainable farms. Inside the group selected will be at least 150 beneficiaries who will receive grants for implementation of 75% of the investment. The remaining 25% will be counterpart contribution. |
| 3.3 Selection of input and servcie provider to provide inputs for the implementation of adaptation option | Identification of the suppliers under criteria of access, stock and prices in order to ensure easy access to items for implementation of sustainable farms with better prices. |
| 4. At least 2 institutions have introduced specific solutions and credit assessments to support the disbursement of credits for adaptation, integrating environmental and climate risks in their operations | There are several public and private financial institutions operating in the zone, however their lending criteria has not adaptation approach at all, thus the credits disbursed for agriculture are, in many cases, to promote non sustainable practices. |
| 4.1 Selection of suitable consultancy providers, definition of general framework with financial institutions and initial institutional analysis. | To build the technical team with financial background to establish the suitable, tools to finance credits oriented to adaptation |
| 4.2 Development of the methodological framework for climate-smart lending management and the introduction of adaptation finance | Construction of the climate risk assessment for all credit portfolio addressed to economic activities, based on software for structured data gathering and including state-of-the-art data analytics solutions; IT tools to facilitate identification, qualification and report of the credits disbursed to adaptation |
| 4.4 Capacity building for partner institutions | Development of internal governance structures and procedures; development of financial products; Disbursement of adaptation credit addressed to sustainable farming. At least 235 people will benefit of this resources; Reporting of green lending oriented to promote sustainable measures in agriculture. |
| 5. One investment fund to promote sustainable development is set up and operational | To build an investment fund to gather financial resources and transfer them into sustainable project in the zone. The permanent flow of resources will persist in the long term to the project. |

| | |
|---|---|
| 5.1 Selection and constitution of the trust | Obtaining legal opinion of current regulation; definition of legal framework to be applied; constitution of the fund; |
| 5.2 Identification and renting of premises and other infrastructure | Prepare the physical set-up of the fund management, including office space, equipments and vehicles, |
| 5.3 Recruitment of the basic personnel of the fund | At least a central manager as well as an administrative assistant will be recruited; |

Component 3: Strengthen local capacities and share lessons

211. Component 3 presents the approach to strengthen the local capacities of the six rural parishes located in the project area and share lessons learnt during the implementation of the project. A plan of action and a set of core activities were defined to achieve the expected results during project execution and that they are also sustainable in the long term. The main objective of component 3 is to increase the local capacity to implement climate change adaptation measures and enhance the project's impact thanks to capacity and knowledge transfer to the community. By institutionalizing climate change adaptation within six parishes the project aims to foster the scale of adoption of practices and procedures for climate change adaptation, and to assure the sustainability and the continuity of the project after its end. Component 3 has a particular focus on women empowerment. Indeed, because women are on average more vulnerable to climate change, by targeting women we assure higher adaptive capacity of the community and more sustainable reduction of community's vulnerability.

212. The two main tools used in Component 3 are: training provision and awareness raising. These will be addressed to the local actors, including but not limited to: public institutions, communities' representatives, vulnerable groups (with special attention on women), local micro and small enterprises, financial institutions. The action plan includes training local actors in key topics, including: ecosystem conservation, water sources management, sustainable agriculture and livestock, access to funding, climate smart rural and agriculture practices, organizational development of associations and vulnerable groups located in the project area. Training will be provided through specific intervention per each stakeholder, or during focus groups or groups discussions, or dedicated events. Awareness raising will be assured thanks to public events, one to one discussions, media communications, demonstration farms, dedicated internet platforms.

213. The training will focus on strengthening measures to adapt to climate change so that the population has appropriate living conditions under the concept of resilience. The trainings will focus on: identification of treats, definition of better coping mechanisms, implementation of climate change adaptation initiatives. Communities will be tough how to use meteorological information and implement climate smart agriculture investments. Component 3 promotes the use of new technologies to involve local actors in the implementation of measures in an effective and sustainable manner.

214. The training will also be directed at parish GADs, who have the responsibility to ensure compliance with article 14 of the Constitution, which guarantees the right of the population to live in a healthy, environmentally balanced environment that guarantees sustainability and Good living, Sumak Kawsay. In component three training will be provided also to financial institutions on climate vulnerability and environmental impacts.

215. To financial institutions it will be explained how to detect climatic and environmental risks within their portfolio, how these risks can manifest as credit risks, and what are effective coping strategies. By including climatic and environmental

considerations within credit processes the aim is to align better financial performance, with ecosystem conservation and reduction of climatic vulnerability.

216. Environmental and climatic criteria will be introduced into financial institutions' processes and procedures, training them to recognize environmental and climatic risks and support the financing of agriculture investments that are at once more profitable, but that also better preserve ecosystems and reduce climatic vulnerability for clients and financial institutions. Demonstration farms will be implemented as well.

217. The rationality is that explicit examples are more convincing than theory. Demonstration farms will show to community's members how to implement an efficient and climate proof farm, and what are the related advantages in term of: yields, vulnerability, ecosystems. Demonstration farms will play both the role of awareness raising, but also of capacity transfer. Hence, farmers from the community will be able to receive trainings on sustainable farming directly at the demonstration farm and compare the results of their farms with the ones of the demonstration farm to understand where and how to improve.

218. In addition, parish GADs will be able to include data and information related to climate change adaptation measures, with emphasis on gender and vulnerable groups, within their development and spatial planning plans. These documents currently have relevant information to articulate and coordinate priority local development actions, so it is possible to include aspects of climate change, as established in the current ministerial agreement number 147. The agreement is based on the following general guidelines:

1. General Data on the Autonomous Government Decentralized GAD and the Plan of Development and Territorial Ordering (PDOT).
2. Identify climate threats and sources of information.
3. Identify the trends of the sectors related to emissions in the GAD territory.
4. Summarize the findings on the vulnerability of the PDOT programs and projects.
5. Summarize the findings on mitigation opportunities in the PDOT programs and projects.
6. Suggest modifications to the PDOT's vision and development objective.
7. Define a prioritized list of mitigation and adaptation measures.
8. Draw up fact sheets of the measures.

219. Strengthening local capacities allows the population and parish GADs to share the lessons learned through on-site visits, use of technology tools, and the communication infrastructure offered by the infocenters in each parish. **Efficient mechanisms to share lessons learned will be key to assure multiplier effects, and foster the instauration of learning processes within the community. This is of fundamental importance to reduce the opportunity-cost of community members that would like to get engaged into climate**

adaptation practices. By capitalizing on the project experiences, the risks of new coming actors will be considerably lower. This will finally allow to scaling up the project and propose to new comers sustainable and climate proof practices already locally experimented and with known outcomes.

220. For the implementation of component 3, 4 outputs have been established, in order to comply with the priorities defined in the logical framework of this project and the allocated budget.

Outcome 4: Local population and parish governments with increased capacity to implement climate change adaptation measures.

221. The present outcome is based on four concrete outputs described further below. The outcome 4 has the objective to transfer capacity for climate change adaptation both directly to local population, but also to parishes' institutions, and hence supporting the establishment of an enabling environment for climate change adaptation for community members.

Output 6: at least 6 parishes being trained to take care and use meteorological information generated by meteorological stations currently installed.

222. The main function of meteorological stations is to provide climatological information to the parishes located in the project area. These stations provide information on temperature, precipitation, relative humidity and wind speed, to establish climate scenarios and improve decision making. This information is useful for socio-economic activities carried out by the population located in the Río Blanco upper basin, including agriculture and livestock, and improving the quality of life of the population. This approach match very closely with output 2. The understanding and inclusion of climatic data into decisions and activities related to agriculture is of major importance. Climate influences when and what to plant, the expected yields, production risk for smallholders and credit risks for the financial institutions, and the decision of which practices or investments to implement being economically more convenient and less vulnerable. For example, information on temperature and precipitations: trends, averages, and oscillations allow to establish the climatic and production risk per crop, define appropriate coping mechanisms for the farmers, and adapted risk management strategies for the financial institutions.

223. INAMHI is responsible for the installation and operation of the meteorological stations. For this project, it will be necessary to enable and maintain the stations in strategic locations in order to ensure adequate coverage.

224. In addition, INAHMI will be responsible for transferring the operation of the stations and for providing the necessary technical knowledge to the GADS personnel to take control of the operations and the appropriate maintenance, from the execution of the project.

225. The weather stations have technical specifications, such as: data logger to store data, modem to transmit data, a power system and sensors. The data generated at each station must be stored and transmitted to a central server for interpretation. This climate information management becomes indispensable to adapt to climate change.

226. Local actors will be trained to interpret data obtained from meteorological stations. This training will be carried out in the field and will have as beneficiaries at least 500 people, of which at least 55% will be women. **To train the target population focus groups, workshops to groups and one to one trainings will be organized. The training will include the provision of generic climatic knowledge, and technical aspects on the meteorological stations. Dedicated materials, in term of flyers and technical simplified guideline for the meteorological stations, will be defined and distributed during trainings.**

227. The climatological information will be integrated with the technological platforms of the Ministry of the Environment and will be presented online and in an interactive way to facilitate the knowledge about the climate to all the population including associations of women, senior citizens and other vulnerable groups.

228. The climate information generated by the meteorological stations will be also included in the tools and methodology developed for the assessment of climate risks for financial institutions (output 4), to improve the predictability of software solutions used to assess the credits. In such a way output 6 will also contribute to strengthen the EbA investments done by the communities and the EbA credits provided by the financial institutions.

Output 7: Six development plans of local parishes incorporate measures for ecosystem-based adaptation to climate change.

229. The Territorial Planning and Development Plans (PDOTs) are planning instruments foreseen by the Constitution, and the Organic Codes for Territorial Organization, Autonomies and Decentralization and the Planning and Public Finance Plan COOTAD and COPFP, in force since October 2010, The GADS develop the concerted management of their territory, oriented to harmonious and integral development.

230. Article 41 of the COPFP states: "Development plans are the main guidelines of the GAD regarding strategic development decisions in the territory. These will have a long-term vision and will be implemented through the exercise of their powers assigned by the Constitution of the Republic and the Laws, as well as those transferred to them as a result of the decentralization process. "

231. PDOTs are a tool used by the GADs located in the project area and are based on the approach of good living proposed by the government, in which nature has rights. Aspects of climate change are included in the ministerial agreement 137.

232. Therefore, incorporating measures for ecosystem-based adaptation to climate change in the PDOTs, is very natural and will benefit the communities in the parishes, including women, associations, vulnerable groups and the community at large. Ecosystem based adaptation measures assure the alignment between ecosystem conservation and climate change adaptation. By conserving the local ecosystems, agriculture production is strengthened as well as community resilience to climate change. The opinion of vulnerable groups regarding changes in the ecosystem will be heard and considered.

233. Moreover the inclusion of ecosystems based adaptation will be beneficial to the most vulnerable population that are the ones that are more exposed to ecosystem degradation and climatic events. Ecosystem-based adaptation will hence support inequality reduction and poverty alleviation. The inclusion of ecosystem-based adaptation to climate change in development plans will be backed by the local community thanks to the organization of community workshops.

234. During the workshops the main aspects of ecosystem based adaptation will be introduced, and then the existing ecosystem adaptation practices already in use in the community will be collected and presented by local farmers already implementing them. This will support knowledge transfer among members of the community and the possibility to adapt best international standards to what has revealed as already working. Hence a catalogue of local practices will be defined and used as base for the introduction of ecosystem based adaptation within the PDOTs.

235. The PDOT will include a guide to priority actions to address climate change. This document will help to monitor and evaluate the results and impacts achieved in a transparent manner.

236. Once finalized the PDOTs will be introduced and explained to the local actors, those interested in the project and the community in general. The document will be available in digital format from the parish GAD website, to guarantee the larger as possible spreading. Once the community actors will be trained on ecosystem based adaptation, the PDOT will be used both as strategic tool to foster adaptation, but also as monitoring and reporting tool for rural development. By introducing elements of climate change adaptation into PDOT the aim is to assure that climate change consideration will be included into parishes' development plan.

Output 8: Strategic plan of communication, education, knowledge transference and scheme of replica

237. The strategic communication plan will ensure that the activities carried out in the project are knowledgeable for all stakeholders. In such a way, that there is an effective and fluid communication of information on the activities that are carried out in the project.

238. Communication will be done using traditional media, such as radio or print media, and social media including Facebook and Twitter. This communication will be guaranteed because each parish GAD has an infrastructure of access to telecommunications and internet under the concept of Infocenters. **Moreover educational material on ecosystem based adaptation, including flyers, actual examples based on the local community experience, and interactive learning material will be developed. In the plan for communication and knowledge transfer the actors that participate to the project will be included as much as possible to support community to community training. The interactive methodology will be privileged, if possible games illustrating ecosystem based adaptation will be developed or adapted and used for knowledge transfer.**

239. The data and information generated in the project will be published on the website of the main technology platform of the project implemented in output 9 and on the website of the parish GADs.

240. The training will be directed according to the requirements of the population and based on the training activities established in this project, components 1 and 2, which include topics such as: Forest Protection, Water Sources, Climate Change Adaptation, Environment, Financial Access, Organizational and Associative Development.

241. Specifically with output three of component one, there is a close link, since farmers, farmers and producers of panela, who will be part of the productive sustainability project, must approve modular courses of 9 sessions, of which 4 will be in classroom and the remaining 5 will be in the field. Only those who have the completely attend the trainings and have the best final performance of sustainable agriculture, livestock and panela production may be eligible for the application of output 3 in their farms. Participation in these courses will regard gender equity and access to vulnerable groups

242. This point includes the selection of six demonstration farms with measures of agricultural, livestock and production of panela. These farms would include the adaptation measures implemented, the monitoring of the productive performance and the recording of the financial dynamics **including** all financial movements such as sales, cost of sales, expenses, income, family consumption, final balance.

The objective of demonstration farms is to show various possible solutions and combination of solutions that could at once increase yields, reduce climatic vulnerability and conserve ecosystems. The demonstration farms aim to provide to the smallholders a real example of what their farm could look like and what are the main advantages. They aim to stimulate a feeling of proximity with adaption practices and how they can be actually implemented: translating from abstract wording into actual experiences.

243. It is important to remark that technical assistance and the means of access to financial resources mentioned in output 3 go hand in hand with this process of strengthening the capacities of farmers and producers,

244. The content of the information will be designed in an interactive format, according to the target population, including: children, youth, women and vulnerable groups. They are interested in being considered and informed of all the projects that are carried out under the Río Blanco upper basin.

245. Output 8 will also promote Exchange site visits among parishes participating in the project, as part of the exchange and replication of knowledge.

246. Moreover output 8 will contribute to strengthen the capacity of financial institutions to introduce climate and environmental aspects into their portfolio. **This is of key importance to assure the medium term financial sustainability of the project. Indeed awareness raising and direct capacity building will be provided to financial institutions to assess environmental and climatic risks for clients and portfolio, and develop and finance ecosystem based adaptation farm investments.**

247. Tailored training on environmental strategies and climate risks will indeed be provided to the management team and loan officers of financial institutions engaging in the project as per output 4. **Generating the buy in of loan officers is key, because they are the one that actually interact with the clients and do the credit assessment and provide advises to the clients. Supporting capacity building of the management team is important as well, to assured that environment and climate are included in all the layers of procedures and assessment of the financial institution. Training will be provided during dedicated workshop and small group session. Guided round tables of discussion with loan officers and management team will be organized.**

Output 9: Systematisation of information gathered during the whole project design and implementation using existing informatics platforms

248. The project will have a main technological platform, which will ensure the systematic capture and dissemination of data, information, lessons learned and good practices generated in the project.

249. The platform will be implemented using disruptive technologies, such as: Cloud Computing and BIG DATA, to ensure the handling of a large amount of data and information of different formats and their online availability to all stakeholders and the general population.

250. With Cloud Computing, data and information will be available online to be accessed from any mobile device and from anywhere within the project area.

251. With big data methodologies, it will be possible to handle a large volume and variety of data, in a fast and agile way, with which it is possible to model and monitor climate information generated by meteorological stations and platforms used by the Ministry of Environment Promote adaptation measures to climate change.

252. The platform will be integrated with the current technological platforms of the Ministry of Environment, and the Ministry will have a main role for the technical integration of the platforms.

253. The integration of the platforms will allow access to the stakeholders in a centralized way to the data and information generated by the meteorological stations, parish GADs, and the Ministry of the Environment.

254. The use of the software solutions for credit and risk assessment of financial institutions (output 4) of farmers' practices will contribute to generate data that will be shared through the above-mentioned platform. This will hence contribute to transfer the institutional learning of financial institutions to the community and support replication of the present project to other locations and with other financial institutions in the country.

255. The following activities and beneficiaries are targeted by the component:

Summary Component 3: Objectives and activities

256. The following table shows the priority areas for intervention under the component 3, the objectives of the two outcomes as well as activities carried out under each.

| Objective | Activity |
|---|--|
| 6. At least 6 parishes being built capacities and prepared to manage and use meteorological information. | Climate and meteorologic data is key to identify suitable adaptation options as well as identify potential threats. Activities will focus on creating the necessary capacities with communities and GADs |
| 6.1 Capacity building of GADs | Training in use and maintenance of meteorological stations for technical staff of each GAD. |
| 6.1.2 Governance of climate data management | Changing administrative operations from INAMHI to GAD technical personal staff. |
| 6.1.3 Capacity building for communities | Training 500 families in the use of climate data and their application in activities, such as: agriculture and livestock. This training will be address for 55% percent of women. Including field visits, food and transportation. |
| 6.1.4 Development of training and information material | Designing of interactive content and generation of newsletters to training GAD population in the area including women associations, older adults and vulnerable groups. |
| 6.1.5 Developing a communication strategy | Integrating the digital media technologies for communication plan and addressed it to the population in general including women, older adult, youth people and children's. |
| 7 Six development plans of local parishes incorporate measures for ecosystem-based adaptation to climate change. | Acquired know-how and capacity will translate into concrete application in the GADs |
| 7.1 Selection of suitable adaptation options | Conducting a technical study to determinate which climate change adaptation measures that must be added for development and territorial planning plans. |

| | |
|---|--|
| 7.2 Integration of adaptation options into territorial development plans | Gathering information on climate change adaptation measures to be added like indicators and statistics into the development and territorial planning plans. The indicators should include gender information and vulnerable groups for climate change. |
| 7.3 Elaboration adjusted development plans | Developing new development and territorial planning documents adding climate change statistics and information and also including gender and vulnerable group's climate change issues. |
| 7.4 Training to producer associations | Training for population including associations, organizations and other stakeholder of the project about climate change adaptation measures incorporated in the PDOTs. |
| 7.5 Communication of new PDOTs | Socialize new PDOTs documents with the population of the project area including associations, organizations and the population in general. |
| 8. Strategic plan of communication, education, knowledge transfer and scheme of replica, including demonstration farms. Plus training on adaptation finance to financial institutions. | Findings of developments throughout all components will be shared with communities to empower them to make informed (adaptation) decisions; supporting activities will be defined. |
| 8.1 Development of a communication strategy | Developing a communication plan addressed for stakeholders in the project including specific women associations and organizations. |
| 8.2 Integration of ICT solutions and social media | Integrating the digital media technologies for communication plan and addressed it to the population in general including women, older adult, youth people and children's. |
| 8.3 Establishment of demonstration farms | Sharing lessons learned and experiences with project stakeholders, and replicate knowledge to other similar projects in the country through demonstrative farms applying sustainable methods for agriculture, livestock and panela production |
| 8.4 Development of training materials of sustainable agricultural practices | Training modular courses on sustainable agriculture and good agricultural practices, open to associations and selected farmers to participate. 12 modules, 6 theorists, 6 in the field and an on-site supervision within 6 months of completing the course. 50% women |
| 8.5 Training of microfinance institutions | Training for all Microfinance Institution (MFI) staff participating in climate risk, green credit and climate change issues with a focus on microfinance |
| 8.6 Certification of agricultural practices | Certification of organic crops or good agricultural practices for the production of panela, mortiño wine or crops of sugar or naranjilla, of those graduates with better performance in their crops. |
| 9. Systematisation of information gathered during the whole project design and implementation using existing informatics platforms | The project will interact with a multitude of actors and gather data on the productive reality in the field; data will be gathered electronically to enable its further processing to several ends, such as identifying suitable adaptation practices over time |

| | |
|---|--|
| 4.4.1 Development of a technological platform | Developing a technological platform to manage knowledge and information about climate change adaptation, using disruptive technologies like: big data and cloud computing. |
| 4.4.2 Integration of platforms - existing and project | Integrating technological platform into others technological platforms used by the Ministry of Environment. |
| 4.4.3 Awareness raising on the new platform | Sociability of the technological platform with all stakeholders in the project including associations and organizations. |

B. Describe how the project / programme provides 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 will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

257. The project targets economic, social and environmental benefits for different groups of stakeholders as presented below.

Beneficiaries

258. Direct beneficiaries or co-executors are defined as those residents, organizations or institutions that will receive a transfer of resources or technology from the project's funds. Within this group of principal beneficiaries are:

- Parish governments of Las Pampas, Palo Quemado, El Chaupi, Aloag and Manuel Cornejo Astorga and Municipal government of Sigchos that will mainstream the climate change variable and adaptation measures in their planning and land use zoning. It is also expected to mainstream adaptation, with a gender perspective, into the plans for the rural area of Sigchos²⁸. These parishes will also have improved forest conservation, better agriculture production, access to hydro-meteorological information, and enabling conditions for multi-level dialogue and collaboration. The population in the rural areas is about 10,542; and 6,167 in populated area, with a very similar proportion between men and women.
- At least 30 technical staff, promoting women's participation to reach at least 50%, of participants, from the parish governments and municipality of Sigchos will benefit from training on adaptation to climate change.
- At least 200 stakeholders will benefit from the exchange of experiences. Women's groups and/or organizations will be identified and targeted to benefit from these activities.
- At least 375 farmer families will benefit sustainable farming and livestock practices and the river basin management. Female-headed households and female-led farms will be identified and targeted to benefit from these activities. If needed, extra training will be provided to level access for women.

²⁸ Sigchos is a canton formed by four rural parishes (i.e., Chugchilán, Isinlivi, Las Pampas and Palo Quemado) and an urban parish (Sigchos). The urban parish is very large, but the urban centre is small. In 2010, the canton had 21,900 people, 91.1% was rural population. Rural parishes have a parish government, but the urban parish is managed by the municipality.

259. Indirect beneficiaries are those persons or institutions that will participate in the project's activities without directly receiving project funds. Within this group the principal beneficiaries are:

- Water users, particularly women, from the Río Blanco drainage basin.
- About 49,367 including people who live in rural areas and populated spots of the drainage basin. (Annex 8)
- HIDROTOAPI hydroelectric plant and the users of the electricity it will generate.

260. Moreover the project is designed to support broader impact within the ecosystems and the communities. The project targets indeed key actors in the communities able to generate multiplier effects with positive impact on the full community and the ecosystems it depends on. For this reason it will work also with technical providers, financial institutions, agronomists, value chains actors in agriculture, private and public local institutions, with the aim to generate systemic changes towards sustainable and adapted practices.

Economic benefits

261. Farmers that apply sustainable farming practices will benefit from an increased yield and income, and at the same time will reduce the risk of losses due to agricultural practices not adapted to adverse climate impacts. It is expected that these farmers will catalyse the use of improved practices by a larger number of producers.

262. As the respective adaptation options will be selected following the methodology presented in Annex 17, only activities that will increase the farming household's economics will be promoted, ensuring a sustainable increase in household income. By gradually increasing the livelihoods of subsistence farming units to make them subjects of lending eligibility, will help to further strengthen their economic development and diversify as well as strengthen economic income activities.

263. While strengthening of ecosystems is usually defined as an environmental benefit, it also bears an economic dimension: as studies show

264. Furthermore, enhanced hydro-meteorological information will support and contribute to prevent adverse effects in agriculture and livestock, and give relevant climate information to be considered into the development plans (PDOT).

265. HIDROTOAPI will benefit from ensuring sufficient water flow for power generation and will avoid a significant increase in maintenance costs due to increased frequency in changing out parts or doing major maintenance or overhauls due to the expected increase in suspended solids.

266. The parishes will benefit of a growing rural economy, able to attract financial service providers and scaling up sustainable practices for the entire community.

Environmental Benefits

267. The conservation of a large vegetation cover will sustain the water cycle by ensuring condensation in the cloud forest and related flora. In addition, these areas will

continue to support local biodiversity (including high-value conservation species) and connectivity among diverse habitats and ecosystems.

268. The Andean Cloud Forests are vital in the uptake and regulation of water within the hydrological cycle. They capture moisture from the cloud cover, acting like a sponge that absorbs and retain water during the wet season and release it during the dry season. This is why maintaining the most possible forest cover is crucial to withhold the impacts of the foreseen climate change.

269. Conserving the vegetation cover of the Río Blanco upper watershed will also contribute to protect valuable biodiversity. The Andean Cloud Forest on the western slopes of the Ecuadorian Andes is very rich in biodiversity. There is limited information about the cloud forest of the project area, but an in-depth analysis in a close area identified 1,640 species of vascular plants. In the Rio Guajalito Reserve about 2,800 vascular plant species have been reported; of these about 100 species are endemic.

270. In the Río Toachi-Chiriboga IBA, 450 bird species have been reported. The area host threatened species like *Pachyramphus spodiurus* and *Ognorhynchus icterotis* (both classified Engangered in the IUCN Red List). In addition, in Rio Guajalito Reserve about 40 species of mammals have been reported, including the spectacled bear (*Tremarctos ornatus*) and the pacarana (*Dinomys branickii*) – both classified Endangered in the Ecuadorian Red List --, and the neotropical otter (*Lontra longicaudis*) (classified Vulnerable in the Ecuadorian Red List).

271. In the Reserva Ecológica Los Illinizas y alrededores IBA, about 257 bird species have been reported. The area host threatened species that are endemic of the cloud forests like *Grallaria gigantea*, *Grallaria alleni* (both classified Vulnerable in the Ecuadorian Red List), and *Haplophaedia lugens* (classified Near Threatened in the Ecuadorian Red List). The area also host threatened mammals like the spectacled bear, the puma (*Puma concolor*) (classified Vulnerable in the Ecuadorian Red List), the collared peccary (*Pecari tajacu*) (classified Near Threatened in the Ecuadorian Red List), and the endemic Ecuadorian spiny pocket mouse (*Heteromys teleus*) (classified Endangered in the Ecuadorian Red List).

272. The project will promote two main implementation strategies, on one hand supporting forest conservation, and on the other hand fostering the development of more sustainable agricultural activities making a responsible use of ecosystems

273. Hence the community will appreciate ecosystems not only as landscape but also as a basis for their production, a mean to reduce their vulnerability. This will contribute to sustain the protection of ecosystems and to strengthen community links needed for their economic and social development.

Social Benefits

274. Stakeholders from the lower part of the water system will benefit from increased social capital. This can be a powerful catalyst for further action to improve the livelihoods of local groups. The improved dialogue, networking, and collaboration among stakeholders will be a major contribution to local development.

275. Farming families will benefit from improved practices. The project will pay particular attention to the role of women and other family members (e.g. children and the elderly) in local farms to adapt, as much as possible, the new sustainable farming practices to the dynamics of the farming families. Female farmers will be specifically targeted to benefit from all project activities.

276. Local communities will also benefit from an inclusive approach. All project actions will be, to a feasible extent, gender and age sensitive and will consider the needs of persons with disabilities

277. Mainstreaming adaptation into daily actions and decision making will also generate major benefits for local communities. This will allow them to adjust their lifestyles and livelihoods to the impacts to be generated by climate change.

278. Better hydro-meteorological information provided to the early warning systems will contribute reduce the risk of impacts from landslides and flooding.

279. In the long-term, HIDROTOAPI's greater stability in electrical generation is an additional benefit at a national level.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

280. Within the project area, the current Business-As-Usual (BAU) agricultural development model has encroached upon forest and riverside areas. The production methods applied within the local agricultural and livestock sector remain traditional and have not been optimized for efficiency. Any growth of the local agricultural sector therefore entails a growth of its land use. Against a backdrop of climate change increasingly affecting the area, non-intervention carries a high cost of opportunity. While it is true that some GADs have incorporated isolated adaptation measures into their development plans, their impact has been extremely limited.

281. The proposed project, in turn, will directly benefit about 553 families (2,600 people) in the project area. Additionally, it will indirectly benefit the entire population of the Río Blanco upper watershed system (ca. 49,367 people). The project will contribute to strengthening the adaptive capacity of local stakeholders reducing the level of future impacts generated by climate change.

| Component | # of Beneficiaries (families) | Assumption(s) |
|--|---|--|
| Conserve vegetation cover | 178 | 50% from highlands and 50% lower basin |
| Adapt farming practices to new climate change conditions, enabled by sustainable climate smart financing | 375 (250 for crops and 125 for livestock) | 1 hectare will be dedicated to this project per farmer and 10% of the average extension (20 ha) per livestock farm |

| | | |
|---|-----|--|
| Strengthen local capacities and share lessons | 553 | Beneficiaries both component 1 and component 2 |
|---|-----|--|

282. The project will use existing structures (such as relevant Ecuadorian laws and regulations) and actors to implement all interventions. Relevant best practices in the national and/or regional context will also be leveraged (e.g. ACUS, Socio Bosque).

283. A core element of realizing the projects' target benefits lies in impacting farming practices. To achieve this, farmers will be equipped both with specific know-how and best practices pertaining to their area of activity in their local context as well as with the physical tools required for this purpose. As many factors influence this equation, it is evident that cost-benefit analysis needs to be conducted on an individual level to achieve maximum impact. On a project level, the focus will thus lie on putting the tools in place to efficiently conduct this case-by-case analysis and monitor relevant micro-indicators over the project duration.

284. In terms of the tools, selection criteria for the identification of suitable adaptation measures for individual farmers need to be flexible and take into account each farmer's specific situation, such as:

- Access to important infrastructure such as roads,
- Inclination of plots or grazing grounds,
- Soil texture and quality,
- Actual crops cultivated or livestock bred, including varieties and types,
- Availability of critical inputs and
- Pricing of inputs in each area.

285. The combination of these critical productivity drivers will not only determine the productivity of farmers under business-as-usual scenarios in face of adverse climate impacts, but also define what actual adaptation measures promise not only the optimum results but also if their implementation is feasible at all. For example, if certain inputs for the implementation of adaptation measures are not available, cannot be transported to the farm due to the lack of access roads or are prohibitively priced, this must be analyzed and the impact taken into account on a case-by-case basis.

286. In order to leverage relevant best practices, the project will seek the cooperation with UN Environment's Microfinance for Ecosystem-based Adaptation project, which has identified a set of 40 EbA measures specifically suitable for the implementation by smallholder farmers. The MEbA project has so far implemented almost 10,000 EbA measures (for a total financing of over USD 12 million, exclusively provided by the microfinance institutions' own funds and paid by the farmers) in cooperation with 5 microfinance institutions in Colombia and Peru and is assessing the implementation of its

solutions in Ecuador. The MEbA project is funded by the German Federal Ministry of Environment via its International Climate Initiative.

287. The MEbA project has developed tools that support the individual assessment and prioritization of EbA measures to be applied with small farmers as part of operational processes of institutions interacting with small farmers as input or service (such as technical assistance or finance) providers.

288. For an overview of EbA measures and the related tool set, please refer to Annex 17.

289. It is assumed that all proposed EbA options have clear and measurable benefits for the health of ecosystems and the services they provide. Additional scientific data gathering will form part of the project. Its purpose is twofold:

- Firstly, to obtain granular (i.e., farm-level) data that can be leveraged to drive individual cost-benefit analysis for a given intervention. As per the nature of the benefits involved (monetizable as well as non-monetizable), this cost-effectiveness analysis will use either a Multi-Criteria or a Cost-Efficiency approach.
- Secondly, low-level data will enable periodic reviews for Monitoring and Evaluation to support the still limited availability of academic studies on the actual impact of EbA.

290. Local and regional service providers (e.g. financial institutions) will be leveraged to collect this data.

291. The proposed mechanism for intervention, channeling funds to local farmers through the local MFI networks and an investment fund (see also sections Component 2, paragraphs), will also be instrumental in achieving cost-efficient results. The underlying principle of incorporating the entire farmer community (as opposed to only a sub-segment) according to its level of vulnerability will assure broad impact. Creating different products for those members of the group who do not have access to market-based solutions for inputs and financing and for those who do is a necessary precondition of this approach. The former need a stronger focus on subsidized components, while the latter can afford to take on more of the intervention's cost in form of a credit.

292. Careful incentive design will be in place to assure that the more vulnerable groups can be brought into the market as far as feasible. Across groups, the program's objectives and individual incentives are aligned by providing adequate performance bonuses for all farmers.

293. By aligning incentives, leveraging market forces where possible and assuring long-term support through the proposed investment fund, cost-effectiveness will be markedly higher than in comparable projects with a stronger focus on subsidies.

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

D. 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.

295. One of Ecuador's advantages in relation to climate change is the articulation of public policies at all levels. The project is aligned directly with current national environmental regulations. The Constitution of the Republic of Ecuador (2008) contains two articles, 413 and 414, relating to climate change management in the country. Article 414 establishes that "the state will adopt appropriate and transverse measures to mitigate climate change, by limiting emissions of greenhouse gases, deforestation and atmospheric pollution; also will take measures for the conservation of forests and vegetation and will protect the population at risk." In addition, the Constitution recognizes the need to "oversee land use planning of watersheds and encourage the creation of watershed councils, in accordance with the law."

296. The national development plan (SENPLADES, 2013) states in its general objective 7 that climate change is a multi-sector problem of national scope that should be approached with programmatic actions which generate results in the short and medium term. Specific objective 7.10 focus on implementing measures to mitigate and adapt to climate change to reduce the economic and environmental vulnerability with emphasis on priority groups. In addition, specific objective 7.6 focus on managing water resources in a sustainable and participatory manner, with a focus on watersheds and ecological flows to ensure the human right to water.

297. The project is in line with the National Climate Change Strategy (MAE, 2012), in particular with specific objectives 2 and 4. The first, focus on initiate action so that the performance levels of productive and strategic sectors and the country's infrastructure are not affected by the effects of change climate. The second, focus on managing water resources with a comprehensive and integrated approach by hydrographic unit, to ensure the availability, quality and sustainable use of water resources for the various human and natural uses. In addition, the National Plan for Climate Change 2015-2018 established the water sector as a national priority and required the analysis of the vulnerability of flagship hydropower plants to the effects of climate change. The results of the analysis for the Toachi -Pilatón hydropower plant have been used to prepare the present project.

298. The project will contribute to implement Ecuador's national plan for integrated and integral management of water resources of watersheds and micro-watershed, and is in line with the national regulations on water resources management.

299. Finally, the project will contribute to strengthen the development and land use plans of parish governments.

E. 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.

300. MAE is the national environment authority and administer (i) the environmental impact evaluation system, (ii) forest use, (iii) protected forests, and (iv) the national

system of protected areas. The project intervention will comply with the environmental regulatory framework established by the Environmental Management Law (Law 37 of 1999, coded in 2004), the environmental impact evaluation system (Executive Decree 061 of 2015), the Forestry and Conservation of Natural Areas and Wildlife law (Law 2004-017 coded in 2004) and complementary regulations.

301. The project will seek to take advantage of the recently adopted Organic Law on rural land and ancestral territories (signed on March 2016). This law establishes that rural lands must serve social and environmental functions (articles 11 and 12). The social function refers to be productive, and the environmental function refers to apply sustainable practices and conserve key habitats. It is relevant to the present project that the law:

- The law recognises that private or communal rural land fulfils the environmental function when is dedicated to conservation of renewable natural resources, including forest protection and production, conservation incentives (e.g., Socio Bosque), ecotourism and recreation. There will be incentives to those who fulfil the social and environmental functions.
- The law states that rural state land cannot be claimed by possessors or invaders (article 18); this opens a line of action to solve certain land-tenure issues.
- The law forbids the expansion of the agriculture frontier into fragile and threatened ecosystems (article 50), including cloud forests. However existing subsistence agriculture activities will be respected.
- The project infrastructure will be minimal (i.e., artisanal sediment retention dams) and may not require an environmental impact assessment. Nonetheless, the design and construction will comply with pertinent building regulations.
- The meteorological stations will comply with INAMHI's required specifications and will be integrated into the national monitoring system.

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

302. No duplication with other funding sources was found. However, the project will have synergies with a number of initiatives.

303. The project will complement the Socio Bosque Programme, by promoting with local partners the development of long-term mechanisms to provide conservation incentives to local landowners.

304. The project will use the results of the following projects:

- Enhancing Resilience of Communities to the Adverse Effects of Climate Change on Food Security (FORECCSA). This project is funded by the Adaptation Fund (AF), the implementing agency is the World Food Programme, and the project partners are MAE, the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP), the Jubones River Basin Public Consortium, and the Provincial Government of Pichincha.

The present project will use the experience and lessons on mainstreaming gender in rural communities for food security and adaptation to climate change.

- Adaptation to Climate Change through Effective Water Governance (PACC). This is a GEF sponsored project (GEF ID 2931) under implementation. The executing agency is MAE, and the GEF implementing agency is UNDP. It does not cover the present area of intervention, but its lessons will be useful to the present project. The present project will use the experience and lesson on mainstreaming water climate risk in local planning and application of water saving measures by farmers.
- Analysis of the vulnerability of flagship hydropower plants to the effects of climate change (CHECC), in particular the results for the Toachi-Pilatón hydropower plant. The present project is using the results of the watershed vulnerability analyses.
- 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 present project will use the results of 3NC, in particular the outcomes of the climate change models and the guidelines for climate change adaptation.

305. The present project will aim for collaboration and synergies with HIDROTOAPI's Environmental Management Plan (EMP) which focus on those communities located in the direct area of influence of the hydropower plant. Actions include strengthening the provision of basic services, education, health and production development. The last element includes improving livestock and agriculture management, promoting tourism microenterprises, and afforestation and reforestation.

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

306. Component 3 of the project focus on learning and knowledge management. It comprises one outcome (i.e., outcome 3) and four outputs (i.e., outputs 6, 7, 8 and 9).

307. The backbone is the public communication and education plan that will (i) raise public awareness and engagement, (ii) facilitate communication and collaboration among stakeholders and project partners, and (iii) enable dissemination of information and lessons.

308. The project will disseminate information and results through MAE's website and the social networks it uses (e.g., Facebook, Twitter). MAE's policy is to maintain a webpage for each project within its main portal. MAE's communications office will ensure that information will be channelled to local and national media to reach a wider audience.

309. The project team will systematically document and record the advances. A monthly electronic information bulletin will be prepared and disseminate to inform the stakeholders and interest groups. It is envisioned to produce promotional material and documents to be used by local communities and stakeholders.

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

310. On Tuesday July 11 and Wednesday, July 12 of 2017, a meeting was held with representatives of the municipal governments of Sigchos and Mejía, and the parish governments of Las Pampas, Palo Quemado and Manuel Cornejo Astorga. On Friday, July 21, a meeting was held with representatives of the parish government of Aloag. During these visits, which lasted an average of one hour, ideas and concerns about the project were collected and also were informed about the progress. Attendees were also anticipated about socialization workshops scheduled for Monday, July 24 and Tuesday, July 25 remarking the importance of participation of women and vulnerable groups. Memories of the event are located in Annex 10.

311. The session plan that was developed for the workshops to work closely with the stakeholders, also exclusive sole space of time of about 30 to 40 minutes was included in the agenda to work only with women and vulnerable groups. In this time period a personal survey was carried out to better understand of their impressions regarding the project (see Annex 11, Session Plan)

312. On Thursday, July 20, a visit was made to the INAMHI facilities to update their new staff members on the progress of the project. Information was also collected on the weather stations in the Toachi river area.

313. On Thursday 20 July 2017, in conjunction with a CAF official, telephone calls were made to the principal representatives of the Municipal and Parish GADs, emphasizing the importance of the assistance of groups of women and vulnerable groups to the workshops.

314. On Friday, July 28, 2017, a visit was made to SENAGUA facilities to inform the new personnel about the progress of the project and to know the implications of a water fund in the context of the Water Law.

315. On Monday, July 24, 2017, a socialization workshop was held in the municipality of Sigchos. The event started at 10:00 a.m. and lasted 7 hours. The round trip transport was facilitated for the assistants of Palo Quemado and the Pampas. This group analyzed in detail the implications of the project for the Toachi River basin. There was an attendance of 38 of which the 42% were women. Food was provided to all attendees.

316. On July 25th, the socialization workshop was held at the meeting hall of the parish government of Manuel Cornejo Astorga (Tandapi). This workshop started at 10:00 a.m. and had a 6 hour address. This group analyzed in detail the implications of the project for the Pilatón river basin. There was an attendance of 49 people of whom 43% were women. Food was provided to all attendees.

317. The workshops had the following elements:

- A brief introduction and contextualization of the project by the authorities of the CAF, MAE and local authority.

- Power point presentation was made, reinforcing the conceptual basis of the adaptation project, emphasizing the effects of climate change on the region and addressing the environmental degradation problem in the Río Blanco upper basin.
- The presentation of the components, "outcomes" and "outputs" of the project with the respective allocation of resources is carried out. In addition, a printed document with the data of the logical framework of the project was given to everyone.
- Subsequently, work groups were set up to carry out a component analysis, then three groups were formed, accompanied by a moderator from the group of consultants. Big papers and markers were given to summarize and present the main points.
- Color maps were given to each of the groups and maps printed in A1 format were placed on the walls of the room, so that the participants could be located geographically by themselves.
- Each of the groups gave a presentation of the relevant topics of discussion and group analysis. Comments and suggestions have been considered for the final version of the project.
- At the same time, an anonymous survey on conditions of access to credit was passed to the attendees
- Finally, we work independently with the groups of women and vulnerable groups with whom the information of a given survey is individually filled. Survey format Annex 11

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

318. The present project will allow to mainstream adaptation into local communities and implement actions to address specific threats and barriers. The AF contribution will allow to implement three key adaptation measures within a watershed perspective: (i) to conserve vegetation cover, (ii) to reduce pressure from farming activities, and (iii) to engage the local population into climate change adaptation.

Component 1. Conserve vegetation cover

Baseline

319. The two existing protected forest (Toachi – Pilaton and Sarapullo), cover a large area of the water system (ca., 230,000 ha) to safeguard the water cycle. MAE´s Forestry National Directorate is responsible for managing these forest. However, these areas are not being managed and guarded. Farmers have invaded and cleared extensive areas to establish grazing areas and extensive farming systems. Some invaders have claimed possession rights to the municipal and central authorities, creating a severe land tenure issue. The extent of the invaded area is unknown.

320. Some landowners have established private reserves to conserve biodiversity. There are at least three private reserves covering about 2,800 ha. There are limited incentives to maintain forest areas in natural condition. The Socio Bosque programme

was an interesting option, but after a promising start ran into financial problems. Private landowners of forest areas also face pressure from illegal farmers.

321. It is foreseen that climate change will reduce rainfall in the Río Blanco upper water system and produce stronger and more frequent ENSO events. Deforestation and forest degradation will exacerbate climate change impacts. The reduction in water availability will affect farmers, household water use, water companies and HIDROTOAPI hydroelectric plant.

With Adaptation Fund investment

322. The project will support the protection of forest cover to mitigate, as much as possible, the impacts from climate change. The key premise is that a large forest will better withstand changes in weather conditions and will continue to capture moisture and feed river streams.

323. The project will allow to:

- Develop and implement a system of incentives to finance the conservation of the existing protected forests and to provide incentives to landowners that voluntarily commit to the conservation and protection of their native forests and vegetation. The investment fund that will be established in the project contributes to finance incentives for adaptive investments providing contributions for a better water use and invest in forest conservation (e.g., incentives to landowners, protection, reforestation), training, technical assistance, ect.
- Strengthen the institutional and legal framework to manage and protect the Toachi – Pilaton and Sarapullo protected forest and private reserves.

Component 2. Adapt farming practices to new climate change conditions

Baseline

324. Local farmers contribute to forest degradation. Their production is based on extensive and subsistence farming and the application of inadequate practices that contribute to soil degradation and erosion. The main pressures come from livestock producers and sugarcane farmers. Livestock producers clear forests and invade river margins to establish grazing grounds. Sugarcane farmers, mainly based in Las Pampas and Palo Quemado parishes, clear forests to expand the production area and to obtain firewood for the artisanal production of panela. Each family furnace consumes about three trees per week.

With Adaptation Fund investment

325. AF support will allow to introduce sustainable farming practices to increase production per unit area, therefore reducing the need to clear forest to expand farming areas.

326. Improved farming practices will be introduced in at least 250 ha of livestock production and 250 ha of crops of sugarcane, mortiño and naranjilla, and Sustainable productions alternatives will be implanted The project will work with farmers´ and women organizations in Las Pampas and Palo Quemado parishes mainly.

327. Panela production will be analysed and upgrading to the furnaces will be introduced to improve efficiency (less energy and equal or more production) and reduce the consumption of fire wood.

328. Dedicated methodology and software solution will be developed for financial institutions providing credits for agriculture activities in the area, supporting them to understand climatic risk and environmental impacts, and incorporating in their credit assessment sustainability criteria and climatic issues.

Component 3. Strengthen local capacities and share lessons

Baseline

329. The local population and stakeholders are not fully aware of the climate-related risks, and are not engaged into taking action to increase their adaptation capacities. Parish plans mention climate change, but do not incorporate concrete actions to implement adaptation measures.

330. INAMHI has eight meteorological stations in the area, but only one is functioning. Therefore, weather monitoring is very limited and the local population do not have access to sound information for decision making. In addition, INAMHI has serious financial limitations to sustain the operation of a network of meteorological stations in the area.

With Adaptation Fund investment

331. With AF support a public communication and education plan, grounded on the parish governments. It will cover about 2.035 people (553 families) of the six parishes that are part of the Río Blanco water system. In addition, the project will directly support parish governments to mainstream climate change into the local development plans. All this will allow to engage local stakeholders into climate change adaptation action, and will be a valuable catalyst to increase local resiliency and build social capital. Training will be provided also to farmers to implement adaptive investment and to financial institutions to understand climatic and environmental risks and opportunities.

332. The project will also allow to update and expand INAMHI's hydro-meteorological network in the area. Sediment samplers will be installed to monitor sediment load. Partnerships will be developed to sustain the operation of the hydro-meteorological network and to feed the information to local stakeholders. An option is to include these costs into the water fund that is being considered.

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

333. The project will have positive environmental impacts. There will be actions to contribute to maintain vegetation cover and to reduce pressures from deforestation and expansion of the agriculture frontier.

334. Social sustainability will be based on the participatory approach and the integration of key stakeholders, where women's participation plays a major role. Engaging both men and women to participate in decision making processes could result in a greater likelihood of sustained change (UN-REDD, 2013); however, additional training targeted to women

may be needed to ensure their full contribution mainly the planning farms. The project will promote multi-level dialogue, networking and collaboration to build social capital in support of watershed conservation.

335. The project is anchored in pertinent local and national authorities responsible for local development and climate change adaptation. Parish governments are the centrepiece of the project, but it will also involve municipal and provincial governments, pertinent sectoral authorities (e.g., MAGAP, SENAGUA) and community organizations (e.g., Flor de Caña). It is foreseen that through this networking the core elements of the project will continue in the institutional agendas.

336. An investment fund is considered as a financial and technical mechanism to sustain critical elements like forest conservation, technical support to local farmers and weather monitoring. It is expected that water users (especially GADs) will be motivated to contribute to the investment fund to maintain long-term key actions. The viability of this instrument will be assessed during project preparation.

337. Finally, it is foreseen that parish governments and other project partners will integrate actions into their institutional budgets to ensure post-project sustainability.

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

338. The Adaptation Fund's Environmental and Social Policy (ESP) (AF, 2013) aims 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.

339. The present final project was screened and assessed as required by the ESP. The results of the screening process are presented in **Annex 15**.

340. The principle on gender equity and women's empowerment has to be considered transversal in all project outputs. During project preparation, it will be necessary to assess that actions on forest conservation and improved farming practices, do not overload the workload of women and other family members. It has been seen that local men are opting for paid jobs in Santo Domingo (capital of the de Santo Domingo de los Tsáchilas province). Therefore, tending for the farm and animals is being delegated to other family member. In addition, it will be necessary to ensure that the adaptation actions to be mainstreamed into the local development plans and the communication and education actions are gender and age sensitive and do consider the needs of persons with disabilities.

341. In addition, screening was done using CAF's preliminary environmental and social risk analysis matrix (instrument FR-086 as presented in Annex 15, 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".

342. 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.

343. A brief overview of the project compliance with the expected outcomes of the 15 environmental and social principles is presented in the following paragraphs.

Principle 1: Compliance with the Law.

344. The Bio-corridor and investment fund in the project that will require a specific coordination with the national laws about Protected Areas and Watershed Committees. The responsible for public declaratory (GAD still to be defined) will require a participative process according with the Environmental Ministry, on the other hand the water investment fund will be adapted to the national regulations in coordination with SENAGUA

Principle 2. Access and Equity.

345. An initial stakeholder analysis was prepared (**Annex 8**). 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.

346. In general, the project actions will promote access to basic services and land rights. However, it is noted that measures need to be taken to ensure that local groups are adequately informed of the project intervention, mainly the actions to conserve the forest cover and the mainstreaming of adaptation measures into the local development plans.

347. During workshops that took place on Monday 23 and Tuesday 24 at Sigchos and Tandapi respectively, all the information about logical framework, outcomes and outputs were presented to all attendants. Also there were groups work to analyse deeper the way of it implementation must be done, their participation and all the suggestion about improvements. Al, this information was gathered by consultants and recorder in the annex 10.

348. A sole space for intervention of women and vulnerable groups was provided, in which through a survey and specific question were asked to know more precisely their opinion or doubts about the project.

Principle 3. Marginalized and Vulnerable Groups.

349. No vulnerable or marginalized populations will be negatively affected by the project scope. Rather the project aims to empower vulnerable communities. **However the project needs to be very carefull that all the activities work with marginalized and vulnerable groups.**

Principle 4. Human Rights.

350. Ecuador has ratified the core international human rights treaties. The US Department of State Country Reports on Human Rights Practices for 2015 indicate that the principal human rights problems in Ecuador are: 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.

351. Despite the general context, in the area 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.

352. Ecuador ranks high in the Global Gender Gap Index. Ecuador has 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 analysis (**Annex 8**) found that there is strong women leadership in local organizations and parish governments. Also, women have an important role in businesses like commerce and restaurants. The condition of women in the Río Blanco upper watershed is similar to other Ecuadorian rural areas.

353. Illiteracy rates are higher for women, particularly in rural areas, and tend to have completed less years of formal education (see Gender Analysis, Annex 13). Also, female labour force participation is lower than men's (57% against 81%), which is consistent with a high proportion of women lacking any source of personal income (35%), in comparison with men (9%). There is an earnings gender gap: female's average monthly earnings represent 78% of male's average monthly earnings. Femininity index in poor households was 117.6 in 2013, meaning there were more females than males living in poor homes in Ecuador.

354. The **project will promote women's participation in project activities**. However, it has to be considered that men are increasingly seeking payed jobs in Santo Domingo, the nearest large city. This, in turn, increases the workload for women to tend for the farm and the animals. In rural areas, women tend to work more average weekly hours than men, 82h and 59h, respectively, most of this difference is explained by non-remunerated activities (such as domestic chores and care-taking tasks). Therefore, the project will have to be cautious to implement actions in support of gender equality and women's empowerment, and to prevent overloading women activities (outputs 1, 2 and 4). Also, it will be needed to ensure that the adaptation actions to be mainstreamed into the local development plans (output 7) and the communication and education actions (output 9) are gender and age sensitive and do consider the needs of persons with disabilities.

Principle 6. Core Labour Rights.

355. Ecuador has 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.

356. ILO convention 16929 is in force in Ecuador. There is no indigenous population in the project area.

Principle 8. Involuntary Resettlement.

357. The project intervention does not imply displacement of local population.

Principle 9. Protection of Natural Habitats.

358. The project will strengthen the Illinizas protected area and will improve other conservation areas. Additionally, it will be important to ensure that the role of natural habitats is integrated into the adaptation measures to be mainstreamed into the local development plans (output 7).

Principle 10. Conservation of Biological Diversity.

359. Ecuador has signed and ratified the Convention on Biological Diversity and have a recently updated National Biodiversity Strategy. The project will not intervene areas with high value biodiversity or introduce invasive species. On the contrary, project actions will contribute to conserve forests and vegetation cover.

Principle 11. Climate Change.

360. The project does not include activities that involve a significant increase in emissions of greenhouse gases or other climate change stressors. On the contrary the implementation of sustainable agriculture practices will reduce green house gas emission, contributing to climate change mitigation. Moreover, reducing community vulnerability thanks to EbA practices, the project will also contribute to support climate change adaptation for the community.

Principle 12. Pollution Prevention and Resource Efficiency.

361. 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 a PAAS to prevent negative impacts during construction works (mitigation measures 1 and 17). The project will contribute to improve the efficient use of energy and natural resources.

Principle 13. Public Health.

362. The project does not imply negative impacts on public health. Moreover supporting the use of efficient cooking systems for panela, **as well as the promotion of family gardens**, the project will contribute to reduce negative health impacts.

Principle 14. Physical and Cultural Heritage.

363. Ecuador is a party of the World Heritage Convention. The project will not affect or intervene physical and cultural heritage.

Principle 15. Lands and Soil Conservation.

²⁹ i.e., Convention concerning Indigenous and Tribal Peoples in Independent Countries.

364. The project action will contribute to soil conservation.

365. During project preparation, a detailed stakeholder and gender analysis will be prepared and details on the role of women in the farms and local organizations will be obtained. This will serve to adjust project actions to be gender, age and cultural sensitive.

366. Also, during project preparation, the project’s Environmental and Social Management Plan will be prepared.

367. The hydroelectric power plant is not part of the present project, but it is worth mentioning that it has an Environmental Impact Assessment, an Environmental License, and an Environment and Social Management Plan. Its construction did not involve displacement of indigenous or vulnerable groups. The plant is under construction; it is expected to begin operation during 2018.

| Checklist of environmental and social principles | No further assessment required for compliance | Potential impacts and risks – further assessment and management required for compliance |
|---|--|--|
| <i>Compliance with the Law</i> | | Low risk. Land ownership is a critical aspect to take into account for the development of the project. |
| <i>Access and Equity</i> | | Low Risk. Ensure that local population and stakeholders are adequately informed and engaged in project actions. Communication and public awareness activities will be open to everyone. |
| <i>Marginalized and Vulnerable Groups</i> | | Low Risk. Ensure that local population and stakeholders are adequately informed and engaged in project actions. The project has to ensure that marginilezed and vulnerable groups participate. Communication and public awareness activities will be open to everyone. |
| <i>Human Rights</i> | 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. | |

| Checklist of environmental and social principles | No further assessment required for compliance | Potential impacts and risks – further assessment and management required for compliance |
|---|---|---|
| <i>Gender Equity and Women's Empowerment</i> | | Low Risk. Ensure that forest conservation and farming actions (outputs 1, 2 and 4) does not negatively increase workload to women and other family members (e.g., children, senior people). Ensure that local development plans and public communication and education actions (outputs 6 and 7) are gender, age and cultural sensitive, and consider special needs of persons with disabilities. |
| <i>Core Labour Rights</i> | No risk or adverse impacts. The project intervention has no implication with the four fundamental principles and rights at work ³⁰ . | |
| <i>Indigenous Peoples</i> | No risk or adverse impacts. The project intervention will not affect indigenous groups or territories. There | |
| <i>Involuntary Resettlement</i> | No risk or adverse impacts. The project intervention does not imply involuntary resettlement. | |
| <i>Protection of Natural Habitats</i> | | Low risk. Ensure that the role of natural habitats is considered while mainstreaming adaptation measures in local development plans (output 7). |
| <i>Conservation of Biological Diversity</i> | | Low Risk. The project does not involve unjustified reduction or loss of biological diversity or the introduction of known invasive species. On the contrary, project actions |

³⁰ 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 |
|---|--|---|
| | | will motivate the conservation of existing vegetation cover and the associated biodiversity and ecological services |
| <i>Climate Change</i> | No risk or adverse impacts. The project will not increase greenhouse gas emissions or the main drivers of climate change indicated in principle 11. | |
| <i>Pollution Prevention and Resource Efficiency</i> | 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. | |
| <i>Public Health</i> | No risk or adverse impacts. The project does not imply negative impacts on public health. | |
| <i>Physical and Cultural Heritage</i> | No risk or adverse impacts. The project will not intervene in cultural / archaeological sites or sites with unique natural values. | |
| <i>Lands and Soil Conservation</i> | | Low Risk. The project will contribute to soil conservation. However, there area of the project has problems of degradation caused by local communities and the continuos work with them is important. Change of culture and conscience is relevant. |

Table 8: Screening matrix to verify compliance with the Adaptation Fund’s Environmental and Social Policy.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

368. CAF will be the implementing agency and MAE will be the responsible entity. The project will be implemented following CAF's administrative and financial regulations as agreed with the Adaptation Fund.

Implementation Modality

369. The project will be implemented over a four-year period, under the National Implementation with CAF as the FA Implementing Agency (IA) and the Ministry of Environment (MAE) as Implementing Partner. In this role MAE will undertake full programmatic and administrative-financial control and responsibility for supervising the project, and will be responsible for approving deliverables prior to their reporting to FA by CAF. Capacity building priorities will be addressed at all times.

Implementing Agency

370. As FA implementing agency, CAF is ultimately accountable and responsible for the delivery of results, subject also to their certification by MAE, as Implementing Partner. CAF shall provide project cycle management services as defined by the AF Council, that will include the following:

- Providing financial and audit services to the project
- Overseeing financial expenditures against project budgets,
- That activities including procurement and financial services are carried out in strict compliance with FA procedures,
- Ensuring that the reporting to FA is undertaken in line with the requirements and procedures,
- Facilitate project learning, exchange and outreach within the FA - CAF family,
- Contract the project mid-term and final evaluations and trigger additional reviews and/or evaluations as necessary and in consultation with the project counterparts.

371. At the request of the Government of Ecuador, CAF shall also provide Direct Project Services (DPS) specific to project inputs according to its policies and convenience. These services, and the costs. In accordance with FA requirements, the costs of these services will be part of the executing entity's Project Management Cost allocation identified in the project budget. CAF and the Government of Ecuador acknowledge and agree that these services are not mandatory and will only be provided in full accordance with CAF policies on recovery of direct costs.

372. CAF will provide Project Assurance, supporting the Project Board Executive by carrying out objective and independent project oversight and monitoring functions.

373. The project partners are the parish governments of Manuel Cornejo Astorga (Tandapi), Aloag, El Chaupi, Palo Quemado, and Las Pampas, the municipal government of Sigchos, MAGAP, INAMHI, SENAGUA and CELEC. Complementary collaboration agreements will be signed with the provincial governments of Cotopaxi and Pichincha, HIDROTOAPI and relevant local organizations through following mechanisms:

374. The Project Board is the project coordination and decision making body. It will meet quarterly to review project progress, approve project work plans and approve project deliverables. The responsibility of the Board is to see that project activities lead to the required outcomes as defined in the project document. The Board will oversee project implementation, approve work plans and budgets as supplied by the National Coordinator, approve any major changes in project plans, approve major project deliverables, arbitrate any conflicts which might arise, be responsible for the overall evaluation of the project. The Board may be convened extraordinarily by the Chair, on the request of individual members.

375. The Project Board will play a critical role in facilitating inter-ministerial coordination, project monitoring and evaluations by quality assuring these processes and products, and using evaluations for performance improvement, accountability and learning. It will ensure that required resources are committed and will arbitrate on any conflicts within the project or negotiate a solution to any problems with external bodies. In addition, it will approve the appointment and responsibilities of the National Coordinator and any delegation of its Project Assurance responsibilities. Based on the approved Annual Work Plan, the Project Board will also consider and approve the quarterly plans and will also approve any essential deviations from the original plans.

376. The Board will consist of the following members:

- The Executive, who will chair the Board. This role will be filled by MAE or his/her representative.
- A representative of the Senior Supplier, who will provide guidance regarding the technical feasibility of the project. This role will be filled by CAF.
- Senior Beneficiaries SENAGUA, institution will represent the interests of those who will ultimately benefit from the project and ensure the realization of project results from the perspective of project beneficiaries.

377. The Technical Support will advise on ensuring coordination between the project and other related initiatives such as the GAD, Communities representatives, National Adaption Direction (MAE), CELEC and MAG.

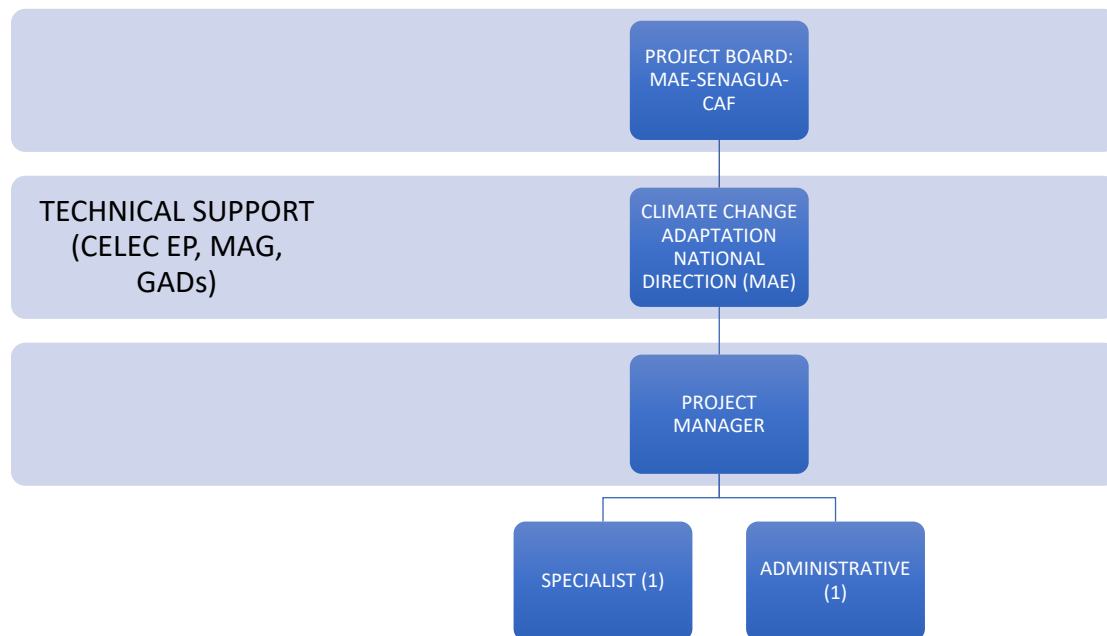


Figure 10: Organizational structure of the project

378. The structure proposed will be reviewed and potentially adjusted in the project's early stage and Operations Manual, detailing roles and responsibilities for the functionality of the Project Board and Technical Committee, will be developed.

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

379. The following risks have been identified for a successful project implementation. In the early stages of the project, the analysis will be updated and constantly monitored:

| Project risks | | | | | |
|---|--------------------|--|---|-------------|----------------------|
| Description | Type ³¹ | Impact & Probability level ³² | Mitigation Measures | Responsible | Status ³³ |
| Change of central government in Ecuador. The new president took office in 2018 ³⁴ , delays were caused in the development of the | Political | P = 5 I = 3 | Present the project to new authorities in MAE | CAF | Over |

³¹ Environmental, Financial, Operational, Organizational, Political, Regulatory, Strategic, Other

³² 1 = low / 5 = high.

³³ Over, reducing, increasing, no change.

³⁴ During the first year of project implementation.

| Project risks | | | | | |
|--|--------------------|--|---|-------------|----------------------|
| Description | Type ³¹ | Impact & Probability level ³² | Mitigation Measures | Responsible | Status ³³ |
| final project proposal. | | | | | |
| Change of municipal government in Ecuador. The new authorities will take office in 2019 ³⁵ . | Political | P = 5 I = 3 | Present the project to new authorities | MAE and CAF | No change |
| Change of in regulatory or legal stipulations might require the adjustments of critical project components for their compliance. | Financial | P = 5 I = 3 | Present the project to new authorities | MAE and CAF | No change |
| The project intends to include a variety of stakeholders that need to be coordinated and engaged. There is a risk that changes in governments or management members, as well as conflicting interests put the project execution at risk. | Organizational | P = 3 I = 3 | Engage stakeholder and key actors early on; provide information on project activities and clarify concrete benefits for each stakeholder; | CAF | Increasing |
| Effect of La Niña in precipitation and local weather conditions ³⁶ . | Environmental | P = 3 I = 3 | Monitor information and alerts in national meteorological entities, NOAA, and World Meteorological Organization | CAF | Increasing |

³⁵ In the mid-term of Project execution.

³⁶ In Ecuador, La Niña produces dryer conditions. Currently, La Niña is favoured to develop during August - October 2016, with about a 55-60% chance of La Niña during the fall and winter 2016-2017 (NPC, 2016).

Table 9: Details project risks

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

380. The following table presents the measures for environmental and social risk management as presented in Annex 15:

| Risk | Level | Response Measure |
|--|--------------|--|
| Poor monitoring capacity in watersheds. The Toachi basin has the worst monitoring system (few meteorological stations, minimum gauging stations and information sediment stations). Therefore, it is not possible to know the flow and sediment with guarantees and prediction senses | High | Develop of hydro meteorological monitoring system in the river basin Strengthening of 7 existing stations located in the area which at the moment are not working properly. |
| Unsustainable agricultural and livestock practices in the basin that increase deforestation, erosion and degradation of water quality. An example is the extensive use of wood for panela production. A largest number of farmers have small areas around 20 ha, where they apply inadequate farming practices. | Medium | At least 375 families participate in sustainable productive activities. At least 250 ha of pasture and 250 ha of crops apply sustainable farming practices |
| Lacks of the ecological flow of rivers. It has adopted the minimum ecological flow recommended by the old regulation (10%), is necessary the actualization. | Medium | To present a study with new calculation of ecological flow for the rivers Toachi and Pilaton. |
| Absence of fish stairs in the project. This aspect is mentioned briefly in the Hydroelectric EIA, the management of the Toachi and Pilaton reservoirs without this structure could cut fish migrations affecting the populations and other species of fauna, producing highly impact in the availability of protein to local populations downstream. | High | To present a study of fish diversity in the Toachi and Pilaton rivers according with Hydroelectric EIA To present a study of the presence of the Olinguito in the area of influence of the Project, which establishes (if confirmed its presence) measures of conservation of its habitat |
| Difficulty of access to credit for sustainable productive activities. Farmers have little access to financing for improving their livelihoods and economic conditions, meanwhile the conventional activities affect the ecosystems mainly the quantity and quality of water in the basin reducing resilience to climate change. | Low | Strengthening of education capacities mainly financing of sustainable productive activities that improve the families incomes and consider profitability. Financial institutions incorporated into their business plans financial sustainability issues, including climate smart lending methodology. |
| Lacks of knowledge about climate change impacts. Interviews with local stakeholders revealed that there is no clear understanding of the likely impacts of climate change, so communities do not take adaptation measures as priority in their activities. Limited information access due to the geographic location and technologies. | Low | Training plan designed according to needs of the population. This plan should include relevant topics like: Water Sources, Climate Change, Environment, Organizational and Associative Development and technological access. Technological platform implemented by Ministry of Environment. |

| | | |
|---|--------|--|
| Local development Plans do not incorporate adaptation criteria and measures to climate change. Local development plans (ie, parishes and municipality) mention climate change as a matter of concern, but do not have specific actions for mitigation or reducing the drivers of deforestation, erosion, invasion of riverbanks, changes in land use, others. | High | 6/6 GADs in target bio-corridor with TLUP that incorporate specific provisions for Bio-corridor of conservation, ACUS y climate change adaptation harmonized with the national norm, with associated budgetary provisions. |
| Social vulnerabilities were identified such as migration process, women and elder groups are likely vulnerable to climate change effects. | Medium | Strengthening of local livelihoods improving the adaptive capacity to climate change effects. Strengthening of local education capacities mainly sustainable productive alternatives that improve the families incomes |

Table 10: environmental and social risk management

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

381. Project-level monitoring and evaluation will be undertaken in compliance with standard CAF requirements as agreed with the Adaptation Fund. It is expected to prepare annual Adaptation Fund Project Performance Reports that include the Adaptation Fund Results Tracker.

382. There will be an independent mid-term review and a terminal evaluation to assess progress and lessons.

383. The budgeted monitoring and evaluation plan is presented as follows:

| Type of M&E activity | Responsible Parties | Budget US\$ <i>Excluding project team staff time</i> | Time frame |
|---|---|---|---|
| Inception Workshop and Report | <ul style="list-style-type: none"> ▪ Project Manager ▪ MAE, CELEC, CAF | Indicative cost: \$5,000 | Within first two months of project start up |
| Measurement of Means of Verification of project results. | <ul style="list-style-type: none"> ▪ CAF/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members. | To be finalized in Inception Phase and Workshop. | Start, mid and end of project (during evaluation cycle) and annually when required. |
| Measurement of Means of Verification for Project Progress on <i>output and implementation</i> | <ul style="list-style-type: none"> ▪ Oversight by Project Manager ▪ Project team | To be determined as part of the Annual Work Plan's preparation. | Annual work plans |
| Annual reports | <ul style="list-style-type: none"> ▪ Project manager and team ▪ MAE | None | Annually |
| Periodic status/ progress reports | <ul style="list-style-type: none"> ▪ Project manager and team | None | Quarterly |
| Mid-term Evaluation | <ul style="list-style-type: none"> ▪ Project manager and team ▪ CAF ▪ MAE ▪ External Consultants (i.e. evaluation team) | Indicative cost: \$ 30,000 | At the mid-point of project implementation. |

| Type of M&E activity | Responsible Parties | Budget US\$ <i>Excluding project team staff time</i> | Time frame |
|----------------------|--|---|--|
| Final Evaluation | <ul style="list-style-type: none"> ▪ Project manager and team, ▪ MAE ▪ CAF ▪ External Consultants (i.e. evaluation team) | Indicative cost: \$ 30,000 | At least three months before the end of project implementation |

Table 11: M& E workplan and budget

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

| Project Program Component | Component 1: Component 1: At least 230,000 ha of native vegetation is conserved to reduce the impact of climate change on the hydrological cycle under integrated watershed management | | | | |
|--|--|--|--|--|---|
| Expected Outcome | Indicator | Baseline | Target by project end | Sources of verification | Assumptions |
| C1.1. 1,000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms. | 1.1.1 # of ha of forest conserved in the Bio-corridor | The forest and conservation areas of the Río Blanco upper basin have outdated management plans. | Establishment of functional conservation areas as part of the Toachi-Pilaton corridor | Ha under conservation categories with formal agreements. Satellite images of high resolution to monitor conservation areas. | The economic activity and the area of use increases. Farm plans and formal protection agreements are required. |
| | | | Bio-corridor working with at least 1,000 ha of conservation to regulate the hydrological cycle. | Administrative records of different project actors. | |
| | 1.1.2 # of Decentralized Governments (GAD) with planning, regulatory and normative instruments for ACUS | -0/6 target GADs have Territorial Land Use Plans (TLUP) that incorporate specific provisions to climate change effects | 6/6 GADs in target bio-corridor with TLUP that incorporate specific provisions for Bio-corridor of conservation, ACUS and climate change adaptation harmonized with the national norm, with associated budgetary provisions. | Territorial Land Use Plans of the target provinces (PDOT) | The GADs are willing and incentivized by MAE to participate in the activity strengthening their management capacities in line with the project's objective, planned outcomes and outputs. |
| | | -0/6 J6GADs in project landscapes have or apply regulatory or normative instruments in relation to | | | |

| | | | | |
|--|--|---|--|--|
| | conservation and ACUS declaration | | | |
| 1.1.3 Percentage (%) reduction of wood used for panela production: | To be determined in the first year of the project | Improve sustainable production alternatives that reduce pressure on forests | Farm's zoning and plan elaboration. | The communities in the Rio Blanco upper watershed are interested in participating. |
| | | 30% of reduction of current use of wood | Technical folder (IBA). | Financing mechanisms for efficient knils will be implemented and are productive, inputs and equipment are available. |
| | | | # of efficient knils installed according to administrative records of the project, financing institutions and service providers; | |
| | | Governance analysis developed to identify relations among actors and avoid possible conflicts | | Monitoring activities provide measurable results to verify baseline and enhancements introduced by the project. |
| 1.1.4 # of families in communities adjoining areas de conservation in target ACUS, participating in livelihood/productive activities demonstrated to reduce pressures on | To be determined, once target families are identified. | - At least 178 families participate in sustainable productive activities. | Field inspections in target communities | If to many target communities are joining the project, spot-sampling methodology will be applied. |
| | No planning is made for farms or the river basin. | - At least one technology transfer agreement signed with universities. | Questionnaires and/or focus groups to verify links of production and reductions in pressures on forest | National universities are interested and can hence be engaged in joining the project |

| | | | | | |
|--|---|--|--|---|--|
| | forest which at least 50% of women participate | | | | |
| | 1.1.5. # of properly performing stations located in the river basin. | Four stations partially working. | 7 hydro-meteorological stations providing climatic data in a regular bases and located accordingly to technical criteria by INAMHI | Previously existing equipment improved and working properly. | No price increases for existing spare parts or identified equipment will occur. |
| | | | | Hydro-meteorological monitoring system working correctly. | |
| | | | | Data reported by hydro-meteorological stations. | |
| C1.2. At least 230,000 ha of native vegetation is conserved to reduce the impact of climate change on the hydrological cycle under integrated watershed management | 2.1.1 Percentage of reduction in the use of forest wood for productive activities in the Upper and Middle Basin of the Toachi River | From the concept note 3 trees per month are being used for firewood. | 30% of reduction of current use of wood for productive activities in the Upper and Middle Basin of the Toachi River through promoting technology change and improvement of the production process of the pana production | Farm's zoning and plan elaboration. | The economic activity and the area of use increases. Farm plans and formal protection agreements are required. |
| | | | | Technical folder (IBA). | Technical folder are available for all actors. |
| | | | Governance analysis performed | # of farms that have experienced technology change/transfer. | |
| | | | | Governance analysis developed to identify relations among actors and avoid possible conflicts | All the relevant actors are willing to cooperate and coordinate among them. |

| | | | | |
|---|--|---|--|---|
| 2.1.2 # of ha of priority conservation areas maintenance through the creation of the Toachi Pilaton Bio-corridor. | Toachi-Pilaton and Sarapullo protected forest already exist. | 230,000ha protected in the watershed that includes ACUS, GADs areas, protected forests. | # of acres under conservation categories through formal agreements. | Administrative records and satellite image will be available for verification. |
| | | | # of ha recovered | |
| | | | Updated management plan. | |
| 2.1.3 # of families with adaptation plans in their farms and % of women participation | There are 0 farm plans in the project area developed with families and communities | At least 178 family farms including adaptation to climate change measures within their operation and with at least 50% of women participation | # of farm and management plans developed, verified by administrative records of the project. | Communities are willing to engage in the project's activities. |
| | | | Inventory of farms with adaptation plans given to the management project unit. | |
| 2.1.4 Ratings of Management Effectiveness Tracking Tool and PGOA | Average total METT score in Illinizas PAs is 50 out of a possible 100 | Reach an average total score of PAs: 70 out of a possible 100 | METT evaluation carried out by the project | n/a |
| | PGOA developed | PGOA by 60% implemented in Illinizas | PGOA report | The project team will verify the implementation of the PGOA. |
| 2.1.5 # and quality of control points in wildlife and forest traffic | There is one control point in Tandapi. | -one additional control point implemented | Audit and monitoring report; project administrative records | The respective authorities will comply with their initial statement of engaging with the project. |
| | | -Tandapi control point strengthened | Training and participants' list | |

| | | | | | |
|--|---|---|--|--|--|
| | | | | Statistics of controls made in both points | |
| Project / Program Components | Component 2. Adapt farming practices to new climate change conditions enable their sustainable climate smart financing | | | | |
| Expected Outcomes | Indicator | Baseline | Targets by project end | Sources of verification | Assumptions |
| C2.1. Sustainable farming practices and livestock adjusted to local realities are being introduced and implemented with assistance of financing mechanisms for adaptation measures | 2.1.1. # of ha of pasture and # of ha of crops apply sustainable farming practices. | Application of sustainable farming practices is non existent or sporadic at best. | At least 250 ha of pasture and 250 ha of crops apply sustainable farming practices and | Inspection report of MAG officials. Administrative records of project partners for sugar cane, mortiño and naranjilla, livestock describing men and women participation | Partners document gender of applicants/participants/ clients |
| | 2.1.2 % of women included in vulnerable groups | Number of women dedicated to agricultural practices | 50% women and 50% men including also vulnerable groups. | Application requests for implementation of sustainable practices. | Groups of women well informed about this initiative and willing to participate |
| | | | | Administrative records of project partners such as training or finance providers. | Partners document gender of applicants/participants/ clients |
| | Report of the selected farmers to be included in the project | Promotion of women participation coming from GAD's | | | |
| 2.1.3 # of panela producers that | 0 efficient knils are being used in the project area | At least 10 artisanal panela producers applying best available technology (BAT) | Invoices with description of the machinery | Partners document gender of applicants/participants/ clients | |

| | | | | | |
|--|---|---|--|--|---|
| | implement better technology to decrease use of firewood. | | | Monitoring report of the project/ administrative records of partners and suppliers | |
| | 2.1.4. # of institutions have introduced specific solutions and risk assessment methodology to support the disbursement of credits for adaptation, integrate sustainable and climate smart criteria in their whole operations | 0 institutions in the project area has up-to-date smart-lending methodologies or green inclusive finance products | 2 financial institutions incorporated into their business operations financial sustainability issues, including climate smart lending methodology and tools. | Climate and Environmental risk assessment reports, including operational audit report | Participation of financial institutions that show first steps towards sustainability issues |
| 2 institutions have introduced specific EbA-focused lending products | | | Climate and Environmental risk assessment reports, including loan portfolio reports | | |
| 2 institutions have trained their personnel on sustainability topics, including EbA and Climate Change | | | Review of training materials and participants' lists | | |
| C2.2 At least 1 long term financing mechanisms has been piloted or introduced | 2.2.1 # of investment funds to promote sustainable development set up and fully operational | No investment fund for sustainable development is active in the project area and hence has no assets | The investment Fund for the care of the upper basin of Río Blanco sustainable development is active an | Constitutional documents of the fund; Audited financial statement for the period 2019-2021 | The Toachi-Pilatón hydroelectric plant in full operation since 2019 |
| | 2.2.2 Assets of the investment fund in USD | | A total of USD 462,314 in assets has been generated | | |

| Project / Program Components | Component 3. Strengthen local capacities and share lessons | | | | |
|---|---|---|--|--|---|
| Expected Outcomes | Indicator | Baseline | Targets by project end | Sources of verification | Assumptions |
| C3 Local population and parish governments with increased capacity to implement climate change adaptation measures. | 3.1.1 # of GADs trained to use meteorological information generated by meteorological stations currently installed. | 0 GADs trained | 6 GADs being trained to take care and use meteorological information generated by meteorological stations currently installed. | Training and participants' list | Integration of captured data by meteorological stations in a central point. |
| | 3.1.2 # of farmers, women and vulnerable groups trained in climate information | 0 farmers from 6 parishes have been trained in use of climate information | At least 500 families trained in the use of climate data, with at least 55% women's participation | Training and participants' list | Storage and processing data to make sure is understandable for the population and other stakeholders. |
| | 3.2.1. # of development plans (PDOT) incorporate measures for ecosystem-based adaptation to climate change | 0 PDOT | 6 GADs PDOTs incorporate measures for ecosystem-based adaptation to climate change. | Development and territorial planning plans published on the website of the parish GAD. | Elaboration of development and territorial planning plans on a regular basis. |
| | 3.3.1 # of communication, education knowledge transfer and replication | 0 events carried out | 12 events over the lifetime of the project carried out | Events' participants' list | Technological platform available for training and communication processes |

| | | | | | |
|--|---|---|--|--|--|
| | events organized | | | | |
| | 3.2.1 # of training provided to financial institutions. | 0 institutions trained | At least 6 trainings provided on adaptation finance and 6 training for climate risk in two financial institution | Training and participants' list | Financial institutions have been identified and engaged. |
| | 3.2.2 # of demonstration farms established | 0 demonstration farms in project area | At least 2 demonstration farms established | Reports on demonstration farm planning and implementation | Suitable plots by public or private actors identified |
| | 3.2.3 # of training events on EbA carried out | 0 training events on EbA carried out | At least 12 training events carried out in 6 parishes with at least 50% women participation | Workshop participants' list | Training materials have been developed in a modular approach |
| | 3.1.5. # of established information system established in the project | 0 technological platforms implemented by Ministry of Environment. | At least 1 information platform collecting lessons learnt by the project and supporting knowledge sharing | Continue access and availability of technological platform for training and communication, or search data and information. | |

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

| Project Objective(s) | Project Objective Indicator(s) | Fund Outcome | Fund Outcome Indicator | Grant Amount (USD) |
|--|--|--|--|--------------------|
| To strengthen the adaptive capacity of the local population in the | Number of people (men and women) with improved | Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced | 2. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased | 120,000 |

| | | | | |
|--|--|---|--|---------|
| Río Blanco water system | adaptive capacity [target 2600 people] | socioeconomic and environmental losses | | |
| | | 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 | 160,000 |
| | | Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress | 5.1. Number of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale) | 475,000 |
| | | Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas | 6.1 Percentage of households and communities having more secure access to livelihood assets | 110,000 |
| Outcome 1. At least 230,000 ha of native vegetation is conserved to reduce the impact of climate change on the watershed's hydrological cycle. | Surface (ha) under improved management. [target 230,000 ha] | Output 5: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability | 5.1. Number of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale) | 950,000 |
| Outcome 2. At least 500 ha of agriculture land apply sustainable farming practices appropriate to the foreseen impacts of climate change | Production area (ha) under improved management [target 500 ha] Number of people (men and women) who implement sustainable farming practices [target >300] | Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability | 6.1.1. Number and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies | 840,000 |
| Outcome 3. Local population and parish governments with | Number of strengthened local | Output 2: Strengthened capacity of national and subnational centres and | 2.1.1. Number of staff trained to respond to, and mitigate impacts of, climate-related events (by gender) | 400.000 |

| | | | | |
|---|---|---|---|--|
| increased capacity to implement climate change adaptation measures. | development plans [target 6] Number of staff (men and women) of local governments and pertinent entities trained on adaptation to climate change [target >25] Number of people (men and women) who have participated in awareness activities and events. [to be defines] Number of visitors to the project's website [to be defined] | networks to respond rapidly to extreme weather events | 2.1.2 Number of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale) | |
|---|---|---|---|--|

G. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

| Output | Responsible entity | Canton / Parish | Budget description | Year 1 | Year 2 | Year 3 | Year 4 | Total | Budget note | Details |
|---|--------------------|------------------------|---|--------|--------|--------|--------|--------|-------------|--|
| 1. 1,000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms. | MAE | All cantons & parishes | Contractual services company (ACUS management plan-conservation bio-corridor) | 46,500 | | | | 46,500 | 1.1 | Contractual services company for the establishment of functional conservation areas as part of the Toachi Pilaton Basin Bio-corridor, the consultancy includes: Technical, biological and zoning file studies; ACUS Management Plan of Conservation Bio-corridor (MPCB). |
| | MAE | All cantons & parishes | Local consultants (Financial and operational sustainability strategy) | | 23,333 | 23,333 | 23,333 | 70,000 | 1.2 | Local consultants for the Financial and Operational Sustainability Strategy according with the investment fund; |
| | MAE | All cantons & parishes | Contractual services individual | 5,375 | 5375 | 5375 | 5375 | 21,500 | 1.3 | Contractual services individual for implementing, monitoring the Biocorredor Management Model |

| | | | | | | | | | | |
|-----|--------------|---|----------------------------------|-------|-------|-------|----------------|-----|---|--|
| | | | (Management and operation model) | | | | | | | |
| MAE | All cantons | Contractual services company (Increases in # of Decentralized Governments (GAD) with planning, regulatory and normative instruments for ACUS) | 3,500 | 3,500 | 3,500 | 3,500 | 14,000 | 1.4 | In support of the Increases in # of Decentralized Governments (GAD) with planning, regulatory and normative instruments for ACUS that includes: the joint identification (PA authorities and GADs) of key habitats, restrictions and monitoring programs, and agreements for their implementation; inclusion in land-use planning processes of specific standards and practices for protecting forest and integrated watershed management; and Municipal ordinances on conservation, land use practices, and ACUS | |
| MAE | All parishes | Equipment and furniture (Strengthen incentive systems for set-asides on private and community lands based ACUS and technology change) | 62,500 | 62500 | 62500 | 37500 | 225,000 | 1.5 | Strengthen incentive systems for set-asides on private and community lands based ACUS | |
| MAE | All cantons | Local consultants (Municipal PAs gazetted, covering 1,000ha, in buffer-zones and corridors identified as critical for water hydrological cycle) | 3,000 | 3,000 | 3,000 | 3,000 | 12,000 | 1.6 | Technicians in monitoring and supporting the Municipal PAs gazetted, covering 1,000ha, in buffer-zones and corridors identified as critical for water hydrological cycle. | |
| MAE | All parishes | Equipment and furniture (Promotion of habitat and connectivity-friendly production options) | | 20000 | 20000 | 20000 | 60,000 | 1.7 | Equipment for the promotion of habitat and connectivity-friendly production options and programs for reduction of human/wildlife conflicts in association with the Ministry of Agriculture | |

| | | | | | | | | | | |
|---|-----|------------------------|--|--------|--------|--------|--------|----------------|-----|---|
| | MAE | All cantons & parishes | Contractual services individual (Increases in # families in communities adjoining conservation areas in target ACUS which at least 50% of women participation) | | 667 | 8,667 | 8,667 | 18,000 | 1.8 | Technicians in support the increases in # families in communities adjoining conservation areas in target ACUS, participating in livelihood /' productive activities demonstrated to reduce pressures on forest which at least 50% of women participation |
| | MAE | All parishes | Equipment and furniture (Strengthening of the hydro-meteorological monitoring system in the Toachi-Pilaton river basin.) | | 8000 | | | 8,000 | 1.9 | Equipment for strengthening of the hydro-meteorological monitoring system in the Toachi-Pilaton river basin that includes maintenance of hydro-meteorological stations |
| | | | Subtotal | | | | | 475,000 | | |
| 2. Improved management of existing protected forests and private conservation areas (ca. 230,000 ha) | MAE | All parishes | Contractual services individual (Reduction in the use of forest wood for productive activities in the Upper and Middle Basin) | 17,875 | 17875 | 17875 | 17875 | 71,500 | 2.1 | Contractual services individual in support of the target: reduction in the use of forest wood for productive activities in the Upper and Middle Basin of the Toachi and Pilaton Rivers (Landscape Las Pampas and Palo Quemado), through technology change in the process of the panela production, that includes planning, assessment and monitoring of the process |
| | MAE | All parishes | Equipment and furniture (Technology change (ovens change to promote efficiency in the production of panela) | 43,720 | 43,720 | 43,720 | 43,840 | 175,000 | 2.2 | Equipment and furniture such as technology change (ovens change to promote efficiency in the production of panela); forest planning and productive alternatives |
| | MAE | All cantons | Contractual services company (Planning and zoning of the river basin with a participatory and inclusive approach. Promote dialogue, coordination and technical support at local level) | 10,333 | 10,333 | 10,333 | | 31,000 | 2.3 | Planning and zoning of the river basin with a participatory and inclusive approach. Promote dialogue, coordination and technical support at local level and improvement of the protector forest. |

| | | | | | | | | | | |
|---|-----|------------------------|--|--------|--------|--------|--------|----------------|-----|---|
| | MAE | All parishes | Contractual services individual (Management plan of the protector forest, including ravine and shore protection activities.) | | 16,667 | 16,667 | 16,667 | 50,000 | 2.4 | Implementation of Management Plan of the protector forest, including ravine and shore protection activities. |
| | MAE | All parishes | Contractual services individual (Train farmers in conservation practices and climate change) | 4,000 | 4,000 | 4,000 | 4,000 | 16,000 | 2.5 | Increase in the process of planning and zoning of farms in which at least 50% of women participate |
| | MAE | All cantons & parishes | Equipment and furniture (Increases in ratings of Management Effectiveness Tracking Tool and PGOA) | 15,000 | 15,000 | 15,000 | 15,000 | 60,000 | 2.6 | Equipment and furniture relationships with increases in ratings of Management Effectiveness Tracking Tool and PGOA |
| | MAE | All cantons | Equipment and furniture (Increases in control capacities in wildlife and forest traffic) | 35,750 | 35,750 | | | 71,500 | 2.7 | Increases in control capacities in wildlife and forest traffic that includes: Equipment for environmental control mainly forest and wildlife with supporting UPMA; Strengthen Tandapi control point; Install a control point in las Pampas, equipment in coordination with the Police; and Monitoring system, newsletter and decentralization of information. |
| | | | Subtotal | | | | | 475,000 | | |
| 3. 250 ha of pasture and 250 ha of crops apply sustainable farming practices | MAE | All cantons & parishes | Contractual services individual | 40,000 | 40,000 | | | 80,000 | 3.1 | Building of the team: Selection of experts in sustainable agricultural management and climate-smart livestock; Incorporation of an industrial technician with technical background to identify options of improvement in the technology for the panela producers; Field visits by specialists to collect information on the type of crop, microclimate, vulnerabilities and resilience; Documentation: Definition of appropriate adaptation measures for farming and production areas; Monitoring visits and documentation of the progress of adaptation measures. Identification of problems |

| | | | | | | | | | | |
|--|----------|------------------------|---------------------------------|--------|--------|--------|--------|----------------|-----|---|
| | CAF/GADs | All cantons & parishes | Grants for implementation | 20,000 | 25,000 | 30,000 | 35,000 | 110,000 | 3.2 | Grants for implementation; Selection: Identify, through the defined procedures and actors, the participants for the construction of sustainable farms; The project management board reviews the profiles of participants entering into vulnerable groups for approval; Subsidy for 150 beneficiaries of vulnerable groups receive 75% of the cost and implementation of adaptation measures as grant. 25% they will put it as counterpart (labor); Delivery to the qualified suppliers of the values for the implementation by means of transference or certified check |
| | MAG | All cantons & parishes | Suppliers identification | 20,000 | 10,000 | | | 30,000 | 3.3 | Suppliers identification; Announcement for all suppliers interested in participating for the delivery of inputs for the construction of sustainable farms. Interesting stock, good experience and reputation is a plus; Visits each of the suppliers to verify the information provided and the prices offered. Documented all the information; Final selection of suppliers and products chosen to participate. Signing of understanding memorandum and a contract |
| | | | Subtotal | | | | | 220,000 | | |
| 4. At least 2 institutions have introduced specific solutions and credit assessments to support the disbursement of credits for adaptation, integrating environmental and climatic risks in their operations. | MAE | All cantons & parishes | Contractual services individual | 10,000 | | | | 10,000 | 4.1 | Selection of consultants who will work on the development of output 2 and 3. Knowledge and good experience in the field of software-based green lending or climate financing will be required; Identification of adequate EbA and other adaptation measures for target customers of participating financial institutions; |
| | MAE | All cantons & parishes | Contractual services company | 10,000 | 20,000 | | | 30,000 | 4.2 | ICT solution to automatically and systematically collect data in the field, software to facilitate the identification, |

| | | | | | | | | | | |
|--|----------------------|------------------------|--|---------|--------|--------|--------|----------------|-----|--|
| | | | | | | | | | | qualification, monitoring and reporting of adaptation credits. |
| | MAE | All cantons & parishes | Contractual services company | 40,000 | 40,000 | | | 80,000 | 4.3 | Development of climate smart lending management, for different crops and to be implemented in lending processes of financial institutions; Development of policies and procedures of climate risk management in the institution; Development of financial products, product design including loan terms; |
| | | | Subtotal | | | | | 120,000 | | |
| 5. One investment fund to promote sustainable development is set up and operational | CAF / CFN | Sigchos | Trust expenses | 21,000 | | | | 21,000 | 5.1 | Legal study for the set-up of the fund |
| | GAD SIGCHOS | Sigchos | Renting premise | 3,600 | | | | 3,600 | 5.2 | Office rent for first year |
| | GADs SIGCHOS Y MEJIA | All cantons & parishes | Recruitment | 31,200 | | | | 31,200 | 5.3 | Recruitment of personnel of first year |
| | GADs SIGCHOS Y MEJIA | All cantons | Vehicle, equipment and furniture | 33,000 | | | | 33,000 | 5.4 | Physical infrastructure of the investment fund |
| | GAD SIGCHOS | Sigchos | Miscellaneous expenses | 3,600 | | | | 3,600 | 5.5 | Office supplies, administrative expenses |
| | GADs SIGCHOS Y MEJIA | Sigchos | Investment in sustainable development investment trust | 327,600 | | | | 327,600 | 5.6 | Seed investment for the set-up of the fund |
| | GAD SIGCHOS | Sigchos | Economic incentives for adaptation disbursements | 25,000 | 25,000 | 25,000 | | 75,000 | 5.7 | Economic incentives for eligible lending customers that will invest into EbA and other adaptation options |
| | GAD SIGCHOS | Sigchos | Reporting | 2,000 | 1,000 | 1,000 | 1,000 | 5,000 | 5.8 | Elaboration of reporting per year, including monitoring visits of financed customers; |
| | | | Subtotal | | | | | 500,000 | | |
| 6. At least 6 parishes being trained | INAHMI / GADs | All parishes | Miscellaneous expenses | | | 10,000 | 10,000 | 20,000 | 6.1 | Training in use and maintenance of meteorological stations for technical staff of each GAD. |

| | | | | | | | | | | |
|---|------------------------|--------------|--------------------------------------|--------|--------|--------|--------|----------------|-----|--|
| to take care and use meteorological information generated by meteorological stations currently installed. | INAHMI / GADs parishes | All parishes | Contractual services individual | | 10,000 | 10,000 | 10,000 | 30,000 | 6.2 | Changing administrative operations from INAMHI to GAD technical personal staff. |
| | INAHMI / GADs parishes | All parishes | Miscellaneous expenses | | | 40,000 | 40,000 | 80,000 | 6.3 | Training 500 families in the use of climate data and their application in activities, such as: agriculture and livestock. This training will be address for 55% percent of women. Including field visits, food and transportation. |
| | INAHMI / GADs parishes | All parishes | Audiovisual & print production costs | | | 5,000 | 5,000 | 10,000 | 6.4 | Designing of interactive content and generation of newsletters to training GAD population in the area including women associations, older adults and vulnerable groups. |
| | INAHMI / MAE | All parishes | Contractual services individual | | 6,666 | 6,667 | 6,667 | 20,000 | 6.5 | Integrating the digital media technologies for communication plan and addressed it to the population in general including women, older adult, youth people and children's. |
| | | | Subtotal | | | | | 160,000 | | |
| 7. Six development plans of local parishes incorporate measures for ecosystem-based adaptation to climate change | GADs | All parishes | Local consultants | 10,000 | | | | 10,000 | 7.1 | Conducting a technical study to determinate which climate change adaptation measures that must be added for development and territorial planning plans. |
| | GADs | All parishes | Local consultants | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 | 7.2 | Gathering information on climate change adaptation measures to be added like indicators and statistics into the development and territorial planning plans. The indicators should include gender information and vulnerable groups for climate change. |
| | GADs | All parishes | Local consultants | | 10,000 | 10,000 | 10,000 | 30,000 | 7.3 | Developing new development and territorial planning documents adding climate change statistics and information and also including gender and vulnerable group's climate change issues. |
| | GADs | All parishes | Miscellaneous expenses | | 3,333 | 3,333 | 3,333 | 10,000 | 7.4 | Training for population including associations, organizations and other stakeholder of the project about climate change adaptation measures incorporated in the PDOTs. |
| | GADs | All parishes | Miscellaneous expenses | | 3,333 | 3,333 | 3,333 | 10,000 | 7.5 | Socialize new PDOTs documents with the population of the project area including associations, organizations and the population in general. |

| | | | | | | | | | | |
|---|------------------------|--------------|---------------------------------|--------|-------|-------|-------|----------------|-----|---|
| | | | Subtotal | | | | | 80,000 | | |
| 8. Strategic plan of communication, education, knowledge transference and scheme of replica, including demonstration farms. Plus training on adaptation finance to financial institutions. | GADs | All parishes | Contractual Individual Services | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 | 8.1 | Developing a communication plan addressed for stakeholders in the project including specific women associations and organizations. |
| | Project Manager / GADs | All parishes | Contractual Individual Services | 3,750 | 3,750 | 3,750 | 3,750 | 15,000 | 8.2 | Integrating the digital media technologies for communication plan and addressed it to the population in general including women, older adult, youth people and children's. |
| | Project Manager / GADs | All parishes | Miscellaneous expenses | 6,250 | 6,250 | 6,250 | 6,250 | 25,000 | 8.3 | Sharing lessons learned and experiences with project stakeholders, and replicate knowledge to other similar projects in the country through demonstrative farms applying sustainable methods for agriculture, livestock and panela production |
| | Project Manager / GADs | All parishes | Miscellaneous expenses | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 | 8.4 | Training modular courses on sustainable agriculture and good agricultural practices, open to associations and selected farmers to participate. 12 modules, 6 theorists, 6 in the field and an on-site supervision within 6 months of completing the course. 50% women |
| | Project Manager | All parishes | Local consultants | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 | 8.5 | Training for all Microfinance Institution (MFI) staff participating in climate risk, green credit and climate change issues with a focus on microfinance |
| | Project Manager | All parishes | Local consultants | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 | 8.6 | Certification of organic crops or good agricultural practices for the production of panela, mortiño wine or crops of sugar or naranjilla, of those graduates with better performance in their crops. |
| | | | Subtotal | | | | | 120,000 | | |
| 9. Systematization of information gathered during the whole project design and | MAE | All parishes | Contractual services individual | 15,000 | 5,000 | 5,000 | | 25,000 | 9.1 | Developing a technological platform to manage knowledge and information about climate change adaptation, using disruptive technologies like: big data and cloud computing. |
| | MAE | All parishes | Contractual services individual | 10,000 | | | | 10,000 | 9.3 | Integrating technological platform into others technological platforms used by the Ministry of Environment. |

| | | | | | | | | | | |
|--|------------|--------------|---------------------------------|-------|-------|--|--|------------------|-----|--|
| implementation using existing informatics platforms | MAE / GADs | All parishes | Contractual services individual | 2,500 | 2,500 | | | 5,000 | 9.4 | Sociability of the technological platform with all stakeholders in the project including associations and organizations. |
| | | | Subtotal | | | | | 40,000 | | |
| Total project cost | | | | | | | | 2,190,000 | | |
| Project/Programme Execution cost | | | | | | | | 180,000 | | |
| Details | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Total project cost | | | | | | | | 2,370,000 | | |
| Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable) | | | | | | | | 119,373 | | |
| Details | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| TOTAL | | | | | | | | 2,489,373 | | |

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

| Output | Responsible entity | Canton / Parrish | Budget description | Year 1 | MILESTONE | Year 2 | MILESTONE | Year 3 | MILESTONE | Year 4 | Total | Budget note |
|--|--------------------|------------------------|---|--------|---|--------|--|--------|-----------|--------|---------|-------------|
| 1. 1,000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms. | MAE | All cantons & parishes | Contractual services company (ACUS management plan- conservation bio-corridor) | 46,500 | ACUS Management Plan according Bio corridor for the conservation elaborated. | | | | | | 46,500 | 1.1 |
| | MAE | All cantons & parishes | Local consultants (Financial and operational sustainability strategy) | | | 23,333 | Financial and operational sustainability strategy elaborated | 23,333 | | 23,333 | 70,000 | 1.2 |
| | MAE | All cantons & parishes | Contractual services individual (Management and operation model) | 5,375 | Technicians for application of Management Model | 5375 | | 5375 | | 5375 | 21,500 | 1.3 |
| | MAE | All cantons | Contractual services company (Increases in # of Decentralized Governments (GAD) with planning, regulatory and normative instruments for ACUS) | 3,500 | Joint identification (PA authorities and GADs) of key habitats | 3,500 | | 3,500 | | 3,500 | 14,000 | 1.4 |
| | MAE | All parishes | Equipment and furniture (Strengthen incentive systems for set-asides on private and community lands based | 62,500 | Strengthen incentive systems for set-asides on private and community lands based ACUS | 62500 | | 62500 | | 37500 | 225,000 | 1.5 |

| | | | | | | | | | | | | |
|-----|------------------------|--|-------|--|-------|--|-------|--|-------|--|---------------|-----|
| | | ACUS and technology change) | | | | | | | | | | |
| MAE | All cantons | Local consultants (Municipal PAs gazetted, covering 1,000ha, in buffer-zones and corridors identified as critical for water hydrological cycle) | 3,000 | | 3,000 | Proposed for monitoring Municipal PAs covering 1,000ha, in buffer-zones | 3,000 | | 3,000 | | 12,000 | 1.6 |
| MAE | All parishes | Equipment and furniture (Promotion of habitat and connectivity-friendly production options) | | | 20000 | Training communities for promotion of habitat and connectivity-friendly production options | 20000 | | 20000 | | 60,000 | 1.7 |
| MAE | All cantons & parishes | Contractual services individual (Increases in # families in communities adjoining conservation areas in target ACUS which at least 50% of women participation) | | | 667 | Technicians for Planning and zoning of the river basin and productive alternatives | 8,667 | | 8,667 | | 18,000 | 1.8 |
| MAE | All parishes | Equipment and furniture (Strengthening of the hydro-meteorological monitoring | | | 8000 | | | | | | 8,000 | 1.9 |

| | | | | | | | | | | | | |
|---|-----|--------------|--|--------|--|--------|---|--------|--|--------|----------------|-----|
| | | | system in the Toachi-Pilaton river basin.) | | | | | | | | | |
| | | | Subtotal | | | | | | | | 475,000 | |
| 2. Improved management of existing protected forests and private conservation areas (ca. 230,000 ha) | MAE | All parishes | Contractual services individual (Reduction in the use of forest wood for productive activities in the Upper and Middle Basin) | 17,875 | Technicians for community training, planning and Reduction in the use of forest wood for productive activities | 17875 | | 17875 | | 17875 | 71,500 | 2.1 |
| | MAE | All parishes | Equipment and furniture (Technology change (ovens change to promote efficiency in the production of panela) | 43,720 | | 43,720 | Technology change (ovens change to promote efficiency in the production of panela) and sustainable production | 43,720 | | 43,840 | 175,000 | 2.2 |
| | MAE | All cantons | Contractual services company (Planning and zoning of the river basin with a participatory and inclusive approach. Promote dialogue, coordination and technical support at local level) | 10,333 | Governance analysis performed to provide recommendations | 10,333 | | 10,333 | | | 31,000 | 2.3 |
| | MAE | All parishes | Contractual services individual (Management plan of the | | | 16,667 | Assessment, monitoring and evaluation of farms to perform and provide | 16,667 | | 16,667 | 50,000 | 2.4 |

| | | | | | | | | | | | | |
|---|-----|------------------------|---|--------|--|--------|--|--------|--|--------|----------------|-----|
| | | | protector forest, including ravine and shore protection activities.) | | | | technology transfer | | | | | |
| | MAE | All parishes | Contractual services individual (Train farmers in conservation practices and climate change) | 4,000 | | 4,000 | Assessment, monitoring and evaluation of farms to perform and provide technology transfer | 4,000 | | 4,000 | 16,000 | 2.5 |
| | MAE | All cantons & parishes | Equipment and furniture (Increases in ratings of Management Effectiveness Tracking Tool and PGOA) | 15,000 | | 15,000 | Increases in ratings of Management Effectiveness Tracking Tool and PGOA | 15,000 | | 15,000 | 60,000 | 2.6 |
| | MAE | All cantons | Equipment and furniture (Increases in control capacities in wildlife and forest traffic) | 35,750 | | 35,750 | increases in control capacities in wildlife and forest traffic; Strengthen Tandapi control point | | | | 71,500 | 2.7 |
| | | | Subtotal | | | | | | | | 475,000 | |
| 3. 250 ha of pasture and 250 ha of crops apply sustainable farming practices | MAE | All cantons & parishes | Contractual services individual | 40,000 | | 40,000 | | | | | 80,000 | 3.1 |

| | | | | | | | | | | | | |
|--|----------------------|------------------------|---------------------------------|--------|---|--------|--|--------|--|--------|----------------|-----|
| | CAF/GADs | All cantons & parishes | Grants for implementation | 20,000 | Fist group of participants must have been selected and initiated the training (output8) | 25,000 | 2th group of participants selected and trained. Investment plan verified | 30,000 | 3th group of participants selected and trained. Investment plan verified | 35,000 | 110,000 | 3.2 |
| | MAG | All cantons & parishes | Suppliers identification | 20,000 | | 10,000 | | | | | 30,000 | 3.3 |
| | | | Subtotal | | | | | | | | 220,000 | |
| 4. At least 2 institutions have introduced specific solutions and credit assessments to support the disbursement of credits for adaptation, integrating environmental and climatic risks in their operations. | MAE | All cantons & parishes | Contractual services individual | 10,000 | | | | | | | 10,000 | 4.1 |
| | MAE | All cantons & parishes | Contractual services company | 10,000 | Personnel trained (output 8) | 20,000 | | | | | 30,000 | 4.2 |
| | MAE | All cantons & parishes | Contractual services company | 40,000 | 1) Catalog of adaption measures developed; 2) Personnel trained (output 8) | 40,000 | 2) Personnel trained (output 8) | | | | 80,000 | 4.3 |
| | | | Subtotal | | | | | | | | 120,000 | |
| 5. One investment fund to promote sustainable development is set up and operational | CAF / CFN | Sigchos | Trust expenses | 21,000 | | | | | | | 21,000 | 5.1 |
| | GAD SIGCHOS | Sigchos | Renting premise | 3,600 | | | | | | | 3,600 | 5.2 |
| | GADs SIGCHOS Y MEJIA | All cantons & parishes | Recruitment | 31,200 | The trust is legally constituted | | | | | | 31,200 | 5.3 |

| | | | | | | | | | | | | |
|---|------------------------|--------------|--|---------|---|--------|--|--------|--|----------------|---------|-----|
| | GADs SIGCHOS Y MEJIA | All cantons | Vehicle, equipment and furniture | 33,000 | Staff hired | | | | | | 33,000 | 5.4 |
| | GAD SIGCHOS | Sigchos | Miscellaneous expenses | 3,600 | | | | | | | 3,600 | 5.5 |
| | GADs SIGCHOS Y MEJIA | Sigchos | Investment in sustainable development investment trust | 327,600 | Staff, premises and equipments must be complete | | | | | | 327,600 | 5.6 |
| | GAD SIGCHOS | Sigchos | Economic incentives for adaptation disbursements | 25,000 | Fist group of participants must have been selected and initiated the training (output8) | 25,000 | 2th group of participants selected and trained. Investment plan verified | 25,000 | 3th group of participants selected and trained. Investment plan verified | | 75,000 | 5.7 |
| | GAD SIGCHOS | Sigchos | Reporting | 2,000 | | 1,000 | | 1,000 | | 1,000 | 5,000 | 5.8 |
| | | | Subtotal | | | | | | | 500,000 | | |
| 6. At least 6 parishes being trained to take care and use meteorological information generated by meteorological stations currently installed. | INAHMI / GADs | All parishes | Miscellaneous expenses | | | | | 10,000 | 50% parishes trained in meteorological stations | 10,000 | 20,000 | 6.1 |
| | INAHMI / GADs parishes | All parishes | Contractual services individual | | | 10,000 | 2 GADs operating metereological stations | 10,000 | 4 GADs operating metereological stations | 10,000 | 30,000 | 6.2 |
| | INAHMI / GADs parishes | All parishes | Miscellaneous expenses | | | | | 40,000 | 50% families trained in climate data | 40,000 | 80,000 | 6.3 |
| | INAHMI / GADs parishes | All parishes | Audiovisual & print production costs | | | | | 5,000 | Interactive content developed and delivered | 5,000 | 10,000 | 6.4 |
| | INAHMI / MAE | All parishes | Contractual services individual | | | 6,666 | Data send from metereological station to MAE platforms | 6,667 | Data send from metereological station to MAE platforms | 6,667 | 20,000 | 6.5 |
| | | | Subtotal | | | | | | | 160,000 | | |

| | | | | | | | | | | | | |
|---|------------------------|--------------|---------------------------------|--------|---|--------|---|--------|---|--------|----------------|-----|
| 7. Six development plans of local parishes incorporate measures for ecosystem-based adaptation to climate change | GADs | All parishes | Local consultants | 10,000 | Technical study finished | | | | | | 10,000 | 7.1 |
| | GADs | All parishes | Local consultants | 5,000 | climate change measures defined | 5,000 | climate change measures defined | 5,000 | climate change measures defined | 5,000 | 20,000 | 7.2 |
| | GADs | All parishes | Local consultants | | | 10,000 | PDOT published | 10,000 | PDOT published | 10,000 | 30,000 | 7.3 |
| | GADs | All parishes | Miscellaneous expenses | | | 3,333 | | 3,333 | | 3,333 | 10,000 | 7.4 |
| | GADs | All parishes | Miscellaneous expenses | | | 3,333 | Trained population | 3,333 | Trained population | 3,333 | 10,000 | 7.5 |
| | | | Subtotal | | | | | | | | 80,000 | |
| 8. Strategic plan of communication, education, knowledge transference and scheme of replica, including demonstration farms. Plus training on adaptation finance to financial institutions. | GADs | All parishes | Contractual Individual Services | 5,000 | events of communication delivered for all population | 5,000 | events of communication delivered for all population | 5,000 | events of communication delivered for all population | 5,000 | 20,000 | 8.1 |
| | Project Manager / GADs | All parishes | Contractual Individual Services | 3,750 | plan communication delivered using media technologies | 3,750 | plan communication delivered using media technologies | 3,750 | plan communication delivered using media technologies | 3,750 | 15,000 | 8.2 |
| | Project Manager / GADs | All parishes | Miscellaneous expenses | 6,250 | Sharing lessons learned | 6,250 | Sharing lessons learned | 6,250 | Sharing lessons learned | 6,250 | 25,000 | 8.3 |
| | Project Manager / GADs | All parishes | Miscellaneous expenses | 5,000 | Trained farms in sustainable agriculture | 5,000 | Trained farms in sustainable agriculture | 5,000 | Trained farms in sustainable agriculture | 5,000 | 20,000 | 8.4 |
| | Project Manager | All parishes | Local consultants | 5,000 | trained staff of finance institutions | 5,000 | trained staff of finance institutions | 5,000 | trained staff of finance institutions | 5,000 | 20,000 | 8.5 |
| | Project Manager | All parishes | Local consultants | 5,000 | certificated organic crops | 5,000 | certificated organic crops | 5,000 | certificated organic crops | 5,000 | 20,000 | 8.6 |
| | | | Subtotal | | | | | | | | 120,000 | |
| 9. Systematisation of information gathered during | MAE | All parishes | Contractual services individual | 15,000 | platform developed, installed and operating | 5,000 | platform maintenance and operation | 5,000 | platform maintenance and operation | | 25,000 | 9.1 |

| | | | | | | | | | | | | |
|--|------------|--------------|---------------------------------|--------|---|-------|--|--|--|--|------------------|-----|
| the whole project design and implementation using existing informatics platforms | MAE | All parishes | Contractual services individual | 10,000 | platform integrated to IT MAE Systems | | | | | | 10,000 | 9.3 |
| | MAE / GADs | All parishes | Contractual services individual | 2,500 | 50% of population with access to platform | 2,500 | 100% of population with access to platform | | | | 5,000 | 9.4 |
| | | | Subtotal | | | | | | | | 40,000 | |
| Total project cost | | | | | | | | | | | 2,190,000 | |
| Project/Programme Execution cost | | | | | | | | | | | 180,000 | |
| Details | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Total project cost | | | | | | | | | | | 2,370,000 | |
| Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable) | | | | | | | | | | | 119,373 | |
| Details | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | 2,489,373 | |

Overview Annexes

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

A. Record of endorsement on behalf of the government³⁷ *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:*

| | |
|---|---------------------------------|
| <i>(Enter Name, Position, Ministry)</i> | <i>Date: (Month, day, year)</i> |
|---|---------------------------------|

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*

| | |
|---|------------------------|
| <p>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 (.....list here.....) and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p> | |
| <p><i>Name & Signature</i> Implementing Entity Coordinator</p> | |
| <i>Date: (Month, Day, Year)</i> | <i>Tel. and email:</i> |
| <i>Project Contact Person:</i> | |
| <i>Tel. And Email:</i> | |

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.



ADAPTATION FUND



GOBIERNO NACIONAL DE
LA REPUBLICA DEL ECUADOR

Letter of Endorsement by Government

Government of Ecuador
Ministry of Environment

Quito, 04th August, 2017

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the National Project Proposal “Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management”

In my capacity as designated authority for the Adaptation Fund in Ecuador, I confirm that the above national project proposal is in accordance with the government’s National Development Plan and its priorities in implementing adaptation activities to reduce adverse impacts of climate change in Ecuador.

Accordingly, I am pleased to endorse the above national project proposal with support from the Adaptation Fund. If approved, the project will be implemented by CAF- Latin American development bank and executed by the Ministry of Environment of Ecuador

Sincerely,


TARSICIO GRANIZO
National Designated Authority
Minister of Environment
Ministry of Environment - Ecuador



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

A. Record of endorsement on behalf of the government¹

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

| | |
|--|---|
| National Project Proposal: <i>Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management</i> | |
| TARSICIO GRANIZO <i>National Designated Authority Climate Change Undersecretary Ministry of Environment – Ecuador</i> | Date: August 04, 2017  |



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.

Annex 1. Abbreviations

| | |
|---------|---|
| AF | Adaptation Fund |
| CBD | Convention on Biological Diversity |
| CELEC | Electric Corporation of Ecuador |
| EbA | Ecosystem based adaptation |
| GEF | Global Environment Facility |
| INAMHI | National Meteorological and Hydrological Institute |
| MAE | Ministry of Environment |
| MAGAP | Ministry of Agriculture, Livestock, Aquaculture and Fisheries |
| masl | Metres above sea level |
| SENAGUA | National Water Secretariat |
| SGR | Risk Management Secretariat |

Annex 2. Bibliography.

AF. 2012. Accessing resources from the Adaptation Fund. The Handbook. Adaptation Fund (AF). Washington DC, USA: 64 pp.

AF. 2016. Guidance document for implementing entities on compliance with the Adaptation Fund Environmental and Social Policy. Revised in June 2016. Adaptation Fund (AF) Washington DC, USA: 21 pp. Online: https://www.adaptation-fund.org/wp-content/uploads/2016/07/ESP-Guidance_Revised-in-June-2016_Guidance-document-for-Implementing-Entities-on-compliance-with-the-Adaptation-Fund-Environmental-and-Social-Policy.pdf

AF. 2016a. Manual of basic Environmental and Social Management System procedures and functions at National Implementing Entities. April 2016. Adaptation Fund (AF) Washington DC, USA: 20 pp. Online: https://www.adaptation-fund.org/wp-content/uploads/2016/07/Manual-of-basic-ESMS-procedures-and-functions-at-NIE_April-2016.pdf

BirdLife International. 2016. Important Bird and Biodiversity Area factsheet: Río Toachi-Chiriboga. Downloaded from <http://www.birdlife.org> on 22/07/2016

BirdLife International. 2016a. Important Bird and Biodiversity Area factsheet: Reserva Ecológica Los Illinizas y alrededores. Downloaded from <http://www.birdlife.org> on 23/07/2016

Boada, C. 2015. Tremarctos ornatus. En: (ed). Mamíferos de Ecuador. Quito, Ecuador. [en línea]. Versión 2015.0. Museo de Zoología, Pontificia Universidad Católica del Ecuador. Quito, Ecuador. <<http://zoologia.puce.edu.ec/vertebrados/mamiferos/FichaEspecie.aspx?Id=658>> [Consulta: sábado, 23 de julio de 2016].

Cai, W., Borlace, S., Lengaigne, M., van Rensch, P., Collins, M., Vecchi, G., Timmermann, A., Santoso, A., McPhaden, M.J., Wu, L., England, M.H., Wang, G., Guilyardi, E. & F.F. Jin. 2014. Increasing frequency of extreme El Niño events due to greenhouse warming. Nature Climate Change 4: 111-116.

Cai, W., Wang, G., Santoso, A., McPhaden, M.J., Wu, L., Jin, F.F., Timmermann, A., Collins, M., Vecchi, G., Lengaigne, M., England, M.H., Dommenget, D., Takahashi, K. & E. Guilyardi. 2015. Increased frequency of extreme La Niña events under greenhouse warming. Nature Climate Change 5: 132–137.

CDB. 2009. Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second ad hoc Technical Expert Group on

Biodiversity and Climate Change. CBD Technical Series 41. Secretariat of the Convention on Biological Diversity. Montreal, Canada: 126 pp.

Chambers, R. & G.R. Conway. 1991. Sustainable rural livelihoods: practical concepts for the 21st century. IDS Discussion Paper 296. Institute of Development Studies (IDS). Brighton, United Kingdom: 29 pp.

GADPRPQ. 2013. Plan de Desarrollo y Ordenamiento Territorial Parroquial Palo Quemado. Gobierno Autónomo Descentralizado Parroquial Rural Palo Quemado (GADPRPQ). Palo Quemado, Ecuador: 54 pp.

Jiménez, D. 2013. Tecnología SIG en apoyo al análisis y desarrollo metodológico de riesgos ocasionados por fenómenos naturales para el cantón Mejía, Provincia de Pichincha, Ecuador. Tesis Magister en Sistemas de Información Geográfica. Universidad San Francisco de Quito. Quito, Ecuador: 135 pp.

MAE. 2012 Estrategia Nacional de Cambio Climático del Ecuador 2012-2025. Ministerio del Ambiente (MAE). Quito, Ecuador: 143 pp.

MAE. 2014. ¿Cómo incorporar cambio climático en la planificación local? Guía Explicativa para la aplicación de los Lineamientos Generales para Planes, Programas y Estrategias de Cambio Climático de Gobiernos Autónomos Descentralizados y la inclusión de consideraciones de cambio climático en el proceso de actualización de los PDOTs. Ministerio del Ambiente (MAE). Quito, Ecuador: 119 pp.

MAE. 2015. Análisis de Vulnerabilidad de Centrales Hidroeléctricas Emblemáticas ante los efectos del Cambio Climático. Consultoría preparada por TECNALIA. Tomo I. Ministerio del Ambiente (MAE). Quito, Ecuador: 64 pp.

NPC. 2016. ENSO: Recent Evolution, Current Status and Predictions. Updated 25 July 2016. Climate Prediction Center (NPC). National Oceanic and Atmospheric Administration (NOAA). Maryland, USA: 32 pp.

Proaño, P. 2015. Análisis y evaluación de los asentamientos informales ubicados en la parroquia Manuel Cornejo Astorga, del Cantón Mejía, provincia de Pichincha. Tesis ingeniería en ciencias geográficas y desarrollo sustentable. Pontificia Universidad Católica del Ecuador. Quito, Ecuador: 91 pp.

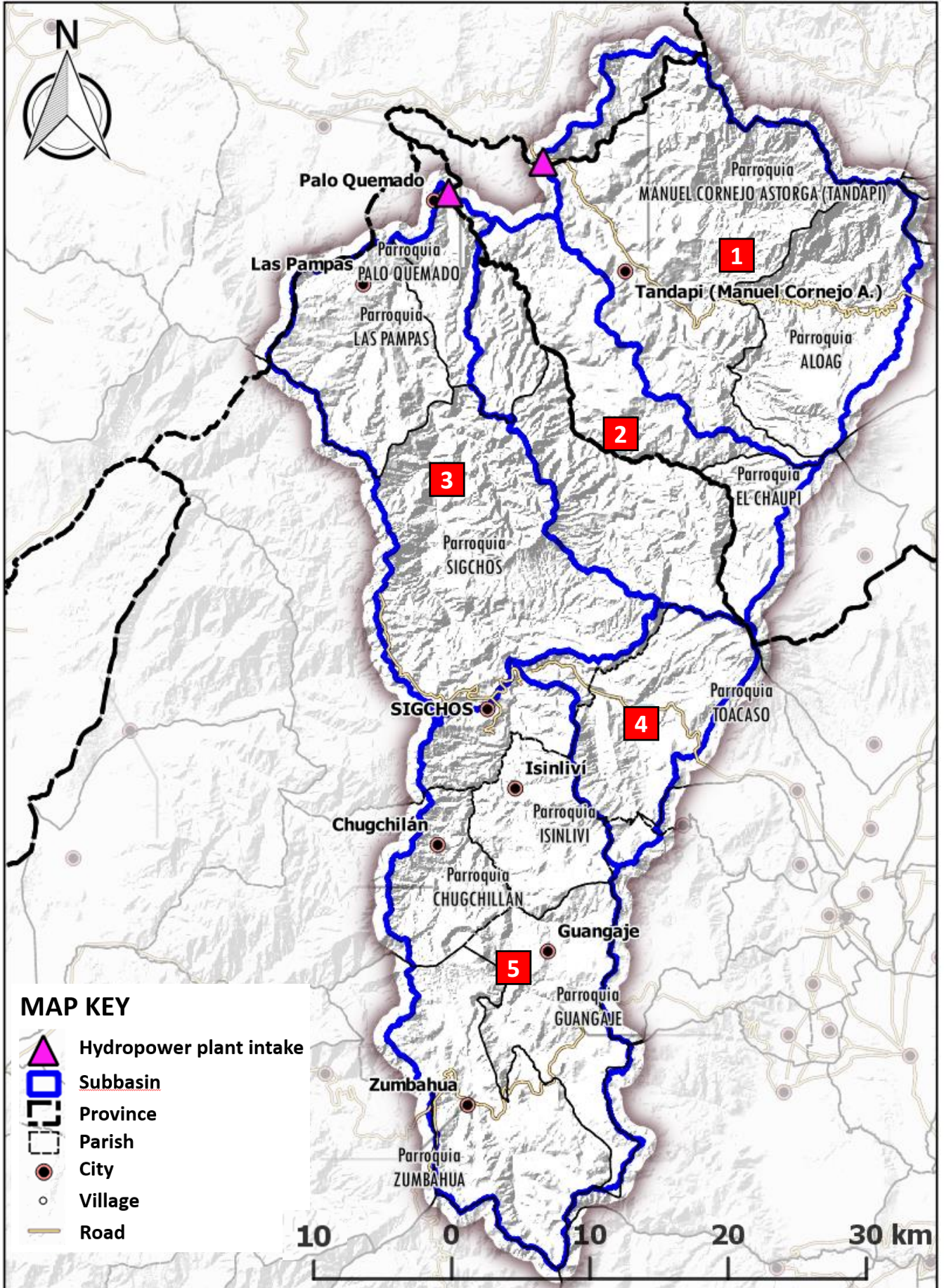
Scoones, I. 1998. Sustainable rural livelihoods a framework for analysis. IDS Working Paper 72. Institute of Development Studies (IDS). Brighton, United Kingdom: 22 pp.

SENPLADES. 2013. Plan Nacional de Desarrollo / Plan Nacional para el Buen Vivir 2013-2017. Secretaría Nacional de Planificación y Desarrollo (SENPLADES). Quito, Ecuador: 594 pp.

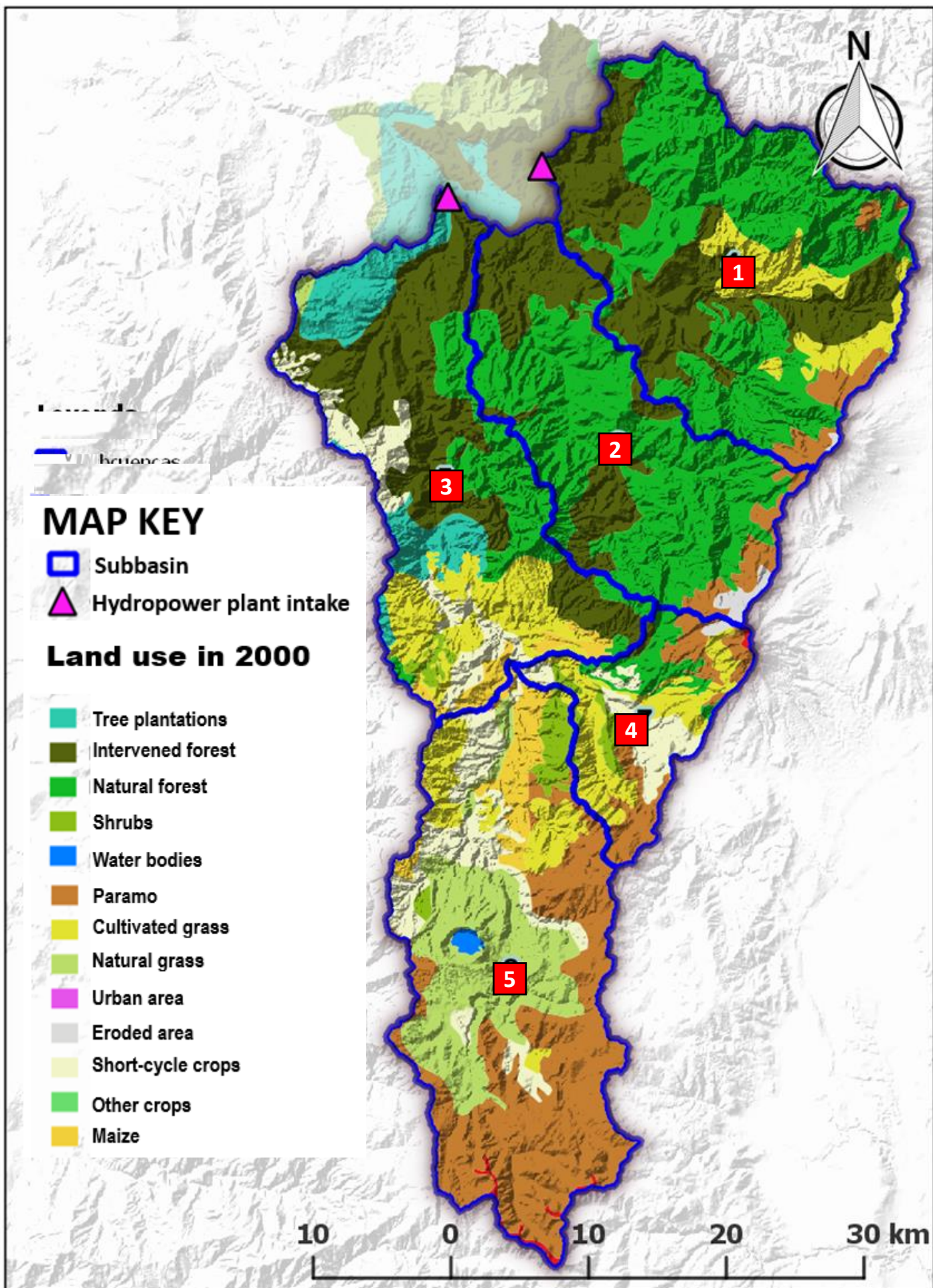
Vallejo, A.F. 2015. Puma concolor. En: (ed). Mamíferos de Ecuador. Quito, Ecuador. [en línea]. Versión 2015.0. Museo de Zoología, Pontificia Universidad Católica del Ecuador. Quito, Ecuador.
<<http://zoologia.puce.edu.ec/vertebrados/mamiferos/FichaEspecie.aspx?Id=636>> [Consulta: sábado, 23 de julio de 2016].

WEF. 2015. The Global Gender Gap Report 2015. World Economic Forum (WEF). Cologny/Geneva, Switzerland: 377 pp.

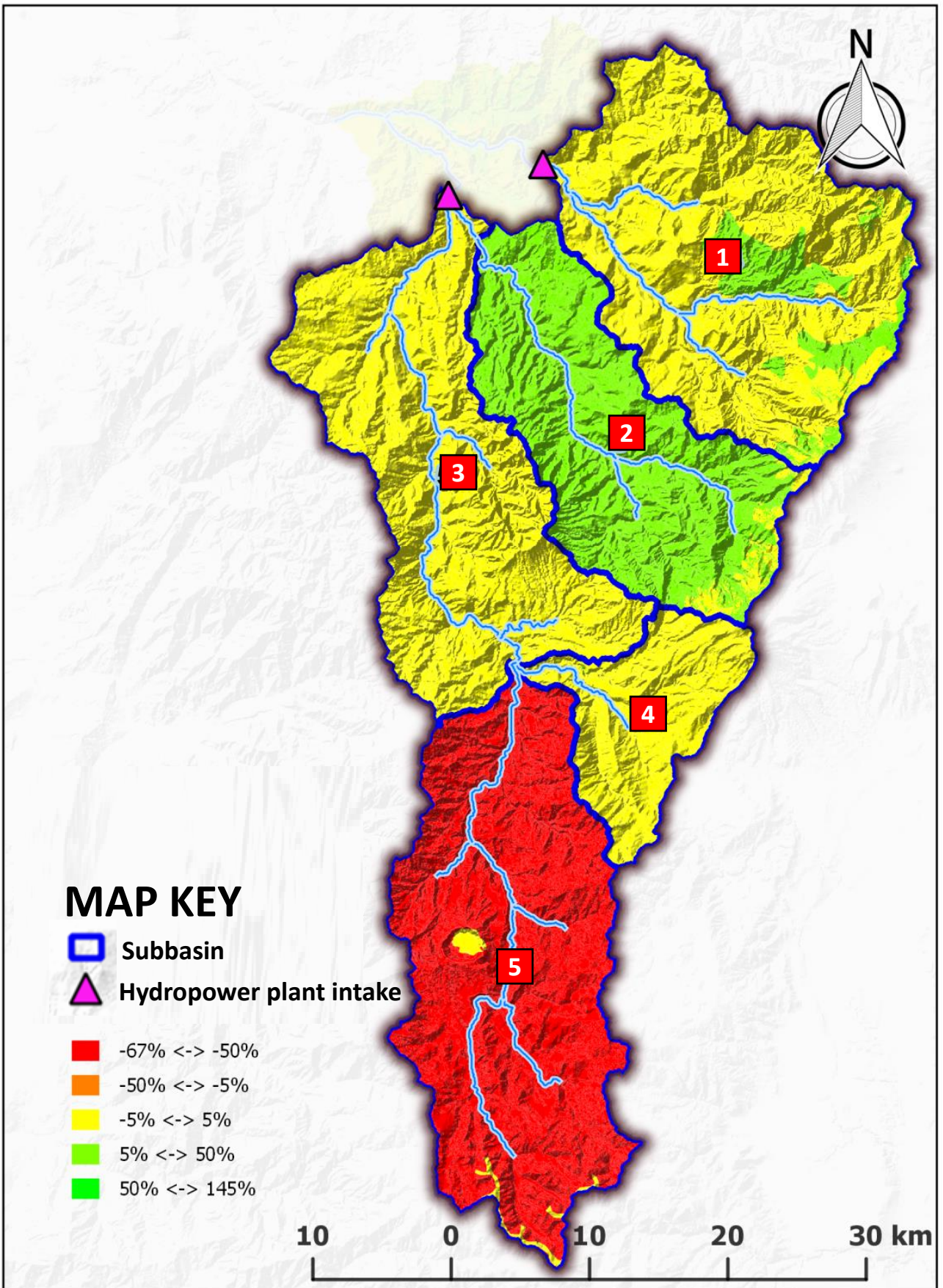
Younes, N. & E. Erazo. 2016. Landslide susceptibility analysis using remote sensing and GIS in the western Ecuadorian Andes. *Natural Hazards* 81(3): 1829-1859.



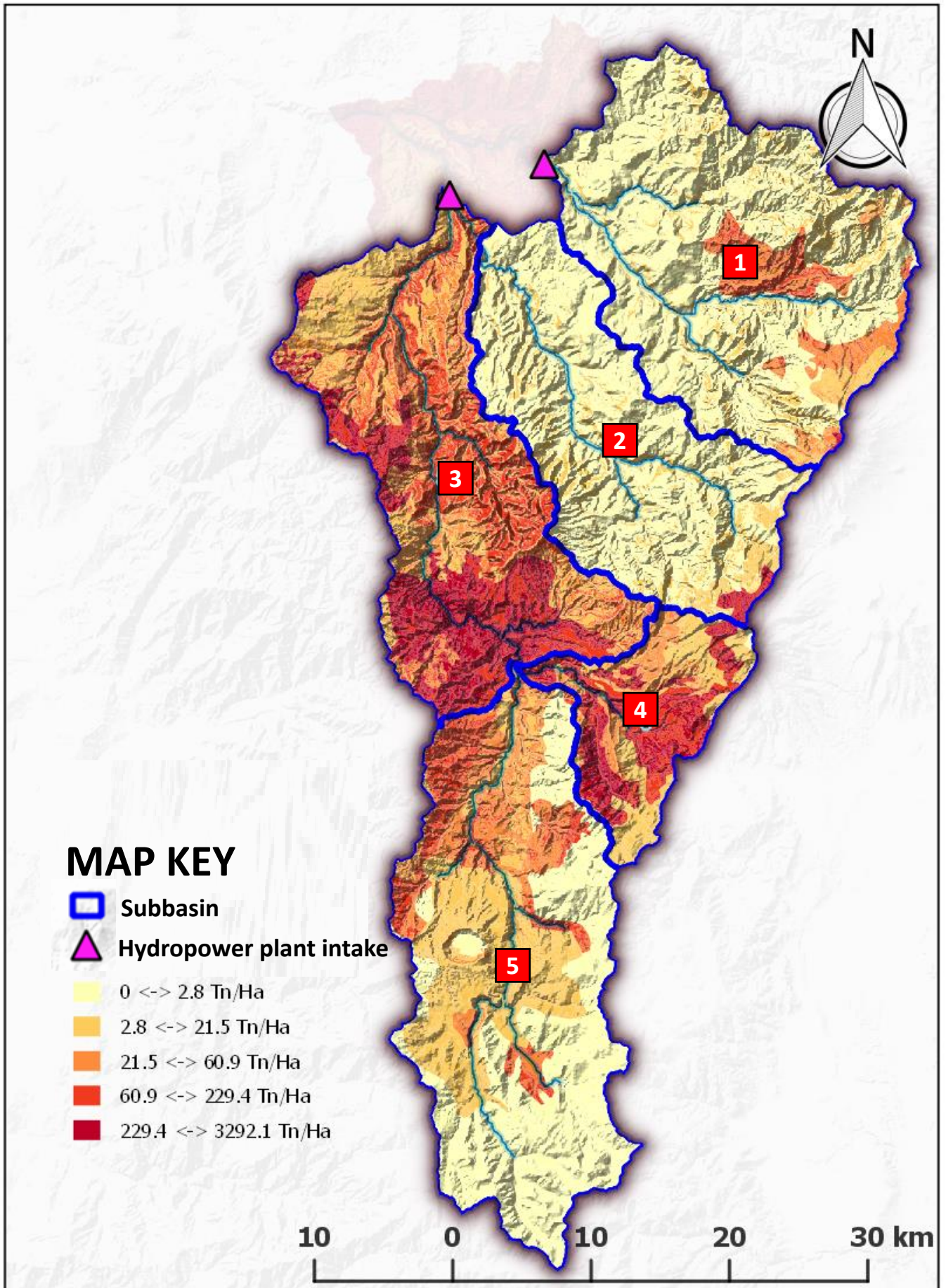
Map 1. Parishes and main localities in the Toachi - Pilatón water system.



Map 2. Land use in 2000 in the Toachi - Pilatón water system.



Map 3. Predicted change (percentage) in runoff during 2016 - 2035 with respect to the present condition in the Toachi - Pilatón water system.



Map 4. Predicted sediment contribution (metric tonnes per hectare) during 2016 - 2035 in the Toachi - Pilatón water system.

SISTEMATIZACIÓN DEL PROCESO DE SOCIALIZACIÓN

Para el proceso de sistematización se realizó en encuentros con los habitantes de las comunidades que se encuentran en las zonas de intervención.

En dichos encuentros se mencionaron los objetivos del proyecto, así como se recogieron las inquietudes y propuestas de los habitantes, esto tiene como fin realizar un proceso participativo que recopile la información necesaria en base a las necesidades reales de la comunidad, no solo frente a los problemas ocasionados por el cambio climático, sino también se consideran aspectos sociales, económicos y organizativos.

En estos procesos se contó con la participación activa de la comunidad. Se hicieron presentes hombres y mujeres y adultos mayores.

A continuación un resumen de estas propuestas y sugerencias que surgieron de parte de las comunidades

Propuestas:

- Que sea un proyecto que proteja las fuentes de agua, en especial las que se encuentran en la zona alta.
- Que motive a los agricultores cambiar sus sistemas productivos principalmente en las orillas de los ríos.
- Que se identifiquen los ojos de agua y priorizar su conservación.
- Que se impulse a los agricultores a iniciar los trámites de legalización en el caso de no contar con los documentos de legalización.
- Sería importante incluir cambio climático en la planificación del territorio.
- Es indispensable iniciar procesos de fortalecimiento de capacidades.

Comentarios generales recogidos en los eventos:

- Se debe fortalecer los procesos participativos y organizativos en las diferentes comunidades para asegurar el empoderamiento de las acciones a implementarse.
- Fortalecer los procesos de capacitación y transferencia de tecnología, en un idioma comprensible y práctico.
- Fortalecer el trabajo interinstitucional para complementar acciones en territorio y no se hagan dobles esfuerzos.

Luego del análisis de las propuestas de los compañeros y compañeras asistentes a estos encuentros, podemos concluir que el levantamiento de información inicial fue acertado y que recoge las necesidades de la comunidad.

El proyecto MATCH, tiene contemplado dentro de sus acciones, los procesos de capacitación y fortalecimiento de capacidades, así como la implementación de medidas de adaptación que serán complementadas por acciones paralelas.





ACTA REUNIÓN PROYECTO "REDUCCIÓN DE LA VULNERABILIDAD DE LA CENTRAL HIDROELÉCTRICA TOACHI PILATÓN ANTE LOS EFECTOS DEL CAMBIO CLIMÁTICO BAJO UN ENFOQUE DE MANEJO INTEGRAL ADAPTATIVO DE CUENCAS HIDROGRÁFICAS – MATCH"

Presente.-

La Dirección Nacional de Adaptación al Cambio Climático de la Subsecretaría de Cambio Climático del Ministerio del Ambiente del Ecuador, tiene como objetivo aumentar la resiliencia de los sistemas sociales, económicos y naturales frente al impacto del cambio climático, a través de la gestión de políticas, programas, acciones y proyectos de adaptación al cambio climático.

En este contexto, la Dirección Nacional de Adaptación al Cambio Climático ejecutó el proyecto "Análisis de la vulnerabilidad de centrales hidroeléctricas emblemáticas ante los efectos del cambio climático en siete subcuencas hidrográficas del Ecuador" en el Proyecto Hidroeléctrico Toachi Pilatón, y en la actualidad desarrolla el proyecto de implementación "Reducción de la vulnerabilidad de la central hidroeléctrica Toachi Pilatón ante los efectos del cambio climático bajo un enfoque de Manejo Integral Adaptativo de Cuencas Hidrográficas - MATCH", el cual tiene como fin, contribuir a la sostenibilidad de centrales hidroeléctricas a través de medidas de adaptación al cambio climático que permitan preservar la inversión realizada por el estado en hidroenergía, y mejorar la resiliencia de los sistemas sociales, económicos y naturales que existen en la cuenca aportante a la central hidroeléctrica. Este proyecto se encuentra enmarcado en la Estrategia Nacional de Cambio Climático, Plan Nacional de Cambio Climático y cambio de matriz energética del Ecuador.

Bajo los antecedentes antes mencionados se realiza la presente reunión referente al proyecto bajo la siguiente agenda:

- Presentación de los asistentes.
- Antecedentes
- Presentación del proyecto
- Preguntas
- Acuerdos

Llegan a los siguientes acuerdos:

- Reconocer y ratificar el proyecto "Reducción de la vulnerabilidad de la central hidroeléctrica Toachi Pilatón ante los efectos del cambio climático bajo un enfoque de Manejo Integral Adaptativo de Cuencas Hidrográficas – MATCH", el cual inserta medidas de adaptación que aumentan la resiliencia de la cuenca hidrográfica ante los efectos del cambio climático.
- Continuar el proceso de participación en la construcción de la propuesta del proyecto entre las partes en cuestión.



ANEXO No. 1

Polo Quevedo

OBSERVACIONES.-

- Transferir tecnología para opciones productivas como
hornos para caña de manera que no se talen los árboles.
- Mirar dentro de la cadena productiva mejorar o
cambiar de producto para figueras a lo largo del río.
- Legalización de predios por reforestar un área del predio
a cambio.



OBSERVACIONES.-

- Ordenar las riberas de los ríos de mejor manera en función de los intereses con los finqueros.
- Cuidar los ojos de agua en las zonas altas.
- Involucrar a los actores y tomadores de decisiones en el manejo integral de la cuenca
- Mirar como opción para implementar cercas eléctricas o varrederos.



ANEXO No. 1 / Sigchos

OBSERVACIONES.-

- Revisar los foros de agua para priorizar las áreas de reforestación, junto con el mapeo de comunidades.
- Manejo de cuencas - competencias compartidas entre el GAD de Sigchos y SENAGUA
- Documento de perfil de proyecto para continuar con un convenio.
- Cómo se podría incluir CC dentro de PDOT.
- Transferir guía metodológica de PDOT - inclusión de CC



Ministerio
del Ambiente

**CARTA GOBIERNO AUTÓNOMO DESCENTRALIZADO DE MANUEL CRONEJO ASTORGA (TANDAPI),
CANTÓN MEJÍA, PROVINCIA DE PICHINCHA PARA EL PROYECTO "REDUCCIÓN DE LA
VULNERABILIDAD DE LA CENTRAL HIDROELÉCTRICA TOACHI PILATÓN ANTE LOS EFECTOS DEL
CAMBIO CLIMÁTICO BAJO UN ENFOQUE DE MANEJO INTEGRAL ADAPTATIVO DE CUENCAS
HIDROGRÁFICAS – MATCH"**

Presente.-

La Dirección Nacional de Adaptación al Cambio Climático de la Subsecretaría de Cambio Climático del Ministerio del Ambiente del Ecuador, tiene como objetivo aumentar la resiliencia de los sistemas sociales, económicos y naturales frente al impacto del cambio climático, a través de la gestión de políticas, programas, acciones y proyectos de adaptación al cambio climático.

En este contexto, la Dirección Nacional de Adaptación al Cambio Climático ejecutó el proyecto "Análisis de la vulnerabilidad de centrales hidroeléctricas emblemáticas ante los efectos del cambio climático en siete subcuencas hidrográficas del Ecuador" en el Proyecto Hidroeléctrico Toachi Pilatón, y en la actualidad desarrolla el proyecto de implementación "Reducción de la vulnerabilidad de la central hidroeléctrica Toachi Pilatón ante los efectos del cambio climático bajo un enfoque de Manejo Integral Adaptativo de Cuencas Hidrográficas - MATCH", el cual tiene como fin, contribuir a la sostenibilidad de centrales hidroeléctricas a través de medidas de adaptación al cambio climático que permitan preservar la inversión realizada por el estado en hidroenergía, y mejorar la resiliencia de los sistemas sociales, económicos y naturales que existen en la cuenca aportante a la central hidroeléctrica. Este proyecto se encuentra enmarcado en la Estrategia Nacional de Cambio Climático, Plan Nacional de Cambio Climático y cambio de matriz energética del Ecuador.

Bajo los antecedentes antes mencionados el Gobierno Autónomo Descentralizado de la Parroquia Manuel Cornejo Astorga (Tandapi), del Cantón Mejía, provincia de Pichincha, reconoce y ratifica el proyecto "Reducción de la vulnerabilidad de la central hidroeléctrica Toachi Pilatón ante los efectos del cambio climático bajo un enfoque de Manejo Integral Adaptativo de Cuencas Hidrográficas – MATCH", el cual inserta medidas de adaptación que aumentan la resiliencia de la cuenca hidrográfica ante los efectos del cambio climático.

Sr. Patricio Ruiz

**Presidente Gobierno Autónomo Descentralizado
de la Parroquia Manuel Cornejo Astorga (Tandapi)**



Ministerio
del Ambiente

CARTA GOBIERNO AUTÓNOMO DESCENTRALIZADO DE PALO QUEMADO, CANTÓN SIGCHOS, PROVINCIA DE COTOPAXI PARA EL PROYECTO "REDUCCIÓN DE LA VULNERABILIDAD DE LA CENTRAL HIDROELÉCTRICA TOACHI PILATÓN ANTE LOS EFECTOS DEL CAMBIO CLIMÁTICO BAJO UN ENFOQUE DE MANEJO INTEGRAL ADAPTATIVO DE CUENCAS HIDROGRÁFICAS – MATCH"

Presente.-

La Dirección Nacional de Adaptación al Cambio Climático de la Subsecretaría de Cambio Climático del Ministerio del Ambiente del Ecuador, tiene como objetivo aumentar la resiliencia de los sistemas sociales, económicos y naturales frente al impacto del cambio climático, a través de la gestión de políticas, programas, acciones y proyectos de adaptación al cambio climático.

En este contexto, la Dirección Nacional de Adaptación al Cambio Climático ejecutó el proyecto "Análisis de la vulnerabilidad de centrales hidroeléctricas emblemáticas ante los efectos del cambio climático en siete subcuencas hidrográficas del Ecuador" en el Proyecto Hidroeléctrico Toachi Pilatón, y en la actualidad desarrolla el proyecto de implementación "Reducción de la vulnerabilidad de la central hidroeléctrica Toachi Pilatón ante los efectos del cambio climático bajo un enfoque de Manejo Integral Adaptativo de Cuencas Hidrográficas - MATCH", el cual tiene como fin, contribuir a la sostenibilidad de centrales hidroeléctricas a través de medidas de adaptación al cambio climático que permitan preservar la inversión realizada por el estado en hidroenergía, y mejorar la resiliencia de los sistemas sociales, económicos y naturales que existen en la cuenca aportante a la central hidroeléctrica. Este proyecto se encuentra enmarcado en la Estrategia Nacional de Cambio Climático, Plan Nacional de Cambio Climático y cambio de matriz energética del Ecuador.

Bajo los antecedentes antes mencionados el Gobierno Autónomo Descentralizado de la Parroquia Palo Quemado, Cantón Sigchos, Provincia de Cotopaxi, reconoce y ratifica el proyecto "Reducción de la vulnerabilidad de la central hidroeléctrica Toachi Pilatón ante los efectos del cambio climático bajo un enfoque de Manejo Integral Adaptativo de Cuencas Hidrográficas – MATCH", el cual inserta medidas de adaptación que aumentan la resiliencia de la cuenca hidrográfica ante los efectos del cambio climático.

Sr. Rodrigo Changoluisa

Gobierno Autónomo Descentralizado

de la Parroquia Palo Quemado



Ministerio
del Ambiente

CARTA GOBIERNO AUTÓNOMO DESCENTRALIZADO DE PAMPAS DE AGUILLA, CANTÓN SIGCHOS, PROVINCIA DE COTOPAXI PARA EL PROYECTO "REDUCCIÓN DE LA VULNERABILIDAD DE LA CENTRAL HIDROELÉCTRICA TOACHI PILATÓN ANTE LOS EFECTOS DEL CAMBIO CLIMÁTICO BAJO UN ENFOQUE DE MANEJO INTEGRAL ADAPTATIVO DE CUENCAS HIDROGRÁFICAS – MATCH"

Presente.-

La Dirección Nacional de Adaptación al Cambio Climático de la Subsecretaría de Cambio Climático del Ministerio del Ambiente del Ecuador, tiene como objetivo aumentar la resiliencia de los sistemas sociales, económicos y naturales frente al impacto del cambio climático, a través de la gestión de políticas, programas, acciones y proyectos de adaptación al cambio climático.

En este contexto, la Dirección Nacional de Adaptación al Cambio Climático ejecutó el proyecto "Análisis de la vulnerabilidad de centrales hidroeléctricas emblemáticas ante los efectos del cambio climático en siete subcuencas hidrográficas del Ecuador" en el Proyecto Hidroeléctrico Toachi Pilatón, y en la actualidad desarrolla el proyecto de implementación "Reducción de la vulnerabilidad de la central hidroeléctrica Toachi Pilatón ante los efectos del cambio climático bajo un enfoque de Manejo Integral Adaptativo de Cuencas Hidrográficas - MATCH", el cual tiene como fin, contribuir a la sostenibilidad de centrales hidroeléctricas a través de medidas de adaptación al cambio climático que permitan preservar la inversión realizada por el estado en hidroenergía, y mejorar la resiliencia de los sistemas sociales, económicos y naturales que existen en la cuenca aportante a la central hidroeléctrica. Este proyecto se encuentra enmarcado en la Estrategia Nacional de Cambio Climático, Plan Nacional de Cambio Climático y cambio de matriz energética del Ecuador.

Bajo los antecedentes antes mencionados el Gobierno Autónomo Descentralizado de la Parroquia Pampas de Aguilla, Cantón Sigchos, Provincia de Cotopaxi, reconoce y ratifica el proyecto "Reducción de la vulnerabilidad de la central hidroeléctrica Toachi Pilatón ante los efectos del cambio climático bajo un enfoque de Manejo Integral Adaptativo de Cuencas Hidrográficas – MATCH", el cual inserta medidas de adaptación que aumentan la resiliencia de la cuenca hidrográfica ante los efectos del cambio climático.



Sr. Mario Porras

**Gobierno Autónomo Descentralizado
de la Parroquia Pampas de Aguilla**



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: 1

EVENTO:

Presentación Proyecto MATCH-GAD Taudapi

LISTA DE PARTICIPANTES

FECHA: 21/03/2015

HORA: 11:30

| N° | NOMBRE | CARGO | INSTITUCIÓN / ÁREA MAE | CORREO ELECTRONICO | TELEFONOS | FIRMA |
|----|------------------|----------------------------|--------------------------|------------------------------------|------------|-------|
| 1 | Nicolás Zambrano | Proyecto COXBRABO CHECC | SCC - TIAE GAD | carlos.zambrano ambiente.gub.ec | 0987176547 | |
| 2 | Julian H Lopez | LICE-PRES. | Presidencia U.P. Taudapi | | 0992507450 | |
| 3 | BAYARDO ENRIQUEZ | TEC AMBIENTAL | CELEC - HIDROTAPI | bayardo.enr.garc@ambiente.gub.ec | 0986762737 | |
| 4 | Luis Paredes C. | Presidencia U.P. Taudapi | CELEC - HIDROTAPI | luis.paredes@ambiente.gub.ec | 0984666555 | |
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| 9 | | | | | | |

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|---|--|-------------------------------|
|  Ministerio del Ambiente | MINISTERIO DEL AMBIENTE Sistema de Gestión de Procesos | |
| | Fecha de revisión: | REGISTRO DE ASISTENCIA |
| Versión: 02 | Página: 1 | |

EVENTO: Presentación Proyecto MATCH - GAD Palo Quemado

LISTA DE PARTICIPANTES

FECHA: 03/09/2015 HORA: 17:00

| N° | NOMBRE | CARGO | INSTITUCIÓN / ÁREA MAE | CORREO ELECTRONICO | TELEFONOS | FIRMA |
|----|---------------------|---|-------------------------|---------------------------------|------------|---|
| 1 | Nicolás Zambrano | Coordinador Proyecto CHECC | MAE-SCC | carlos.zambrano@ambiente.gob.ec | 0918717657 |  |
| 2 | América Ruiz | Presidenta Producers Producers del Zorchi | | | 0999569946 |  |
| 3 | Marcos Changuelusa | Vocal | GAD. PARROQUIAL | marcochanguelusa@gmail.com | 0945282428 |  |
| 4 | Rodrigo Changuelusa | Presidente | GAD P. R. El Quimsa | rodrigochanguelusa@yahoo.es | 0994180465 |  |
| 5 | Lennis Yuya | Secretaria Técnica | GAD. P. R. Palo Quemado | lennisalvarez@york.com | 0980141143 |  |
| 6 | Manuel Guardia | Vocal | GAD. P. R. | carlihuaraca12@gmail.com | 0981471457 |  |
| 7 | Rosa Harapinda | Vicepresidenta GADPRPA | GADPR P. Q. | rosa.harapinda@york.com | 0992599408 |  |
| 8 | Luisa Pineda | Especialista Ambiental | CHECC TP HIDROGRAFIA | harapinda@york.com | 008166-855 |  |
| 9 | | | | | | |



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Ambiente

MINISTERIO DEL AMBIENTE
Sistema de Gestión de Procesos

Fecha de revisión:

REGISTRO DE ASISTENCIA

Código:

MAE-REG-PRO-01.6

Versión: 02

Página: 1

EVENTO: Resolución Proyecto MATCH-GAD Los Pampas

LISTA DE PARTICIPANTES

FECHA: 03/09/15

HORA: 19:00

| N° | NOMBRE | CARGO | INSTITUCIÓN / ÁREA MAE | CORREO ELECTRONICO | TELEFONOS | FIRMA |
|----|------------------|----------------------------|------------------------|---------------------------------|------------|-------|
| 1 | Nicolás Zambiano | Coordinador Proyecto SIECC | MAE - SCC | Carlos.Zambiano@ambiente.gob.ec | 0987176549 | |
| 2 | Mario Porras | Presidente | GAD Los Pampas | mario_porras1908@hotmail.com | 0981473252 | |
| 3 | Elizabeth Aji | Secretaria Tesorera | GAD Los Pampas | elizabethaji@hotmail.com | | |
| 4 | Joaquín Soyencia | Vocal | GAD Los Pampas | | 0992872668 | |
| 5 | Leonora Porras | Vicepresidente | GAD Los Pampas | leonoraporras@hotmail.com | 099901185 | |
| 6 | Mesías Guller | Vocal | GAD Los Pampas | mesiasguller@hotmail.com | 0990854421 | |
| 7 | Carlos Hueroez | Vocal | GAD Los Pampas | | 099509572 | |
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Ministerio del Ambiente

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Sistema de Gestión de Procesos

Fecha de revisión:

REGISTRO DE ASISTENCIA

Código:

MAE-REG-PRO-01.6

Versión: 02

Página: 1

EVENTO: Presentación Proyecto MATCH - GAD Sigchos

LISTA DE PARTICIPANTES

FECHA: 03/09/15

HORA: 10:00

| N° | NOMBRE | CARGO | INSTITUCIÓN / ÁREA MAE | CORREO ELECTRONICO | TELEFONOS | FIRMA |
|----|------------------|----------------------------|-------------------------|---------------------------------|------------------|-------|
| 1 | Nicolás Zambrano | Coordinador Proyecto CHECC | MAE-SCC | Carlos.zambrano@ambiente.gov.ec | 3987600 ext 1315 | |
| 2 | Carlos Pacheco | Director Desarrollo | GADMS | carlos.pacheco@yahoop.es | 0991481927 | |
| 3 | Tatiana Ojeda | Coordinadora Técnica | GADMS | sofyolien@telcel.com | 0994465850 | |
| 4 | Lidia Paredes C. | Encargada Desarrollo | CELEC EP - Hidroenergía | lidia.paredes@celce.gub.ec | 098466-255 | |
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**Proyecto para potenciar la resiliencia al cambio climático en
la cuenca hídrica Toachi - Pilatón**

Memoria

Taller inicial de formulación

Unión del Toachi

República del Ecuador

15 de julio de 2016

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- Anexo 1. Registro de participantes
- Anexo 2. Mapas
- Anexo 3. Marco de resultados propuesto
- Anexo 4. Ubicación de las estaciones meteorológica e hidrológicas de INAMHI

Introducción

El Ministerio del Ambiente de Ecuador (MAE), en colaboración con CAF - Banco de Desarrollo de América Latina – van a presentar al Fondo de Adaptación la propuesta del proyecto para potenciar la resiliencia al cambio climático en la cuenca hídrica Toachi – Pilatón. 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 ha sido conceptualizada por el MAE, quien ha realizado consultas preliminares a varios actores públicos y privados. El MAE tiene información sobre el probable impacto del cambio climático en el sistema hídrico Toachi – Pilatón a partir de los resultados del proyecto “análisis de la vulnerabilidad de las centrales hidroeléctricas priorizadas ante los efectos del cambio climático” que fue realizado por la empresa TECNALIA. Complementariamente, en julio de 2016 se realizó un sondeo preliminar de los actores locales que sirva de base para realizar un primer taller de consulta para analizar las ideas iniciales del MAE.

Se prevé presentar el concepto de proyecto al Fondo de Adaptación a finales de julio de 2016 con miras a que sea aprobado en la 28 reunión de la junta directiva del Fondo de Adaptación que se realizará el 4 de octubre de 2016 en Bonn (Alemania). A efectos de avanzar en la preparación del concepto, se requiere analizar las ideas iniciales con los actores claves públicos y privados. Consecuentemente, se organizó el taller inicial en la localidad Unión del Toachi con el objetivo de presentar las ideas del concepto a los posibles socios clave, recibir retroalimentación e iniciar el proceso de preparar la propuesta de concepto para ser presentado hasta el 01 de agosto de 2016¹.

El taller se realizó en la casa comunal de la localidad Unión del Toachi (Foto 1).

Agenda

La reunión tuvo los siguientes elementos:

08:30 h Registro de participantes

09:00 h Bienvenida

09:15 h Presentación de participantes

09:30 h Revisión de la agenda

09:45 h Introducción al cambio climático

10:00 h El Fondo de Adaptación

10:15 h Cambio climático en la cuenca Toachi – Pilatón

10:30 h Concepto de proyecto

11:00 h Trabajo en grupo. Análisis de situación

¹ Fecha límite para ingresar propuestas a ser consideradas en 28 reunión de la junta directiva del Fondo de Adaptación.

- 12:00 h Presentación de los grupos
- 13:00 h Almuerzo
- 14:00 h Trabajo en grupo. Acciones del proyecto
- 15:00 h Presentación de los grupos
- 16:00 h Próximos pasos
- 16:30 h Cierre

Bienvenida

La bienvenida estuvo a cargo de Nicolás Zambrano del Ministerio del Ambiente y Dayana Vega de CAF (Foto 2 y Foto 3), quienes agradecieron la asistencia de los participantes y proveyeron información sobre el marco general de la reunión. Participaron en la reunión 39 personas, el registro de asistencia está en el Anexo 1.

Introducción al cambio climático

La presentación estuvo a cargo de Nicolás Zambrano del MAE, quien explicó el cambio climático global y sus impactos en Ecuador. También resumió el marco político e institucional en el que se desarrollan las acciones de mitigación y adaptación al cambio climático.

El Fondo de Adaptación

La presentación estuvo a cargo de Segundo Coello, consultor de CAF a cargo de la preparación del proyecto. Se 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.

Cambio climático en la cuenca Toachi – Pilatón

La presentación estuvo a cargo de Nicolás Zambrano del MAE (Foto 4), quien explicó con los mapas disponibles para los grupos (Anexo 2) que el escenario futuro podría ser disminución de la precipitación e incremento de la escorrentía de sedimentos. En porcentaje la mayor disminución de precipitación sería en la parte alta de la cuenca del río Toachi. La disminución de precipitación en la parte baja de ambas cuencas es menor en porcentaje, pero este sector tiene mucha mayor precipitación. Además, hay fuerte presión de deforestación en los bosques de la estribación, lo que agravaría la situación.

Concepto de proyecto

La presentación estuvo a cargo de Segundo Coello, consultor de CAF, quien resumió la propuesta de marco de resultados y presupuesto que se ha esbozado al momento. El proyecto tendría tres componentes: (i) conservar la cobertura vegetal existente, (ii) adaptar las actividades productivas a las nuevas condiciones derivadas del cambio climático y (iii) robustecer las capacidades locales para implementar medidas de adaptación al cambio climático. El proyecto generaría tres resultados y siete productos, tendría una

duración de cuatro años y requeriría un financiamiento de unos USD2.4 millones. 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 indicó que luego de presentar el concepto al Fondo de Adaptación, se deberá trabajar en desarrollar el proyecto durante los próximos meses. Se trataría de tener listo el documento de proyecto para presentarlo al Fondo de Adaptación en diciembre de 2016, con miras a que sea aprobado en los primeros meses de 2017.

Mesas de trabajo

Los participantes conformaron dos grupos de trabajo que analizaron la cuenca del río Toachi (grupo 1) y la cuenca del río Pilatón (grupo 2). Los grupos realizaron dos sesiones de trabajo, luego de cada sesión se realizó una presentación de resultados en plenaria para tener comentarios y recomendaciones de los demás participantes.

Primera sesión de trabajo en grupo. Análisis de situación

Cuenca del río Toachi

El grupo de cuenca del río Toachi (Foto 5 y Foto 6) indicó que, en efecto, hay un severo problema de deforestación en la cuenca. A esto se suma la invasión de zonas boscosas para ampliar el área agrícola. Se indicó que los bosques protectores existen sólo en papel pues no hay manejo y están muy intervenidos. Igualmente, se indicó que la Reserva Ecológica Los Ilinizas estaría invadida en un 65%.

Los productores de caña de azúcar indicaron que cada finquero usa unos tres árboles semanales para la producción de panela. La madera ha escaseado y cada vez hay que traerla de más lejos o comprarla. La Asociación Flor de Caña de la localidad de Palo Quemado, está trabajando con Maquita Cushunchic para desarrollar la producción de panela orgánica con miras a exportación. Los finqueros están interesados en incorporar tecnología para mejorar la producción. Se está pensando en buscar un combustible alternativo para cocinar el jugo de caña.

La producción agropecuaria tiene bajos rendimientos, predominan los sistemas de producción extensivos. Es común la siembra en laderas y la invasión de las riberas de los ríos. Se considera que un incentivo para que los agricultores se interesen en reforestar y conservar el bosque es apoyarles para incrementar los rendimientos por hectárea.

Se recomendó que las acciones de reforestación se centren en las pendientes y en recuperar las riberas de los ríos principales y sus aportantes. Se resaltó que es indispensable asegurar el cuidado de las plantas que se siembren, no sólo enfocarse en plantar, sino en cuidarles los primeros dos o tres años.

Con respecto a la idea de robustecer la gestión de los bosques protectores existentes, se recomendó enfocarse en los bosques protectores Toachi – Pilatón y Zarapullo. También sería necesario considerar robustecer la gestión de la reserva Los Ilinizas que está en muy mal estado.

Con respecto a la idea de presas artesanales de retención de sólidos, los participantes consideran que tal vez no serían necesarias. Se mencionó que incluso podrían ser destruidas por las fuertes corrientes del invierno. No obstante, se recomendó no excluir la idea del concepto de proyecto. Hay que tener un mejor criterio técnico sobre la utilidad de este tipo de presas en el sistema hídrico Toachi – Pilatón. En todo caso, se destacó que, aunque sean unidades artesanales, será necesario que haya un diseño de ingeniería para asegurar su adecuado funcionamiento.

Con respecto a mejorar los cultivos, se recomendó que se cubra todo el sector desde Sigchos hasta la Unión del Toachi. De ser posible valdría considerar mejoras en los sistemas de riego e incentivar el agroturismo.

Los participantes estuvieron de acuerdo en que hay que mejorar la recopilación de información climatológica, pero destacaron que es necesario asegurar que la información llegue a los gobiernos locales y los pobladores.

Finalmente, el grupo indicó que hace falta mapas de mayor detalle para poder precisar las áreas de intervención.

Los resultados del trabajo en grupo están en la Figura 1.

Cuenca del río Pilatón

El grupo destacó que es necesario pensar en robustecer la conectividad de los hábitats y ecosistemas. Se planteó una serie de criterios para seleccionar los sitios de intervención del proyecto (Figura 2). Se planteó que el proyecto también considere intervenir en las zonas de riesgo de deslizamientos e inundaciones que existen en esta cuenca.

Con respecto a monitoreo climático, se recomendó repotenciar las estaciones meteorológicas existentes que no están operativas. Es probable que adicionalmente se requiera instalar alguna estación adicional, pero esto debe ser analizado con más detalle. El representante del INAMHI proporcionó un mapa de ubicación de las estaciones meteorológicas e hidrológicas en ambas cuencas (Anexo 4).

Segunda sesión de trabajo en grupo. Acciones del proyecto

Cuenca del río Toachi

Con respecto a áreas para ampliar la cobertura vegetal, el grupo anotó para cada parroquia las localidades que se deberían considerar (Figura 3). No obstante, hacen falta mapas con mayor detalle para ubicar los sitios. Se mencionó que la información sobre uso de suelo es del 2000 (Anexo 2) y no corresponde a la situación actual.

Con respecto a robustecer la gestión de áreas existentes, el grupo propuso que se considere la reserva Los Ilinizas, pero robusteciendo la gestión de la superficie existente pues hay reclamos por terrenos.

Con respecto a robustecer la producción agropecuaria, se propuso trabajar con mejoramiento de pastos en unas 250 h con la Asociación de Ganaderos de Las Pampas, y mejorar unas 200 ha de caña de azúcar con la Asociación Flor de Caña de Palo Quemado. Se recomendó incluir en el proyecto apoyar la mejora

tecnológica de la producción, en particular mejorar la eficiencia energética de la cocción del jugo de caña. También se propuso trabajar con los productores de Quinticusig (Sigchos), quienes producen vino de mortiño.

Con respecto a monitoreo climático, se sugirió incorporar dos estaciones de monitoreo en esta cuenca. Sin embargo, es necesario el criterio técnico del INAMHI.

Se estuvo de acuerdo en incorporar adaptación en los planes de desarrollo parroquial.

Finalmente, se recomendó que las acciones de comunicación y educación ambiental incorporen un componente de educación formal con escuelas y colegios. Además de considerar el uso de medios de comunicación locales y material informativo para el público en general.

Cuenca del río Pilatón

El grupo preparó un mapa hablado en el que se ubica los tributarios de la cuenca que se deberían analizar para intervención (Figura 4). Igualmente destacaron que la información de uso de suelo es muy antigua y que es necesario tener mapas actualizados con mayor detalle para poder decidir las áreas de intervención del proyecto.

Próximos pasos

Se destacó que el concepto será preparado teniendo en cuenta los resultados del taller y que será enviado al Fondo de Adaptación el viernes 29 de julio de 2016. Luego de esto se organizarán reuniones adicionales para precisar acciones con los grupos que se han identificado.

En octubre o noviembre habría un segundo taller con todos los actores clave para revisar el borrador de proyecto y preparar la versión final que se presentaría al Fondo de Adaptación en diciembre de 2016.

Cierre

La clausura estuvo a cargo de Nicolás Zambrano del MAE, quien agradeció los aportes y activa participación de los presentes.

Figuras

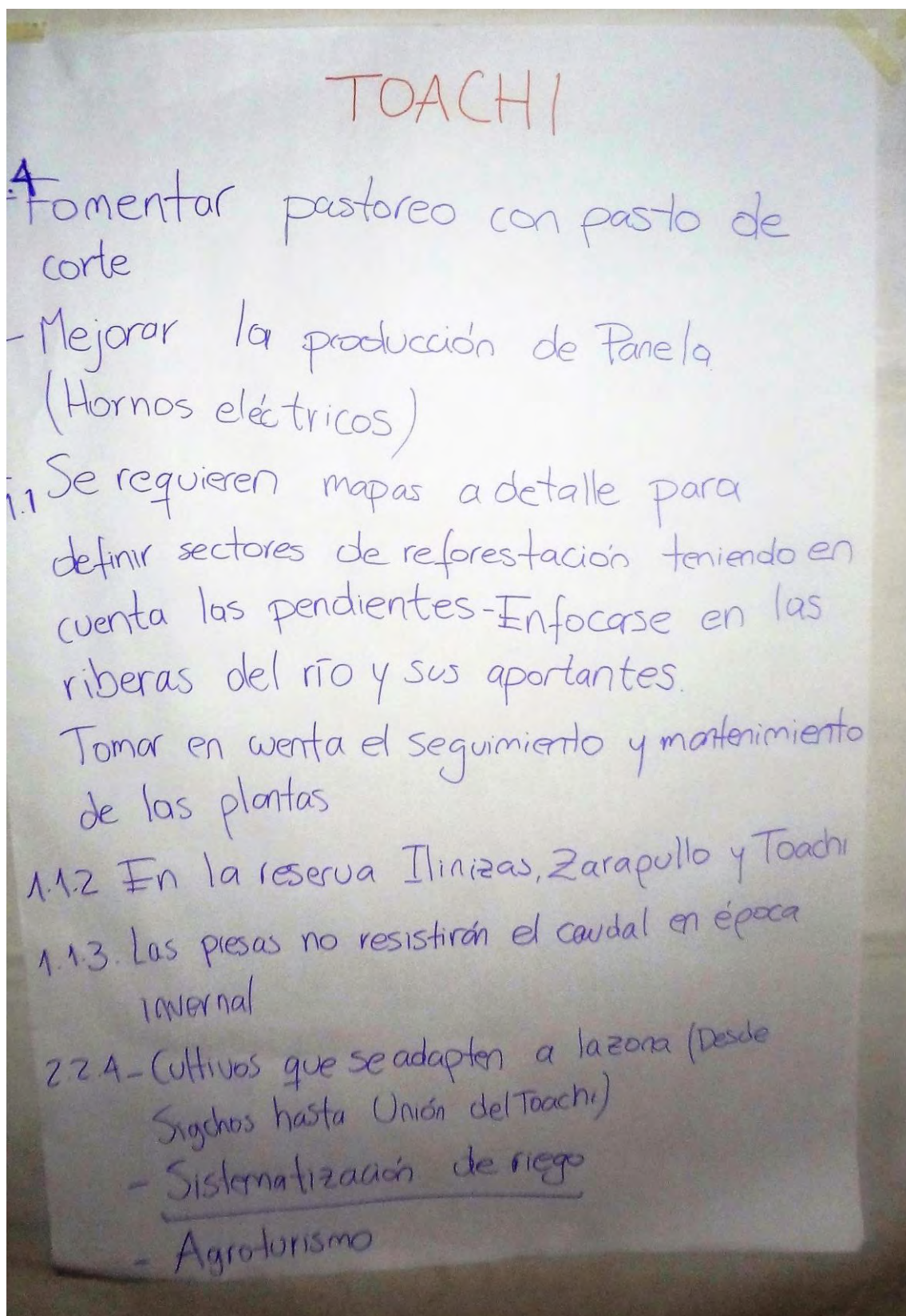


Figura 1. Resultados del trabajo del grupo 1 (cuenca del río Toachi) en la primera sesión de trabajo grupal.

TOACHI

- 3.3.5 - Invertir en aplicaciones de información a la comunidad
- Invertir en el mantenimiento, calibración y sistema de base datos
 - Transmitir información en radios municipales
 - Presupuesto para personal y manejo de la información (luego entregar a GAD)
- 3.3.6 - Ya se tiene establecido cada GAD (pasar este recurso a otro ítem)
- 3.3.7 - De acuerdo con la sensibilización en toda la zona. (toda la población)

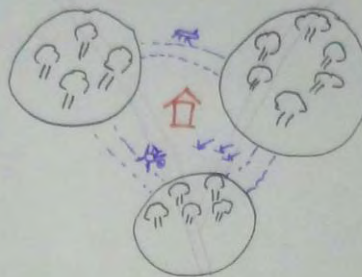
Figura 1. Continuación.

CUENCA DEL RÍO "PILATÓN"

CRITERIO DE SELECCIÓN DE ZONA GEOGRÁFICA

1. ÁREAS AFECTADAS POR INCREMENTO DE PLUVIOSIDAD
- CORREDORES ECOLÓGICOS
- PROPIEDADES PRIVADAS
2. RESERVAS PRIVADAS
- ÁREAS QUE APROVECHAN LOS SERVICIOS DEL ECOSISTEMA
3. ZONA DE MAYOR APORTACIÓN DE SEDIMENTOS
4. ÁREAS CON POTENCIAL TURÍSTICO
- ÁREAS DE PRODUCCIÓN (PUNTO VERDE)
- ÁREAS DE GANADERÍA Y AGRICULTURA SUSTENTABLE
5. UNA ESTACIÓN HIDROMÉTRICA DONDE FALTA CONTROL
6. INVERSIÓN EN ZONAS DE ALTO RIESGO (DESLAVES, INUNDACIONES)
7. ÁREAS RURALES - PRIORIDAD
- ÁREAS URBANAS - ALTO RIESGO

MEDIDAS RECOMENDADAS



- No Necesario en Pilatón

- Mejoramiento especies
- Productos punto verde - café, cacao
- Planificación Uso de Suelo

- Repotenciar estaciones existentes.



Figura 2. Resultados del trabajo del grupo 2 (cuenca del río Pilatón) en la primera sesión de trabajo grupal.

CUENCAS DEL R. TOACHI

① → Parroquia Tsinlivi - Incorporación de Vegetación
 - Pilapuchin, Tunguichi, Itualó, Chimaló Bajo, Guangumala, El Rodeo, Cochalo, Colaguila.

Parroquia Chugchitan

Guayama San Pedro, Guayama Grande, Sigui, Guanto, Chimaló Alto, Canjolo Alto

→ Parroquia Sigchos - Sta Cochalo - Aliso - Jaló, Quinticusig, Yuncusig - Tiliguila - Tagna - Santa Rosa - Guacusig - Amaliquin - Antimpe - Guarumal - Guarumal Grande - Asache - Cutzualó

→ Parroquia Las Pampas - San Juan, Sn. Pablo, La Pelicia, Campo Alegre Bajo, Las Juntas, Galapagos - Rio Tingó - Campo Alegre Alto.

→ Palo Quemado - Sarapullo (cuencas) - Praderas del Toachi - La Florida, Los Minos - Santa Rosa.

② → Robustecer las ~~2200~~ Ha. de Reserva. lo existente ILINISAS

③ → NO APLICA!

④ → 250 Ha de gasto y As. Ganaderos Las Pampas.

200 Ha. para mejorar la Caña Asociación Flor de Caña, Sn. Pablo, Oro Pasa.

Asociación Vino de Mortiño Sigchos
 Punto Verde

⑤ → Ampliar el Sistema de Monitoreo en la Cuenca (2)

⑥ → Incorporar y Coordinar con los GADs Parroquial

⑦ → Plan de educación Ambiental con Escuelas Locales y Medios de Comunicación Material Informativo

Figura 3. Resultados del trabajo del grupo 1 (cuenca del río Toachi) en la segunda sesión de trabajo grupal.

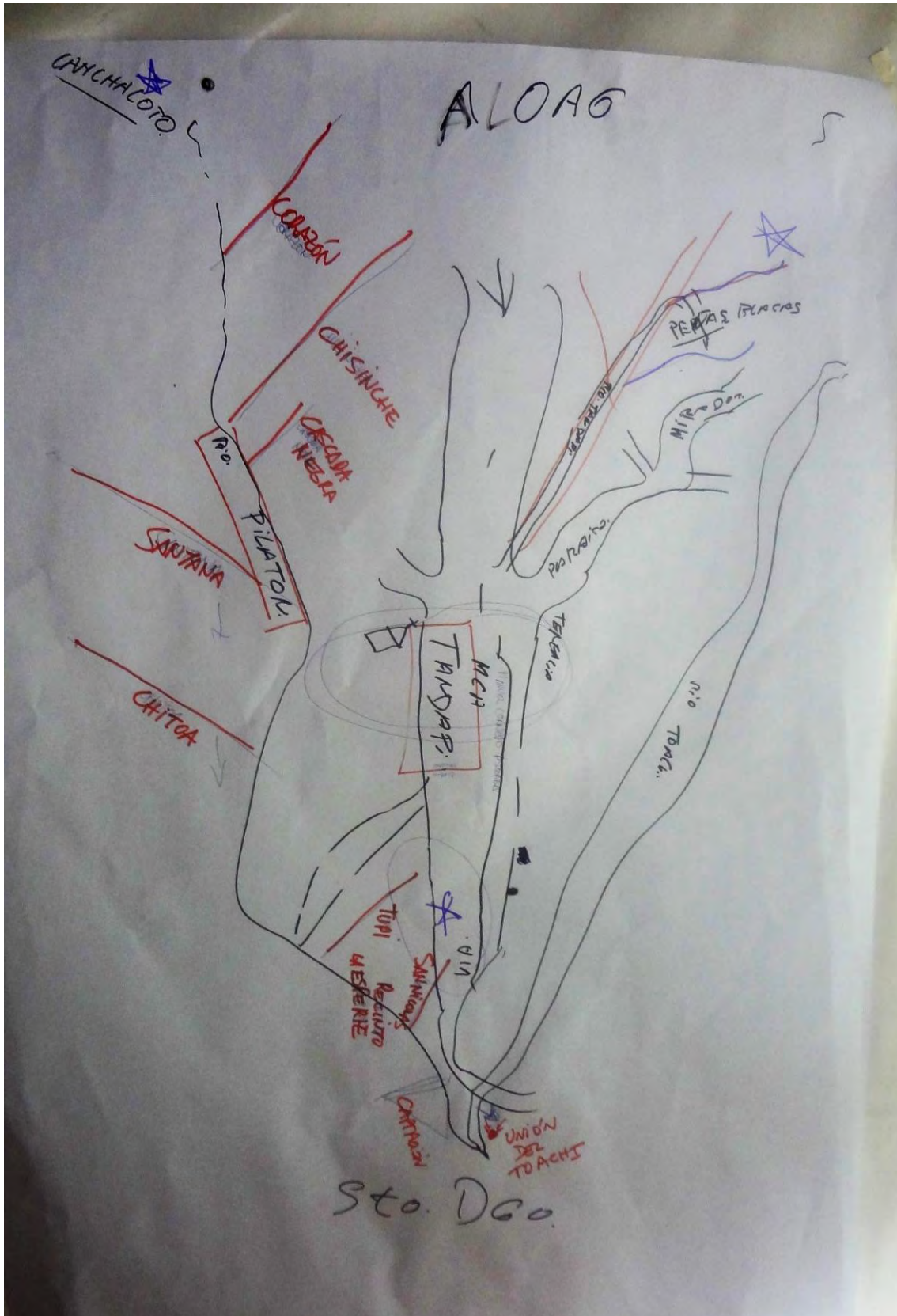


Figura 4. Resultados del trabajo del grupo 2 (cuena del río Pilatón) en la segunda sesión de trabajo grupal.

Fotos



Foto 1. Casa comunal de la localidad de Unión del Toachi.



Foto 2. Bienvenida a cargo de Nicolás Zambrano del Ministerio del Ambiente.



Foto 3. Bienvenida a cargo de Dayana Vega de CAF.



Foto 4. Presentación de Nicolás Zambrano sobre los posibles impactos del cambio climático en el sistema hídrico Toachi - Pilatón.



Foto 5. Primera sesión de trabajo, grupo 1 (río Toachi).

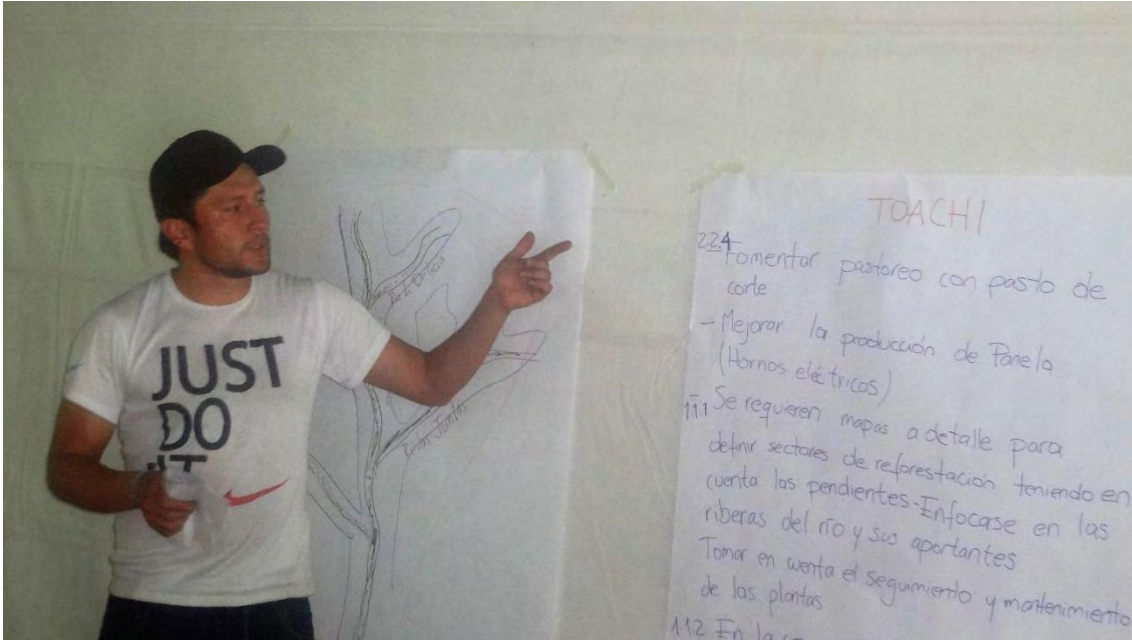


Foto 6. Primera sesión de trabajo, grupo 1 (río Toachi). Presentación de resultados.



Foto 7. Primera sesión de trabajo, grupo 2 (río Pilatón).



Foto 8. Primera sesión de trabajo, grupo 2 (río Pilatón). Presentación de resultados.



Foto 9. Segunda sesión de trabajo, grupo 1 (río Toachi).



Foto 10. Segunda sesión de trabajo, grupo 1 (río Toachi). Presentación de resultados.



Foto 11. Segunda sesión de trabajo, grupo 2 (río Pilatón).



Foto 12. Segunda sesión de trabajo, grupo 2 (río Pilatón). Presentación de resultados.

Anexo 1. Registro de participantes



Ministerio
del Ambiente

Taller inicial formulación del proyecto para potenciar la resiliencia al
cambio climático en la cuenca hídrica Toachi - Pilatón

Unión del Toachi, 15 de julio de 2016



BANCO DE DESARROLLO
DE AMÉRICA LATINA

POR FAVOR ESCRIBIR EN LETRA DE IMPRENTA

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Taller inicial formulación del proyecto para potenciar la resiliencia al
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Unión del Toachi, 15 de julio de 2016



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Taller inicial formulación del proyecto para potenciar la resiliencia al
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Unión del Toachi, 15 de julio de 2016



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Unión del Toachi, 15 de julio de 2016



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|--------------------|----------------------------------|--------------------|--------------|---------------------|--|
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Taller inicial formulación del proyecto para potenciar la resiliencia al
cambio climático en la cuenca hídrica Toachi - Pilatón

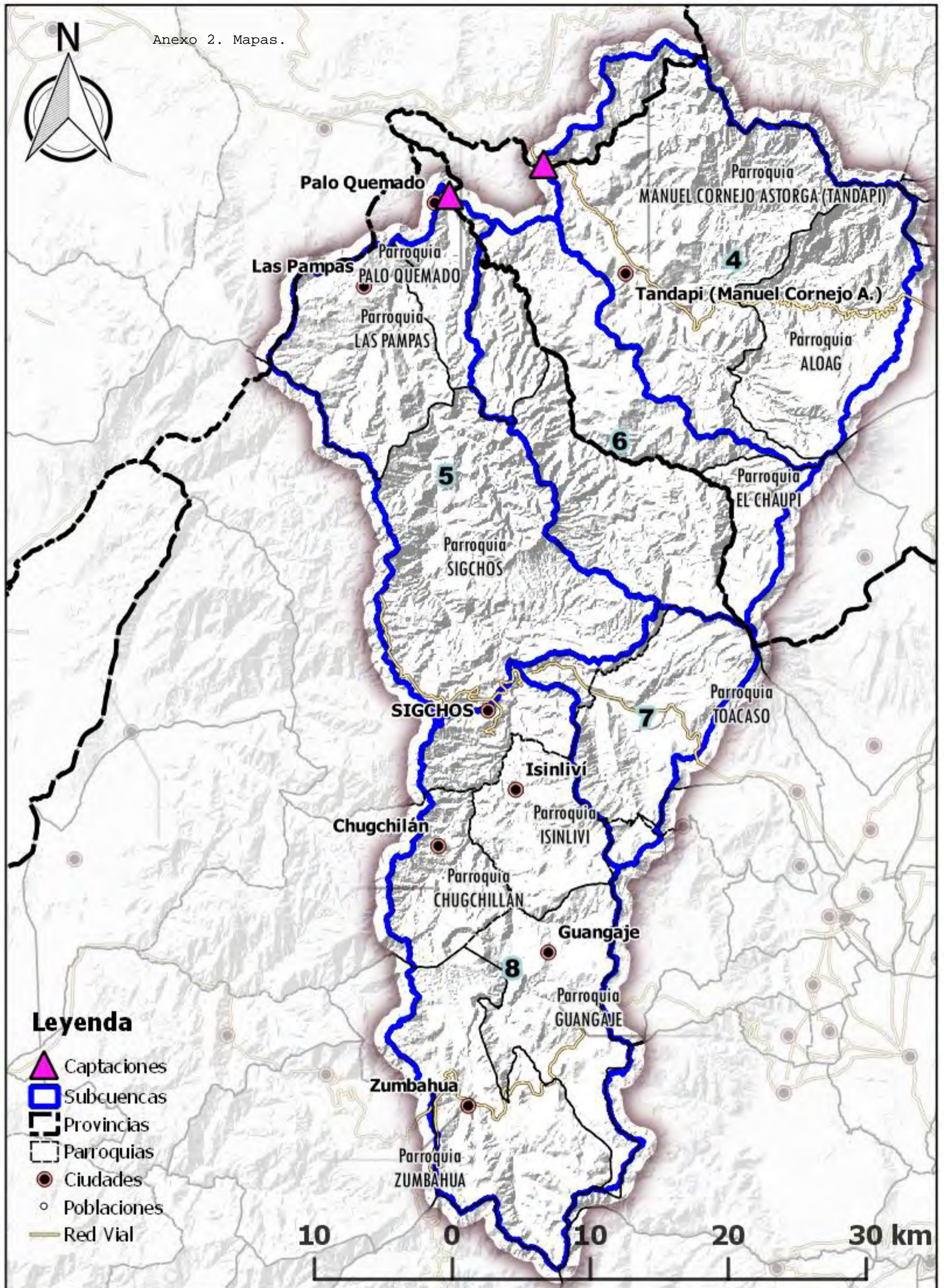
Unión del Toachi, 15 de julio de 2016



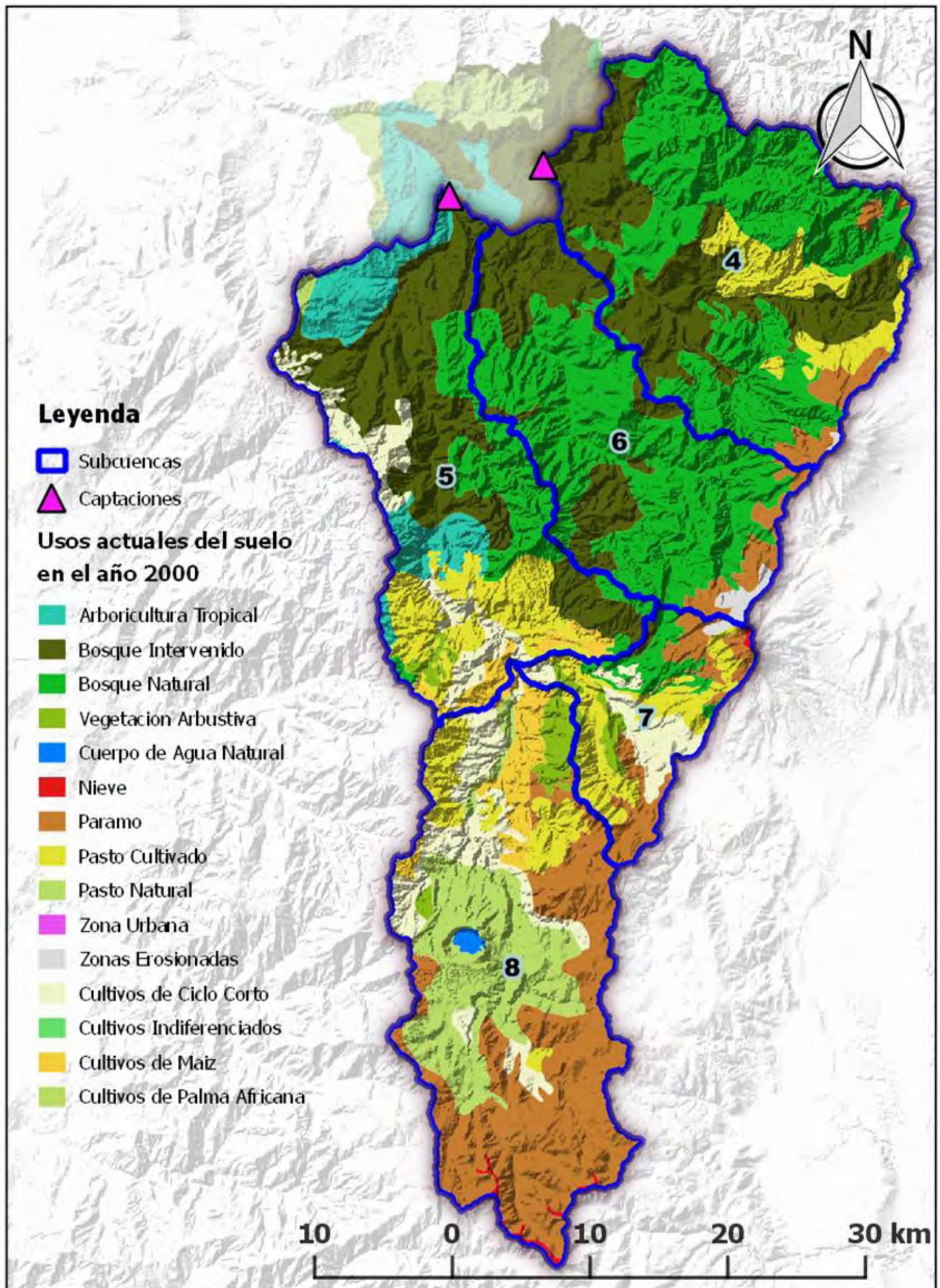
POR FAVOR ESCRIBIR EN LETRA DE IMPRENTA

| Nombre | Entidad | Cargo | Ciudad | Teléfono(s) | Correo electrónico |
|---------------------|-------------------|--------------------------|--------------|-------------|----------------------------|
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| MARCIA CHIONZA | CELEC-HIDROTOACHI | ASISTENTE ADMINISTRATIVO | STO-DOSO | 0986926413 | jeaneth-chica@hotmail.com |
| Nancy Oña | Palo Quemado | Morador | Palo Quemado | 099047299 | |
| JUAN CARLOS JIMENEZ | MEER | ANALISTA TECNICO | QUITO | | juan.jimenez@meer.gob.ec |
| | | | | | |

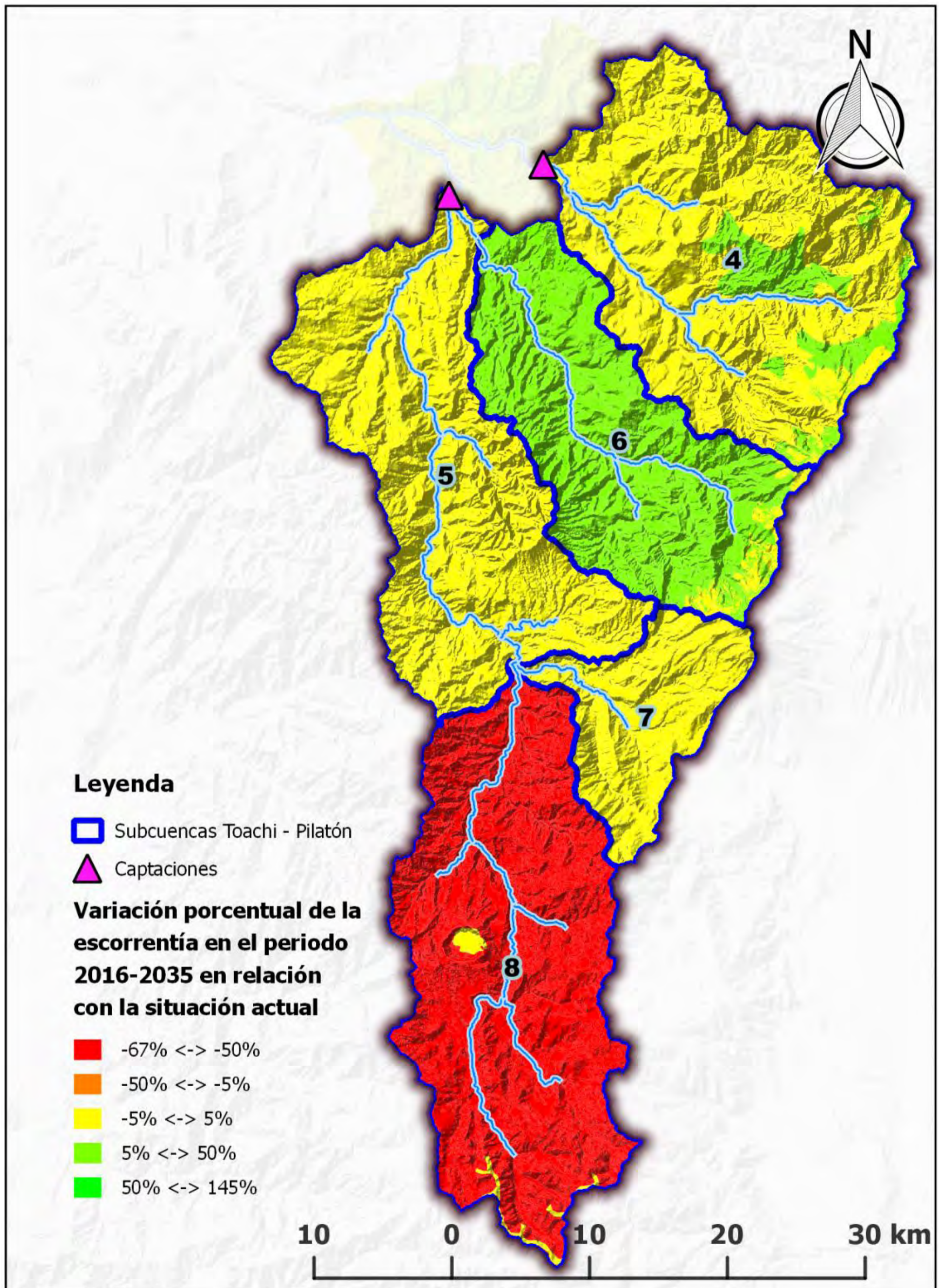
S/S



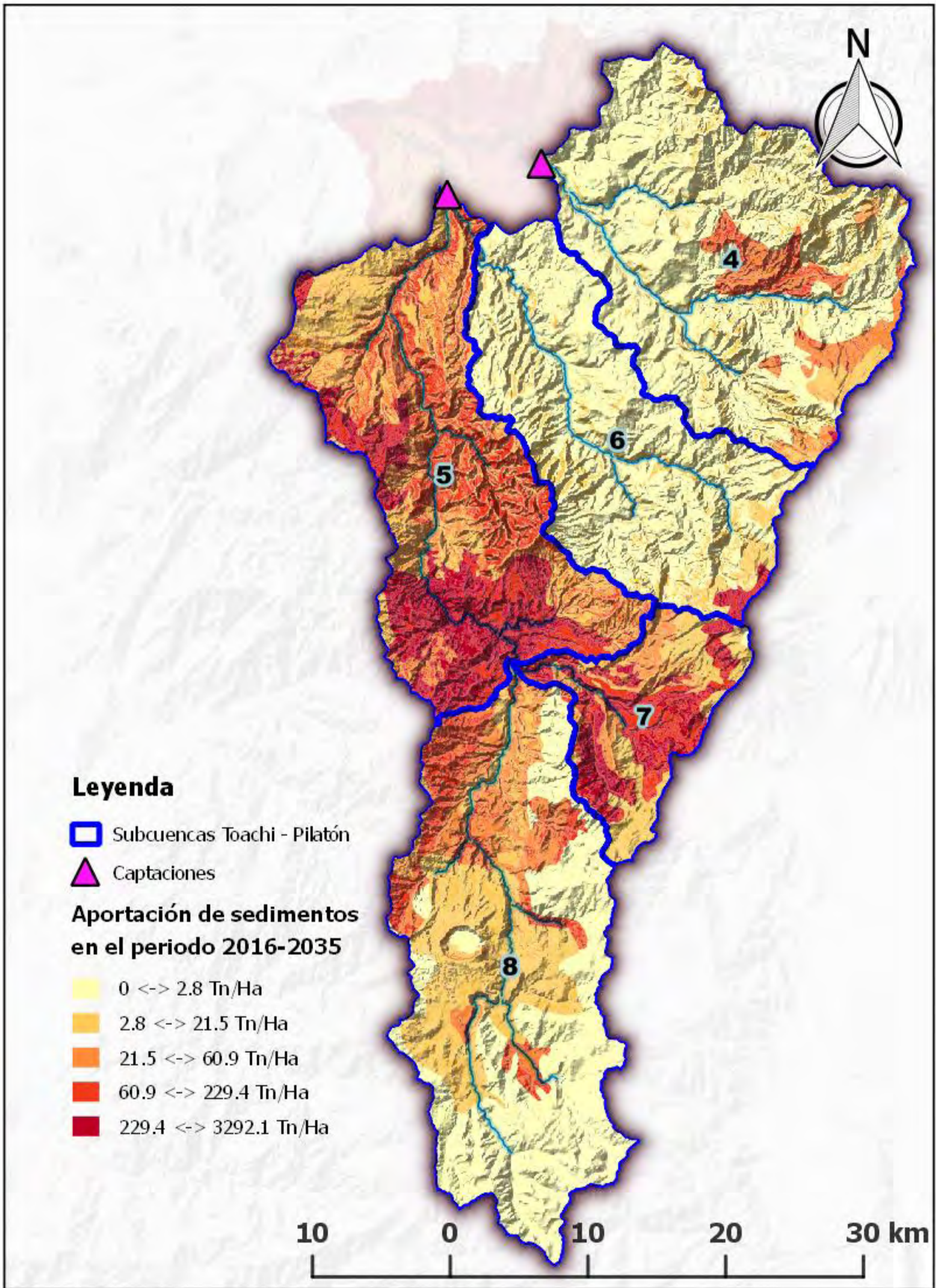
Mapa división político administrativo, con la red vial y con la ubicación de los núcleos urbanos dentro de las subcuencas aportantes de la Central Hidroeléctrica Toachi Pilatón



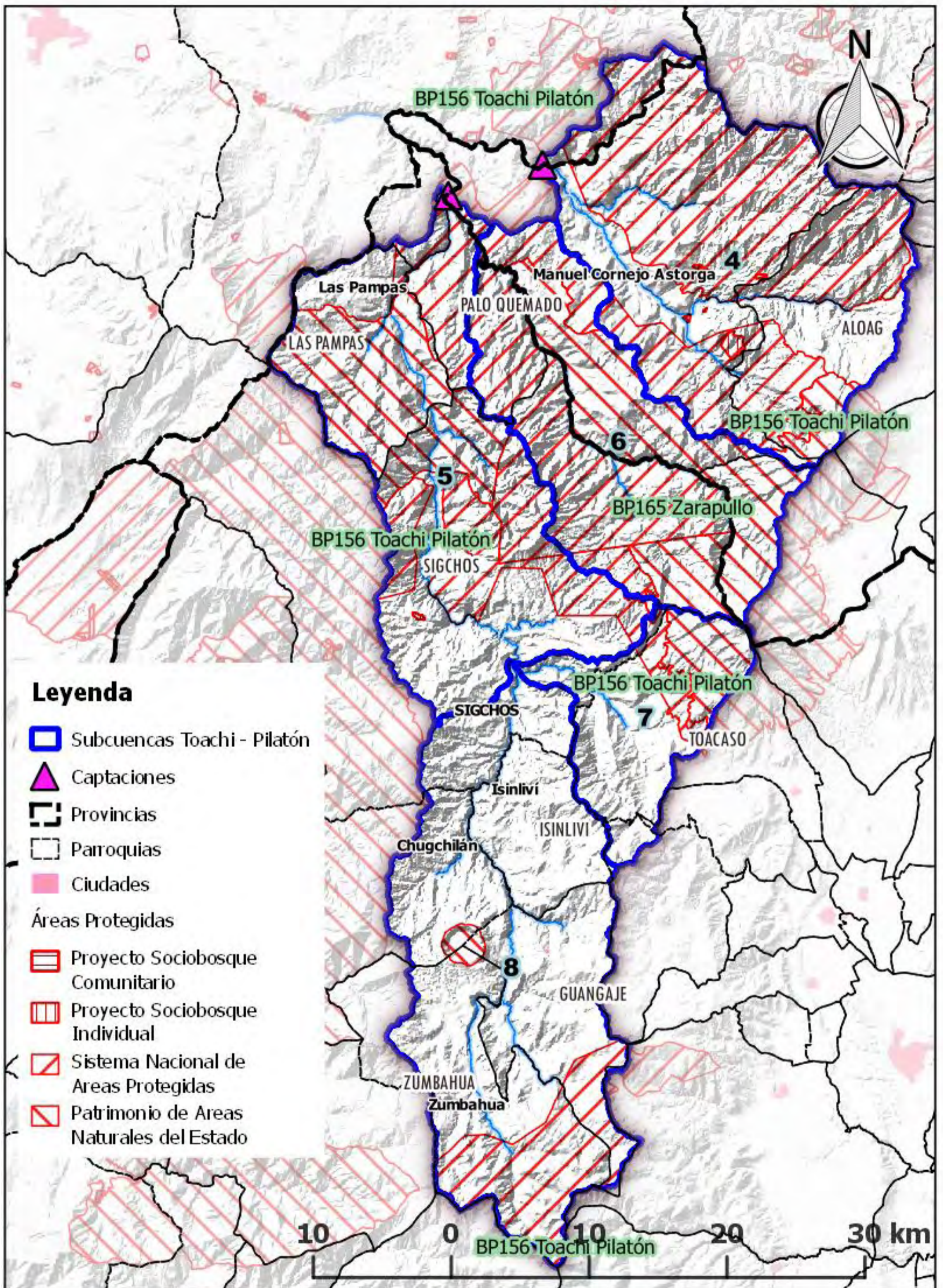
Usos actuales del suelo al año 2000 dentro de las subcuencas de los ríos Toachi y Pilatóns de la CH Toachi Pilatón.



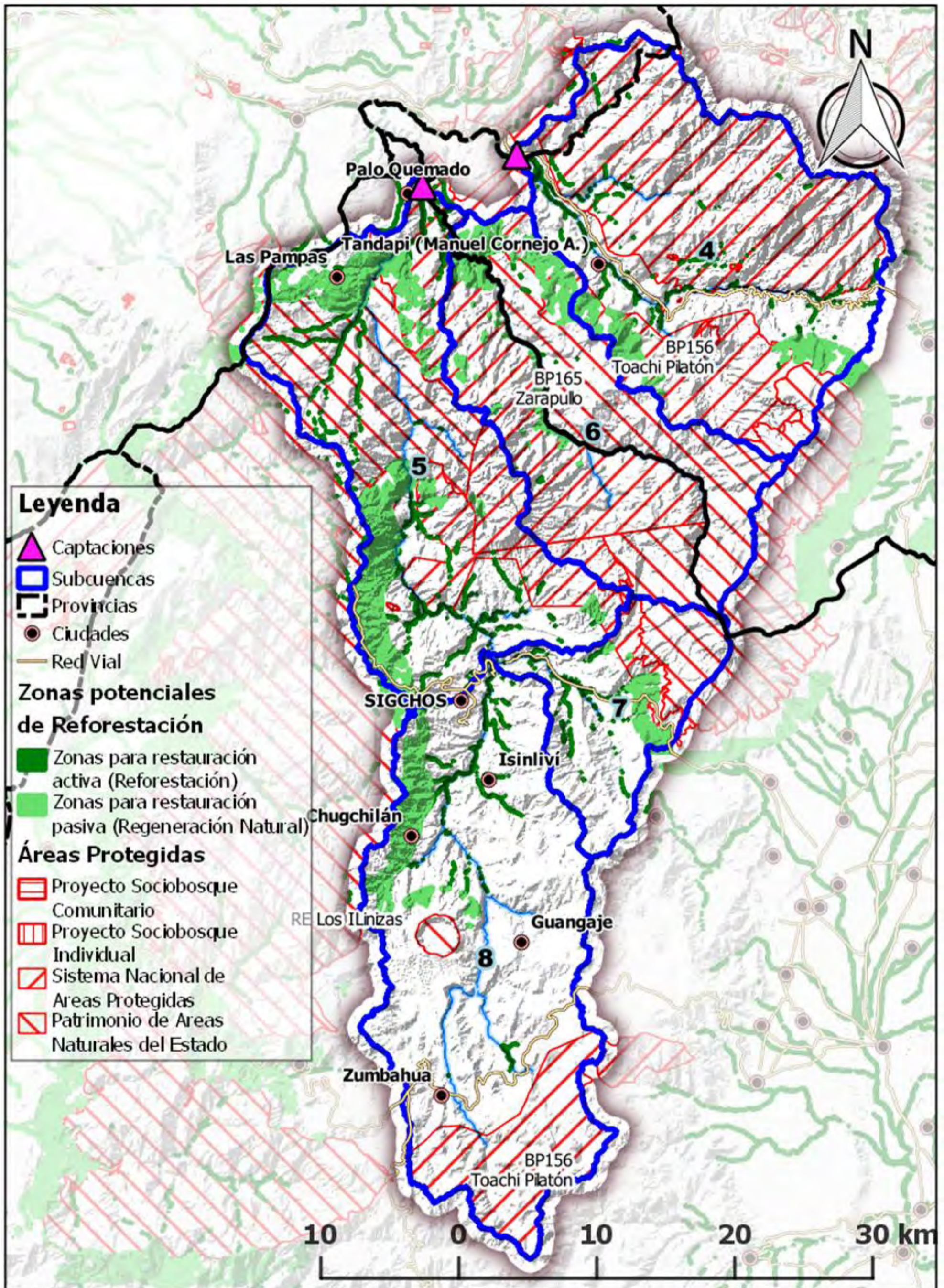
Variación porcentual de la escorrentía en el periodo 2016-2035 en relación con la situación actual, la unidad es en %.



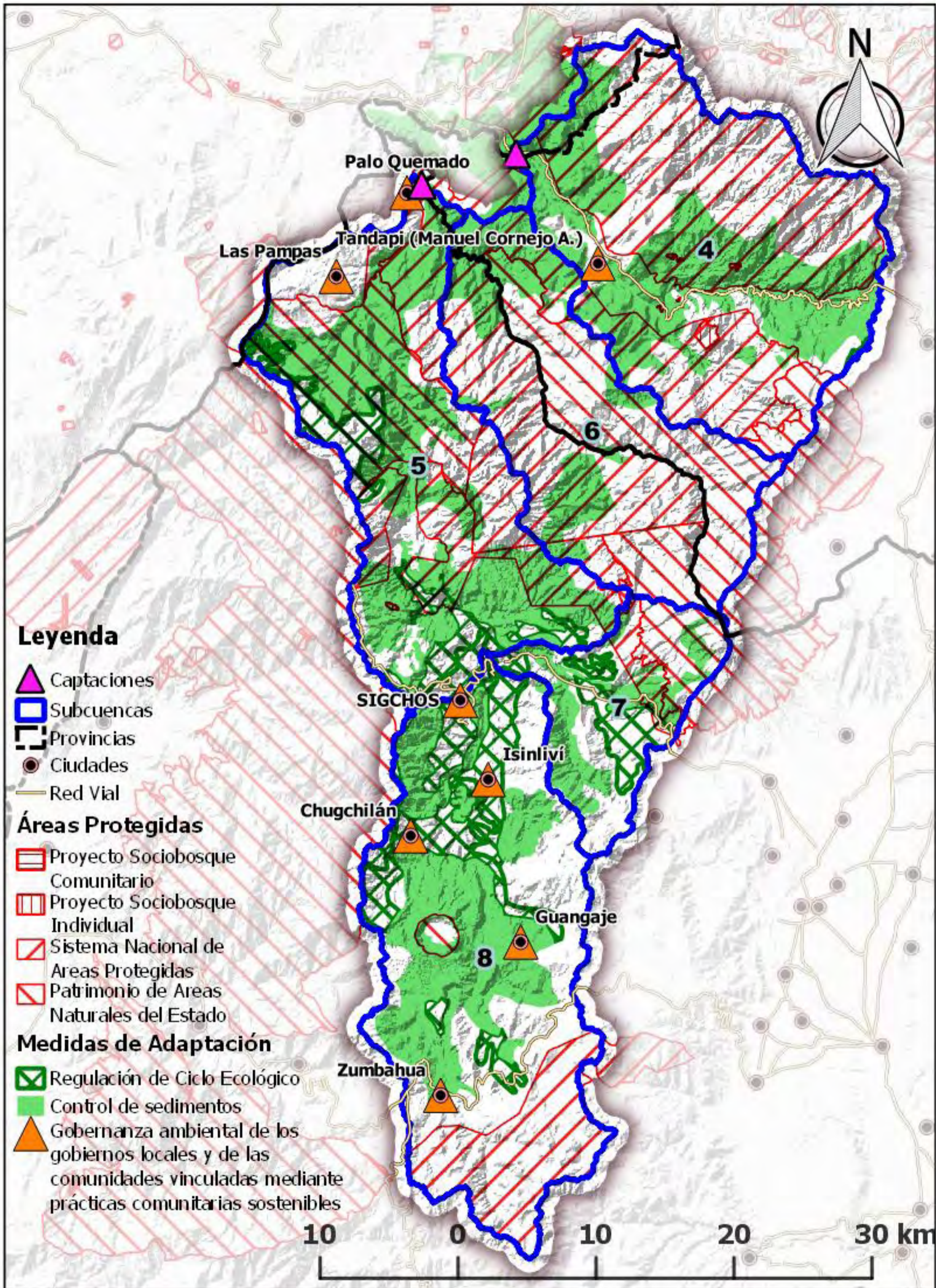
Aportación de sedimentos en el periodo 2016-2035, la unidad es ton/ha



Áreas protegidas, bosques protectores y Socio Bosque incluidos en las subcuencas Toachi y Pilatón



Ubicación de las Zonas de Reforestación Potencial para las subcuencas (río Toachi y río Pilatón), incluye áreas protegidas, centros poblados y subcuencas.



Medidas de Adaptación propuestas para las subcuencas de los ríos Toachi y Pilatón.

Anexo 3. Marco de resultados propuesto.

Objetivo Fortalecer la capacidad adaptativa de las poblaciones de la cuenca de los ríos Toachi y Pilatón ante los impactos del cambio climático.

Presupuesto solicitado USD2.400.000 / cuatro años

| Componente | Resultados | Productos | Presupuesto referencial (USD) |
|--|---|--|-------------------------------|
| 1. Conservar la cobertura vegetal | 1. Se conserva xxx ha de vegetación nativa y se reduce la carga de sedimentos (xxx t/año) para reducir el impacto del cambio climático en el ciclo hidrológico de la cuenca | 1. Incorporar 1,000 ha de vegetación nativa bajo esquemas de conservación y manejo forestal sustentable | 500,000 |
| | | 2. Robustecer la gestión de XXX ha de bosques protectores y áreas de conservación existentes | 275.000 |
| | | 3. Construir XXX presas filtrantes para retención de sedimentos. | 200.000 |
| 2. Adaptar las actividades productivas | 2. XX% de la superficie cultivada incorpora prácticas de producción sustentable ajustadas a los posibles impactos del cambio climático | 4. 125 ha de cultivos han adoptado prácticas sostenibles para adaptarse al cambio climático | 1.000.000 |
| 3. Robustecer las capacidades locales y compartir experiencias | 3. Población y gobiernos parroquiales con mayor capacidad para implementar medidas de adaptación al cambio climático | 5. Ampliar la capacidad de monitoreo hidroclimático (4 estaciones hidrométricas y 3 estaciones meteorológicas) y de entrega de información a la comunidad. | 200.000 |
| | | 6. XXX planes parroquiales incorporan medidas de adaptación al cambio climático con perspectiva de cuenca hidrográfica. | 75.000 |
| | | 7. Plan de sensibilización y educación sobre adaptación al cambio climático implementado (XXX personas / XXX % población). | 150.000 |

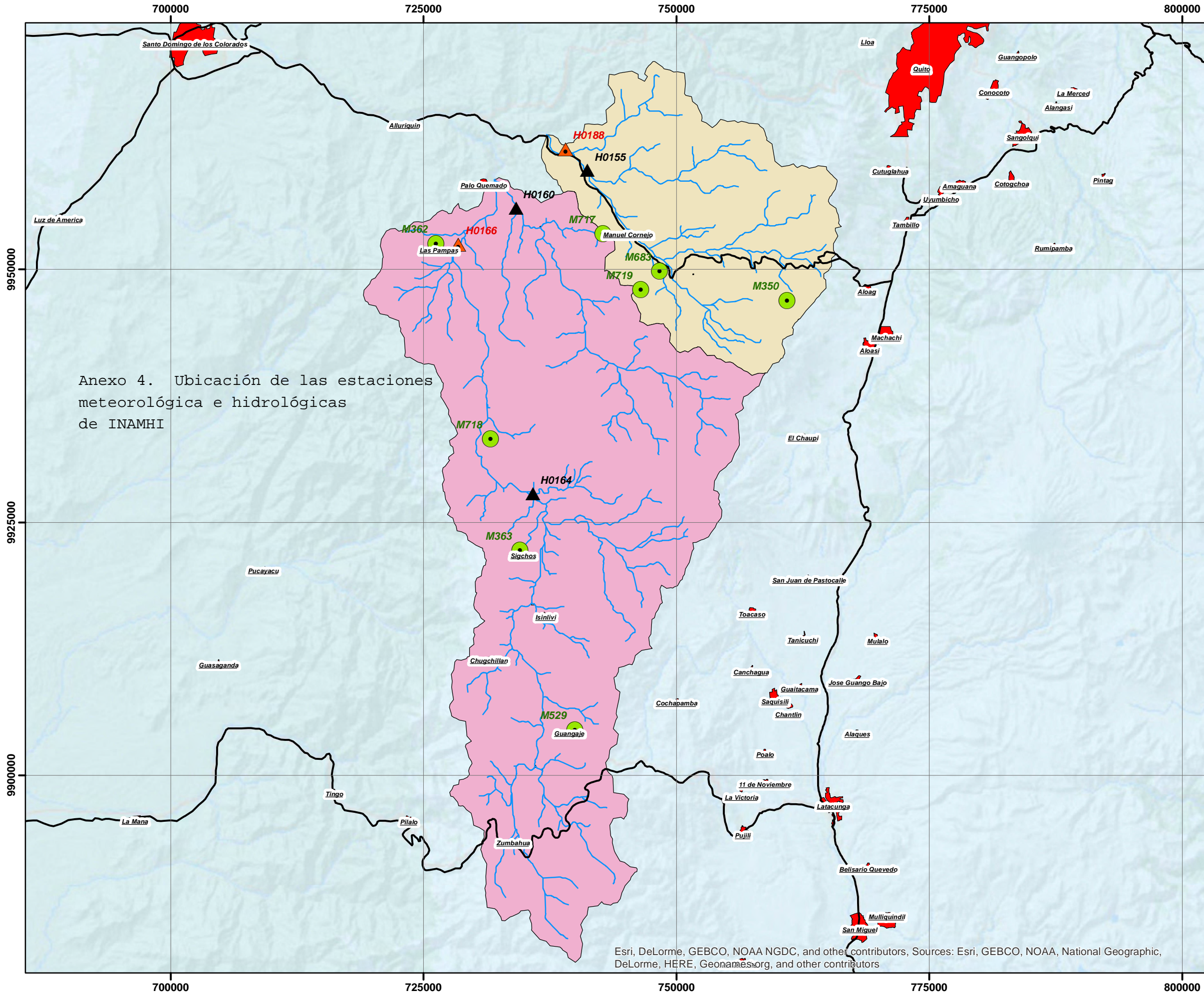
Agenda

08:30 h Registro de participantes
09:00 h Bienvenida
09:15 h Presentación de participantes
09:30 h Revisión de la agenda
09:45 h Introducción al cambio climático
10:00 h El Fondo de Adaptación
10:15 h Cambio climático en la cuenca Toachi – Pilatón
10:30 h Concepto de proyecto
11:00 h Trabajo en grupo. Análisis de situación
12:00 h Presentación de los grupos
13:00 h Almuerzo
14:00 h Trabajo en grupo. Acciones del proyecto
15:00 h Presentación de los grupos
16:00 h Próximos pasos
16:30 h Cierre

Notas

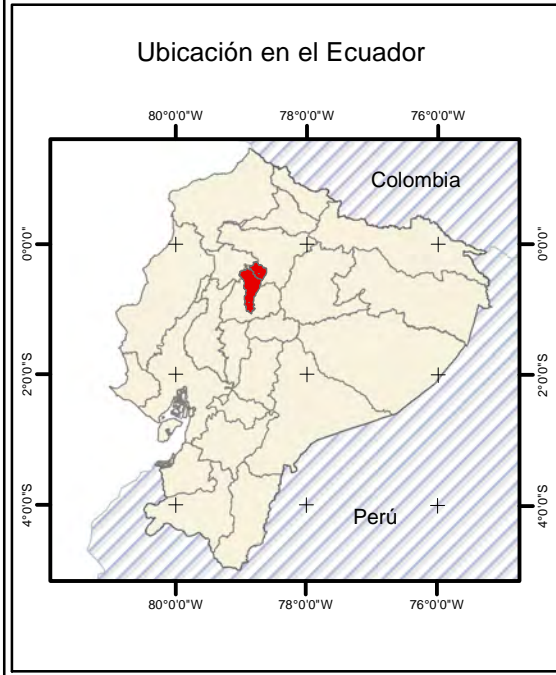
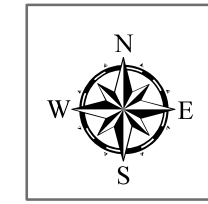
Dentro de subcuenca del río Blanco
Cantones Santo Domingo (Santo Domingo) Sigchos y Pujilí (Cotopaxi), Mejía (Pichincha)
Parroquias Aloag, Manuel Cornejo Astorga (Tandapi) [Pichincha], Alluriquin [Santo Domingo], Las Pampas, Palo quemado Sigchos [Cotopaxi]
Acelerada deforestación y cambio de uso de suelo
Incremento de sedimentos en los ríos
Pronóstico reducción 25% de pluviosidad

MAPA DE LOCALIZACIÓN DE ESTACIONES MATEOROLÓGICAS E HIDROLÓGICAS SUBCUENCA TOACHI - PILATÓN



Anexo 4. Ubicación de las estaciones meteorológica e hidrológicas de INAMHI

- Legenda**
- ESTACIONES MATEOROLÓGICAS
 - ▲ ESTACIONES HIDROLÓGICAS OPERATIVAS 2016
 - ▲ ESTACIONES HIDROLÓGICAS NO OPERATIVAS 2016
 - VIAS_MOP_WGS84
 - RIOS
 - RÍOS
 - SUBCUENCA TOACHI
 - SUBCUENCA PILATÓN

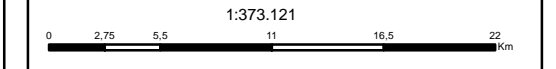


REPÚBLICA DEL ECUADOR
Secretaría Nacional de Gestión de Riesgos
Instituto Nacional de Meteorología e Hidrología

Mapa de localización de estaciones Meteorológicas e Hidrológicas Subcuenca Toachi - Pilatón

Fuente:
 Mapa Base: I.G.M, SGR, INAMHI (Escala 1:50.000)

SISTEMA DE COORDENADAS:
 UTM, Elipsoide Internacional Datum Horizontal WGS84 (World Geodetic System) Zona 17S



| | | |
|-------------------------|-----------------------|-------|
| INAMHI | Formato de impresión: | Mapa: |
| Dirección de Hidrología | DIN A3 | No_1 |

Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors

Preliminary Environmental and Social Risks Analysis Matrix for Infrastructure, Social
Development and Environmental Projects

Annex 6. CAF's preliminary environmental and social risk analysis matrix

| | |
|--------------------------------|---|
| Name of the Project | Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Toachi – Pilatón watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management |
| Country | Ecuador |
| Client | Ministry of Environment of Ecuador. Donor: Adaptation Fund |
| Date | July 2016 |
| Environmental Executive | Carolina Cortés |
| Project Category | 1C - ■ Category II Moderate risk (3a, 2b, 1c) |

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 | <ul style="list-style-type: none"> - Plants hydroelectric power generation (large-scale) - Plants thermoelectric power generation - Plants nuclear power generation | |
| Water y Sanitation | <ul style="list-style-type: none"> - Dams and reservoirs for drinking water - Use of watersheds - Transfer of basins - Macro drains | |
| Transport | Construction and / or opening, reconstruction: <ul style="list-style-type: none"> - Primary Roads - Secondary roads - Rural roads and / or tertiary - Railways and underground - International and domestic airports - Sea and river ports - Major urban roads | |

**Preliminary Environmental and Social Risks Analysis Matrix for Infrastructure, Social
Development and Environmental Projects**

| | | |
|-----------------------|--|---|
| Agriculture y Fishing | <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> - Facilities for handling solid waste and / or hazardous - Forestry production | |
| Hydrocarbons | <ul style="list-style-type: none"> - Exploration - Production - Pipelines - Refining | |
| Mining | <ul style="list-style-type: none"> - All | |
| Other | Specify | |
| Type b | | |
| Electric Energy | <ul style="list-style-type: none"> - Electric power transmission / Rural Electrification - Small hydroelectric power plants (PCH) - Use of alternative energies (wind , biomass) | |
| Water y Sanitation | <ul style="list-style-type: none"> - Treatment Plants drinking water and / or wastewater - Transmission and distribution of drinking water - Public Sewer | |
| Transport | Rehabilitation / Maintenance : <ul style="list-style-type: none"> - Secondary roads - Rural roads and / or tertiary - Urban Roads | |
| Agriculture y Fishing | <ul style="list-style-type: none"> - Irrigation and drainage (small scale) - Aquaculture and ocean-culture (small scale) | |
| Environmental | <ul style="list-style-type: none"> - Facilities for the recycling of solid waste | |
| Hydrocarbons | <ul style="list-style-type: none"> - Distribution of domestic gas | |
| Other | <ul style="list-style-type: none"> - Ecotourism infrastructure - Industrial Restructuring - Expansion projects , operation and maintenance of category "A " - Projects involving significant generation of electromagnetic fields | |
| Type c | | |
| Electric Energy | <ul style="list-style-type: none"> - Commercial distribution of electricity - Photovoltaic Parks | |
| Telecommunications | <ul style="list-style-type: none"> - Projects involving the use of optical fiber and minimal generation of electromagnetic fields | |
| Health | <ul style="list-style-type: none"> - Health Programs - Health infrastructure (hospitals) | |
| Education | <ul style="list-style-type: none"> - Education Programs - Infrastructure in Education (schools) | |
| Environmental | <ul style="list-style-type: none"> - Integrated Watershed Management - Comprehensive Management of Protected Areas - Restoration of degraded natural areas | X |

Preliminary Environmental and Social Risks Analysis Matrix for Infrastructure, Social
Development and Environmental Projects

| | | |
|-------|---|--|
| Other | <ul style="list-style-type: none"> - 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. | |
|-------|---|--|

(*) Mark the appropriate

**Preliminary Environmental and Social Risks Analysis Matrix for Infrastructure, Social
Development and Environmental Projects**

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 | <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> - 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 | X |
| Social, Economic and Cultural component | <ul style="list-style-type: none"> - 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 | X |

Referencia: Procedimiento para la Evaluación y Seguimiento Ambiental y Social de Operaciones de Infraestructura, Desarrollo Ambiental y Social
FR / DACC – 086

**Preliminary Environmental and Social Risks Analysis Matrix for Infrastructure, Social
Development and Environmental Projects**

| Moderate Sensitivity (2) | | |
|---|---|--|
| Physical component | <ul style="list-style-type: none"> - Undulating land (15-35 % slope) - Moderate earthquake risk - Moderate potential for erosion - Sporadically flooded areas | |
| Biological component | <ul style="list-style-type: none"> - Young secondary forests or in succession | |
| Social, Economic and Cultural component | <ul style="list-style-type: none"> - 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 | |
| Low Sensitivity (3) | | |
| Physical component | <ul style="list-style-type: none"> - Land undulating planes (< 15 % slope) - Areas without flooding | |
| Biological component | <ul style="list-style-type: none"> - Herbaceous vegetation operated and / or wide geographical distribution | |
| Social, Economic and Cultural component | <ul style="list-style-type: none"> - 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 |
|--|---------------|----------|
| Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Toachi – Pilatón watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management | Type C | 1 |

The project focuses on key drivers that will worsen the probable impact from climate change. The expected mid-term impacts are improved enabling conditions to sustain forest cover and sustainable small-scale farming in the area. 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 parts of Ecuador and other Andean countries.

Component 1 will focus on the conservation of forests. Three outcomes will be generated by (i) expanding protection of existing forests under mechanisms of conservation and sustainable forest

Preliminary Environmental and Social Risks Analysis Matrix for Infrastructure, Social Development and Environmental Projects

management⁷, (ii) strengthening the management of existing protected forests and private reserves, and (iii) to build artisanal sediment retention dams⁸ in key risk areas.

Component 2 will focus on introducing sustainable farming practices to reduce the impact on the local water cycle and to adapt to probable conditions of reduced rainfall. One outcome will be generated by introducing best practices in about 250 ha of pasture land and 200 ha of crops (including sugarcane).

Component 3 will focus on strengthening private and public local capacities to implement adaptation measures. Three outcomes will be generated by (i) strengthening climate-monitoring, (ii) introducing adaptation to climate change into parish development and land use plans, and (iii) implementing public communication and education plans. It is foreseen that this component will facilitate dialogue and collaboration among stakeholders to strengthen social capital.


Matrix Preliminary Analysis of Environmental and Social Risk

| Category of the Project | | | | Associated Risk | |
|-------------------------|----|----|----|-----------------|--|
| SM \ TO | a | b | c | | |
| 1 | 1a | 1b | 1c | ■ | Category I High risk (1a,1b, 2a) |
| 2 | 2a | 2b | 2c | ■ | Category II Moderate risk (3a, 2b, 1c) |
| 3 | 3a | 3b | 3c | ■ | Category III Low Risk (3b, 2c, 3c) |

Assigned Category: 1C - ■ Category II Moderate risk (3a, 2b, 1c)

Annex 7. 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 ¹ | Project outputs | | | |
|--|--|---|--|---|
| | 1. 1000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms | 2. Improved management of existing protected forests and private conservation areas (ca., 230,000 ha) | 3. Five artisanal sediment retention dams. | 4. 250 ha of pasture and 250 ha of crops apply sustainable farming practices. |
| 1. Compliance with the Law | No risk. This is privately owned land that voluntarily apply to receive an economic incentive to conserve forest cover. The Socio Bosque incentive is regulated by several Ministerial Agreements ² | No risk. The existing protected forests are regulated under the forestry law. The private conservation areas are recognised under the Ecuadorian law. | Requires environmental permit. Risk (low): Inadequate implementation of mandatory environmental and social management measures required by the national authority and CAF. | No risk. These are private farmland. |

¹ As listed in section B of the Environmental and Social Policy (AF, 2013).

² Ministerial Agreement 169 of 2008 that creates Socio Bosque, Ministerial Agreement 130 of 2012 that establish the operation manual for Socio Bosque, Ministerial Agreement 114 of 2013 that established the national policy for governance of the nation’s natural patrimony, and Ministerial Agreement 131 of 2013 that creates the national programme of incentives Socio Bosque.

| Environmental and social principles ¹ | Project outputs | | | |
|--|--|---|---|---|
| | 1. 1000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms | 2. Improved management of existing protected forests and private conservation areas (ca., 230,000 ha) | 3. Five artisanal sediment retention dams. | 4. 250 ha of pasture and 250 ha of crops apply sustainable farming practices. |
| 2. Access and equity | Risk (low): local land owners not adequately informed of the proposed use of economic incentives (Socio Bosque). If not adequately informed, the local land owners may believe that the project will affect their land rights. | No risk. The protected forests are state property. The proposed actions do not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, and land rights of local groups. | No risk. The artisanal dams will not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, and land rights of local groups. They will be managed by the parish governments. | No risk. The project intervention will occur in farms chosen by the farmers' organizations. The demonstration plots will be open to all local farmers. |
| 3. Marginalized and vulnerable groups | No risk. The project actions will not negatively affect marginalized and vulnerable groups. | No risk. The project actions will not negatively affect marginalized and vulnerable groups. | No risk. The project actions will not negatively affect marginalized and vulnerable groups. | No risk. The project actions will not negatively affect marginalized and vulnerable groups. |
| 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. |
| 5. Gender equity and women's empowerment | Risk (low). Women with increased work load. No specific factors will impede or limit women's participation. However, some farmers are opting for paid employment in Santo Domingo. This increases the responsibility of | Risk (low). Women with increased work load. No specific factors will impede or limit women's participation. However, some farmers are opting for paid employment in Santo Domingo. This increases the responsibility of | No specific factors will impede or limit women's participation. | Risk (low). Women with increased work load. No specific factors will impede or limit women's participation. However, some farmers are opting for paid employment in Santo Domingo. This increases the responsibility of |

| Environmental and social principles ¹ | Project outputs | | | |
|--|---|---|---|--|
| | | 1. 1000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms | 2. Improved management of existing protected forests and private conservation areas (ca., 230,000 ha) | 3. Five artisanal sediment retention dams. |
| | tending the farm and rural property to women and other family members. | tending the farm and rural property to women and other family members. | | tending the farm and rural property to women and other family members. |
| 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. |
| 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 project actions 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 economic incentives will be given to rightful landowners. | The project intervention does not imply displacement of local population. The protected forests are State property and the private conservation areas are private property. | The project intervention does not imply displacement of local population. | The project intervention does not imply displacement of local population. The farms are private land. |
| 9. Protection of natural habitats | The project intervention does not involve unjustified conversion or degradation of critical natural habitats. On the contrary, project actions will motivate the conservation of existing vegetation cover. | The project intervention does not involve unjustified conversion or degradation of critical natural habitats. On the contrary, project actions will motivate the conservation of existing vegetation cover. | The project intervention will not intervene areas with high value biodiversity. | The project intervention will not intervene areas with high value biodiversity. Project actions will occur in existing farmland. |

| Environmental and social principles ¹ | Project outputs | | | |
|--|--|--|--|---|
| | 1. 1000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms | 2. Improved management of existing protected forests and private conservation areas (ca., 230,000 ha) | 3. Five artisanal sediment retention dams. | 4. 250 ha of pasture and 250 ha of crops apply sustainable farming practices. |
| 10. Conservation of biological diversity | The project intervention does not involve unjustified reduction or loss of biological diversity or the introduction of known invasive species. On the contrary, project actions will motivate the conservation of existing vegetation cover. | The project intervention does not involve unjustified reduction or loss of biological diversity or the introduction of known invasive species. On the contrary, project actions will motivate the conservation of existing vegetation cover. | The project intervention will not intervene areas with high value biodiversity. | The project intervention will not intervene areas with high value biodiversity. Project actions will occur in existing farmland and will improve farming practices of existing crops. |
| 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. |
| 12. Pollution prevention and resource efficiency | The project intervention will not use large quantities of energy, water or other natural resources. Nor produce wastes or release pollutants. | The project intervention will not use large quantities of energy, water or other natural resources. Nor produce wastes or release pollutants. | Risk (low). Pollution generated during construction works. | The project intervention will not use large quantities of energy, water or other natural resources. Nor produce wastes or release pollutants. |
| 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. |

| Environmental and social principles ¹ | Project outputs | | | |
|--|---|---|---|---|
| | | 1. 1000 ha of native vegetation is conserved by sustainable forest management and conservation mechanisms | 2. Improved management of existing protected forests and private conservation areas (ca., 230,000 ha) | 3. Five artisanal sediment retention dams. |
| 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. | The project intervention will not affect or intervene physical and cultural heritage. |
| 15. Lands and Soil Conservation | The project intervention will not negatively affect valuable land. On the contrary, project actions will contribute to soil conservation. | The project intervention will not negatively affect valuable land. On the contrary, project actions will contribute to soil conservation. | The project intervention will not intervene valuable land. | The project intervention will not negatively affect valuable land. On the contrary, project actions will contribute to soil conservation. |

| Environmental and social principles | Project outputs | | |
|-------------------------------------|---|---|--|
| | | 5. Improved monitoring stations (3 meteorological and 4 hydrometric) provide prompt and reliable information to the local population and relevant authorities | 6. Six development plan incorporate measures for climate change adaptation with a watershed perspective. |
| 1. Compliance with the Law | No risk. The stations will be managed by the national authority (INAMHI). | No risk. Updating the plans is within the faculties of the parrish goverments | No risk. There are no legal requirements to comply. |

| Environmental and social principles | Project outputs | | |
|--|---|---|---|
| | 5. Improved monitoring stations (3 meteorological and 4 hydrometric) provide prompt and reliable information to the local population and relevant authorities | 6. Six development plan incorporate measures for climate change adaptation with a watershed perspective. | 7. Public communication and education plan implemented in the lower basin (ca., 13,000 people). |
| 2. Access and equity | No risk. The benefits from the project intervention (i.e., meteorological and hydrological information) will serve all the population. | Risk (low): Local population not adequately informed about the changes in the local development plans. | Risk (low): Local population not adequately aware of climate-related risks (communication channels insufficient to address the intended audience) |
| 3. Marginalized and vulnerable groups | No risk. The project actions will not negatively affect marginalized and vulnerable groups. | No risk. The project actions will not negatively affect marginalized and vulnerable groups. | No risk. The project actions will not negatively affect marginalized and vulnerable groups. |
| 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. |
| 5. Gender equity and women's empowerment | No specific factors will impede or limit women's participation. The information generated will serve all the population. | Risk (low): The adaptation measures are 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. |
| 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. |
| 7. Indigenous peoples | The project actions will not affect indigenous groups or territories. | The project actions will not affect indigenous groups or territories. | The project actions 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. |
| 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 natural habitats in the climate change adaptation measures to be included in the local development plans. | The project intervention will not intervene in protected areas or high value conservation areas. |

| Environmental and social principles | Project outputs | | |
|--|---|--|--|
| | | 5. Improved monitoring stations (3 meteorological and 4 hydrometric) provide prompt and reliable information to the local population and relevant authorities | 6. Six development plan incorporate measures for climate change adaptation with a watershed perspective. |
| 10. Conservation of biological diversity | The project intervention will not intervene areas with high value biodiversity. The stations will be located in intervened areas. | The project intervention does not involve unjustified reduction or loss of biological diversity or the introduction of known invasive species. On the contrary, project actions will motivate the conservation of existing vegetation cover. | The project intervention does not involve unjustified reduction or loss of biological diversity or the introduction of known invasive species. On the contrary, project actions will motivate the conservation of existing vegetation cover. |
| 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. |
| 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. | The project intervention will not use large quantities of energy, water or other natural resources. |
| 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. |
| 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. |
| 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. |



Annex 8. Stakeholders, interests and socioeconomic situation in the project: "Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management"

ANNEX 8

Stakeholders, interests and socioeconomic situation in the Río Blanco upper watersheds.

August of 2017

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GLOSSARY OF TERMS

| | |
|---------|--|
| ARCOM | Agencia de Regulación and Control Minero |
| CELEC | Corporación Eléctrica del Ecuador |
| ESPE | Escuela Politécnica del Ejército |
| ELEPCO | Empresa Eléctrica Cotopaxi |
| GAD | Gobierno Autónomo Descentralizado |
| INEC | Instituto Nacional de Estadísticas y Censos |
| MAE | Ministerio del Ambiente |
| MAGAP | Ministerio de Agricultura Ganadería, Acuacultura y Pesca |
| MEER | Ministerio de Electricidad y Energía Renovable |
| MINTUR | Ministerio de Turismo |
| SENAGUA | Secretaría Nacional del Agua |
| SEPS | Superintendencia de Economía Popular y Solidaria |

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Stakeholders, interests and socioeconomic situation in the Río Blanco upper watersheds.

INTRODUCTION

The hydrographic watershed of the Toachi Pilatón hydroelectric power plant is formed by the Toachi and Pilatón rivers, and receives contributions from the Verde, Siguí, Pashillin, Zumbahua, Santa Ana and Zarapullo rivers, on the western slope of the Andes. (TECNALIA) Toachi river originates in the badlands of the Ecological Reserve of the Ilinizas around Quilotoa lagoon, between Ilinizas volcanoes north and south in the province of Cotopaxi. Pilatón River born from badlands of the slopes of volcanoes Atacazo and Guagua Pichincha and the hill Corazón. (TECNALIA)

A watershed is an “area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel” (USGS 2016). Besides of being such natural framework watersheds are also areas of intense socioeconomic exchange where people and organizations of diverse type and range (state, natural resources extractors, traders, farmers and so on) exert their agency in order to get and influence management of the existent resources in the area.

Because of the diversity of existing geographic areas, the often difficult access to them, and the social competition for its natural resources, watersheds are of complex management and then prone to be ecologically neglected and significantly altered by socioeconomic activities. Since whatever natural and human-induced issues happening in upper areas can affect the rest of the basin until the river-outflow point, watersheds are extremely vulnerable to socioeconomic activities. For that it is important to apply integrated water management strategies where all stakeholders can coordinate and exchange experiences, and be regulated and controlled in a comprehensive plan intended to protect the hydric resources.

The ecological vulnerability of the watershed supposes also a socioeconomic vulnerability of the societies living in these areas especially those already vulnerable like women, children and indigenous people. By historical and socioeconomic issues these groups are the most vulnerable in any society and particularly in those of frontier where social life depends of direct natural resource extraction. In this understanding the climate change phenomenon and the expected impacts on nature and society will particularly affect watersheds and women and indigenous people as the most vulnerable in natural and social environments. Therefore in the efforts to promote adaptation measures to address the problem of climate change especial attention must be devoted to watersheds, its societies, and the women, children and indigenous peoples existing in these environments.

Considering the issues of social and natural vulnerability and the expected effects of climate change, this document presents an ecological and socioeconomic overview of the Toachi and Pilatón watersheds pointing the situation of the three rural jurisdictions in which lie the critical part of this area and identifying stakeholders and their perceptions regarding weather and climate change issues. As part of this analysis this document also points the situation of women and issues of gender inequality in this area.

The Toachi and Pilatón watersheds located in the North-Central area of Ecuador, in the so-called Cordillera Occidental de los Andes, in the provinces of Cotopaxi, Pichincha and Santo Domingo de los Tsachilas. Starting both watersheds in different volcano systems at more than 14,000 feet over the sea level in the Cotopaxi province; they joint at 2,000 feet altitude in the Santo Domingo de los Tsachilas province and then under the name of Blanco River run northbound to then be part of the Esmeraldas basin, which finally drains its waters in the Pacific Ocean. Besides, because of the elevated altitude and topographic steepness of ridges

Stakeholders, interests and socioeconomic situation in the Río Blanco upper watersheds.

and hills of the cordillera where the basin starts, the Toachi and Pilaton rivers are the outflow point of several smaller watersheds which increase the ecological complexity of this area.

Analysis and conclusions of this document are intended to put in perspective the ecological and social complexity of the Toachi-Pilaton watershed, to address both in the efforts to promote adaptation measures to deal with the expected issues related with climate change events. In addition, introduce to Adaptation Fund a final document with a map of stakeholders in Toachi-Pilaton watershed.

Stakeholders, interests and socioeconomic situation in the Río Blanco upper watersheds.

NATURAL SCENE OF THE AREA

The Toachi river starts in the foothills of the Chugchilán mountains, a branch of the Western Cordillera, in territories of the Chugchilán and Isinlivi parishes, in the county of Sigchos, province of Cotopaxi. The river begins at an altitude of 4500 m and descends to 1000 m altitude to join the Pilatón River. The Toachi basin is flanked to the east by the Corazon hill (4,788 m s.n.m) and the volcanoes Illiniza Sur (5 248 m s.n.m.) and Illiniza Norte (5,126 m s.m.). To the South by the Era Urco hill (4,473 ms s.n.m.). These elevations contain several smaller water courses that end in the river Toachi. The basin of this river has a length of 104 km, and a contribution area of 1,478 km². The average slope is of 34.7%.

The Pilatón river is formed by the thawing of the volcanoes glaciers of the Corazón (4,790 msnm) and Atacazo (4,455 feet altitude) creating a watershed that has an east - west direction and is formed on the western slopes of the Cordillera Occidental, El Corazón and Atacazo hills, has an contribution area of 514 km², the main channel length is 42.5 Km, the average slope represents 42.7%. This river join with the Toachi and then form the Blanco river which in turn join the Quinindé river and then flow into the Esmeraldas hydrographic system which drains in the Pacific Ocean.

As shown in Table 1 the hydrologic complex that conform the area of interest of this document lies in a territorial mosaic of three provinces, three counties and three rural parishes. There more than 10,000 people live in more than 35 communities.

| Drainage unit | Province | Canton | Parrish | Total population in the Parrish | Population within the drainage unit |
|--|--------------------------------|---------------|----------------------------------|---------------------------------|-------------------------------------|
| Toachi | Cotopaxi | Latacunga | Toacaso | 7,685 | 7,685 |
| | | Pujili | Guangaje | 8,026 | 8,026 |
| | | | Zumbahua | 12,643 | 12,643 |
| | | Sigchos | Chugchilan | 7,811 | 7,811 |
| | | | Isinlivi | 3,227 | 3,227 |
| | | | Las Pampas | 1,943 | 1,943 |
| | | | Palo Quemado | 1,030 | 1,030 |
| | | | Sigchos | 7,933 | 7,933 |
| | | Pichincha | Mejía | El Chaupi | 1,456 |
| Pilatón | Pichincha | Mejia | Aloag | 9,237 | NA |
| | | | Manuel Cornejo Astorga (Tandapi) | 3,661 | 3,661 |
| | Santo Domingo de los Tsachilas | Santo Domingo | Alluriquin | 9,725 | 9,725 |
| Total population in 2010 | | | | 74.377 | 53.959 |
| NA = Not available, but it is known to be very small | | | | | |

Table 1 Population in the Toachi – Pilatón system

Because of the altitudinal variability this territory is biologically rich. It contains from the paramo ecosystem at more than 9,000 feet altitude to tropical and cloud forest at about 1,000 feet altitude. This natural configuration of the area explains the existence of several ecosystems

Stakeholders, interests and socioeconomic situation in the Río Blanco upper watersheds.

and watershed, and then of a rich biological diversity. The most important watersheds of this hydro-geologic system are those of the Toachi and Pilatón rivers. Smaller watersheds in this ecological reserve are of the Zarapullo river, which drains to the Toachi and the Corazon and Santa Ana rivers which drains to the Pilatón.

In the Toachi river basin, the largest area corresponds to natural forest (22.8%), followed by páramo (18%) and forest intervened plus cultivated grass 70-30 with 15.4%, the remaining area (43.8%) corresponds to others Types of land use mainly crops In the Pilatón river basin; The largest occupation corresponds to natural forest (52.8%) and forest intervened plus cultivated grass 70-30 (31%), the remaining 16.2% is destined for other uses. The natural richness of this natural compound has guided the human interventions in the area, which is still basically a frontier. Practically all the socioeconomic activities in the region rely in the extraction of primary natural resources. One of the major problems in the upper part of both basins is the transformation of the natural ecosystems of paramo and forest due to agricultural activities. This change in vegetation cover affects the surface runoff.

This ecological complex is important for hydric resources and because of its biodiversity, for the reproduction of both the flora and fauna of the region and then, important for ensuring water and food security of the local communities. Then the importance of the Toachi-Pilatón watershed must be understood under the complex natural mechanisms of biodiversity and hydric natural resource availability in which the local communities have built their culture and food and water security.

Areas under conservation status

Because of its natural landscape and biological importance the area of study have several public and private protected areas. The public areas under conservation statuses are Sarapullo and Toachi Pilatón Protected Forests and the Ilinizas Ecologic Reserve. The private protected areas have been created under the category of “protected forests” that was the first category for conservation of natural areas allowed in private lands before 2008 when the national constitution established the creation of private and public decentralized¹ ecological reserves. The protected forest is an administrative figure for conserving soil and hydric resources and in function of these primary goals is considered that forests and natural or introduced vegetation must be maintained undisturbed in critical areas of the watersheds. By creating protected forests the state promoted the protection of the steepest areas of the watersheds and then avoiding landslides, land erosion and drainage alterations.

Ilinizas Ecologic Reserve and Sarapullo Protected Forest

The Ilinizas Ecological Reserve is a public protected area consisting of 149,900 has of paramo and Andean Humid and Subtropical Forests. It is located in the provinces of Cotopaxi and Pichincha. This area encompasses the twin peaks of the Ilinizas as well as the extinct volcano Quilotoa best known by its crater lake. The reserve lie in the Cordillera Occidental de los Andes its territory contains also several hills and ranges like the Lelia Cordillera, the El Corazón, Jaligua Alto and Tenefuerte hills. This mountain system barrier the evaporations from the costal forcing its condensation in the west side of the Cordillera Occidental and

¹ Before the National Constitution of 2008, protected areas of any kind were created only under the central government control, with the new legal framework of 2008 municipalities and rural parishes can create their own protected areas and rural communities, indigenous people and private owners can also legally create areas for conservation in the lands under their control.

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therefore increasing the hydric resources of the watersheds or even favoring the creation of micro-watersheds in the entire area.

The Sarapullo Protected Forest was created in 1986 before the Ilinizas Ecological Reserve. Then when the Ilinizas was declared as a reserve the entire territory of the Sarapullo forest was incorporated in such new protected area. So now in practice all the policies and management measures regarding this area are made considering the main area that is the Ilinizas Ecological Reserve.

Toachi – Pilatón Protected Forest

This protected forest was created in 1987 as a means to maintain unchanged the forest other vegetation of the Toachi and Pilatón river basins. This forest has an area of 212,000 has and is under the control of the state forest districts of Cotopaxi and Pichincha. Although the status of protected forest is lesser than the national parks and ecological reserves it is still prohibited logging and the use of the area for any socioeconomic activity. Activities in this type of areas must be compatible with conservation purposes only. The main goals of this area are the protection of soil, water resources and biodiversity. About 20% of the Palo Quemado territory lies in this protected forest and the Las Pampas parish is also next to this area. Most of the problems of the Toachi Pilatón protected forest become from the socioeconomic activities of the mentioned parishes.

The international environmental organizations Birdlife Internacional and Conservación Internacional have stated that the lower area of the Toachi Pilatón protected forest is a place of high importance for protecting birds because about 420 bird species has been found here. However insufficient control has promoted illegal logging and even the invasion of parts of the area for cattle ranching are damaging the habitats of these and other species existent here. Moreover, several land tenure issues have not yet solved in this ecological area.

Private protected forest

Protected forests and reserve have been created in private lands in the Toachi-Pilatón watershed. These areas combine conservations goals with scientific research, environmental education, organic agriculture, and eco-tourism activities so that are source of income generation for their owners. The creation of protected areas in private lands in this zone is a very important form to show the neighbors that other socioeconomic uses can be applied to the lands. As a frontier area, the Toachi Pilatón watershed system has been traditionally seen as a wilder or an area to mine any existent natural resource. Such mentality is still present and private owner who devote their lands to conservation purposes are helping to change such extractive view.

Typically private conservation areas are composed by temperate, cloudy and subtropical forests. Significant parts of these areas are secondary and highly degraded forest for which programs of ecological recovery has been established. Reforestation activities in areas previously used for agriculture are also in process. In addition by creating this type of conservation areas many steep zones of the hills and ridges are being protected otherwise they would be subject of forest fires, illegal logging and unsustainable agriculture.

The private areas that have been legally declared as reserves or protected forests are the following:

1. Reserva Biológica La Esperanza
2. Hesperia Biological station and reserve
3. Otongachi biológica reserve

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4. Río Guajalito Scientific Station
5. Tanti protected forest
6. Río Lelia watershed protected forest
7. La Favorita Scientific Station

In practical terms these private areas for conservation provide patches of ecological security for birds, mammals and other migratory species that need of scattered habitats to survive. They are also creating biological corridors and then allowing genetic variability in areas that otherwise would be isolated and prone to genetic erosion.

Notwithstanding the importance of private protected areas it is worth to mention that a significant flaw of them is the lack of sufficient resources for ensuring adequate control and the application of technically standardized management practices. This observation is also valid for the public protected forests for which the state has not established a particular administrative mechanism for control and management. However, new legal frameworks and technical regulations for this type of areas are under preparation by the Ministerio del Ambiente.

The Socio Bosque and the conservation initiatives in the area

In addition to the public and private system for protecting the natural areas of the watershed the Ministerio del Ambiente has established the nationwide Socio Bosque program which main goal is to help private owners and parishes to protect the existent natural forests presents in their lands or to carry out reforestation plans. The Manuel Cornejo Astorga, Palo Quemado and Alluriquin rural parishes are beneficiaries of the Socio Bosque program and about 692 hectares of public and private forests areas are under this scheme of protection, distributed in 22 plots and 15 private owners.

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LOCAL JURISDICTIONS IN THE TOACHI PILATON WATERSHED

The Toachi Pilaton watershed intersect in the territories of three provinces, three counties and six rural parishes. Three of them are in the influence area of the project. Below you will find a description of each parish:

Sigchos:

Sigchos is located in the province of Cotopaxi, northwest of Latacunga city. It was created on July 21, 1992. Sigchos is situated on the sub-watershed of the Toachi River and has an area of 1,266.6 km². The population is composed of approximately 23,236 inhabitants. (GAD Cotopaxi, 2014)

Sigchos has an urban parish, it's also called Sigchos, and four rural parishes, that two are located in the Toachi River watershed into the project area. These rural parishes are: Las Pampas and Palo Quemado. Map below shows where Sigchos is located and its parishes: (GAD Cotopaxi, 2014)



Map 1 Parishes located in Sigchos

In Sigchos, annual average temperature is 13 ° C and annual precipitation reach values between 500 to 1000mm. (GAD Cotopaxi, 2014). Table below shows the temperature chart with maximum, minimum values:

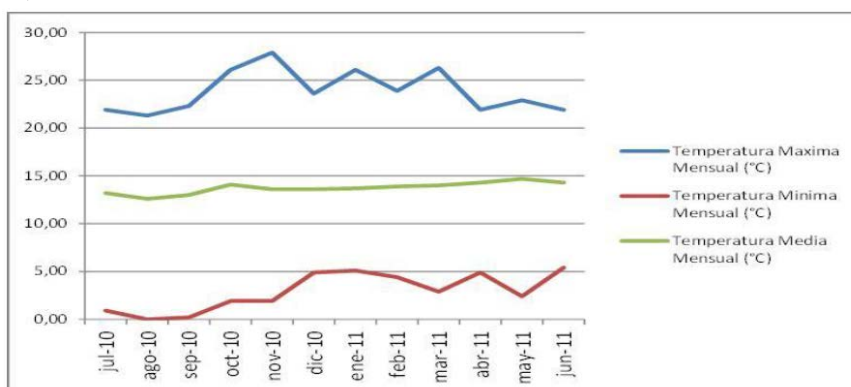


Figure 1 Sigchos Annual Average Temperature

According to PDOT document, Sigchos has been experimented changes of temperature, which produce prolonged droughts between July and December, with very strong winds, and very strong and prolonged rainfall, between January and June. (GAD Sigchos, 2012)

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As a consequence of changes in temperature, crops have been destroyed, human and animal health has been affected, and also roads network has been damaged, and of course economic losses are produced in the project area.

Most of settlements are located in areas of slopes, which means a high risk due to landslides, and it makes difficult communication between villages.

In the Sigchos parish, the population is engaged in the following economic activities: (GAD Sigchos, 2012)

| Economic Activities | Percentage (%) | Description |
|---------------------|----------------|--|
| Agriculture | 20 | Local consumption or familiar economic subsistence. Main products: panela, beans, maize, zambo, squash, mackerel, mora, mortiño. |
| Cattle range | 70 | Cattle for meat production |
| Tourism | 5 | Community tourism |
| Others | 5 | Dairy production |

Table 2 Sigchos Economic Activities Source

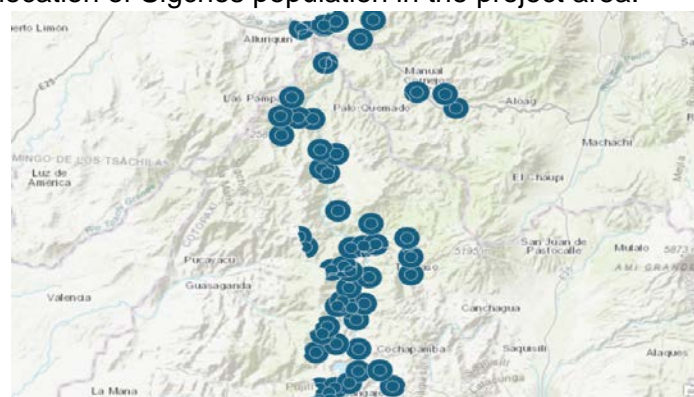
According to census of population and housing carried out in 2010, population economically active is composed as follows: (GAD Sigchos, 2012)

| | Population economically active (PEA) | Population economically inactive (PEI) | Total Economic Population (PET) |
|-------|--------------------------------------|--|---------------------------------|
| Men | 2.077 | 992 | 3.069 |
| Women | 1.295 | 1.759 | 3.054 |
| Total | 3.372 | 2.751 | 6.123 |

Table 3 Sigchos Population Economically Active

Likewise, census of population and housing carried out 2010, shows that all Sigchos urban and rural parishes, represent economically active population (EAP) with a value of 42.50%, that its equals a total number of 9,327 habitants, while a percentage 57.49% represent elderly, children and adolescents population, which is equivalent to 12,617 people.(GAD Sigchos, 2012)

Map below shows location of Sigchos population in the project area:



Map 2 Sigchos population located in the project area Source

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Las Pampas:

Parish Las Pampas is located at northern end of Sigchos canton, which it's belong to Cotopaxi province. Las Pampas is located 53.6 km from cantonal head. This parish has 2 extremes of territorial height levels, one as lowest part from 1,200 msnm, and other as highest part of 2,481 msnm.(GAD Las Pampas, 2015)

This parish has an area of 13,178.27 m2, and it's located in the upper and middle part of the hole of the Toachi River. Below is the map showing the area delimitation for Las Pampas parish:(GAD Las Pampas, 2015)



Map 3 Territorial map Las Pampas

According to the field study carried out in 2015, for development of the Territorial Planning document (PDOT), Las Pampas parish consists of 15 precincts and they reach a population of 2,405 habitants.

According to INEC, data related to Las Pampas parish population in 2010, it's ranged between 14 and 44 years as shown in chart below:

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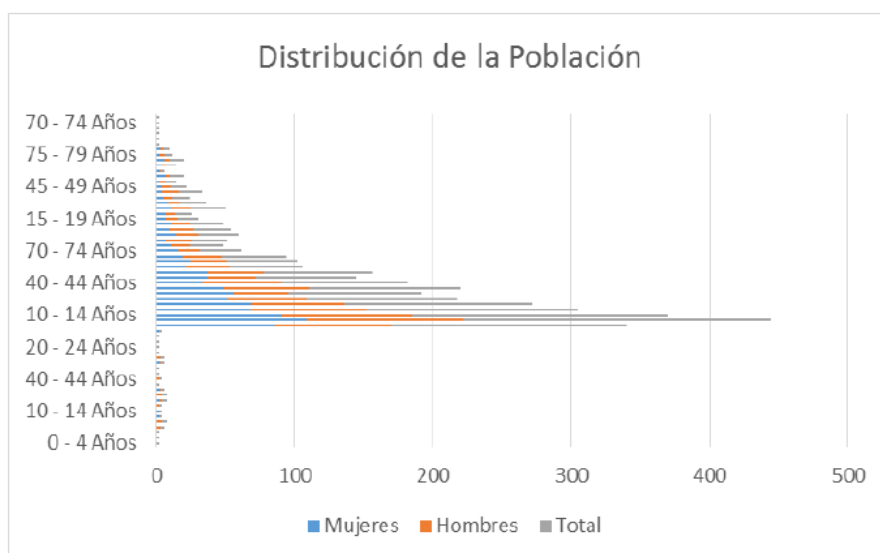


Figure 2 Las Pampas population in 2010 Source

In the year 2015, a field study was carried out to determine more accurately the distribution of population in the Las Pampas parish. A summary of results are shown below: (GAD Las Pampas, 2015)

LAS PAMPAS POBLACIÓN

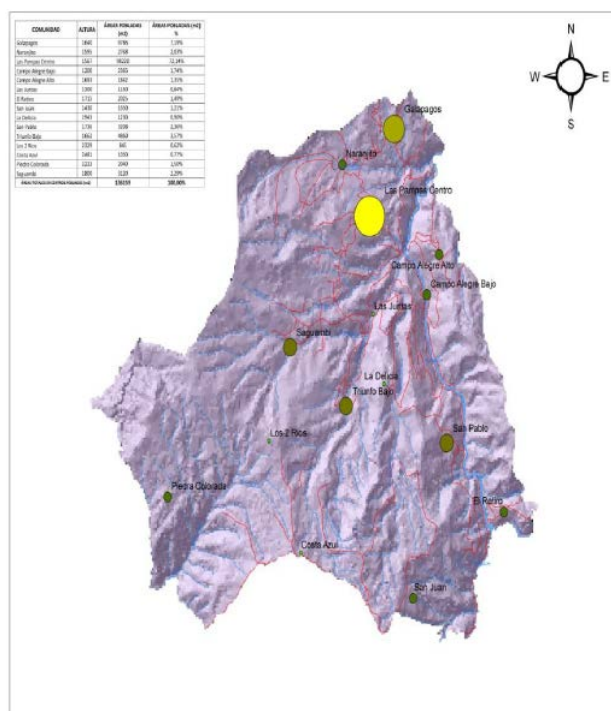
| COMUNIDAD | X | Y | ALTURA | POBLACION | Poblacion % |
|-------------------|--------|---------|--------|-------------|----------------|
| Galapagos | 727460 | 9954701 | 1640 | 250 | 9,69% |
| Naranjito | 725297 | 9953582 | 1595 | 100 | 3,88% |
| Las Pampas Centro | 726437 | 9951953 | 1567 | 780 | 30,23% |
| Campo Alegre Bajo | 728825 | 9949479 | 1200 | 160 | 6,20% |
| Campo Alegre Alto | 729339 | 9950738 | 1693 | 70 | 2,71% |
| Las Juntas | 726584 | 9948873 | 1300 | 60 | 2,33% |
| La Delicia | 727041 | 9946674 | 1943 | 45 | 1,74% |
| San Pablo | 729645 | 9944814 | 1736 | 280 | 10,85% |
| Triunfo Bajo | 725461 | 9945979 | 1662 | 150 | 5,81% |
| Los 2 Ríos | 722254 | 9944881 | 2329 | 35 | 1,36% |
| Ana María | 723573 | 9941357 | 2481 | 40 | 1,55% |
| Piedra Colorada | 718021 | 9943112 | 2223 | 185 | 7,17% |
| Saguambi | 723121 | 9947826 | 1800 | 250 | 9,69% |
| | | | | 2405 | 100,00% |

Table 4 Las Pampas Population distribution by community in 2015

The most population in Las Pampas parish is mestizo, around 97%, while remaining 3% is divided into indigenous population and other ethnic groups. (GAD Las Pampas, 2015)

Below a map shows populated areas of the parish of Las Pampas: (GAD Las Pampas, 2015)

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Map 4 Las Pampas populated areas in the map

In the parish Las Pampas the population is dedicated to the following economic activities: (GAD Sigchos, 2012)

| Economic Activities | Percentage (%) | Description |
|---------------------|----------------|----------------------------|
| Agriculture | 15 | Panela |
| Cattle range | 80 | Cattle for meat production |
| Tourism | 0 | |
| Others | 5 | Various activities |

Table 5 Las Pampas Economic Activities

In Las Pampas unemployment rate reach 0.5%. Table below shows employment rates in the parish and sources of employment:

| Percentage | Sources of Employment |
|------------|-----------------------------|
| 75% | Own work in their lands |
| 25% | Trade and service provision |

Table 6 Las Pampas Employment Rates

The population of Las Pampas has 90% coverage of electric power, which is obtained from the national electric interconnection network and service is delivered by the Cotopaxi Electric Company (ELEPCO). However, several communities in the parish do not have these service due to dispersal. (GAD Las Pampas, 2015)

Access for Las Pampas has deteriorated road conditions but there are 3 access roads. The main access is from Alluriquín (Santo Domingo) and the others from Sigchos cantonal road network; Union Toachi (Santo Domingo) / Palo Quemado.

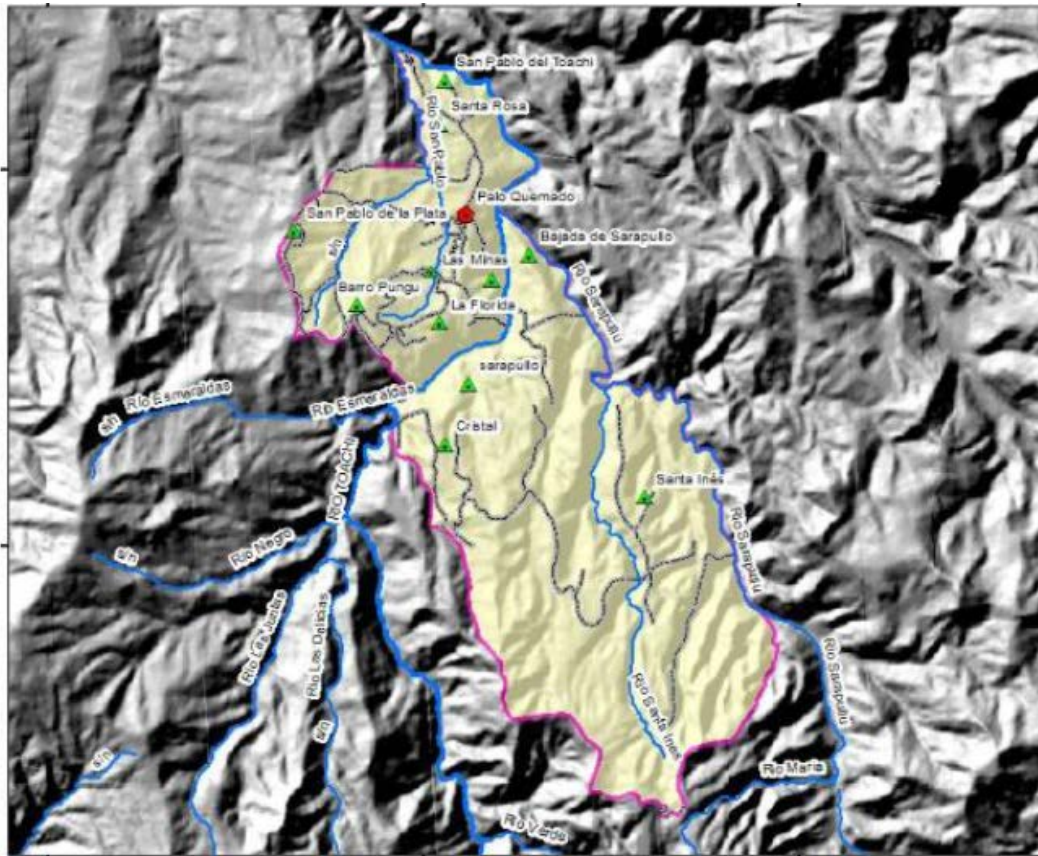
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In Las Pampas, it is also observed that contamination rate by solid wastes (garbage) is a high value, due to the inefficiency in the service of garbage collection, and in some cases by the non-existent culture of recycling. So, it is necessary to build garbage dumps.

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Palo Quemado:

Palo Quemado is a rural parish depending of the Sigchos county and Cotopaxi province. It is located at 4,500 feet altitude right next to the flanks of the Toachi river watershed (Map 1). In terms of road connectivity, this jurisdiction is served by a second order road, which connects Sigchos and the rural town of La Union.



Map 5 Palo Quemado populated areas

According the last census (INEC 2010) the total population of this parish is of 1,030 inhabitants (55% men and 45% women) who live in eight townships or communities as follows: Palo Quemado Centro, San Pablo de la Plata, Las Praderas, Santa Rosa de Lima, Las Minas de la Plata, El Cristal, Zarapullo, and La Florida.

According to the national census (INEC 2010) the women-men correlation in Palo Quemado is 55-45%. The 57% of the population is under 30 years old and 30% are in the age range of 15-30 years old.

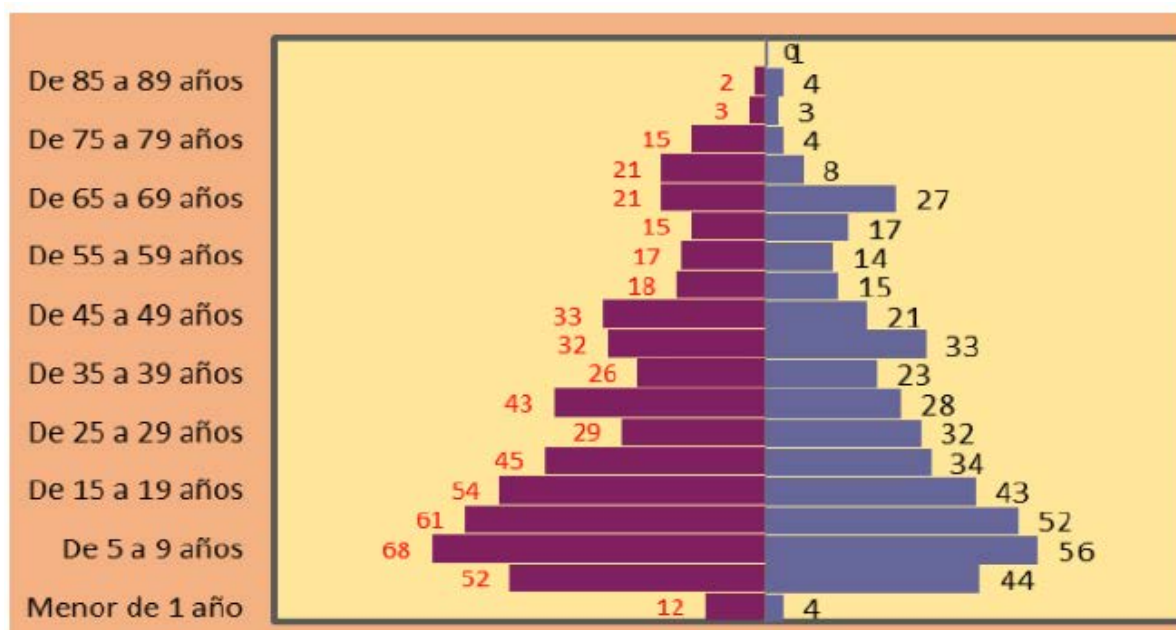


Figure 3 Palo Quemado population

Ethnic self-representation in this parish is basically the “mestizo” accounting the 80% of the population. “Montubios” with 11% of the people is the second form of ethnic identity, and white 5%. There are no other forms of ethnic self-identification. (GAD-PQ 2015) The subsistence of this population comes from small scale agriculture and cattle ranching. Sugar cane and raw milk are the most important products providing about the 75% of the work opportunities in this jurisdiction. While the cane is processed in the locality the milk is sold in the cities of Latacunga and Santo Domingo. The workforce of Palo Quemado is composed of 504 people. According to the national last census (INEC 2010), 234 people of this parish work in agriculture and cattle ranching activities and 141 in manufacture activities, which is basically the production of panela, the most important product of this locality. Other relevant activities are related with services: local trade, transportation and education.

Palo Quemado is an important regional producer of “panela”² which is the main source of local income. The panela made in this parish is sold practically in all the central Andean area. In the last few years the sugar cane producers have started producing granulated brown sugar, which is being well accepted in urban regional markets as a healthy alternative to the centrifuged white sugar.

Other local socioeconomic activities in Palo Quemado are around local transportation (regular shifts to La Union, Alluriquin and Santo Domingo), local trade of rural utensils, staples, agrichemicals and other products and artifacts required for living in the rural environment of the parish. Modest production of fruits and tuberos like naranjilla, limón, naranja, banana, tree tomato, camote, yuca, papa china, among other is mostly used for family consumption and local exchange.

The most important local organizations are the associations Flor de Caña formed by the sugar cane producers and the Asociación Agroartesanal San Pablo de la Plata created by agriculture

² Panela is basically the unrefined whole cane sugar. It is the result of boiling and evaporating raw sugarcane juice and then poured into molds to obtain hard round blocks for easy transportation. Each block has a standard weight of 32 pounds.

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and cattle ranching producers. Most of the economically active people in the parish are member of either one of these organizations. Finally it is important to note that the territory of Palo Quemado has some mine resources, especially gold and copper. Concessions of about 2,347 hectares³ of the parish territory have been established for mining purposes. At the moment three mine sites are in the area (Table 7), however this activity is still not relevant for the local economy and the companies working there have not significant relation neither with local authorities nor with the socioeconomic life of the parish.

| PLACE | MINE COMPANY | TYPE | AREA |
|----------------|--------------------------------------|--------------------------|------|
| La Florida | Sultana del Còndor Minera Sulcomi SA | Metallic | 642 |
| Loma del Tigre | Sultana del Còndor Minera Sulcomi SA | Metallic | 1658 |
| Toachi | GADs Sigchos and Pichincha | No-Metallic ⁵ | 47 |
| TOTAL | | | 2347 |

Table 7 Mining places in Palo Quemado parish⁴

The mines operated by the Sigchos Municipality and the Consejo Provincial de Pichincha are natural deposits for temporal extraction of sand, crushed stone and aggregate for construction needed for road construction and maintenance and other public works. According the mining legislation, the nonmetallic mining is under the control of the municipalities while the metallic one is controlled by the central government so that the local governments, Junta Parroquial has nothing to do with this activity and then it has a no relevant role in the local economy.

Based in the national census 2010, Table 8 shows a comprehensive overview of the parish.

| Sector / Indicator | Measure | Palo Quemado |
|-----------------------|--------------------------|--------------|
| Illiteracy | % (15 years old or more) | 9.54 |
| Functional illiteracy | % (15 years old or more) | 15.91 |

³ Typically the mine concession areas are higher than the actual place of mine activity. So although a concession can be of hundred or thousand hectares, the place where the mine resource is extracted is significantly smaller.

⁴ Nonmetallic mining is for extracting sand, gravel; rock stone and other related mine products.

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| | | |
|---|-----------------------------|----------|
| Education | Años de estudio | 6.84 |
| Universitary education | % (24 years old or more) | 4.77 |
| Complete Elementary School | % (12 years old or more) | 81.11 |
| Complete High School | % (18 years old or more) | 18.86 |
| Working children 15 - 17 years old | % (children 5-17 years old) | 46.15 |
| Working children 5 - 14 years old | % (children 5-14 years old) | 6.75 |
| People economically active | Number | 504.00 |
| People in working age | Number | 794.00 |
| Afroecuadorian population | Number | 16.00 |
| White population | Number | 47.00 |
| Total population | Number | 1,030.00 |
| Men population | Number | 567.00 |
| Indigenous people | Number | 8.00 |
| Mestizo population | Number | 846.00 |
| Women population | Number | 463.00 |
| Women proportion | % (total population) | 44.95 |
| Extreme poverty for non-satisfied basic needs | % (total population) | 33.60 |
| Poverty for non-satisfied basic needs | % (total population) | 95.60 |
| Human Development Bonus | Number | 314.00 |
| Water service inside home | % (houses) | 11.37 |
| Sewage network | % (houses) | 9.41 |
| Electric service | % (houses) | 85.49 |
| Telephone land line | % (houses) | 11.40 |
| Gas use for cooking | % (homes) | 83.65 |
| Firewood / charcoal use for cooking | % (homes) | 15.20 |
| Own home | % (homes) | 79.46 |

Table 8 Socioeconomic Overview of the Palo Quemado Parish

The data shows that this rural parish presents some signs of acute social vulnerability. For example, education, water and sewage services are insufficient,

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Manuel Cornejo Astorga (Tandapi)

Although the official name of this rural parish is Manuel Cornejo Astorga, the name of the main town in the territory is known as Tandapi, a traditional name since this side road town was created. It is located in the Pilaton watershed and next to the Aloag-Santo Domingo road, the most important artery to communicate Quito and Guayaquil, the main Ecuadorian cities (Map 2). The area of this parish is of 495,89 km², with an altitudinal range between the 3,800 feet and 8,000 feet. According the national census of 2010 the population is of 3,661 people of which 60% (2,197) is considered economically active.



Map 6 The Manuel Cornejo Astorga – Tandapi Rural Prish

According to the national census (INEC 2010) the women-men correlation is 53-47%. The 68% of the population is under 40 years old and 30% are in the age range of 15-30 years old. (Figure 9) The most extended ethnic self-representation in this parish is basically that of “mestizo” representing almost the 90% of the local population. Other ethnic self-representation are white (4.5), indigenous (4%), and Afroecuadorian (2.2%).

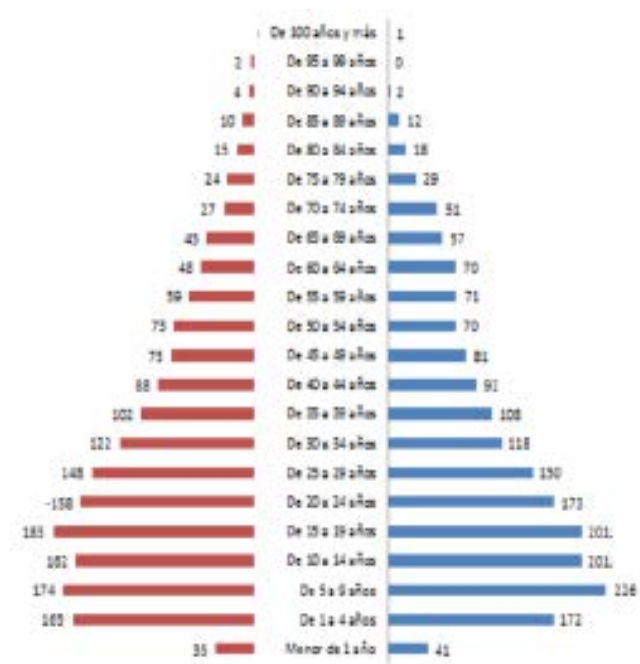


Figure 4 Age distribution in the Manuel Cornejo Astorga – Tandapi Rural Parish

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The main economic activities in this rural parish are related to agriculture, livestock, milk and meat production, flower, tourism, and transportation. Agriculture and livestock are the main sources of income and subsistence for the local population representing the 46% of the entire economic activities in the parish. Trade and small business represent the 11.5% of the economic activities. Food and accommodation represent 7.78 % (Table 9). The most important products are maize, cocoa, cassava, banana, oil palm, potatoes, cereals, maize, beans, quinoa, vegetables⁵, pork and chicken meat, milk, fish.

| RAMA DE ACTIVIDAD | CASOS | % |
|---|--------------|----------|
| Agricultura, ganadería, silvicultura y pesca | 806 | 46,78 |
| Industrias manufactureras | 57 | 3,31 |
| Suministro de electricidad, gas, vapor y aire acondicionado | 9 | 0,52 |
| Distribución de agua, alcantarillado y gestión de desechos | 7 | 0,41 |
| Construcción | 71 | 4,12 |
| Comercio al por mayor y menor | 199 | 11,55 |
| Transporte y almacenamiento | 78 | 4,53 |
| Actividades de alojamiento y servicio de comidas | 134 | 7,78 |
| Información y comunicación | 5 | 0,29 |
| Actividades financieras y de seguros | 1 | 0,06 |
| Actividades profesionales, científicas y técnicas | 7 | 0,41 |
| Actividades de servicios administrativos y de apoyo | 42 | 2,44 |
| Administración pública y defensa | 14 | 0,81 |
| Enseñanza | 40 | 2,32 |
| Actividades de la atención de la salud humana | 6 | 0,35 |
| Artes, entretenimiento y recreación | 3 | 0,17 |
| Otras actividades de servicios | 12 | 0,70 |
| Actividades de los hogares como empleadores | 56 | 3,25 |
| No declarado | 155 | 9,00 |
| Trabajador nuevo | 21 | 1,22 |
| | 1723 | 100 |

Table 9 Economic activities in the Manuel Cornejo Astorga – Tandapi Rural Parish

⁵ These are products for warm and cold weather, favored by the location of the parish between the Coast and Sierra regions.

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Alóag

Alóag is a rural parish of Mejía canton, which is near road highway, and its located in the connection between the north and south mountains and country's coast region, this is 33 kilometers from Quito, near the El Corazón volcano, which its 4,786 meters of height. Alóag has an area of 255.56 square kilometers and its altitude reaches 3040 meters above sea level. In 2014, population reaches 10,602 habitants, which is estimated in 3% of population density of habitants per kilometer considering total of the canton.(GAD Mejía, 2014)



Map 7 Aloat location

In 2010, the population of Alóag was estimated in 9237 habitants, which value is calculating a population density of 36.14 habitants per square kilometer. The population density estimates for the year 2020 in 37.99 habitants per square kilometer and for 2025 in 38.95 habitants per square kilometer. According to PDOT, in this parish the total amount of houses reaches 2353. Below is a chart with a projection of population for canton Mejía by parishes:

| TABLA CAH 62 | | Población de las parroquias, Cantón Mejía | | | | | | |
|-----------------------|-----------------|---|---------------------|----------------------------|-------|-------|-------|-------|
| Parroquias | Población total | | Tasa de crecimiento | Proyección de la población | | | | |
| | 1990 | 2001 | Año 2001 | 2005 | 2010 | 2015 | 2020 | 2025 |
| Machachi | 18402 | 22492 | 2,02 | 24309 | 26581 | 28853 | 31124 | 33396 |
| Cutuglagua | 3593 | 9987 | 16,17 | 16447 | 24521 | 32596 | 40670 | 48745 |
| Aloat | 6301 | 8850 | 3,67 | 10149 | 11773 | 13397 | 15021 | 21019 |
| Aloasi | 5175 | 6855 | 2,95 | 7664 | 8675 | 9686 | 10697 | 11708 |
| Tambillo | 5960 | 6571 | 0,93 | 68,13 | 7115 | 7417 | 7720 | 8022 |
| Uyumbicho | 3217 | 3679 | 1,3 | 3870 | 4109 | 4349 | 4588 | 4827 |
| Manuel Comejo Astorga | 2776 | 3132 | 1,16 | 3279 | 3462 | 3645 | 3828 | 4011 |
| El Chaupi | 1263 | 1322 | 0,42 | 1345 | 1373 | 1402 | 1430 | 1458 |

Fuente: INEC; PD y OT 2002-2012; POT PICHINCHA, P.D.L. UCE 2009; Cálculo proyección Población. Consultoría se tomó los datos del INEC-2001 Año: 2001 Proyección al 2025. Elaboración: EQUIPO PDOT GAD. MEJÍA 2014

Table 10 Population project for Mejía parishes

Regarding basic services for Alóag population, it is estimated in the following table:

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| TABLA CAH 69 Servicios básicos por parroquia | | | | | | |
|--|---------------------------|---|--|---------------------------------------|---|--|
| Parroquia | Vivienda con agua potable | Vivienda con servicio de alcantarillado | Vivienda con servicio de recolección de basura | Vivienda con servicio de electricidad | Vivienda con servicio higiénico exclusivo | Vivienda con características adecuadas de piso |
| Machachi | 46,15 | 56,14 | 61,41 | 92,75 | 47,93 | 90 |
| Alóag | 33,67 | 45,03 | 46,15 | 79,75 | 39,41 | 85,24 |
| Aloasi | 34,19 | 37,11 | 32,9 | 90,36 | 44,48 | 89,17 |
| Cutuglagua | 8,81 | 22,02 | 27,13 | 71,05 | 30,24 | 84,62 |
| El Chaupi | 13,88 | 8,47 | 19,18 | 77,55 | 18,95 | 86,94 |
| Manuel Comejo Astorga | 17,64 | 16,9 | 19,75 | 43,03 | 20,03 | 96,12 |
| Tambillo | 38,83 | 56,93 | 54,78 | 94,48 | 50,13 | 89,31 |
| Uyumbicho | 61,95 | 62,93 | 56,37 | 95,71 | 59,66 | 87,98 |

Fuente: GPP-DPLA
Elaboración: SISE

Table 11 Basic Services for Mejía parishes

In 2014, the urban and rural population of Mejía canton was distributed according to the table below:

| TABLA CSC 1 Población Urbana y Rural del Cantón Mejía | | | |
|---|--------------|-------------|--------------|
| Población | Hombres | Mujeres | Total |
| Rural | 7301 | 3187 | 43,65 |
| Urbana | 2331 | 952 | 40,84 |
| Total | 2525 | 876 | 34,69 |
| TOTAL | 21127 | 9059 | 42,88 |

Fuente INEC: 2010
Elaborado: EQUIPO PDOT GAD MEJÍA 2014

Table 12 Urban and Rural population for Mejía Canton

In Aloag, the weather is considered as equatorial meso thermal semi-humid, with the following temperatures: minimum of 3.6 ° C, maximum of 12.4 ° C, average 12.4 ° C.

Mainly, canton Mejía is characterized by the richness of volcanic soils and presence of water resources. It has highly agricultural areas, small and medium owners. In the last two decades extensive export agriculture was carried out, principally of flowers and vegetables. Livestock activity is developed and large farms and dairy companies.(GAD Mejía, 2014) Chart below shows land use in canton Mejía:

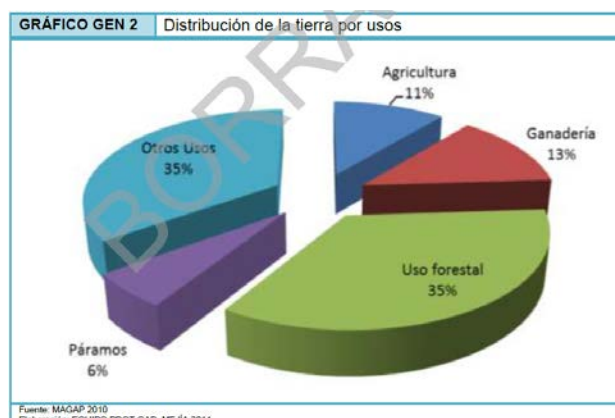


Figure 5 Land use for Mejía canton

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In 2010, according to data from MAGAP, in Mejía canton, was estimated that 59,962 hectares were destined to cattle range for milk production, while 5,420 hectares for traditional agriculture and 1,408 hectares to export crops. The high moors cover the ecological reserve and 28,017 hectares are part of water sources generation.

Agricultural production of small producers is based on the following main crops: maize, vegetables, beans and potatoes, with a production of 2,300 hectares per year. In Alóag are located industries, which 52% are dedicated to the processing and elaboration of food products and 48% diversified activities.

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El Chaupi:

The Chaupi Parish is located to the southwest of Mejía, near the Ilinizas Ecological Reserve, and it is located at altitude of 2900 meters above sea level. The area of this parish reaches 136, 91 square kilometers.

The weather for this parish is humid, sub-tempered, with an average temperature of 9.11° C. El Chaulpi parish uses 30% of tropical humid forest. El Chaulpi GAD has been carried out several reforestation projects for the massive planting of native trees, such as: quishuar, puma maqui, arrayan.

In 2010, a population of 1,373 was estimated. In 2014, studies were carried out to estimate a density population per parish, those results are shown in chart below:

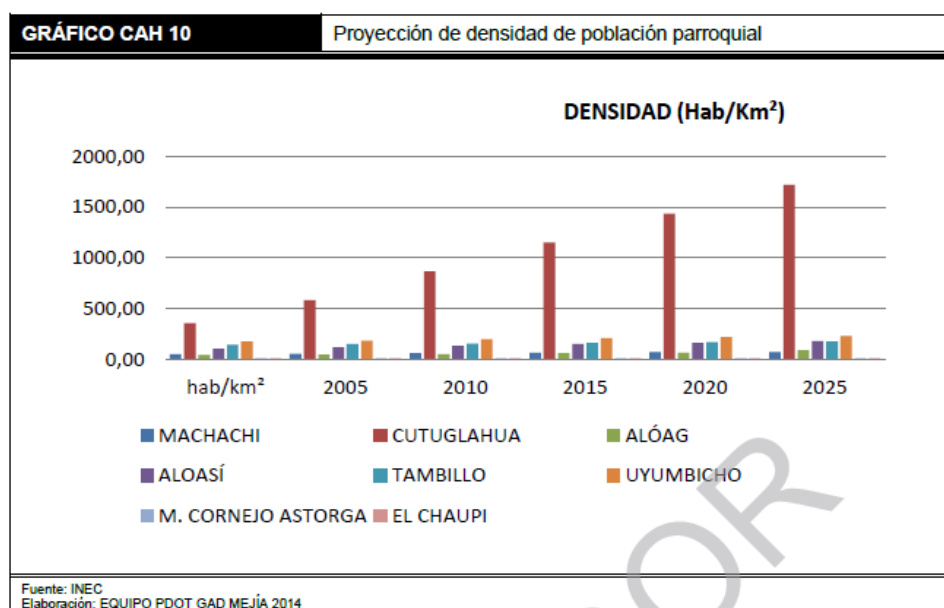


Figure 6 Projection of density of parish population

El Chaulpi is characterized by being a productive parish, and it has several access roads, which allows villagers to mobilize between farms to transport their products.

Tables below show historical milestones of El Chaupi parish, in the following aspects: Economic, Social and Environmental:

• **ECONÓMICO**

| AÑO | HITO | IMPACTO POSITIVO | IMPACTO NEGATIVO | OBSERVACIONES |
|-----------|---|--|---|---|
| 1930 1940 | Producción de los campos | Aumento de las fuentes de ingreso | Contaminación ambiental | |
| 1908 | El pase del tren | Mejora la economía, Movilidad y conectividad | | |
| 2009 | Asentamiento de la empresa agroquímica Quimiroburg S.A. | | | Requerir estudio de impacto ambiental para el correcto funcionamiento de la empresa. |
| 2008 | Florícolas Ilinizas Big Roses CIA. LTDA. | Positivo (Mano de obra local) | Utilización de Químicos. Personal afectado en su salud y desatención de la empresa. | Requerir estudio de impacto ambiental para el correcto funcionamiento de la florícola |

Table 13 Economic Historical Milestones for El Chaulpi

Stakeholders, interests and socioeconomic situation in the Río Blanco upper watersheds.

• **SOCIAL**

| AÑO | HITO | IMPACTO POSITIVO | IMPACTO NEGATIVO | OBSERVACIONES |
|-----------|--|--|---|---|
| 1930-1940 | Fraaccionamiento De los terrenos | | Aumento de necesidades de infraestructura Destrucción de bosque Daño al suelo | Propiedad de la Sra. Doña Manuela Carcelén (Marquesa de Solanda) |
| 1949 | Se presenta la propuesta ante el Concejo para la parroquialización de El Chaupi | Organización Social | | |
| 1996 | Creación del salón de usos múltiples y sede del Gobierno Parroquial. | Espacios físicos para desarrollo de actividades sociales | | |
| | Estadio parroquial El Chaupi | Disfrute de actividades deportivas de la población | | |
| 2009 | Grupo Club Adulto Mayor | Atención a personas de tercera edad | | |
| 2009 | Biblioteca Municipal | Servicio a la comunidad como fuente de consulta | | |
| 2000 | Destacamento Policial - UPC | Seguridad a la ciudadanía | | Organización ciudadana. |
| 1912 | Primer ascenso de los hermanos Martínez y Rafael Villavicencio a los Illinizas. Inicio de actividades turísticas hacia los Illinizas y demás atractivos naturales. | Asentamiento De Hosterías Y Hospedajes Para Turistas | | Débil promoción turística y capacitación a dueños de hosterías de la parroquia sobre promoción turística y atención a clientes. |

Table 14 Social Historical Milestones for El Chaulpi

• **AMBIENTAL**

| AÑO | HITO | IMPACTO POSITIVO | IMPACTO NEGATIVO | OBSERVACIONES |
|------|---|--|--|---|
| 1996 | Se establece la Resolución 066 publicada en el Registro Oficial No. 92 Como Reserva ecológica los Illinizas | Promueve la conservación del medio ambiente y el turismo | | Ejercer cumplimiento de la Ley sobre las reservas ecológicas. |
| 1886 | Erupción del Cotopaxi | | Contaminación del aire , agua, suelo | Afecto a todo el país. |
| 2011 | Incendio Forestal | | Contaminación de las aguas del Río Nieves toma El Corazón. Destrucción forestal en la reserva ecológica Illinizas. | Descuido de autoridades competentes. |
| | Empresa Novopan | | Daños a la esponja natural de gua (páramo) | Daño permanente al medio ambiente. |
| 2007 | Empresa ACOSA | | Siembra de árboles de Pino causando daño y erosión al suelo | Cultivos y talas permanentes |
| 1995 | Helada natural que terminó con la especie Batracio (Jambato) | | Desaparición de la especie. | |
| | Contaminación de quebradas y ríos de la parroquia por descargas de aguas servidas. | | Contaminación de ríos y daño de animales y cultivos. | |

Table 15 Environment Historical Milestones for El Chaulpi

In the El Chaulpi parish, one of the most important environmental problems is the inappropriate handling of solid waste, which is a threat for human and animal health located close this parish, especially in areas without garbage collection.

The El Chaulpi parish has suffered from the exploitation and deterioration of the forests in El Chaulpi hill, which has caused losses in biodiversity, and it's generating a decrease in water sources and pollution. The main threats of the area are: deforestation, forest fires, grazing and clearing activities.

This parish has experienced economic and population growth, because there is soil fertility in to carry out productive activities, such as floriculture and livestock. So, there has been considerable pollution and environmental degradation which has resulted in a decline in natural resources.

Deforestation, is the main cause for the destruction of the habitat of the species and its disappearance. However, presence of forests and ecological reserves, promote the tourist activity in the parish. Table below shows information about reforestation projects in El Chaulpi parish:

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| Ubicación/ Sector | PROYECTOS | | |
|--------------------------|------------------------|--------|---|
| | Acciones o Estrategias | Avance | Actores Involucrados |
| Barrio Pucará | Reforestación | 10% | Junta Parroquial, Consejo Provincial de Pichincha, Ministerio de Ambiente y Comunidad |
| Vertientes de San Marcos | Reforestación | 10 % | Junta Parroquial, Consejo Provincial de Pichincha |

Table 16 Reforestation Projects in El Chaulpi

Agriculture and livestock are main sources of income and subsistence for population, these activities are complemented with other family incomes. Table below shows results of studies carried out about economically active population and data obtained are sorted by activity, group and occupation category.

| RAMA DE ACTIVIDAD | CASOS | % |
|---|------------|---------------|
| Agricultura, ganadería, silvicultura y pesca | 369 | 59,23 |
| Explotación de minas y canteras | 2 | 0,32 |
| Industrias manufactureras | 44 | 7,06 |
| Suministro de electricidad, gas, vapor y aire acondicionado | 5 | 0,80 |
| Distribución de agua, alcantarillado y gestión de desechos | 1 | 0,16 |
| Construcción | 25 | 4,01 |
| Comercio al por mayor y menor | 41 | 6,58 |
| Transporte y almacenamiento | 23 | 3,69 |
| Actividades de alojamiento y servicio de comidas | 8 | 1,28 |
| Actividades financieras y de seguros | 3 | 0,48 |
| Actividades profesionales, científicas y técnicas | 5 | 0,80 |
| Actividades de servicios administrativos y de apoyo | 10 | 1,61 |
| Administración pública y defensa | 7 | 1,12 |
| Enseñanza | 10 | 1,61 |
| Actividades de la atención de la salud humana | 7 | 1,12 |
| Artes, entretenimiento y recreación | 3 | 0,48 |
| Actividades de los hogares como empleadores | 12 | 1,93 |
| No declarado | 28 | 4,49 |
| Trabajador nuevo | 20 | 3,21 |
| Total | 623 | 100,00 |

CUADRO 17
RAMA DE ACTIVIDAD
Fuente: Censo INEC, 2010
Elaboración: ETP-GADPP

| GRUPO DE OCUPACIÓN | CASOS | % |
|--|------------|---------------|
| Directores y gerentes | 18 | 2,89 |
| Profesionales científicos e intelectuales | 6 | 0,96 |
| Técnicos y profesionales del nivel medio | 7 | 1,12 |
| Personal de apoyo administrativo | 18 | 2,89 |
| Trabajadores de los servicios y vendedores | 58 | 9,31 |
| Agricultores y trabajadores calificados | 201 | 32,26 |
| Oficiales, operarios y artesanos | 47 | 7,54 |
| Operadores de instalaciones y maquinaria | 58 | 9,31 |
| Ocupaciones elementales | 161 | 25,84 |
| Ocupaciones militares | 1 | 0,16 |
| no declarado | 28 | 4,49 |
| Trabajador nuevo | 20 | 3,21 |
| Total | 623 | 100,00 |

CUADRO 18
GRUPO DE OCUPACIÓN
Fuente: GPP - DIPLA
Elaboración: ETP-GADPP

| CATEGORÍA DE OCUPACION | CASOS | % |
|--|------------|---------------|
| Empleado/a u obrero/a del Estado, Gobierno, Municipio, Consejo Provincial, Juntas Parroquiales | 33 | 5,47 |
| Empleado/a u obrero/a privado | 170 | 28,19 |
| Jornalero/a o peón | 153 | 25,37 |
| Patrono/a | 12 | 1,99 |
| Socio/a | 2 | 0,33 |
| Cuenta propia | 193 | 32,01 |
| Trabajador/a no remunerado | 9 | 1,49 |
| Empleado/a doméstico/a | 17 | 2,82 |
| Se ignora | 14 | 2,32 |
| Total | 603 | 100,00 |

CUADRO 19
CATEGORÍA DE OCUPACION
Fuente: Censo INEC, 2010
Elaboración: ETP-GADPP

Table 17 Economically Active Population in El Chaulpi

Table below shows a summary of productive activities in El Chaulpi parish:

| ACTIVIDADES PRODUCTIVAS | TIPO DE PRODUCCION O CULTIVOS | PRINCIPALES MERCADOS DE COMERCIALIZACIÓN |
|-------------------------|----------------------------------|--|
| Agrícola | Papas, Haba, Melloco, Hortalizas | Quito, Guayaquil, Latacunga, Saquisilí |
| Ganadería | Leche Y Derivados | |
| Florícola | Rosas | |

Table 18 Productive Activities in El Chaulpi

Regarding to gender projects, those have been executed in this parish; one in La Llovizna farm, which employs 20 women to dehydrate fruits and produce tea. Other projects developed were focus on involving women to work in agriculture activities in small family gardens for planting and harvesting organic vegetables.

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In 2010, a study of vulnerable groups was carried out, which results are show in the table below:

| TIPO DE VULNERABILIDAD | POBLACIÓN APROXIMADA |
|--|--|
| En qué sector de vulnerabilidad se ubica | Número aproximado de personas que sufren esta vulnerabilidad |
| Adultos/as mayores | 40 |
| Discapitados | 35 |

Table 19 Vulnerable Groups in El Chaulpi 2010

STAKEHOLDERS AND PERCEPTIONS ON CLIMATIC ISSUES

As described above the Toachi-Pilatón watershed is a natural framework of intense socioeconomic exchange where people and organizations of diverse type and range exert their interests in order to get and influence management of the existent natural resources.

This approach is helpful for understanding that any measure for promoting sustainable development, water management or adaptation strategies for climate change and vulnerabilities should be the result of the dialogue among the different stakeholders of the area. This part of the report is based on fieldwork carried out in the three rural counties in June 2016. During the field work was used semistructured questionnaires to interview representatives of the Cotopaxi, Sigchos, Las Pampas, Alóag, Palo Quemado, and Manuel Cornejo Astorga GADs, representatives of the Environmental and Communitarian sections of the Hidrotoachi project, members of productive organizations, and local residents. People interviewed were asked how they perceived climate issues and how they think they affect the daily life of the people.

Questions during the interviews looked for understanding five basic issues:

- What kind of weather issues are occurring in the area of study,
- How they are affecting the local people and socioeconomic activities,
- What are the explanations of local people to these events,
- What is the understanding of climate change phenomenon; and,
- How concerned are local authorities in watershed management and climate issues in the Toachi-Pilatón watershed.

These questions were helpful to know the perception and the level of preparedness for climatic events and issues of vulnerability in the area.

Stakeholders in the area

Stakeholders or Interest Groups are people and entities with a declared or conceivable interest or stake in the management of a given area. Stakeholders are not necessary organized they can be of any form, size and capacity like individuals, organizations, or even unorganized groups.

To carry out a detailed analysis of stakeholders or interest groups in the area, a categorization was required as follow:

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Figure 7 Stakeholders by category

Below a description of each category:

Government Sector: Organizations that are part of the state apparatus and have their functions determined according to national legislation.

Private Sector: Heterogeneous organizations that know the problem in the Toachi-Pilatón watershed including financial institutions.

Productive Organizations: Organizations that carry out their productive economic activities within the project area.

Civil Society and foundations: Individuals or foundations part of civil society in the project area.

Communities and Local Interest Groups: Communities and local groups that live in the Project area.

Academy: Organizations that have technical knowledge and collaborate in projects with the GAD.

For development of the final proposal, working meetings and consultations were held with Toachi Pilatón watershed stakeholders. As a result a list of stakeholders is shown in the following table:

| Category | Represented Organizations | Roles |
|--------------------------|--|---|
| Government Organizations | MAE | Administrative agency for providing climate change and environmental guidelines |
| | INAMHI | Implementing meteorological stations |
| | CELEC-HIDROTAPI | Administrative agency for implementing the project |
| | MEER | Administrative agency for providing energy technical knowledge |
| | MAGAP | Administrative agency for providing agriculture technical knowledge |
| | MINTUR | Promoting tourism in the project area |
| | Regional GAD: Pichincha | Administrative agency - province |
| | Regional GAD: Cotopaxi | Administrative agency – province |
| | Regional GAD: Santo Domingo de los Tsachilas | Administrative agency - province |

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| | | |
|----------------------------------|---|--|
| | Subregional GAD: Mejía | Administrative agency - municipality |
| | Subregional GAD: Sigchos | Administrative agency - municipality |
| | Subregional GAD: Santo Domingo | Administrative agency - municipality |
| | Local GAD: Manuel Cornejo Astorja | Administrative agency - local |
| | Local GAD: Palo Quemado | Administrative agency - local |
| | Local GAD: Alluriquin | Administrative agency - local |
| | Local GAD: Las Pampas | Administrative agency - local |
| | SENAGUA | Reporting and monitoring water quality |
| | Water Board Santa Rosa (Palo Quemado) | Water providing and administration |
| BanEcuador | Providing financial services | |
| Private Sector | Ranchers and farmers | |
| | Sultana del Còndor Minera Sulcomi SA (Palo Quemado) | Mining |
| | Toachi GADs Sigchos and Pichincha mining processing sites (Palo Quemado) | Mining |
| | Teegra Ecuador S.A. (Alluriquin) | |
| | Caselogic (Alluriquin) | |
| | Sultana del Còndor Minera (Sulcomi S.A), Loma del Tigre concession (Alluriquin) | Mining |
| | Coop "San Miguel de Sigchos" (Segment 4) | Providing financial services |
| | Coop "Unión y Progreso" (Segment 3) | Providing financial services |
| | Coop "CACPECO" (Segment 1) | Providing financial services |
| | Majinta Cusunchi | Providing financial services |
| | Credi Fé Banco Pichincha | Providing financial services |
| | Manantial de Oro | Providing financial services |
| Mining Company "Mina de la Plata | Mining production | |
| Civil Society and foundations | Fundación Tangaré (Tandapi) | |
| | Reserva Biológica La Esperanza | |
| | Hesperia Biological station and reserve | |
| | Otongachi biológico reserve | |
| | Río Guajalito Scientific Station | |
| | Tanti protected forest | |
| | Rio Lelia watershed protected forest | |
| | La Favorita Scientific Station | |
| | ORCOPROSAN | Productive community organization Santa Rosa Lima. (Paloquemado) |
| | Association of agricultural producers and dealers "Quinticusig" | Production of mulberry wine |
| | Association women's "Marianita de Jesús" Las Pampas | Working in cattle and agriculture |
| | Association of Cattle Rancher "Las Pampas" | Working in cattle raising |
| | Association "Flor de Caña" | Production of panela |

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| | | |
|--|---|--|
| Productive Organizations | Agroartesanal Association “San Pablo de la Plata” | Working in agriculture and cattle ranching |
| | Pre-Asociación de Cafetaleros (Tandapi) | |
| | Pre-Asociación de Cafetaleros (La Esperie) | |
| | Asociación de Productores Agropecuarios “Pampas Argentinas” (Tandapi) | |
| | Asociación Agropecuaria Mirabad (Tandapi) | |
| | Asociación de Trabajadores El Progreso | |
| Local interest groups | Juan Játiva | |
| | Unión del Toachi (Alluriquin) | Community |
| | La Esperanza community (Tandapi) | Community |
| | El Mirador community (Tandapi) | Community |
| | Mirabad community (Tandapi) | Community |
| | El Paraíso community (Tandapi) | Community |
| | San Francisco community (Tandapi) | Community |
| | Los Olivos community (Tandapi) | Community |
| | Peñas Blancas community (Tandapi) | Community |
| | Ilusión community (Tandapi) | Community |
| | Canchacoto community (Tandapi) | Community |
| | Iliolan community (Tandapi) | Community |
| | Cordilleras del Paraíso community (Tandapi) | Community |
| | San Antonio community (Tandapi) | Community |
| | La Esperie community (Tandapi) | Community |
| | La Palma community (Tandapi) | Community |
| | Pampas Argentinas community (Tandapi) | Community |
| | Praderas del Toachi community (Palo Quemado) | Community |
| | Palo Quemado Centro community (Palo Quemado) | Community |
| | San Pablo de la Plata community (Palo Quemado) | Community |
| | Las Praderas community (Palo Quemado) | Community |
| | Santa Rosa de Lima community (Palo Quemado) | Community |
| | Las Minas de la Plata community (Palo Quemado) | Community |
| | El Cristal community (Palo Quemado) | Community |
| | Zarapullo community (Palo Quemado) | Community |
| | La Florida community (Palo Quemado) | Community |
| Unidad Educativa Juan Salinas (Palo Quemado) | Community | |

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| | | |
|---------|---------------------|--|
| Academy | ESPE University | Providing technical knowledge and training |
| | Católica University | Providing technical knowledge and training |

Table 20 Stakeholders in the project area

During consultations, all stakeholders agreed on relevant importance of climate change adaptation project in the Toachi Pilatón watershed because they have evidenced a remarkable change in the climate over at least 5 years. This change is affecting the community's way life and their subsistence.

Using meetings each stakeholder presented their opinions and recommendations for the project and also they share information of projects in connection with adaptation climate change project. Parallel, according to National Constitution the regional decentralized governments are invested with the exclusive competence for watershed planning and for creating watershed council to carry out its management.⁶ Besides the conservation, recuperation and integrated management of water resources are also under the state responsibility through the regional governments.⁷ This competence bestow these governments to regulate all activities that can affect the water quality and quantity and the ecosystemic equilibrium especially and water recharge areas.⁸

As a summary stakeholders did focus in the following main aspects:



Table 21 Stakeholders aspects

Although the importance of the legal framework regarding watersheds, the regional governments have not been created yet, so their competences are not fully executed by any public organization. As a result there are not administrative councils for watershed managements and no control agency that can assure an overview of all the watershed of the country. Some control activities regarding these areas are carried out by the Ministry of Environment (MAE) and Ministry of Agriculture, livestock, aquaculture and fisheries. (MAGAP) but in any case an integrated policy of management and control can be applied by several and dispersed organizations.

⁶ See articles 262 and 263 of National Constitution

⁷ See article 411 of National Constitution

⁸ Idem

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Provincial governments have the competence for promoting public works in watershed of all type in their territories and to carry out the environmental management. However these competences can be conflictive since the promoting of public works means the construction of roads, irrigation channels, bridges and other infrastructure that can impact watershed if environmental issues are not considered. In addition, not all provincial governments have still authorization for environmental management⁹ so in practice no competences over watershed can be applied.

Another issue regarding one of the productive stakeholders in the watershed is the mining activity. As known mining is among the most nature transformation activities and typically they are executed in very difficult to access areas where rural governments are more efficient to reach. However according the national law, metallic mining activities are under the control of the central government and non-metallic mining under the municipal governments. In the area of study there are six metallic mining concessions and a number of non-metallic extracting places. Since rock, sand, stone and other non-metallic mine resources are abundant in the area it is virtually impossible for the local municipalities to control all of them. Companies granted with metallic mine concessions report to ARCOM (Agencia de Regulaciòn and Control Minero) and not to local rural parishes in whose territories the environmental impacts occur. As a result, mining companies work in the area but have not relationship with local organizations.

The effect of the above explained situation is that there is not any organization in the Toachi-Pilaton watershed that can carry out a comprehensive management of the existing hydric resources and to coordinate activities of the local public organizations in order to establish management activities for the control and conservation of the area.

Two institutions only are carrying some type of activities in coordination with local authorities, and other stakeholders. They are the MAE in the framework of Plan Bosque, in which coordination at different levels is performed with rural parishes, communitarian organizations and forest private owners. The other organization is the Hidrotoapi Hydroelectric Project, a large infrastructure construction executed by a private company under the order of the central government. As a part of the environmental requirements Hidrotoapi must execute communitarian consultation in the area of direct and indirect impact of such project. In order to fulfill such need this project has organized a comprehensive plan to inform local communities about potential environmental and socioeconomic impacts that can affect local livelihoods.

In the above mentioned scenario, the local stakeholders has few opportunities for communication, coordination and exchange strategies for organizing their activities in a sustainable way or at least to make them more efficient. On the other hand, the absence of a management straggles leave the stakeholders to perform their activities at large with a minimum of considerations for the security and sustainable use of the watershed.

Climate issues in the Toachi Pilaton watershed

Four climatic issues were mentioned consistently during the interviews: drought, rainfalls, temperature increase and strong winds. The local people are now aware of the weather events and negative impacts since it is fresh in the memory the catastrophic spate in the Alluriquin

⁹ According the MAE legal framework only provincial and municipal governments that fulfil some requirements are bestowed for environmental management in their jurisdictions.

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parish occurred a couple months before the field work for this report and caused by record precipitations. Most of the communities of the parishes involved in this study have also experienced landslides in their lands in the last two years due to sudden and excessive rains.

So for most of the interviewed people it is evident that changes in weather patterns have occurred over the last years and they are interconnected. Then awareness regarding climatic issues in the area has been triggered by the experience with such disasters which have affected practically all the region.¹⁰

Drought was considered an important issue especially in the Toachi watershed area. Communities of the upper basin like Palo Quemado and even of Sigchos referred that most of the year 2015 the entire area has suffered an extreme dry season. For communities of the lower basin it was not an issue because of the alternatives to offset the problem through the use of the river water, but for those of the higher and middle watershed it was more problematic because the river is far from the communities. However after several months of dryness there was a sudden rainy season including deluges that caused spate, mass movements and flooding in different communities of the lower and middle areas in the watershed.

Strong winds have also been reported during the interviews. These events occurred especially in Palo Quemado where the winds were so intense that several trees were uprooted. This weather condition is also pointed as part of the climate pattern change that is experiencing this region.

Effects of the weather issues on local socioeconomic activities

Local people have been concerned of threats to the communities caused by changes in the climate patterns especially in terms of human and economic security (i.e. landslides, flooding and crops quality). Ongoing changes in weather patterns are seen acutely since the Lamas river spate occurred in April 2016 and the string of landslides and avalanches occurred in the last months of 2015 and first trimester of 2016 in different areas of the three involved counties.

The related weather events have affected negatively the local people in several ways. First, long periods of dryness and short but intense periods of rains are pointed as the cause of the decreasing of sugar cane quantity and quality. Sugar producers said that the panela production has significantly decreased in the last year because of the lack of the cane quality.

Now they need more canes to produce the same amount of panela that is the standard for commercialization.¹¹ Other sectors like the cattle ranchers and agriculture producers have also experienced problems derived from extreme weather events. Low productivity, fungus and pest¹² increase, and plant destruction by intense rains are the most common problems the

¹⁰ The spate occurred in the Damas River in Alluriquin have had an economic impact beyond the micro-region of the lower Toachi-Pilatón watershed. Since the Aloag Santo Domingo road was closed during few days it affected the transportation between Quito, Santo Domingo and Guayaquil. Some landslide occurred in the same period near to Tandapi also forced to close the Aloag Santo Domingo road.

¹¹ Each piece of panela or “banco” for commercialization weight 32 pounds.

¹² Pests can appear during dry or wet season, but now with the intense weather conditions have appeared others previously unknown. For example in the naranjilla crops were common the “lancha negra” and “lancha blanca” pest, but now have appeared two more the “ojo de pollo” and “muerte lenta”, to control which farmers must apply more and stronger agrichemicals. This make costly some crops.

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farmers attribute to weather problems. For that they need to use more agrichemicals and devote more time for caring the crops.

On the other hand extreme rains soften the soils of deforested areas or steep hills and produce landslides or mass movements and flooding. During the last months of 2015 and the early 2016 several landslides occurred in the entire region and in most of the cases closing paths and roads and then causing transportation problems sometimes for several days. In the Manuel Cornejo Astorga rural parish more than 200 small and medium scale landslides occurred in the last year. Practically all the 26 communities of the parish have had landslides in their territory. The worst landslide occurred in May 2016 at the point in the kilometer 32 of the Aloag - Santo Domingo road forcing to close it for a couple days.

As already explained the spate in the Damas River that caused avalanche and flooding in Alluriquin was the most extreme effect of the concentrated rains occurred in April 2016. Besides the actual damage that can cause a landslide if it occur over towns, houses or roads, it affect the transportation of products to the markets and some of them like milk and other perishable can be ruined at all causing significant economic damage to the producers.

Strong winds have less impact in the farmers however some crops can be affected and accidents can occur when trees are uprooted. However any of the interviewed has reported accidents due to this type of event. On the other hand, the combination of winds, drought and high temperature sparked some wildfires in the area, especially in Sigchos.

Finally considering the sharp contrasts of the dry and wet periods local people realize that during the drought there was also a significant increment of temperature. However it may be a subjective observation. In any case cases of skin irritation especially in children have been experienced in the communities of Palo Quemado and Pampas de Agüilla in the middle and upper part of the Toachi watershed.

Perceptions of local people regarding weather events

Experience has provided rural communities a knowledge about the local environment and climatic issues. Based in such knowledge these communities have designed a yearlong calendar determining periods for planting, cropping, applying agrichemicals for caring the crops, and even for festivities and other celebrations. However, when sudden changes in local conditions occur, the people tend to fall in fabrications and attributions in order to make an understanding of the new or extreme events.

Pyhälä et al (2016) has studied how people can easily astray when issues go beyond of what is considered normal in terms of their experimental knowledge. He calls it memory illusions in which facts from previous knowledge and new imaginations can be mixed to get sense of new realities. However this may affect the experiential knowledge of the communities acquired through daily observation of their environment. Precisely this has happened in the Toachi – Pilaton areas.

Common explanation of why the creeks of the lower basin area have become dry during 2015 is that the waters were sank through the cracks opened in the soil because of the dynamite explosions carried out to build the Hidrotoapi hydroelectric project. In the upper part of the basin there are also communitarian explanations based in the imagination. For example the drought that has affected most of the year during 2015 and 2016 becoming an overwhelming problem and even a political issue. Since this weather condition affected five counties of the

Stakeholders, interests and socioeconomic situation in the Río Blanco upper watersheds.

Cotopaxi province included Sigchos in the upper part of the Toachi River, there was a public petition for creating “veedurias” or commissions in charge to investigate the cause of such abnormal drought (GAD-C 2016). In the communities sparked the idea that a program of “cloud seeding”¹³ was being carried out by flower cultivators in order to produce rain in specific areas to favor their agribusiness (GAD-C 2016). The popular explanations to new or unknown events may have been caused by influential or fantastic memories of extreme events mixed with new situations observed in the area.

However people also retain some indicators of recurrent local problems and provide more scientific explanation for new events. For example the drought problem and the landslides occurred in the upper basin, has been explained by the productive associations as a direct result of the constant deforestation in the area. The association of panela producers, Flor de Caña has explained that farmers use now more trees every week to produce panela, so the nearest forest in Palo Quemado are being significantly degraded. This means also that logs for firing the cauldrons should be brought from more distant places which make more expensive the production.¹⁴

The above explanations show how stakeholders are eager to determine whether situations and to establish them in terms of what is their interest. Beyond of what true or false can be the explanations, this situation also show that local are prone to know about climate issues and that information, capacitation and measures implementation on climate change adaptation are needed.

Understanding on climate change and awareness of local authorities

There is not a clear understanding regarding climate change in the communities in the three counties. Climate change is still a far reality and then there is not a conception on how to take actions to response it. However the adverse events of rainfall, spate and landslides have suddenly forced the people to take a position regarding the recurrent and catastrophic events that occurred in the area.

The Alluriquin disaster made people aware that climate has changed and some collective actions should be adopted. It is obvious that local communities are now more favorable to protect forest especially in the steep areas of the river bank and hills. In addition private reserves are more popular and seen as something positive for the community.

Notwithstanding the increase in public awareness it is not easily translated to local authorities in terms to move them devise plans for bettering the watershed management or coordinating among the different institutions to take common measures. This situation is due to normative and practical issues. From the point of view of the national legislation, the responsibility for watershed management corresponds to the regional GADs which as has already said are still inexistent. These institutions are bestowed by the National Constitution and COOTAD¹⁵ to

¹³ This process consists in “seeding the heavy clouds with tiny particles of silver iodide whose electrical charge would pull together the cloud's water droplets. Once enough droplets had gathered together, their weight would make them fall from the sky as rain.” See: <http://www.dailymail.co.uk/sciencetech/article-1351437/Can-scientists-REALLY-make-rain-useless-shower.html#ixzz4V92o0FR7>

¹⁴ To address this problem, the Association Flor de Caña of Palo Quemado is working with Maquita Cushunchic, a fair trade organization based in Quito, to introduce more efficient technologies and improve the production.

¹⁵ Código Orgánico de Ordenación Territorial y Administración Descentralizada.

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carry out the management of the hydrographic systems. This means that parish GADs cannot take initiative in promoting watershed management activities. So in this case while local authorities (the parish GADs) may understand the climate change issues and the potential impacts that can produce in their territories, they do not feel that can take actions or decisions in response to such global event.

Another issue that conspire against the adoption of local measures for watershed management is that some activities that cause severe impacts in the hydrographic basin are not under the control of local governments (the parish GADs). For example metallic and nonmetallic mine activities are under the control of the central government and of the municipal GADs. As a result these activities are not reported to the local parish authorities –the most idoneous to locally verify any situation- and then the control of the problems caused by mine companies not always are known by the control agencies.

The related issues and perceptions in the Toachi-Pilaton watershed show that capacity-building and community-based education are important activities for raising awareness on climate change impacts and promoting adaptation measures. These approaches are important to promote sustainable livelihoods, food security and finally sustainable development.

Gender Issues and Vulnerable groups:

As in most of rural areas in Ecuador, gender is a complex issue. It is difficult to evaluate women issues not only because there is an evident level of “machismo” but also because women have types of agency that do not necessarily have been analyzed by feminist studies and then may not fit in what gender inequality stands for.

The first aspect of gender inequality in the area is the invisibilization of the female work. Despite the current interest of the government for promoting women visibilization, most of the productive female activity is still not socially recognized, and in that sense it is not statistically reflected either. The division between labor for the market and domestic work is often diffused and part of the productive work ends up being counted as unrecognized domestic labor. In other words, female work counts only when it is sold in the market economy (as waged worker or as independent entrepreneur) but not when women work at home. Two factors contribute to this statistical invisibility: on the one hand the fact that all of the female home work has a high use value but it is of null exchange value. For example, cooking for the family, caring children, making the room and so on are activities that cannot be sold in the free market and then it is not worth or practical accounting them. On the other hand, the home female activities are seen as part of the gender work division so it is the task that women must contribute for family and social reproduction.

Beyond the above theoretical considerations since many men in the Toachi Pilaton area are increasingly incorporated in waged work activities, rural women have taken on bigger roles in agricultural production and community labour. The resulting effect of this fact is that the women must assume the place that men have left vacant and then must work an average of 14-16 hours daily. The personal impact of this social phenomenon can be devastating in terms of women health and of physical abuse from husbands.¹⁶ Here also is affected the right of women

¹⁶ In rural areas women have reported health problems like of the spine, of respiratory and reproductive organs, hernias, bruises, and wounds (MacMillan 1995) and gender violence (Camacho 2014).

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to have time for leisure, which in turn men enjoy in any case working in family subsistence activities or in waged work outside the town.

Notwithstanding evident gender inequality issues in the area of study it is also important to consider the women agency for creating income opportunities for their families. In practically all the areas women control most of the formal and informal food business. This provides them great economic independence counterbalancing home male-women asymmetries. In this case women are visibilized through a work inserted in the market economy.

Regarding other vulnerable people beyond women and children, there are no other particular groups that can be identified as vulnerable. Since the area of study of the Toachi Pilaton watershed is a frontier territory, there are no indigenous people nor Afroecuadorians.

En el cantón Sigchos, para el trabajo de las parcelas se utiliza la mano de obra familiar de las mujeres y sus hijos, los cuales también se encargan de la crianza de aves de corral. (GAD Sigchos, 2012)

During 2008, in the parish of “Las Pampas” was created the women's association “Marianita de Jesus”, which is supervised by the Superintendence of Popular and Solidarity Economy (SEPS). At present, the association made up of 18 women and they are owns a land for economic activities. Those activities are agriculture and cattle raising. For this association the main objective is generate income for their families.

In Las Pampas parish, there is an important role of women in the economic activities. According to data from INEC in 2010, population distribution in the productive sector is as show table below:



Figure 8 Las Pampas productive sectors

For 2018, according to PDOT, in the main precincts of Las Pampas parish, the goal is to build at least 13 centers of support for community social organization including women's groups, local social groups, among others.

In the parish of “Tandapi”, the municipality promotes entrepreneurship projects where women from the community participate in different activities such as: dance therapy, crafts, beauty, etc.

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Finally, another important project is one from Palo Quemado parish, where population is interested in implementing agriculture associations for single mothers and support them to granting land.

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BIBLIOGRAPHY

GAD Cotopaxi. (2014). *Sigchos*. Obtenido de Cotopaxi Gobierno Autónomo Descentralizado Provincial: <http://www.cotopaxi.gob.ec/index.php/2015-09-20-00-13-36/2015-09-20-00-15-41/sigchos>

GAD Las Pampas. (2015). *Plan de Desarrollo y Ordenamiento Territorial*. Las Pampas - Sigchos.

GAD Mejía. (2014). *Actualización del Plan de Desarrollo y Ordenamiento Territorial Cantón Mejía*.

GAD Sigchos. (2012). *Plan de Desarrollo y Ordenamiento Territorial (PDOT)*. Sigchos.

TECNALIA. (s.f.). *Análisis de la vulnerabilidad de las centrales hidroeléctricas priorizadas ante los efectos del cambio climático*.

Camarero Rioja, Luis Alfonso

2006 El trabajo desvelado. Trayectorias ocupacionales de las mujeres rurales en España. Instituto de la Mujer, Ministerio de Trabajo y Asuntos Sociales. Madrid.

EC (EiComercio.com)

2016 Cuatro personas fallecidas por el desbordamiento del río Damas en Santo Domingo de los Tsáchilas. El Comercio Newspaper, April 26, 2016. Available at: <http://www.elcomercio.com/actualidad/aloag-santodomingo-cierre-deslizamiento-desbordamiento.html>

GAD-A

2015 Plan de Desarrollo y Ordenamiento Territorial de la parroquia Alluriquín 2015-2019. Gobierno Autónomo Descentralizado de la parroquia Alluriquín.

GAD-C

2016 Comunidades exigen solución y ayuda ante la aguda sequía en la provincia. Consejo Provincial de Cotopaxi. Noviembre 18, 2016 <http://www.cotopaxi.gob.ec/index.php/noticias/item/1759-comunidades-exigen-solucion-y-ayuda-ante-la-aguda-sequia-en-la-provincia>

GAD-MCA

2012 Plan de Desarrollo y Ordenamiento Territorial de la parroquia Manuel Cornejo Astorga - Tandapi 2012-2025. Gobierno Autónomo Descentralizado de la parroquia Manuel Cornejo Astorga.

GAD-PQ

2015 Plan de Desarrollo y Ordenamiento Territorial de la parroquia Palo Quemado 2025. Gobierno Autónomo Descentralizado de la parroquia Palo Quemado.

MacMillan, Neale

1995 Ecuador: Health and the Working Woman. IDCR Reports Vol. 23, No. 2. July 1995. Available at <https://idl-bnc.idrc.ca/dspace/bitstream/10625/22843/2/112201.pdf>

Stakeholders, interests and socioeconomic situation in the Río Blanco upper watersheds.

Pyhälä, A., Á. Fernández-Llamazares, H. Lehvävirta, A. Byg, I. Ruiz-Mallén, M. Salpeteur, and T. F. Thornton.

2016 Global environmental change: local perceptions, understandings, and explanations. *Ecology and Society* 21(3):25. <http://dx.doi.org/10.5751/>

USGS

2016 What is a watershed?. The USGS Water Science School. Available at: <https://water.usgs.gov/edu/watershed.html>

Annex 9. Alternative approaches considered but not adopted in the project.

| Barrier | Project action | Alternative approaches considered but not adopted |
|---|--|--|
| Local population not fully aware of climate-related impacts. | Prepare and execute a public communication and education plan (output 7) | At first, it was thought to concentrate on formal education actions. However, there is a need to inform and engage all local stakeholders. Therefore, it was decided to have a wide-spectrum action that includes communication and education to the range of local audiences. |
| Local development plans do not incorporate adaptation measures. | Mainstream in six development plans ¹ measures for climate change adaptation with a watershed perspective (output 6). | At first, it was considered to concentrate on municipal development plans. However, during the consultation process it was clear that parrish governments are closer to the local population. In addition, municipal plans include the urban areas that have complex issues that are not within the scope of the present project proposal. Therefore, it was decided to focus on the parrish development plans of the five key parishes, and the municipal plan of Sigchos, which is majoritarian rural. |
| Local production is based on extensive farming practices. | Introduce sustainable farming practices in the two main activities (i.e., | It was thought to incentive agroforestry as an alternative to existing farming systems. Also, it was considered to incentive a change of crops. These were thought as alternatives to reduce the expansion of the agriculture frontier. However, it became obvious that these |

¹ Parishes Manuel Cornejo Astorga, Aloag, El Chaupi, Palo Quemado, and Las Pampas, and the rural area of Sigchos. These parishes are in the lower basin of the Toachi – Pilatón water system.

| Barrier | Project action | Alternative approaches considered but not adopted |
|---------------------------------|---|--|
| | sugar cane and pasture) (output 4). | alternatives will not produce short-term benefits to the local farmers. Since the two most important activities are (i) the production of sugar cane and panela and (ii) cattle ranching, it was decided to better build on the interest of local farmers to improve their production to explore better markets. Sugar cane producers have been exploring forms to have their product certified to enter international markets. |
| Forest areas are not protected. | Increase the forest cover under conservation (output 1), improve the management of the existing protected forests (output 2), and take measures to trap sediments from eroded hillsides (output 3). | <p>The first idea was to incentive the use of Socio Bosque incentives. However, it was considered that this economic incentive will not necessarily contribute to give value of standing forests and vegetation to the local population (it is the central government which “pays” for conservation). The idea of combining Socio Bosque type incentives and a water fund is being explored. The concept is that water users value the conservation of the water sources and contribute to sustain the fund. The fund in turn, will finance (i) incentives to local land-owners, (ii) the management of the large state-own protected forests, and (iii) complementary measures for soil conservation and the control hill erosion. This is an idea in progress. During project preparation, the feasibility of establishing a water fund will be analysed.</p> <p>The artisanal sediment retention dams is an adaptation measure proposed by the consultants that analysed climate change incidence in priority watersheds of Ecuador. Local groups have arguments in favour and against their use. The feasibility of their use will be analysed during project preparation.</p> |

| Barrier | Project action | Alternative approaches considered but not adopted |
|-------------------------------------|--|---|
| Limited climate-related information | Potentiate meteorological and hydrometric data collection and use (output 5) | The first idea was to use stations that have been installed by HIDROTOAPI. However, it was found that they do not serve to provide watershed-wide information, and are not fully operative. Current ideas are to invest in new equipment for the stations managed by INAMHI. The main limitation is securing funding for their long-term operation and maintenance. The water fund seems a probable source of funding, but its feasibility has to be assessed during project preparation. |



Project: “Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed (Toachi-Pilaton watershed) with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management.”

Report of consultation of stakeholders and workshops

Visited Places

- Sigchos
- Las Palmas
- Palo Quemado
- Tandapi
- Hidrotoapi
- Mejia

ANNEX 10

República del Ecuador

July of 2017

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MEMOIR OF VISITS TO GOVERNMENTS AUTONOMOUS DECENTRALIZED (GADs)

INTRODUCTION

During the construction of the Final Proposal for the Adaptation Fund under the project "Enhancing the adaptability of local communities, ecosystems and hydroelectric systems in the Río Blanco upper basin, with emphasis on Adaptation to Ecosystems and Communities and the Integrated Management of Adaptive Basins, "a route of each of the decentralized autonomous governments related to the management of the Río Blanco upper basin.

In the following order were visited the GAD's of: Sigchos, Las pampas, Palo Quemado, Tandapi and Machachi.

The organization of the trip and the visits was made by Nicolás Zambrano, an official of the Ministry of the Environment (MAE) and as a counterpart, the following persons were present during the visits:

- Dayana Vega Officer of the Adaptation to Climate Change Division of the Latin American Development Bank (CAF)
- Mauricio Velásquez, Executive of the Environment of the Latin American Development Bank (CAF)
- Diego Quishpe, Team consultant of Yapu Solutions
- Alvaro Torres, Team consultant of Yapu Solutions
- Miguel Herrera, Team consultant of Yapu Solutions

The schedule for the visits was as follows:

| Proyecto "Incremento de la capacidad adaptativa de comunidades locales, ecosistemas y sistemas hidroeléctrico en la cuenca hidrográfica del Toachi-Pilatón con enfoque de Adaptación basada en Ecosistemas y Comunidades y Manejo Integral Adaptativo de Cuenas Hidrográficas" | | | |
|--|----------------------------------|--|--|
| SALIDA MIÉRCOLES 12 DE JULIO | | | |
| HORA | LUGAR | ACTIVIDAD | PARTICIPANTES |
| 06H00 | MAE | SALIDA | MAE, CAF |
| 06H00-07H00 | QUITO-ALOAG | RECORRIDO, ENCUENTRO CON CELEC EP | MAE, CAF, CELEC EP |
| 07H00-08H30 | ALOAG-SIGCHOS | RECORRIDO | MAE, CAF, CELEC EP |
| 08H30-09H30 | SIGCHOS | ENCUENTRO CON MAEDP COTOPAXI / REUNIÓN | MAE, CAF, CELEC EP, MAEDP COTOPAXI - GADM SIGCHOS |
| 09H30-11H30 | SIGCHOS-LAS PAMPAS | RECORRIDO | MAE, CAF, CELEC EP, MAEDP COTOPAXI |
| 11H30-12H30 | LAS PAMPAS | REUNIÓN | MAE, CAF, CELEC EP, MAEDP COTOPAXI - GADP LAS PAMPAS |
| 12H30-13H30 | LAS PAMPAS | ALMUERZO | MAE, CAF, CELEC EP, MAEDP COTOPAXI |
| 13H30-15H30 | LAS PAMPAS-PALO QUEMADO | RECORRIDO | MAE, CAF, CELEC EP, MAEDP COTOPAXI |
| 15H30-16H30 | PALO QUEMADO | REUNIÓN | MAE, CAF, CELEC EP, MAEDP COTOPAXI - GADP PALO QUEMADO |
| SALIDA JUEVES 13 DE JULIO | | | |
| HORA | LUGAR | ACTIVIDAD | PARTICIPANTES |
| 08H00-10H00 | HIDROTOAPI | RECORRIDO HIDROELÉCTRICA | CAF, CELEC EP |
| 10H00-11H00 | HIDROTOAPI-TANDAPI | RECORRIDO | CAF, CELEC EP |
| 11H00-12H00 | MANUEL CORNEJO ASTORGA (TANDAPI) | REUNIÓN | CAF, CELEC EP, GADP MANUEL CORNEJO ASTORGA (TANDAPI) |
| 12H00-13H00 | MANUEL CORNEJO ASTORGA (TANDAPI) | ALMUERZO | CAF, CELEC EP |
| 13H00-14H30 | TANDAPI-MACHACHI | RECORRIDO | CAF |
| 14H30-15H30 | MACHACHI | REUNIÓN | CAF, GADM MEJIA |
| 15H30-17H00 | MACHACHI-QUITO | RECORRIDO | CAF |

Objective: The main objective of these on field visits was to inform the various stakeholders about the progress of the adaptation project, the next steps to take, the presentation of the team of consultants and know their concerns. During the visits it was also sought to know the activities planned by the autonomous governments decentralized within their territories and that had close link with the components of the project.

Methodology: Plenary sessions were held with all participants, motivating stakeholders to openly express their views on the project's approach and scope,

detailing the concerns or concerns from its perspective. These interviews were documented by the members of the consulting team. Transcripts of the most relevant aspects are recorder in this document.

VISIT 1

DATE: Wednesday July 12 from 09h30 to 11h00

PLACE: Gobierno Descentralizado Municipal de Sigchos.

ATENDANTS: Dr. Mario Andino Escudero, Alcalde de Sigchos, Dr. Iván Gomezgurado, Director de Sustainable Development, Heidi Niño y Daniel Obando from CELEC EP Nicolás Zambrano, Dayana Vega, Mauricio Velásquez, Diego Quishpe, Alvaro Torres y Miguel Herrera. (Anexo 2).

ABSTRACT: The representatives of the Municipal GAD of Sigchos stated that they were aware of the adaptation project and the importance of its implementation in their territories. They emphasize their total willingness to collaborate in the implementation of this project in the Sigchos canton, since they recognize the importance of their territories for the generation of the water resource that towards the western flank turn into the rivers named Río Blanco.

They explain that the agricultural activities are generating affectations that put at risk the capacity of its ecosystems of paramo and montane cloud forest to be able to regulate the water cycles. They highlight the difficulties and restrictions they have in order to develop projects oriented to the protection of the river basin, which is evident in the limiting composition of staff of the direction of sustainable development because, hardly has a technician and its annual budget allocated is restricted.

However, there have been specific initiatives aimed at strengthening capacities, so the Municipal GAD of Sigchos has the “Punto Verde” award granted by the Ministry of the Environment in 2017. They also work in conjunction with ESPE and Catholic universities to train the farmers of the area in Good Agricultural Practices.

Additionally, they state that at present they have a system of monitoring the quality of water for consumption and with two wastewater treatment plants for the city.

There is also an initiative to produce mortiño wine, which grows wildly. This project has been running for three years, involving about 60 families, whose members are part of the 130 existing partners. It is estimated that this activity also indirectly generates economic benefits to 90 people in the area.

Regarding the synergies to work in the implementation of the project, the Director of the Sustainable Development has proposed the following working areas in his canton

- 1) Water sources conservation,
- 2) Reforestation,

Memoir of visits to GAD and workshops

- 3) Soil conservancy, y
- 4) Socio-organizational development.

The GAD of Sigchos has been working with about 40 organizations from the existing 80, with which awareness and reforestation processes have been carried out.

It is stressed that, for the execution of these projects, the following technical aspects must be considered in order to achieve an effective implementation:

- 1) Water sources inventory,
- 2) Status of the vegetation coverage of intervention sites,
- 3) Communities' inventory.

The canton of Sigchos counts on parishes located in zones of paramo and subtropical, the ones that are to the south are those that more environmental affections have. Deforestation is a problem that could not be controlled, even though almost 70% of the canton is within the Los Illinizas Ecological Reserve.

In the city of Sigchos there are credit and saving cooperatives: San Miguel De Sigchos (segment 4), Unión y Progreso (Segment 3) and CACPECO (Segment 1)

Finally, it is agreed with the authorities of Sigchos, that the socialization workshop of the adaptation project, would be held on July 24, for which the respective invitation will be extended, emphasizing the importance of female participation.

VISIT 2

DATE: Wednesday, July 12 from 14h20 to 15h30

PLACE: Gobierno Parroquial de Las Pampas

ATTENDANTS: Mario Porras Presidente del GAD Parroquial Las Pampas, Elizabeth Ati y Leoda Porras from GAD Las Pampas, Clara Villamarín y Judith Pérez from women association Marianita de Jesús, Galo Hernández Livestock Association President of Las Pampas, Nicolás Zambrano, Dayana Vega, Mauricio Velásquez, Heidi Niño y Daniel Obando from CELEC-EP, Diego Quishpe, Alvaro Torres y Miguel Herrera.

ABSTRACT: Attendees of the meeting express that they have perceived that the climate in the area has varied in the last 10 years, in summer the rivers reduce significantly their flows, which generates difficulties for the farmers of the zone, for this reason many crops of naranjilla and sugar cane, getting closer to the banks.

Although they do not have upgraded to irrigation systems, they mention that they once did a drip irrigation project for family farms.

Livestock for fattening is another activity of the area, there are about 1,200 heads of cattle belonging to the 26 members of the association. Of a significant number

of cattle there is no record of their status or location. Livestock is extensive, so an average of 1.5 head of cattle per hectare is estimated.

The manufacture of panela is traditional in the area, many producers have been improving their technology with the help of the Cooperative of Savings and Credit Maquita Cusunchig. The burners they use today in part use bagasse from the same cane as a source of energy through their combustion. This has significantly diminished the use of wood that they remove from the forests. In addition, the panela of the Palmas manufacturers has obtained quality certifications to be able to export the product in the close future.

As main problems in Las Pampas, attendees mention the sewer system, which is already several years old and needs maintenance and expansion. Likewise, there is discomfort with the management of the garbage because at present the waste, without any classification, is deposited in a dump less than 50 meters from the nearest human settlements. This dump does not have any type of cladding, and is located near a ravine.

Illegal deforestation is an issue that seems daily and of which there is a lack of action coming from MAE.

Moreover, the attendees show their concern about the mining activity, which indicate that it is being developed in the contiguous parish, Palo Quemado. They reject mining, and are afraid that their operation will deteriorate the quality of water and soils.

Last but not least, the fact that Las Pampas is one of the few Parish GADs that already has an association of women oriented to promote their economic development is emphasized. At present many of them are active part of the factories of panela, of the cane cultivations and of the cattle ranch.

Apart from the Cooperative Maquita Cusunchig, the financial institutions which operates on the spot are Coop. Union and Progress, and BanEcuador.

VISIT 3

DATE: Wednesday, July 12 from 16h10 to 17h00

PLACE: Gobierno Parroquial de Palo Quemado

ATTENDANTS: Rodrigo Changoluisa President, Wilfrido Pazmiño Responsable from Environment and Marco Changoluisa, in charge of economic promotion, all of them belonging to GAD Parroquial Palo Quemado. In addition, Heidi Niño y Daniel Obando from CELEC-EP, Nicolás Zambrano, Dayana Vega, Mauricio Velásquez, Diego Quishpe, Alvaro Torres and Miguel Herrera.

ABSTRACT: The parochial GAD president mentions that ignorance of the relationships between traditional agricultural activities and vulnerability to climate change is a notorious and remarkable subject, since he mentions having deforested on his lands to encourage agricultural activities without any regret because of lack of knowledge.

Farmers often use wood sticks for fences on their ranches. Five years ago began with a pine planting initiative as an alternative to reduce the use of wood sticks and reduce pressure on forests.

They are aware of the illegal deforestation that occurs in the area, especially in the private protected forest Sarapullo, mention that they have gradually invaded areas of the protected forest, causing deforestation for the development of agricultural activities. In this sense, the GAD of Palo Quemado recognizes its limitations of personnel and budget to carry out activities against illegal logging. The GAD budget reaches USD 150,000 annually, which includes the items to cover administrative expenses and investment.

The sugar cane crops are the main ones and the panela producers are grouped in the “Flor de Caña” and “San Pedro de la Plata” associations. The Savings and Credit Cooperative Maquita Cusunchig has promoted in the producers, its access to a better practices for export of its products. In addition, they mention that the burners used in this activity were modernized 5 years ago, which has made it possible to reduce the use of wood by replacing it with the bagasse of the cane.

They propose that an additional technological leap could help fuel the furnaces to be completely replaced, eliminating the use of wood. There are proposals such as the use of electric ovens, however, would require the use of 220v electric grids. They comment on being open to a detailed and technical analysis, allowing them to identify better available technology (Best Available Technology) to reduce the pressures on the forests.

VISIT 4

DATE: Thursday July 12 from 08h30 to 11h00

PLACE: Premises of CELEC-Hidrotoapi

ATTENDANTS: Heidi Niño from CELEC-EP, Dayana Vega, Mauricio Velásquez, Diego Quishpe y Miguel Herrera.

ABSTRACT: A field visit to the facilities of the Toachi-Pilatón Hydroelectric was carried out. The construction of the civil works has a 95% advance, however, the hydro-mechanical construction is less than 50%, as the Russian company, in charge of this construction phase, did not comply with the contract, which is why the contractual relationship was cancelled. Will be a new process to select the tender for the completion of the mechanical work. However, this gives and realistic idea that the hydro would not come into operation in 2017, there is even talk of starting operations by 2019.

The economic crisis that worsened in 2015, reduced the staff of Environmental Management staff, currently there are 2 environmental engineers, a veterinarian and two community relations officers.

The contributions of the hydroelectric to the community, are given through support in reforestation events, with the delivery of seedlings and transportation for events, have also built infrastructure as sports fields for the community. In

previous years they have provided support with their machinery to repair the second-order roads communicating the neighboring parishes, however, because of malfunctions in the machinery this year have not.

They have left a space of 5 meters away from the water mirror as security in the reservoir. They affirm that this construction has not generated displacements of settlers of the zone. All the lands in the area that will be covered by the reservoir, have been acquired by the hydroelectric plant, cut all the trees in that area (counting on a forest exploitation license issued by the MAE) and delivered the wood to the community

They acknowledge that deforestation exists, especially in the protected forest Sarapullo, the hydroelectric plant has committed to build a non-carriage bridge for the community of Las Praderas. The Ministry of the Environment does not allow the construction of a bridge with capacity for vehicles, since it is intended to avoid illegal deforestation and expansion of the agricultural frontier.

Hidrotoapi has the respective Environmental Impact Study (EIA) approved in 2009 and Annual Environmental Management Plans. They still do not have the results of the 2016 environmental audit.

VISIT 5

DATE: Thursday July 13 from 11h20 to 12h20

PLACE: Gobierno Parroquial de Tandapi

ATTENDANTS: Silena Betancour, Secretary and treasury of GAD Parroquial de Tandapi, Heidi Niño from CELEC-EP, Dayana Vega, Mauricio Velásquez, Diego Quishpe y Miguel Herrera

ABSTRACT: The parochial GAD President of Tandapi was not present at the time of the visit.

To date the most relevant activities in environmental matters have been reforestation events on Pilatón River. For example, recently they would have carried out a reforestation with the participation of students of schools, of about 1000 plants were seed remaining 200 to be planted.

Mirador and Sarapullo are the main areas of deforestation, although there is a forest control of the MAE in Tandapi, it is recognized that there is illegal logging that is transported by roads without any control.

In Manuel Cornejo Astorga "Tandapi", the predominant economic activities are agriculture, livestock, commerce and services, the latter two of which are majority in the center (Tandapi) where the Aloag-Santo Domingo road crosses.

In the place there is a water bottler called "The Quebrada" and a laboratory of Tilapias that are exported to Colombia mainly. Sport fishing is also a relevant economic activity on place.

In the sector, the main supplier of credits is Credifé of Banco del Pichincha, followed by Cooperativ Manantial de Oro.

In terms of gender, there are projects to promote the participation of women, especially through the provision of dance therapy, crafts and beauty trainings, etc. The objective is to promote her entrepreneurship.

VISIT 6

DATE: Thursday July 13 from 14h10 to 15h10

PLACE: Gobierno Municipal de Machachi

ATTENDANTS: Ing. Fernanda Chávez Environment Management Coordinator, Alicia Vizuete Director of Environment and Risk Management Unit from municipal GAD of canton Mejia, Dayana Vega, Mauricio Velásquez, Diego Quishpe, y Miguel Herrera.

EXTRACTO: There is a first comment on the text of the "Concept Note", since it has been difficult to read for municipal GAD officials because it is in English. The request is made to be provided in Spanish.

The degradation of the watersheds of the San Pedro and Pilatón Rivers have been a matter of concern for the municipal GAD, for which they have planned reforestation events and have a vivarium in Romerillos.

There is interest in supporting the implementation of the Adaptation Project. They comment that in parish Manuel Cornejo Astorga there is a pilot project to develop Bocashi using the organic wastes of the harvesting process in Tandapi. It is a project that is expected to incorporate recyclers, among them mainly women, to transport to the transfer station and make the required inputs for Bocashi.

Another concern expressed in this meeting is the chance to use some of the resources of this project to improve actions to be taken in other sites of the canton, so an explanation about the exclusive use of this fund for the protection of Río Blanco upper basin was given.

VISIT 7

DATE: Friday July 22 from 09h10 to 10h10

PLACE: Gobierno Municipal de Aloag

ATTENDANTS: Wilson Rodriguez GAD Aloag's President, Miguel Herrera and Alvaro Torres.

EXTRACTO: It is mentioned that in terms of environmental issues they have carried out reforestation projects with the help of the Banco del Estado with non-reimbursable resources and support from the private company Adelca. While it is true that they are aware that the waters of Río Blanco come from Pilatón river which born in the parish of Aloag, the need to expand crops and pastures for milk and beef cattle have led to deforestation and degradation of the river basin.

Memoir of visits to GAD and workshops

Livestock in many cases is carried out at 3,500 meters high, practically where the paramo is born.

Waste management and classification is done in a transfer plant in Romerillos, where recyclable materials are used. They have sewage and potable water, however the sewage is not treated and is discharged directly into the waters of the San Pedro River.

There is great interest and commitment on the part of the parish government to participate in the socialization processes of this project and its subsequent execution.

The opportunity is taken to personally deliver the invitation to the socialization workshop of the adaptation project and stresses the importance of the attendance of representatives of women's groups.

Memoir of the socialization workshops which took place on Monday July 24 in Sigchos and Tuesday July 25 in Tandapi

WORKSHOP IN SIGCHOS

PLACE: Municipal hall of Sigchos

DATE: Monday, July 23 of 2017

ATTENDANTS: 22 men (58%) and 16 women (42%)

Point 1: The local authority, representative of the Ministry of the Environment and the Latin American Development Bank CAF welcomes the attendees and indicates the agenda for the day. They stress the importance of having their views on the overall project proposal.

Point 2: CAF consultants present the background to the adaptation project, briefly addressing the issue of climate change, the importance of adaptive processes for a highly vulnerable country, and entering into a conceptual review for some terms to be generally used during the presentation. A brief review of the general conditions of the Río Blanco upper basin is made mentioning the importance of the paramos and cloud forest ecosystems due to the water recharge they generate and addressing the main causes of degradation.

Subsequently, a brief time line review of the milestones of the project and adaptation from the lifting of the information for the concept note until the present date is made. It is stressed that the final document must be submitted on Monday, August 7 and 2017 as deadline.

Point 3: Presentation and explanation of the project components, the proposed outcomes and outputs. Doubts are clarified concerning the scope of some topics. At the same time, printed documents are delivered with the breakdown of the project's logical framework.

Point 4: A brief presentation by the Department of Sustainable Development of the Municipality of Sigchos is given by the director of the area Dr. Iván Gomezjurado, who shows the vision of the municipality of Sigchos on the subject of climate change and remark proposals that they consider complementary with those addressed by the adaptation project.

Point 5: The presentation of the Environmental Unit of the National Police is given by Captain Fernando Navarrete. This presentation emphasizes the work done by the UMPN in the sector. Forest control points that currently exist and objectives in the short term. Brief interactions with the community are made to clarify doubts and collect suggestions. Annex 2.

Point 6: The attendants are organized in groups of work by component, which means, three working groups each with the task to discuss internally the following points with respect to each component. Some guidelines questions are provided:

- Did you have any participation during the design of the project?
- What do you think will be the main achievements to be achieved with this project?
- What aspects do you think should be improved?
- Sustainable agriculture is economically viable. What do you think?
- Can public and private bank financing and COACs be considered as an important tool to promote more sustainable agriculture?
- How could the Investment Fund interact with the Basin Councils?
- What are the most relevant obstacles of the project that should be addressed?
- How do you think your community could contribute to the achievement of the project?
- How could - from its individual or associative role - contribute to the long-term sustainability of the project?
- In what measures could women's groups and vulnerable groups benefit from this project?
- What sustainable agricultural or livestock practices are your community or association carrying out?

Point 7: The groups work in number of 10 to 15 people with the assistance of the consultants of CAF like moderators. It takes about an hour and a half to discuss the relevant aspects of the component with respect to the guiding questions and their own points of view.

Point 8. Each of the groups makes a short presentation of 15 minutes on the main aspects discussed and contributed in their group. Consultants take notes.

Group 1: They mention activities such as: upgrading techniques and infrastructure for the panela production, conservation of protected areas, zoning and watershed planning, riverine protection plans, ravines and protective forest. Among the means of verification mentioned are: a reduction of 30% in the use of wood, participation of at least 50% of women, number of hectares protected and number of development plans.

Group 2: Propose training in new production technologies and attitudinal changes for the application of more sustainable agriculture and livestock methods. Among the ideas they have about agricultural sustainability is increasing the productivity of land to slow the advance of the agricultural frontier as well as the creation of vivarium that serve to boost reforestation programs. Access to credit is considered very important because BanEcuador is the institution that mostly works in the area and provides access to credit with low interest rates. However better terms and installment conditions according to the production cycles consider it an element to improve.

Group 3: The proposals were aimed at strengthening people's capabilities regarding climate change, understanding the cause-and-effect relationship between ecosystem degradation and the reduction of water flows. Awareness of the population and the strengthening of social network are seen as important elements to act effectively against climate change through adaptation.

Point 9. An individual anonymous survey of access to financing among attendees is given. (Session Plan annex 11).

Point 10. It is requested that only the groups of women, the disabled and the elderly be present at the meeting. These groups work through personal interviews and surveys to better understand their points of view regarding the project and document them.

Point 11. The work session is closed with words of thanks from Dr. Ivan Gomezjurado on behalf of the Mayor of Sigchos and Nicolas Zambrano representing the MAE.

WORKSHOP IN TANDAPI

Place: Parochial GAD of Tandapi's hall

Date: Tuesday, July 24 of 2017

Attendants: 28 men (57%) and 21 women (43%)

Point 1. This meeting had a good attendance of groups of older adults and women. For the efficient wording of this texts and considering that the development of the session the points 1 to 10 was a replication of the one done the previous day in Tandapi. Therefore only the group work has different outcomes, so that part is what is emphasized in this writing. Three groups were created so that each one is dedicated to the discussion of the respective components. It took about 2 hours for this activity including the development of the presentation of the main points. At the same time the survey of access to credit was delivered.

Point 2. Each group appointed its moderator to summarize the main points as follows

Memoir of visits to GAD and workshops

Group 1: The most relevant aspects were the placement of a checkpoint by the environmental police in the Las Pampas sector. Technological transfer mechanisms were also proposed through the institutions involved in the project and the universities participation. For the meteorological monitoring of the areas of influence of the project it is proposed the participation of INAMHI and the respective GADs, this information should be published in bulletins to be available to all stakeholders

Group 2: Farmers claim that they do not know any other way to do their activities, if there is an economically viable alternative and do effectively reduce the pressure on the environment, they would be willing to apply it. The financial institutions that are in place are mainly BanEcuador and Banco del Pichincha, although they offer credit many times the requirements are difficult to meet and the payments do not consider the seasonality of agricultural activities. They consider that the creation of an investment fund can be a good alternative to obtain financing of productive activities in the area, as well as to support protection ecosystem action. As for the selection of demonstrative farms, they mention that it is a good option as long as they keep their educational character and full openness for those who want to know them. The selection of participants for the demonstration farms should regard the backgrounds of serious efforts in training processes. This experience has CELEC through its community relations officers.

Group 3: highlight the importance of strengthening cooperation and knowledge networks, unity, organization and prevention are considered fundamental aspects to face the challenges of climate change. They consider their participation in this event as a way of being taken into account in the decisions which also are treir business. Training and support for construction and family orchards that apply good agricultural practices. Learning and strengthening their knowledge of economically viable and environmentally friendly farming practices will help many people to opt for these methods of production, stepping forward and producing organic products. Economic strengthening is important in order to avoid the migration of young people to big cities.

The annexes will compiled pictures about sessions and presentations.

Annex 1: Visits to parochial and municipal GADs



Memoir of visits to GAD and workshops



Memoir of visits to GAD and workshops



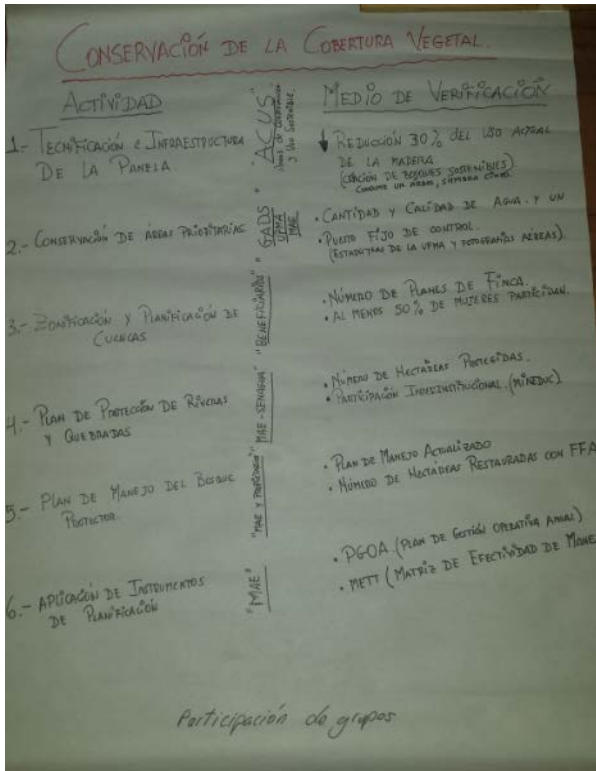
Annex 2: Workshop in Sigchos.



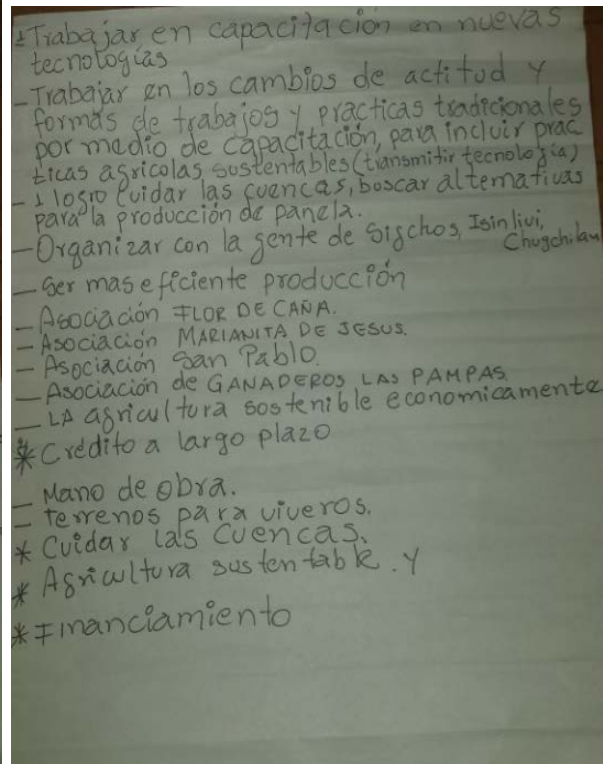
Memoir of visits to GAD and workshops



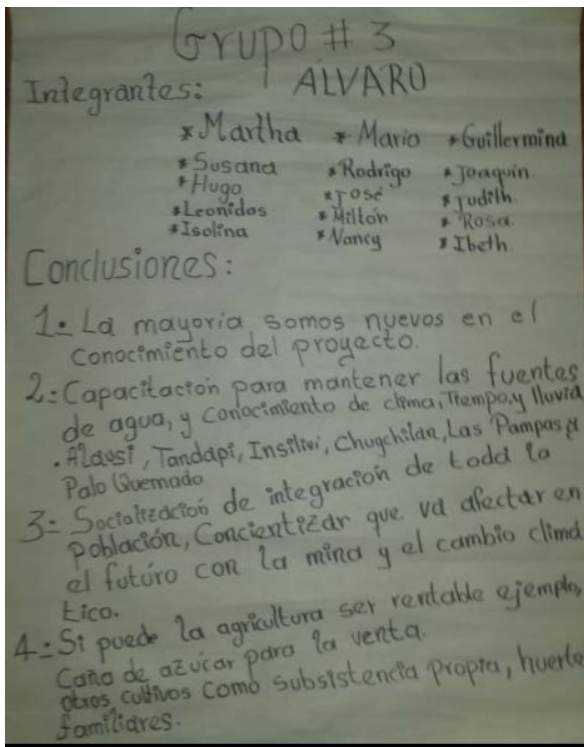
Annex 3: Groups presentations



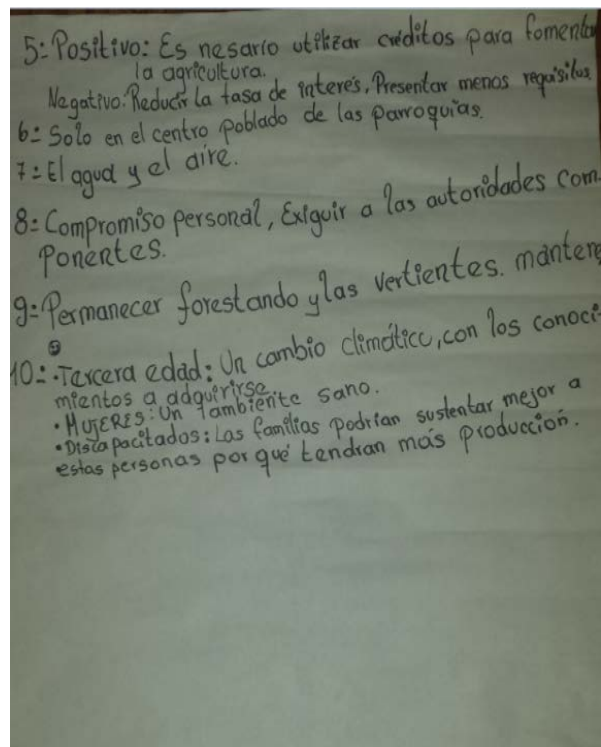
GROUP 1



GROUP 2



GROUP 3



GROUP 3

Annex 4: Workshop in Tandapi.



Annex 5: Groups presentation

| Actividad | Actor | Medio de Verificación | Lugar |
|---|--|--|--|
| 1.- BIODIVERSIDAD DE CONSERVACIÓN | GADS/SOCIEDAD CIVIL | EXPEDIENTE TÉCNICO (EBA) ZONIFICACIÓN PLAN DE MANEJO ESTRATEGIA DE SOSTENIBILIDAD FINANCIERA MODELO DE GESTIÓN ACUS | BPTP BUMBOLZ OTONGA HESPERIA RÍO BLANCO CANCHACOTO ZAPAPULLO QUEBRADA NEGRA CHITOA |
| 2.- ZONIFICACIÓN Y PLANIFICACIÓN DE FINCAS. | BENEFICIARIOS UNIDAD DE GESTIÓN DE PROYECTO IFIS | AL MENOS EL 50% DE MUJERES PARTICIPAN # DE PLANES DE FINCA | TODOS LOS INTERESADOS |
| 3.- CONTROL | MAE/UPMA | PUESTO FIJO DE CONTROL | TANDARA LAS PAMPAS |
| 4.- PROGRAMA DE TRANSFERENCIA DE TECNOLOGÍA | UNIVERSIDADES UNIDAD DE PROYECTO | CONVENIO | INTERESADOS |
| 5.- FORTALECIMIENTO DEL SISTEMA DE MONITOREO HIDROMETEOROLÓGICO | INAMHI UGP (Unidad Gestión Proyecto) GADS | EMISIÓN DE BOLETINES PLATAFORMA | TODA LA CUENCA |

GROUP 1

-2-

CRÉDITOS BANCO FORENTE PARA GANADERÍA, INICIA PASA A PARTIR DE LOS 3 MESES (INTERÉS 11,5% VS 25% OTROS BANCOS)

NO HAY CAPACITACIÓN PARA MEJORAR LAS TÉCNICAS EN GANADERÍA, EVITAR DEFORESTACIÓN (SIEMBRA PASTISALES)

QUE PROYECTO ES VIABLE Y QUIEN LO VA HACER

CAPACITACIÓN Y ACOMPAÑAMIENTO PERMANENTE (MAGAP)

-1-

MEJORAR LAS PRÁCTICAS AGRICOLAS, OPTIMIZANDO USO SUELO

DIVERSIFICAR PRODUCCIÓN AVICOLA / PORCINA

IMPULSAR INVERSIÓN Y ADAPTACIÓN YUCA RATON / QUEJERA BARRIDO PROTEGE LAS RAÍZES Y SUELOS (ASOCIACIÓN AGRPECUARIA PAMPAS AGRICOLA)

BIBEROS DE ESTACAS (CULTIVOS SIRVO PASTORILES)

HUERTOS

FINCAS DEMOSTRATIVAS

UBICAR UNA ORGANIZACIÓN COMPROMETIDA (APOYO PERMANENTE)

USO CON FINES EDUCATIVOS

-3-

FONDO DE AYUDA PARA PROYECTOS COLECTIVOS (ABORTAN EMPRESAS QUE SE BENEFICIAN DEL USO HÍDRICO) GAD LOCALES / CELEC

A SU VEZ HAY BENEFICIOS PARA TODOS - REQUISITOS

DEFINIR Y DELIMITAR EL FONDO VOLVERLO ATRACTIVO PARA EL AGRICULTOR

PROPUESTA - GANADO POREL SISTEMA DE EMBRIONES

INCENTIVAR DESDE ESCUELAS LAS PRÁCTICAS AGRICOLAS GRANJAS - SISTEMAS DE RIESGO (ATRATIVO?)

GROUP 2

Componente 3

Grupo: Terera Edad

Asociación del Adulto Mayor Persona jurídica 2007

Proyectos Huertos Hortícolas (cebolla, col, lechuga, etc) orgánicos

OBJETIVOS: 1- Mantenerse Unidos 2- Ayudarse los unos a los otros

Problemas: Afectaciones de clima y ecosistemas

Mucho calor → riego diario a las plantas

Necesidad / Tierra negra y abono

Dirección técnica MAGAP y apoyo de CELEC e P. Hidrotopi

La cosecha utilizan para consumo de la Asociación

Capacitación → Mayor Producción (asesor como van a sembrar)

Terreno si 4300 mts. No hay cercamiento

Necesidades: Donación de terreno y herramientas. Arreglo de la casa techo. Que las autoridades les tomen en cuenta y les incluyan en proyectos.

Asociación Adulto Mayor. Otras Actividades

Bailo terapia.

Manualidades (tejidos, cerámicas).

Incluir al grupo/Asociación dentro PAOT.

Cambios Climáticos

Hace 10 años era abrigado.

Clima variado

En temas de ganadería han delegado a sus hijos

transmiten sus experiencias.

Han migrado a la ciudad los hijos y familiares

Instituciones que pueden aportar en las Capacidades: CELEC e P. Hidrotopi, Fundación Touge' La Hesperia

Grupos: Adulto Mayor, otros grupos vulnerables: jóvenes, niñas, mujeres, GAD Parroquial

Capacitación y hacer consciencia del Cambio Climático

Capacitación interactiva (videos)

GROUP 3

Annex 6: Registration of attendants.



Taller de Presentación y retroalimentación los componentes del proyecto en conjunto con la comunidad y actores locales, con la finalidad de incorporar sus aportes y comentarios.

Sigchos, 24 de julio de 2017

POR FAVOR ESCRIBA CON LETRA IMPRENTA



| | NOMBRE | ENTIDAD | CARGO | CIUDAD | TELÉFONO | CORREO ELECTRÓNICO |
|----------|---------------------------|---------------------------------|--------------------------|--------------|------------|---|
| 30 -H | Marcelino Durancho | morador | morador | Las Pampas. | | |
| 31 -H | Leonido Viteri | flor de caña | Socio P | Quevedo | 0986862646 | Leonido V. |
| 32 -H | Yosé Inaias Viteri | flor de caña | Socio | Las Pampas | 0961326986 | Yosé Viteri |
| 33 -M | Margoth Robayo | Asociación Mananita de Jesús | Local Socio | Las Pampas | 0998869110 | Margoth Robayo |
| 34 -M | Judith Pérez Sti | Asociación Mananita de Jesús | Presidenta | Las Pampas | 0998343551 | Judith Pérez |
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| 37 -H | Ibeth Tipanguiza | Aso. San Pablo | Secretaria Carcultura | Palo Quemado | 0997199162 | |
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Taller de Presentación y retroalimentación los componentes del proyecto en conjunto con la comunidad y actores locales, con la finalidad de incorporar sus aportes y comentarios.

Sigchos, 24 de julio de 2017

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BANCO DE DESARROLLO DE AMÉRICA LATINA

Asociación Joralea

| NOMBRE | ENTIDAD | CARGO | CIUDAD | TELÉFONO | CORREO ELECTRÓNICO |
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UNOCS 12 años

Asociación Gumbos

Vocal

HUGO



Taller de Presentación y retroalimentación los componentes del proyecto en conjunto con la comunidad y actores locales, con la finalidad de incorporar sus aportes y comentarios.

Sigchos, 24 de julio de 2017

POR FAVOR ESCRIBA CON LETRA IMPRENTA



BANCO DE DESARROLLO DE AMÉRICA LATINA

| NOMBRE | ENTIDAD | CARGO | CIUDAD | TELÉFONO | CORREO ELECTRÓNICO |
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| Maria Rosa | Galapagos | | Palo Quemado | 0990629004 | <i>[Signature]</i> |
| Maria Esth. Manzano | Galapagos | | Palo Quemado | | <i>[Signature]</i> |
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Memoir of visits to GAD and workshops

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Taller de Presentación y retroalimentación los componentes del proyecto en conjunto con la comunidad y actores locales, con la finalidad de incorporar sus aportes y comentarios.

Sigchos, 24 de julio de 2017

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| NOMBRE | ENTIDAD | CARGO | CIUDAD | TELÉFONO | CORREO ELECTRÓNICO |
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| | | | | | |
| | | | | | |

Memoir of visits to GAD and workshops



Taller de Presentación y retroalimentación los componentes del proyecto en conjunto con la comunidad y actores locales, con la finalidad de incorporar sus aportes y comentarios.

Tandapi, 25 de julio de 2017

POR FAVOR ESCRIBA CON LETRA IMPRENTA



| NOMBRE | INSTITUCIÓN | CARGO | CIUDAD | TELÉFONO | CORREO ELECTRÓNICO |
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| Monica Dolores Cubrena | Banris | Mostrar | Tandapi | | makreza |
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Memoir of visits to GAD and workshops



Taller de Presentación y retroalimentación los componentes del proyecto en conjunto con la comunidad y actores locales, con la finalidad de incorporar sus aportes y comentarios.

Tandapi, 25 de julio de 2017

POR FAVOR ESCRIBA CON LETRA IMPRENTA



BANCO DE DESARROLLO DE AMÉRICA LATINA

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Tandapi, 25 de julio de 2017

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Memoir of visits to GAD and workshops



Taller de Presentación y retroalimentación los componentes del proyecto en conjunto con la comunidad y actores locales, con la finalidad de incorporar sus aportes y comentarios.

Tandapi, 25 de julio de 2017

POR FAVOR ESCRIBA CON LETRA IMPRENTA



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Memoir of visits to GAD and workshops



Taller de Presentación y retroalimentación los componentes del proyecto en conjunto con la comunidad y actores locales, con la finalidad de incorporar sus aportes y comentarios.

Tandapi ~~Sigchos~~, ²⁵ 25 de julio de 2017

POR FAVOR ESCRIBA CON LETRA IMPRENTA



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Workshops for the project “Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed (Toachi-Pilaton watershed) with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management.”

Session Plan

ANNEX 11

July 24 of 2017

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Introduction

This is a proposal of the session plan to apply into the stakeholder consultation meetings related to the project.

Objective of the consultation sessions

To present and receive feedback the components of the project together with the community and local actors, with the purpose of incorporating their contributions and comments.

Groups to be invited:

The entities and groups that participated in the consultation workshops held on July 15, 2016 in the communal house of Union del Toachi and others identified in previous meetings and by local actors.

Organizations / representatives of vulnerable groups (women, the elderly, the disabled, migrants, etc.) who can be co-executors for the project.

To take into account for the invitation:

1. Announce in advance the realization of the event and been aware to avoid coinciding with any other planned event
2. Choose an easily accessible place for communities (or provide the means of transportation to get there)
3. Ensure comfortable and safe spaces for all participants. If necessary, call separately men and women, and even consider the need to have a facilitator for men and a facilitator for women
4. Identify whether women in the community have where to leave their children (or if they can bring them) during the consultation workshop.
5. Establish a schedule that favors participation (which does not intercede with working hours or complicated schedules for people who take care of relatives, this is linked to the previous point)
6. Take into account the language of the communities for the facilitation of the consultation (Spanish may not be the suitable language)
7. If representatives of communities participate, verify that they effectively represent their community (and not just a particular group or sector)

Taking into account that, the interest of the participants focuses directly on the areas of influence of the project, that involve their communities and farms, it is proposed to conduct two separate workshops with the participation of stakeholders in each basin, ie a workshop for the stakeholder group from the Toachi River sub-basin and another stakeholder group from the Toachi River sub-basin.

Sigchos

The event will be held on Monday, July 24, 2017 in the city of Sigchos, starting at 10h00. It is important to coordinate with the Director of the Directorate of Sustainable Development, Mr. Ivan Gomezjurado (0999-666650) of the Municipal GAD, who has contact with the communities of different parishes and knows who their representatives are.

Transportation to facilitate the moving for the meeting of Las Pampas and Palo Quemado participants is provided by consultant.

The event in Sigchos will be attended by representatives of this parish and will also send the invitation to the communities of:

1. Las Pampas Agüilla, y
2. Palo Quemado
 - 2.1. Community of Santa Rosa
 - 2.2. Community of La Florida
 - 2.3. Praderas del Toachi
3. GAD Municipal de Sigchos

Manuel Cornejo Astorga (Tandapi)

1. The next workshop will be held on Tuesday, July 25, 2017 in Tandapi. For this final socialization process, apart from Tandapi representatives, the invitation will be sent to the communities of: Manuel Cornejo Astorga
 - 1.1. Comunidad La Esperie
 - 1.2. Comunidad Pampas Argentinas
 - 1.3. Comunidad La Esperanza
 - 1.4. Comunidad El Mirador
 - 1.5. Comunidad Mirabad
 - 1.6. Comunidad El Paraíso
 - 1.7. Comunidad San Francisco
 - 1.8. Comunidad Los Olivos
 - 1.9. Comunidad Peñas Blancas
 - 1.10. Comunidad Ilusión
 - 1.11. Comunidad Canchacoto
 - 1.12. Comunidad Iliolan
 - 1.13. Comunidad de San Antonio
 - 1.14. Cordilleras del Paríso
2. GAD Municipal Mejia
 - 2.1. Aloag
 - 2.2. GAD Municipal Machachi

In addition, the invitation will be made to officials from public and private institutions that participated in the first workshop in July 2016 and others identified in previous meetings and by local actors.

Prior activities to the consultation meetings

Sigchos y Tandapi

1. The Ministry of Environment (MAE) will send a letter addressed to Dr. Mario Andino Escudero Mayor of the city of Sigchos (with a copy to Dr. Iván Gomezjurado) to kindly request the use of the Municipal Hall.
2. Perform a guest list, considering changes in the functions of public servants or incorporation of new players.
3. Taking into account the recommendations of the Adaptation Fund, concerning gender issues, special emphasis should be made on the invitation to groups of women and vulnerable groups. It is expected to exceed 35% of female attendance reached at the first socialization workshop. Representatives of the elderly or disabled groups should also be considered.
4. Coordinate with the municipal and parish GAD's the delivery of printed invitations to the participants.
5. Make phone calls to the guests to confirm their attendance.

Session plan

Date of the event: Monday 24 July in Sigchos and Tuesday 25 July in Tandapi.

Location: Municipal Hall of Sigchos and meeting room of the Parish of Tandapi.

Objective: Present and get feedback about the components of the project together with the community and local actors, with the purpose of incorporating their contributions and comments.

Key activities:

1. Report on the progress of the project to the Adaptation Fund.
2. Present the draft project
3. Receive comments from local stakeholders.

Expected outcomes:

1. Comments for adjustment of draft project document
2. Agreement on the next steps for submission of the project to the Adaptation Fund

Considering the time of mobilization of some distant parishes, it is considered appropriate for the meeting to begin at 10:00 a.m. The total time required is 300 minutes (5 hours).

| Hour | Activity | Responsible and notes |
|--------------------------|------------------------------|---|
| 15min 10h00- 10h15 | Registration of participants | At the entrance to the site, a table should be available to attend the participants. A person must be available for registration in an elaborate format. An identification with the name of each participant will also be given to wear on the flap. Debe estar disponible un servicio de bebidas frías y calientes y bocaditos para que los participantes los consuman durante la reunión. |
| 15 min | Wellcome words | Initial welcome by local authorities, MAE. And representative of CAF |

| Hour | Activity | Responsible and notes |
|-----------------------|--------------------------------------|--|
| 10h15-10h30 | | |
| 10 min 10h30-10h40 | Participants presentation one by one | Participants will be asked to make a brief individual presentation, indicating the name, activity, place of origin and entity they represent. |
| 10 min 10h40-10h50 | Agenda presentation | The purpose of the meeting will be explained. Rules will be established (avoid cell phones, respect the use of the word, listen to opinions of all). The agenda will be explained. Digital projector required. |
| 30 min 10h50-11h20 | Status of the project | PowerPoint presentation (15 minutes). The CAF representative will present (i) an explanation of the Adaptation Fund (1 sheet), (ii) background of the project (1 sheet), (iii) timeline of the process carried out (1 sheet), (iv) Critical themes (1 or 2 sheets). Questions and answers (15 minutes). In the event that there is a power outage, the presentations of the components in paperboard will be made detailing the relevant aspects and verbally explaining each of them. |
| 60 min 11h20-12h20 | Presentation of draft | PowerPoint presentation (20 minutes). The elements of the project will be presented with emphasis on (1) logical framework (products and results), (2) budget and (3) implementation arrangements. Clarifying questions and answers (20 minutes). |
| 60 min 12h20-13h20 | Plenary or working groups | Depending on the number of people involved, a plenary session (<15 persons) or groups (> 15 persons) will be held. It is advisable to identify groups of homogeneous interests and group them (eg, associations, NGOs, etc). In both cases, it will seek to obtain recommendations and suggestions from the participants. Interventions should be recorded to have record for memory. Guiding questions: <ul style="list-style-type: none"> • Did you have any participation during the project design? • What do you consider to be the main achievements to be achieved with this project? • What aspects do you think should be improved? • Sustainable agriculture is economically viable. What do you think? • Can public and private bank financing and COACs be considered as an important tool to promote more sustainable agriculture? • How could the Water Fund interact with the Basin Councils? |

| Hour | Activity | Responsible and notes |
|--------------------------|---|---|
| | | <ul style="list-style-type: none"> • What are the most relevant obstacles of the project that should be considered? • How do you think your community could contribute to the achievement of the project? • How could - from its individual or associative role - contribute to the long-term sustainability of the project? • In what measures could vulnerable groups and women benefit from this project? • What sustainable agricultural or livestock practices are being carried out by your community or association? <p>Questions will be given in a printed document. One sheet per group.</p> <p>In addition, an anonymous survey will be conducted among those attending to know their situation of access to credit. Appendix 1</p> <p>Expected results: To know, from the perspective of the residents of the area of influence of the project, their points of view about the relevance of the measures proposed in the components, and the degree of incidence in their living conditions. Also know their empowerment and predisposition for the implementation of the project.</p> <p>Section of the project that reinforces this part:</p> <p>Point 3: Does the project / program provide economic, social and environmental benefits, in particular to vulnerable communities, including gender considerations, avoiding or mitigating negative impacts, in accordance with the Environmental and Social Policy and Gender Policy From the bottom?</p> <p>Point 9: Has a consultative process been carried out involving all key stakeholders, including gender considerations in compliance with the Environmental and Social Policy and the Gender Policy of the Fund?</p> |
| 13h20-14h20 | | LUNCH TIME |
| 40 min 14h20 15h00 | Plenary only with women and vulnerable groups | <p>Open forum of opinions and impressions by groups of women and vulnerable groups attending the event. Through open-ended questions, participation will be promoted, so they could present their opinions, doubts or concerns about how the project will affect their daily lives. Their expressions and comments will be recorded by the consulting team.</p> <p>Guiding questions:</p> <p>What are the labor or personal difficulties you face in your day to day life in your community?</p> |

| Hour | Activity | Responsible and notes |
|---------------------------|----------|---|
| | | <p>What is your personal opinion about the project, what concerns you or what leaves you with doubts?</p> <p>How does your economic activity and your family life relate to the scope of the project?</p> <p>To what extent do the public policies in your community affect your role within it?</p> <p>Which components of the project do you consider most relevant to your current situation?</p> <p>What aspects of the project should be improved from the perspective of the group you represent?</p> <p>Which components of the project directly benefit vulnerable groups and women?</p> <p>Expected results: To know more deeply, from the perspective of vulnerable groups and women, their empowerment and degree of affinity with the scope of the project. Also identify aspects to be improved regarding gender assessment within the wording of the Final Proposal</p> <p>Section of the project that reinforces this part:</p> <p>Point 3: Does the project / program provide economic, social and environmental benefits, in particular to vulnerable communities, including gender considerations, avoiding or mitigating negative impacts, in accordance with the Environmental and Social Policy and Gender Policy From the bottom?</p> <p>Point 9: Has a consultative process been carried out involving all key stakeholders, including gender considerations in compliance with the Environmental and Social Policy and the Gender Policy of the Fund?</p> |
| 10 min 15H00- 15H10 | Closure | The CAF representative explains the next steps (it would be useful to have a PowerPoint slide) and thank the participants. Closure by the Ministry of Environment if possible. |

Logistics requirements:

1. Room with capacity to accommodate about 30 people sitting, with ease so that they can work in groups, using walls to place their results.
2. A person who takes notes of the interventions for memory.
3. Digital Projector.
4. Digital recorder.
5. Maps printed in A1 format.
6. In the case of group work: flip charts, masking, two-color thick tip markers.

ANNEX 1: Survey on access to financing.

SEXO: F M OCUPACION: _____

SECTOR EN EL QUE VIVE: _____

Esta encuesta es de carácter anónimo, la información recabada servirá para conocer la situación de acceso a crédito en las zonas de influencia del proyecto.

1) ¿Tiene cuenta de ahorros? SI (pase a pregunta 2)

NO (pase a pregunta 3)

2) ¿En qué institución financiera tiene su cuenta de ahorros?

3) ¿Tiene crédito con alguna institución financiera? SI (pase a pregunta 4)

NO (pase a pregunta 6)

4) ¿Con qué institución financiera trabaja?

Banco Privado: Nombre de la institución: _____

Banco Público: Nombre de la institución: _____

Cooperativa de Ahorro y Crédito: Nombre de la institución: _____

5) ¿En qué invierte usualmente su crédito?

Capital de trabajo (mercadería, materia prima)

Activos Fijos (máquinas, implementos)

Consumo (viajes, alimentación, etc.)

Otros: Especifique: _____

6) ¿Qué aspectos considera que deberían mejorar las instituciones financieras de su localidad? (seleccione máximo 2 respuestas)

Tasa de interés Plazos más largos

Trámites más sencillos Flexibilidad de garantías

Agilidad Acceso a crédito

7) Comentarios:

Gracias por su atención. ¡Que tenga una buena tarde!

ANNEX 2: Survey about gender and vulnerable groups

Datos Generales:

Fecha: _____ Nombre: _____

Edad: _____ Ocupación: _____ Lugar donde vive: _____

Preguntas:

1. Indique por qué son importantes las mujeres y los grupos vulnerables en cada componente del proyecto y que sugerencias tiene para ser considerado:

Componente 1: Conservación de cobertura vegetal

Componente 2: Adaptar las prácticas agrícolas y las nuevas condiciones de cambio climático y permitir su financiamiento sustentable

Componente 3: Fortalecer las capacidades locales y compartir lecciones

2. Escriba los nombres de las asociaciones, organizaciones, grupos que existen en su parroquia en la que participen mujeres y grupos vulnerables. Además llene los datos de la tabla.

| Nombre Asociación, Organización o Grupo | Número de mujeres | Número de personas que son parte de los grupos vulnerables | Actividad Económica principal de la Asociación, Organización o Grupo | Tipo de productos que produce la asociación, organización o grupo | ¿Es propietario de algún predio? (a nivel de la asociación) |
|---|-------------------|--|--|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

3. Describa la situación en general de los grupos vulnerables en su parroquia, asociación, organización, comunidad o recinto (Sigchos solamente)

4. Indique los siguientes dato(Tandapi solamente)

Salario mensual (USD) de: mujeres: _____ hombres: _____

Grupos vulnerables: _____

Es dueño de un terreno: Si ___ No___ Qué produce en su terreno: _____

Escriba como ha sido amenazado con el cambio climático:



**Feasibility study for the creation and operation of an
Investment Fund within the scope of the project
"Increasing adaptive capacity of local communities,
ecosystems and hydroelectric systems in the Río Blanco
upper watershed (Toachi-Pilatón watershed) with a
focus on Ecosystem and Community Based Adaptation
and Integrated Adaptive Watershed Management"**

ANNEX 12

Feasibility of investment fund

July of 2017

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FEASIBILITY STUDY OF THE INVESTMENT FUND TO PROMOTE THE SUSTAINABLE DEVELOPMENT OF THE RÍO BLANCO UPPER BASIN

1. ABSTRACT: The investment funds have been set up in the country some years ago to provide financial resources for the implementation of projects that would otherwise not be possible, water funds are the most common figure used to this end.

The recovery of vegetation cover, the preservation of water basins, transfer of knowledge to communities, etc., are actions that, even in the absence of economic yields, generate important environmental and social benefits that are difficult to quantify. Therefore, the Sustainable Development Investment Fund (FONDESA, name suggested) seeks to pool economic resources to ensure its own sustainability and to have resources that boost projects that improve the livelihoods and productive activities of the people.

The degradation conditions of the Toachi and Pilatón rivers basins require coordinated actions between control authorities, surrounding populations, producers associations and direct beneficiaries of the water resource like hydropower plants. The Investment Fund has a well-defined and proven governance structure in the funds fully operating in the country. Strategies of success models will have to be adapted according to the local characteristics (political, social and economic) to the management of this watershed

The contribution of seed capital for the constitution of the fund may trigger the interest of sectional governments, which have among their various concerns, environmental protection within their territories. The addition of local constituent adherents to the Investment Fund will give them a sense of belonging and ownership of the management of this financial instrument. The correct selection of the technical staff - who will support the work of the fund from the very beginning- and the promotion of various projects in favor of the basin will be important reasons to attract and maintain the contributions of the constituents and achieve the adhesion of others.

The creation of suitable means to gather economic resources from the autonomous governments (GADs) through new bills or taxes is within their competence, as is the case in the city of Quito and in the municipalities of Loja with FORAGUA, without a doubt, this strategy merits political will that can be achieved with a correct and wide dissemination of the Investment Fund performance throughout the basin.

The transparent management of resources and the periodic accountability will be decisive elements to show the benefits generated by the operation of the fund in the area. Adequate management of resources, under criteria of prudence, security and profitability, will allow the equity of this fund to be progressively expanded, even after the Adaptation Fund Project has been completed. Sustainability, understood as the permanence in time of financial resources for the benefit of the basin, will be fully achieved, constituting an illustrative and demonstrative case to promote the emerging of similar initiatives in the country.

2. BACKGROUNDS: As a most remarkable model of functioning is the water fund scheme, as it was mentioned, are financial instruments that can guarantee the sustainability in time of activities related to the protection of the water resources of a defined area and to give support for more ecofriendly productive practices. In Ecuador, there are fully operational water funds with increasing equity. For example, the Water Protection Fund of Quito (FONAG) was constituted in 2000 with an initial contribution of USD 20,000 currently has a net equity of USD 12 million, and is an exemplary model of performance for others Funds. Nevertheless, the rules for the management of public funds have limited the bunch of investments of trust funds can do when obtain public resources in an amount greater than 50% of the contributors, even so these funds continue to strengthen their equity by seeking new investment niches, and at the same time, actively promote the integral management of water basins under their scope.

Another similar example but with different target is CORPEI CAPITAL, this is an investment fund that started operating from 2009, with one million dollars of equity, their main objective is to give support to micro, medium and a small enterprises (MSME) to boost their business models trough: join venture scheme, equity investments, factoring and sometimes conventional lending. Today CORPEI CAPITAL is no longer receiving resources form its constituents because have the capacity to sustain itself with their investment returns. But it's worth remark that CORPEI is able to invest in private sector getting higher interest rates among 10%-12%-15% which is interesting with an equity of around USD 7 million dollars.

Below is a summary of the main features of existing funds.

| WATER FUND | CONSTITUTION YEAR | MAIN CONSTITUENTS | INICIAL EQUITY | CURRENT EQUITY |
|--|-------------------|---|----------------|----------------|
| Fondo para Protección del Agua (FONAG) | 2000 | Empresa Municipal de Agua Potable de Quito (EMAP-Q) | USD 20.000 | USD 12.000.000 |
| Fondo Regional del Agua (FORAGUA) | 2009 | Gobierno Autónomo Descentralizado Municipal de Loja | USD 51.961 | USD 2.444.141 |
| Fondo Ambiental para la Protección del Agua (FONAPA) | 2008 | Empresa de agua potable de Cuenca ETAPA y de Azogues EMAPAL | USD 532.000 | USD 1.396.000 |
| Fondo de Manejo de Páramos y Lucha | 2008 | Gobierno Autónomo Descentralizado | USD 460.000 | USD 3.300.000 |

| | | | | |
|----------------------------|------|--------------------------|---------------|---------------|
| contra la Pobreza (FMPLPT) | | Provincial de Tungurahua | | |
| CORPEI CAPITAL | 2009 | Private investors | USD 1.000.000 | USD 7.000.000 |

3. OBJECTIVE: The current analysis seeks to determine the conditions under which the Sustainable Development Investment Fund (FONDESA) for the protection of the Río Blanco upper basin through the support of innovative production models can become an alternative of sustainability that provides financial support to activities needed to increase the protection of the rivers basin among other environmental benefits. For this end, we are taking into account the successful experiences of water funds and private funds at a national level, in various regions and mechanisms according to the reality of each locality, common and appropriate elements will be assimilated for the formation of the Toachi-Pilatón Sustainable Development Investment Fund, using the resources of the Adaptation Fund as efficiently as possible.

The trust agreement, as with other funds, will be valid for 80 years, after the expiration date, it will be possible to decide on their liquidation or continuation of their operations.

The construction of this fund will be with the contribution of mainly public constituents that are maintained in the time and generate the necessary resources to support the local initiatives oriented to protect the rivers basin Toachi-Pilatón. The organizational structure of the fund will include democratic decision-making criteria, in a representative manner, aligned with the legislation stated at Organic Environmental Code. Water Law, and Stock Market Law, etc.; and whose decision-making process and the establishment of governing bodies include criteria of gender equity and attention to vulnerable groups.

4. MARKET STUDY: The different investment funds that operate in the provinces of Loja, Guayas, Tungurahua, Azuay and the Metropolitan District of Quito (IMQ), have been growing through the returns of their investments and the contributions from constituents, both are the main traditional mechanisms to strength the capital each year. Although there are several models for the management of the resources of the mercantile trust, they generally split by 60% to strengthen the capital and the remaining 40% for operating expenses and investment in watershed protection activities. There is also the possibility of allocating 100% of the initial contribution to the strengthening of the capital, without directing any resources to the investments in projects. However, the absence of visibility of the benefits generated by the existence of the fund can, discourage the incorporation of adherents.

Investments in the last year have been affected by the decrease in the passive interest rate, due to the accumulation of liquidity in the financial system at the end of the last year. To this, must be added the difficulty of finding better financial options, because of the restrictions that oblige funds, which are fed mostly (>

50%) of government resources, to invest in institutions that belong to the same public sector, this fact limits the alternatives of placing resources in financial instruments with better rates, as CORPEI does. In some public financial institutions such as the Pacific Bank, the interest rate has fallen to 2.15% in the last year, while BanEcuador's deposit certificates have kept the interest rate at 5%. Also there is options to buy government bonds with rates that exceed 8%. The search for profitable investment options has led to funds like FONAG to acquire retirement bonds with attractive discount rates that improve the return on these investments to 10%. Handling the alternatives to get a relevant weighted interest rate, is responsibility of the investment manager

5. ADMINISTRATIVE MATTERS: The Investments Funds have a well-defined organizational structure, the constituents are part of the Board of Directors with voice and vote, generating a sense of equality and appropriation of the fund. The manager is in charge of the political, administrative and implementation issues of the annual planning and make decision of investments.

The majority of Investment funds in the country that receives public resources, work with CFN fiduciary businesses, for that reason, we consider its charges as reference for the estimation of the costs of the constitution of the trust.

The hiring of an administrative assistant will complement the start-up staff structure. Likewise, the premises, office equipment and mobilization will be the initial investments that will enable the Investment Fund to function in the first year. Regarding personnel management, it's important to remark that initially, the recruitment figure of the Investment Manager and the administrative assistant, will be under the figure of professional fees.

Estimation of administrative costs:

| ITEM | EXPENCE | MONTHS | TOTAL YEAR |
|---|-----------|--------|-------------------|
| Trust administration expenses | USD 1.500 | 12 | USD 18.000 |
| Payment to the technical secretary | USD 1.800 | 12 | USD 21.600 |
| Payment to the administrative assistant | USD 800 | 12 | USD 9.600 |
| Payment of rent and utilities | USD 300 | 12 | USD 3.600 |
| Petty cash. | USD 300 | 12 | USD 3.600 |
| TOTAL | | | USD 56.400 |

Feasibility of investment fund

Cost estimation for creation of the trust:

| ITEM | EXPENCE | TOTAL |
|--|-----------|-----------|
| Expenses for constitution of the trust | USD 3.000 | USD 3.000 |

Fix assets investment:

| ASSETS | AMOUNT |
|----------------------------|-------------------|
| IT Equipment | USD 5.000 |
| Vehicle (four wheel drive) | USD 28.000 |
| TOTAL | USD 33.000 |

The fiduciary costs correspond to the payment for the creation of the trust contract, the management of the resources of the fund and the inclusion of adherents. Due to national regulation, the Trust that is most likely to assume the management of this fund, is the Trust Business of the Corporación Financiera Nacional (CFN) or the Pacific Bank.

During the first year of operations, the Investment Manager will have the exclusive responsibility of seeking potential actors to become adherents to the Investment Fund and allocate the equity in profitable investments, for that purpose, the professional profile of the Investment Manager will have to include, among others: Professional knowledge in the areas of Sustainable Development, Environmental Economy, management of financial resources or related; Have at least 3 years of experience in the field of fiduciary business preferably of investments funds either private or public, good public relations skills and being desirable to have business administration knowledge.

The role of the Investment Manager is mainly political-technical, with the ability to interact with relevant political actors and obtain long-term commitments for the allocation of resources on a regular and secured basis.

6. INVESTMENTS: The resources that get in as contribution to the capital will be of USD 327.600 that corresponds to the net amount of investment once extracted the operative expenses of the first year. This contribution will be invested in diversified financial instruments, as far as possible, according to the alternatives available in the market, such as: fixed-term deposits that generate a better interest rate, certificates of deposit, purchases of bonds from public institutions, government bonds or retirement bonds will be, among others, the alternatives to invest. The amount of the investments, the maturity, interest rates agreed, the frequency of interest and the capitalization periods must be clearly agreed as part of the duties of the Investment Manager, who will finally give the Board of Directors the full information for the respective investment decision.

7. CONTRIBUTIONS OF THE CONSTITUENTS: The main actors identified to participate in the constitution of the trust are:

Feasibility of investment fund

| ACTOR | RELATION WITH THE BASIN | POSSIBILITY OF CONTRIBUTION |
|---|---|-------------------------------------|
| Gobierno Provincial de Pichincha | Canton Mejía and its parishes Aloag, El Chaupi and Manuel Cornejo Astorga are directly related to the Pilatón river basin. | High |
| Gobierno Provincial de Cotopaxi | The Sigchos canton and its rural parishes are quite important to provision water into de basin, mainly in the highlands | Medium |
| Gobierno Municipal de Sigchos | 70% of its territory is within the ecological reserve Illinizas. It has "Punto Verde" recognition for good environmental practices. | High |
| Gobierno Municipal de Mejia | It has an Environmental Management and Risk Management Unit. It has initiated reforestation initiatives in the basins. | High |
| Gobierno Municipal de Santo Domingo | The populations like Alluriquin, Union del Toachi among others are beneficiaries of the water resource | Medium |
| CELEC-Unidad de Negocios Hidrotoapi | The hydroelectric is the main beneficiary of the Toachi and Pilatón flows, however, at the beginning of operations is expected for 2009 | Medium (at least in the short term) |
| Gobierno Parroquial de Las Pampas | Beneficiaries of the Toachi water resource for crops and livestock mainly | High |
| Gobierno Parroquial de Palo Quemado | Beneficiaries of the Toachi water resource, mainly for crops and livestock | High |
| Gobierno Parroquial de Manuel Cornejo Astorga | Beneficiaries of the water resource of Pilatón for crops mainly | High |
| Gobierno Parroquial de Aloag | Beneficiaries of the water resource of Pilatón for crops mainly | High |
| Gobierno Parroquial El Chaupi | Some water sources that become the Pilaton River are born in its territory. | Medium |

The adhesion to the investment fund, is a political decision mainly, the source of economic contributions can be generated by means of the creation of municipal ordinances that include an item in the water bill. In the case of the IMQ there is the municipal ordinance 213 issued in 2009, in which an economic contribution is created in the water bill which reaches 2% of the total billed, these funds go to FONAG. In the case of Loja the collection comes by means of 10% of the environmental tax applied to the municipalities that are the constituents of FORAGUA.

Feasibility of investment fund

In the case of decentralized autonomous governments (GADs), adherence may take time, considering that approval must be guaranteed by provincial, municipal or parish councils. Which can generate the support or the rejection according to the political affinity of the councils. The change of authorities by means of popular elections, must be taken into account for the continuity in the process of adhesion the fund. The mentioned processes of formal adherence by the GADs and the approval of the Ministry of Finance for the automatic debit of the contributions must be considered and monitored to solve delays or obstacles to the process of creation and operation of the fund.

8. PROJECTION OF CASH FLOWS: With estimations of acquisition of the public contributors (could be private too), who are more likely to be part of the investment fund, and estimations of operating expenses in the first year, the projection is made of the movement of cash flows including the following assumptions:

- 1) 60% of the resources are addressed to the strengthening of the capital and the remaining 40% for expenses of operation and investments in conservation projects.
- 2) The contributions of the constituent adherents will be made effective from the following year to the implementation of this project, considering all the administrative and legal procedures that must be solved for approval and adhesion.
- 3) Investment Manager and his/her assistant will have as sole responsibility, to ensure the incorporation of adherents to the fund in the first year and the wide diffusion of the Sustainable Development Investment Fund.
- 4) The items for investment projects will be available from the year following the launching of the fund.

Ordinary annual contributions: These figures are composed by the estimation of the economic contributions that will be made by the adherents, taking as a reference the amount that public and private companies have given in other funds which they participate.

| CONSTITUENTS/YEAR | SEED CAPITAL | 2018 | 2019 | 2020 | 2021 | TOTAL CONTRIBUTION |
|-----------------------------|----------------------|---------------------|---------------------|---------------------|---------------------|----------------------|
| GAD Provincial Pichincha | | \$ 20.000,00 | \$ 20.000,00 | \$ 20.000,00 | \$ 20.000,00 | \$ 80.000,00 |
| GAD Municipal de Sigchos | \$ 200.000,00 | \$ 15.000,00 | \$ 15.000,00 | \$ 15.000,00 | \$ 15.000,00 | \$ 60.000,00 |
| GAD Municipal de Mejia | \$ 127.600,00 | \$ 15.000,00 | \$ 15.000,00 | \$ 15.000,00 | \$ 15.000,00 | \$ 60.000,00 |
| GAD Parroquial Las Pampas | | \$ 3.000,00 | \$ 3.000,00 | \$ 3.000,00 | \$ 3.000,00 | \$ 12.000,00 |
| GAD Parroquial Palo Quemado | | \$ 3.000,00 | \$ 3.000,00 | \$ 3.000,00 | \$ 3.000,00 | \$ 12.000,00 |
| GAD Parroquial Tandapi | | \$ 3.000,00 | \$ 3.000,00 | \$ 3.000,00 | \$ 3.000,00 | \$ 12.000,00 |
| GAD Parroquial Aloag | | \$ 3.000,00 | \$ 3.000,00 | \$ 3.000,00 | \$ 3.000,00 | \$ 12.000,00 |
| TOTAL | \$ 327.600,00 | \$ 62.000,00 | \$ 62.000,00 | \$ 62.000,00 | \$ 62.000,00 | \$ 248.000,00 |

Total contributions

The contributions of CELEC-Hidrotoapi are not considered for two reasons: First, the hydropower plant is expected to start functioning on 2019, so no current incomes at all to Hidrotoapi for the moment, the second reason is the new raw-

Feasibility of investment fund

water tariff, which began to apply since this year, Hidrotoapi is billed for the use of the Toachi river flow (32,000 liters / second) a payment of USD 86,852.67 and USD 62,425.36 for the use of the Pilatón river flow (23.000 liters / second) , these values meat an increase of 46% compared to 2016

The rest of actors are considered to contribute in a conservative way, in comparison with the current contribution that similar organizations do in other operating investment funds.

Contributions to the growing capital: The contributions that are obtained from the adherents, 60% will be channeled for the strengthening of the capital through the investment in financial instruments.

| CONSTITUENTS/YEAR | 2019 | 2020 | 2021 | TOTAL CONTRIBUTION |
|-----------------------------|---------------------|---------------------|---------------------|----------------------|
| GAD Provincial Pichincha | \$ 12.000,00 | \$ 12.000,00 | \$ 12.000,00 | \$ 36.000,00 |
| GAD Municipal de Sigchos | \$ 9.000,00 | \$ 9.000,00 | \$ 9.000,00 | \$ 27.000,00 |
| GAD Municipal de Mejia | \$ 9.000,00 | \$ 9.000,00 | \$ 9.000,00 | \$ 27.000,00 |
| GAD Parroquial Las Pampas | \$ 1.800,00 | \$ 1.800,00 | \$ 1.800,00 | \$ 5.400,00 |
| GAD Parroquial Palo Quemado | \$ 1.800,00 | \$ 1.800,00 | \$ 1.800,00 | \$ 5.400,00 |
| GAD Parroquial Tandapi | \$ 1.800,00 | \$ 1.800,00 | \$ 1.800,00 | \$ 5.400,00 |
| GAD Parroquial Aloag | \$ 1.800,00 | \$ 1.800,00 | \$ 1.800,00 | \$ 5.400,00 |
| TOTAL | \$ 37.200,00 | \$ 37.200,00 | \$ 37.200,00 | \$ 111.600,00 |

Amount allocated to investments

Since the resources of the constitution of a Trust go to the accounts of the Central Bank and do not generate interest, it is essential that the Investment Manager define the suitable investments to be made from the first year

Contributions to the extinguishing capital: 40% of the contributions of the constituents will be used for the payment of operating expenses and for the financing of priority projects for conservation protects to conserve the ecosystems of the Toachi-Pilatón River basin.

Note: USD 80.000 to pay lending incentives will be keep as liquid asset, not invested.

| CONSTITUENTS/YEAR | 2019 | 2020 | 2021 | TOTAL CONTRIBUTION |
|-----------------------------|---------------------|---------------------|---------------------|---------------------|
| GAD Provincial Pichincha | \$ 8.000,00 | \$ 8.000,00 | \$ 8.000,00 | \$ 24.000,00 |
| GAD Municipal de Sigchos | \$ 6.000,00 | \$ 6.000,00 | \$ 6.000,00 | \$ 18.000,00 |
| GAD Municipal de Mejia | \$ 6.000,00 | \$ 6.000,00 | \$ 6.000,00 | \$ 18.000,00 |
| GAD Parroquial Las Pampas | \$ 1.200,00 | \$ 1.200,00 | \$ 1.200,00 | \$ 3.600,00 |
| GAD Parroquial Palo Quemado | \$ 1.200,00 | \$ 1.200,00 | \$ 1.200,00 | \$ 3.600,00 |
| GAD Parroquial Tandapi | \$ 1.200,00 | \$ 1.200,00 | \$ 1.200,00 | \$ 3.600,00 |
| GAD Parroquial Aloag | \$ 1.200,00 | \$ 1.200,00 | \$ 1.200,00 | \$ 3.600,00 |
| TOTAL | \$ 24.800,00 | \$ 24.800,00 | \$ 24.800,00 | \$ 74.400,00 |

Amount to be used for operation and projects investments

9. EXPECTED RETURNS The amount allocated as seed capital for the formation of the Investment Fund is USD 420,000; of which USD 83,000 will be used to cover operating costs (salaries, leasing, etc.) for the full operation of the Fund. The remaining USD 327,600 will be used exclusively for investment in long-term financial instruments that will provide interest rates between 5% and 8%.

For the estimation of income has been considered the yields of financial tools that are currently used by some existing water resources.

Investments year 1

| INVESTMENT TOOL | CAPITAL | INTEREST RATE | RETURNS |
|-----------------------------|---------------|---------------|--------------|
| Goberment bonds to 20 years | \$ 327.600,00 | 0,0776 | \$ 21.312,49 |
| | \$ 327.600,00 | | \$ 21.312,49 |

The seed capital given by Adaptation Fund will go to investments in State Bonds with a conservative rate of 7.76% per year. Currently, these bonds are paying rates of 8.45% per annum.

The interest generated by this investment is calculated only for the 10 months regarding only the time that have elapsed since the actual investment until the close of the fiscal year. The following years will calculate the interest rate applied for a full year (365 days).

Investment year 2

| INVESTMENT TOOL | CAPITAL | INTEREST RATE | RETURNS |
|-----------------------------|---------------|---------------|--------------|
| Goberment bonds to 20 years | \$ 348.912,49 | 0,0776 | \$ 27.075,61 |
| Goberment bonds to 20 years | \$ 37.200,00 | 0,0776 | \$ 2.886,72 |
| | \$ 348.912,49 | | \$ 29.962,33 |

The interest earned in the first year, is added to the capital and constitutes the new amount on which the return is calculated for the following year with the same interest rate. Additionally, USD 37.200 is included as an additional investment of the contributions, provided by the constituents corresponding to 60% under the figure of growing capital.

Investment year 3:

| INVESTMENT TOOL | CAPITAL | INTEREST RATE | RETURNS |
|-----------------------------|---------------|---------------|--------------|
| Goberment bonds to 20 years | \$ 378.874,82 | 0,0776 | \$ 29.400,69 |
| Goberment bonds to 20 years | \$ 37.200,00 | 0,0776 | \$ 2.886,72 |
| | \$ 378.874,82 | | \$ 32.287,41 |

Just as the year before the invested capital sum the corresponding interest of the year, this amount becomes the new capital. Like the previous year, USD 37.200

is also invested, corresponding to 60% of the contributions for increasing capital delivered by the constituents that year.

Investments year 4

| INVESTMENT TOOL | CAPITAL | INTEREST RATE | RETURNS |
|-----------------------------|----------------------|---------------|---------------------|
| Goberment bonds to 20 years | \$ 411.162,22 | 0,0776 | \$ 31.906,19 |
| Goberment bonds to 20 years | \$ 37.200,00 | 0,0776 | \$ 2.886,72 |
| | \$ 411.162,22 | | \$ 34.792,91 |

The capitalization of interest and equity increases for new contributions will maintain this dynamic year after year. This short analysis is done within the scope of the Adaptation Fund project duration, however the same process is foreseen year by year. Interest is capitalized and the new capital and investment are formed and USD 37.200 of contributions for growing equity are added.

10. CASH FLOWS: Once we have projected information expected from the contributions of the founding constituents splitting them towards capital for strengthen the equity and extinguishable capital, and making a projection of operating expenses, we can build the projected flow of cash or the Investment Fund

The basic scenario for the construction of cash flow are modeled like this:

- Scenario 1 (the ideal one): it is assumed that all the constituents contribute amounts considered based on the experiences of water funds existing in other regions of the country. In addition, this model includes a lower interest rate than has been obtained in the market in current times with the same instruments.

In this scenario the equity growth is kept, the adjustment variable to get a better performance of the flows is through the amount of investment for conservation projects, so in this scenario the investment amount available from the second year and on, can reach over USD 30,000 per year or this amount can be take it for new investments, under the premise that, the more increase the equity, the higher returns will be obtained.

The resources coming to be used for lending incentives will be channeled through the Investment Fund, however the dynamic of that activity must be well known prior to decide which part of this resources (USD 75.000 for incentives and USD 5.000 for reporting) will be invested, and which part will remain liquid for incentives payments. For the cash flow exercise we assume that all this resources will be kept out of investments.

Feasibility of investment fund

Projected cash flow from the Investment Fund 2017-2021

| PROYECTION | March | April | May | June | July | August | Sept. | October | Nov. | Dec. | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 |
|---|---------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|---------------|---------------|---------------|
| +INCOMES | | | | | | | | | | | \$ 519.225,18 | \$ 88.881,76 | \$ 93.367,49 | \$ 98.167,21 |
| Seed capital | \$ 420.000,00 | | | | | | | | | | \$ 420.000,00 | \$ - | \$ - | \$ - |
| Contributions to equity | | | | | | | | | | | \$ - | \$ 37.200,00 | \$ 37.200,00 | \$ 37.200,00 |
| Extinguishing capital contributions | | | | | | | | | | | \$ - | \$ 24.800,00 | \$ 24.800,00 | \$ 24.800,00 |
| Funds to be used for lending incentives | \$ 80.000,00 | | | | | | | | | | \$ 80.000,00 | | | |
| Returns | | | | | | | | | | | \$ 19.225,18 | \$ 26.881,76 | \$ 31.367,49 | \$ 36.167,21 |
| Others | | | | | | | | | | | \$ - | \$ - | \$ - | |
| -EXPENSES | \$ 7.400,00 | | | | | | | | | | \$ 110.000,00 | \$ 82.400,00 | \$ 84.092,00 | \$ 60.834,76 |
| Constitution expenses | | \$ 3.000,00 | | | | | | | | | \$ 3.000,00 | \$ - | \$ - | \$ - |
| Trust administration expenses | \$ 1.500,00 | \$ 1.500,00 | \$ 1.500,00 | \$ 1.500,00 | \$ 1.500,00 | \$ 1.500,00 | \$ 1.500,00 | \$ 1.500,00 | \$ 1.500,00 | \$ 1.500,00 | \$ 15.000,00 | \$ 18.000,00 | \$ 18.540,00 | \$ 19.096,20 |
| salaries expenses | \$ 2.600,00 | \$ 2.600,00 | \$ 2.600,00 | \$ 2.600,00 | \$ 2.600,00 | \$ 2.600,00 | \$ 2.600,00 | \$ 2.600,00 | \$ 2.600,00 | \$ 2.600,00 | \$ 26.000,00 | \$ 31.200,00 | \$ 32.136,00 | \$ 33.100,08 |
| Leasing and basic services | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 3.000,00 | \$ 3.600,00 | \$ 3.708,00 | \$ 3.819,24 |
| Fix assets aquisition | | \$ 33.000,00 | | | | | | | | | \$ 33.000,00 | \$ - | \$ - | \$ - |
| Projects investments | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Incentives in lending and reporting | \$ 2.700,00 | \$ 2.700,00 | \$ 2.700,00 | \$ 2.700,00 | \$ 2.700,00 | \$ 2.700,00 | \$ 2.700,00 | \$ 2.700,00 | \$ 2.700,00 | \$ 2.700,00 | \$ 27.000,00 | \$ 26.000,00 | \$ 26.000,00 | \$ 1.000,00 |
| Others | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 300,00 | \$ 3.000,00 | \$ 3.600,00 | \$ 3.708,00 | \$ 3.819,24 |
| BALANCE | | | | | | | | | | | \$ 409.225,18 | \$ 6.481,76 | \$ 9.275,49 | \$ 37.332,45 |
| + INITIAL BALANCE | \$ - | | | | | | | | | | \$ - | \$ 409.225,18 | \$ 415.706,95 | \$ 424.982,43 |
| FINAL BALANCE | \$ - | | | | | | | | | | \$ 409.225,18 | \$ 415.706,95 | \$ 424.982,43 | \$ 462.314,88 |
| | | | | | | | | | | | Increase | 2% | 2% | 9% |
| | | | | | | | | | | | Total increase | 13% | | |

Some considerations that were applied in this projection are:

- The amount received to incentives in lending (Scheme 1) will not be invested because it will needed in the short term, even though the portion that will be used in the next years indeed can be invested at least in short term, but the amount must be assessed once the dynamic of credits is already well known. **In the present analysis is assumed not be invested**
- The management of the adherents and their contributions are effective as of the following year of the constitution of the trust
- It is considered an inflation component of 3% per year in the estimation of expenses
- Interest is capitalized annually

11. REGULATIONS: The Investments funds are complementary with the Basin Councils, not opposed to them. However, the Basin Councils are collegiate consultative bodies of water areas known as Local Hydrographic Planning Units (acronym in Spanish UHPL), which are basin extensions that include several sub-basins and basins. Therefore, the geographical demarcation of the Basin Council will most probably not coincide with the demarcation of the basin on which the fund will work.

The Investment Fund will be used to leverage activities related to the area inside the boundaries of Toachi-Pilatón basin exclusively, which is one part of the jurisdiction of the basin council for the UPHL Esmeraldas.

In order to have a more complete idea of the legal considerations that the constitution of the Investment Fund should have, it would be worthwhile to make a brief review of the pertinent rules:

According to the Organic Law of Water Resources, Uses and Use of Water, Regulation and Instruction, specifies:

Art. 26: Functions of the Basin Council: The Basin Council has the following functions:

- 1) To choose among its members or representatives to the Intercultural and Plurinational Council of Water, in accordance with the regulation of this law;
- 2) Participate in the formulation of guidelines and guidelines as well as the monitoring of the management plan by river basin, in the Marc of the National Plan of Water Resources;
- 3) Generate proposals for sectorial public policies related to water resources, which will be presented to the Intercultural and Plurinational Water Council, through their representatives;
- 4) To speak to the sole authority of water, in all matters that are of interest or request;
- 5) Participate in the consultation processes carried out by the single water authority and propose priority issues for the management of the basin or the water units that comprise it;
- 6) Resolve the matters that concern and that could influence the operation of the council;
- 7) Monitor that the decisions of the policies and plans of integral management of the watershed are materialized in budgetary items of the different levels of government that take part in the watershed;
- 8) The others that are established in the regulation of this law.

In the framework of the Nuevo Código Orgánico del Ambiente, the following rules are identify regarding creation of water funds:

Article 86.- Financing of environmental services. In order to finance the mechanisms for remuneration for conservation activities, sustainable management and recovery of ecosystems and their subsequent flow of environmental services, public and private contributions will be promoted, as

well as funds from donations, loans or international contributions , Taxes or fees and any other source that is identified for these purposes.

Article 20.- Of the funds for environmental management. The National Environmental Authority shall issue standards and guidelines for the operation of public, private or mixed funds, based on the National Development Plan, national environmental policy and other priorities defined by said authority. The funds will be regulated in accordance with the law and will be subject to the control activities of the competent entities. The Decentralized Autonomous Governments may create environmental funds that contribute to the environmental management of their competencies, under the guidelines of the National Environmental Authority and the provisions of this Code. Private funds will contribute to the financing of environmental management on the basis of the principles of internalization of costs and environmental responsibility, without prejudice to other actions that may be undertaken in the framework of social responsibility, as well as other contributions free of charge.

In the Código Orgánico Organización Territorial Autonomía Descentralización (COOTAD), is stated:

Article 135: ... It is the responsibility of the autonomous decentralized provincial governments to govern, direct, order, arrange, or organize environmental management, environmental and nature advocacy, within their territory; These actions will be carried out within the framework of the decentralized national environmental management system and in accordance with the policies issued by the national environmental authority. For the granting of environmental licenses must be compulsorily accredited as an environmental authority with responsible application in its circumscription.

12.LESSONS LEARNED: The experience of fully operational investment fund (mainly of water funds) in the country can be considered as a positive example of the capacity of these structures to mature and be strengthened over time. As this happens the benefits for its constituents and for the ecosystems and, communities inside its jurisdiction will also increase. However, it is worth to recognize that there was also an unsuccessful case of FOOPAD, this water fund constitution was attempted to be implemented in Riobamba but currently is running out of business. The lessons of success and failure, leave us with the following lessons to take into account for the construction of the Investment Fund of the Toachi-Pilatón basin:

- 1) Sponsor or godfather: There must be a person or company dedicated to promoting the construction of the water, agglutinate intentions and monitor progress. This first interested in the achievement of this project must be the initial actor involved in the project. In this case the Mayors of municipal GAD of Sigchos and Mejia are pretended to assume this roll.

- 2) The Investment Manager must be hired from the very beginning and inform the promoter / sponsor of the progress made, especially in the identification of potential adherents and their commercial and political progress. The Investment Manager must have a safe and agreed remuneration since the beginning because the lack of payments can discourage him/her and spread doubt about the investment fund
- 3) It is important that initial "seed" resources start investing with profitability criteria, since stagnation in the trust accounts will cause a periodic reduction of the fund's resources.
- 4) The return on investments as a function of the interest rate must be higher between the smaller the funds are, and can be gradually decreasing as the capital grows. For example: FONAG that has a capital of USF 12 million has an average return of 5% a year, while the FMPLPT with a capital of USD 3.3 million requires to invest in financial tools with a rate of 7% or 8%.
- 5) Only those actors who have a regular contribution to the mechanism will have a vote in the structure of decisions and decisions.
- 6) Having the political leadership in the creation of a fund is a determining factor when initiating this initiative. If there is no political will to create a mechanism to conserve water resources in the long term, it will be difficult to carry out this process¹.
- 7) Ensure that the mechanism is inclusive of different actors and users that can be part of the fund and of the decision making process ².

13.ORGANIZATIONAL STRUCTURE: The organizational structure of the Investment Funds is homogeneous and has proven to be useful for the proper functioning of the fund.

From the experiences observed we have the following:

Board of Directors: Conformed by a representative of the constituents, this is responsible for approving the planning and investment proposals submitted by the technical secretariat. It is desirable to have, among their representatives, different actors or users of water to have a broad vision.

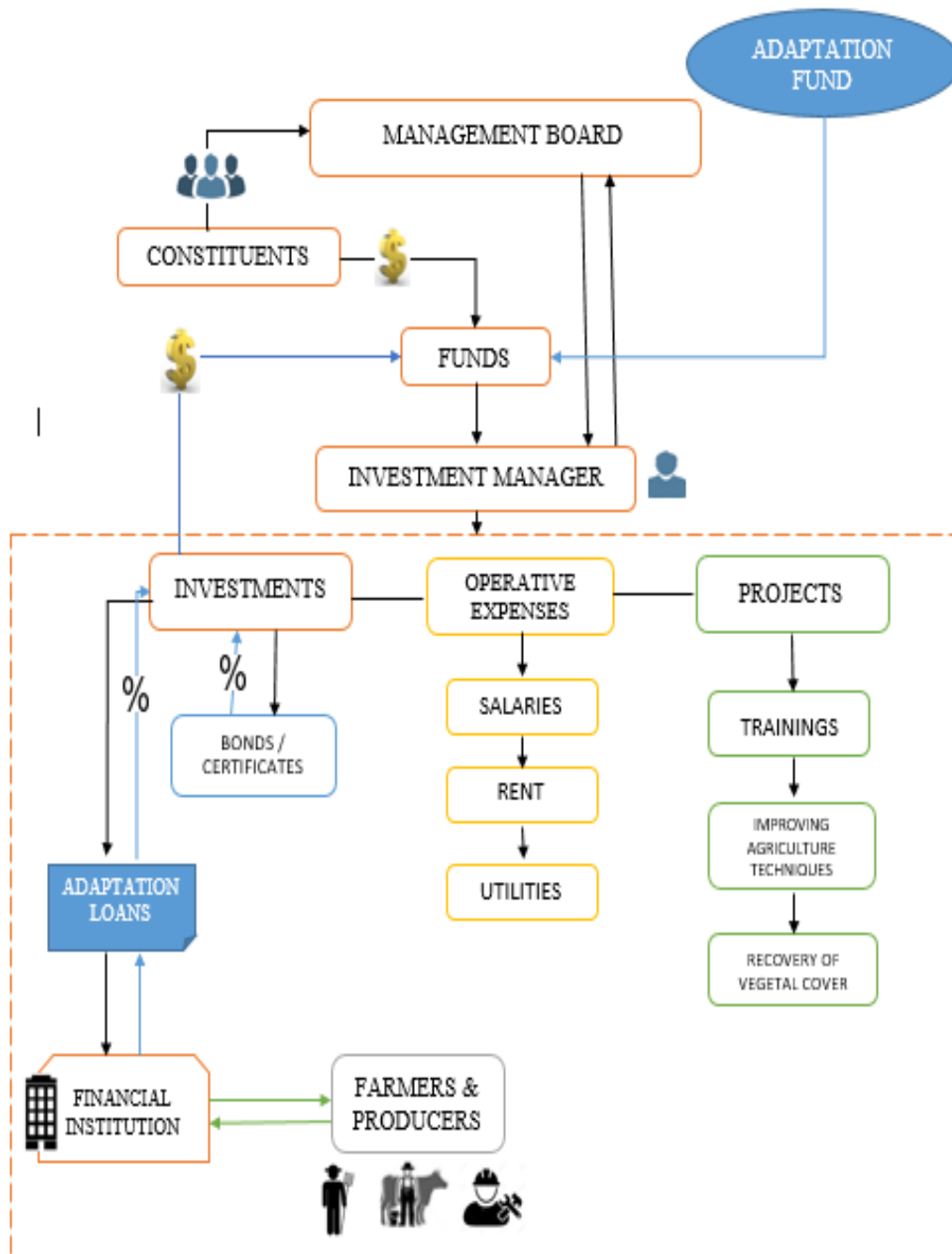
Investment Manager: who under the waters fund structure is named Technical Secretary in the case of water funds and Investment Manager in the case of investment funds, he/she is in charge of the execution of the planning, of the investments to be made, of the dissemination of the

¹ Mecanismos financieros: Elementos para la creación y consolidación de un fondo de agua. Cooperación alemana, p 67.

² Ibid

programs and projects that are carried out and of attracting new adherents. The Investment Manager is the person responsible for its management and representation. He/she must report to the Board of Directors

14. DIAGRAM: Illustration of the functioning of Investment Fund





Annex 13 Gender Analysis for the project “Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Toachi-Pilatón watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management.”

ANNEX 13
Gender Analysis
August of 2017

Gender analysis

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Gender analysis

Glossary of terms:

| | |
|------|---|
| FAO | Food and Agriculture Organization of the United Nations |
| INEC | National Institute of Statistics and Censuses |
| PDOT | Development and Territorial Planning |

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Introduction

In Article 11 of the Constitution of the Republic of Ecuador recognizes the principle of equality and non-discrimination, which states: "All persons are equal and shall enjoy the same rights and opportunities." The Ecuadorian state is working on incorporating and translating this gender approach into public policies. In Ecuador, the Commission on Gender Statistics was created to promote and produce statistics and indicators based on the information obtained in the Population and Economic Census 2010.

Ecuador presents a high Gender Gap Index¹, however, gender inequalities still persist, particularly in political participation and access to decision-making processes. Given that illiteracy rates (also functional and digital) in Ecuador are higher for women, communication and education strategies will need to be gender-sensitive and convey appropriate and understandable messages for both sexes. This disadvantage should also be taken into account when designing project outputs such as capacity building, training and creation of new financial products, so women are enabled to effectively participate in these activities. Women are more vulnerable to climate change and disasters than men, because of gender roles and responsibilities, project design takes into consideration gender differences and finds ways to promote women's participation.

The World Conference on Women held in Beijing in 1995 marked an important milestone in the development of gender statistics. They propose to collect, compile, analyze and periodically present data disaggregated by age, sex, socio-economic and other relevant indicators, including the number of dependents, for use in the planning and implementation of policies and programs. Promote further development of statistical methods to improve data related to women in economic, social, cultural and political development. (Mujeres y Hombres del Ecuador en cifras III)

The Brasilia consensus held in July 2010 recommends states to "Strengthen the production of necessary statistical information disaggregated to make feasible the problems of gender inequality in the area of physical and economic autonomy and decision-making", in agreement with the observatory of equal gender.

Climate change is a global phenomenon that will affect natural and managed ecosystems and systems, such as water resources, agriculture, food production systems, forest ecosystems, coastal-marine areas, and society in general (Género y Adaptación al Cambio Climático, 2014)

In particular, women and men in rural areas have different roles, tasks, responsibilities, and rights assigned in relation to natural resources. According to the FAO, "women make key contributions in the rural economy of all regions of developing countries as farmers, laborers and entrepreneurs." Women in rural areas play an important role in food production. Women are the ones who guarantee feeding of their families, through subsistence farming and cattle breeding, in their orchards. For their part, men tend to work in producing organizations in different places of their home. Women, in their role of providing food, rely heavily on natural resources and a healthy environment, which is why they are the first to be affected by the impacts of climate change. (Stock, 2012)

Vulnerability to climate change is linked to people's current capabilities to deal with or adapt to the environmental changes induced by global warming. The effects of climate change have

¹ WEO, Global Gender Gap Index

potential to aggravate gender inequalities. In this sense, existing gender inequality shows that some women are less likely to access and control production such as: use of land, finance, training or information, and therefore will be more vulnerable to the effects of climate change than men. This means that they will lose their livelihoods more easily and it will be less easy for women to find alternative means to meet their needs and that of their families. (Género y Adaptación al Cambio Climático, 2014)

Another task for women is motherhood, childcare and housekeeping. This includes provision of health services and hygiene measures, using energy and water supplies. In several societies women and girls are the ones that provide water for domestic use.²

Women and men face problems of climate change, such as: heat waves, floods, storms and drought, which can lead to increased morbidity and mortality.³

In 2007, according to the United Nations Development Program Human Development Report, climate change is likely to increase the disadvantages currently affecting women.⁴

In 2010, at the sixteenth Conference of the Parties in Cancun, it was identified for first time, the needs of designing climate change adaptation actions that took gender dimensions into account.

If gender is not mainstreamed into climate change adaptation programs, women will continue to be more vulnerable because their role depends more on access to natural resources and land, compares to men, for their livelihoods and for their families. In rural areas, women have a broad knowledge of the environment. This knowledge about how to manage and protect households is extremely valuable when seeking solutions for adaptation to climate change.

² Dankelman, I., Gender and Climate Change, 2010, p. 28.

³ UN WomenWatch, Fact Sheet: Women, Gender Equality and Climate Change ver en http://www.un.org/womenwatch/feature/climate_change/

⁴ PNUD, Human Development Report 2007/2008, p. 24.

Conceptual Framework

Climate change is not a neutral issue for gender dimensions. The impacts of climate change affect women and men differently, so it is necessary to address these differences in the design of responses to these challenges. From this context, micro and small producers are generally most disadvantaged in the face of climate change, because their livelihoods depend directly on the climate. Therefore, climate change adaptation measures have the potential to promote the role of women in the socio-economic activities of the parishes located in the Toachi-Pilaton watershed and address following basic elements:

- Access to land and resources
- Access to financial services
- Access to education and professionalization
- Access to information
- Access to public participation
- Access to justice

From a gender perspective, the word gender does not refer to men or women, but masculine and feminine, that is, to the qualities or characteristics that society attributes to each sex. Gender is a central factor in the organization of societies and can affect the processes of production, consumption and distribution.

The influence of gender on the rural population is important and it determines that "with any indicator of human development, women's power and resources are lower in rural areas of the developing world. Rural women's are part of majority of the world's poor. Despite recent improvements in their status, they have the lowest levels of schooling in the world and the highest illiteracy rates. In all developing regions, female-headed households are among the poorest." (FAO, 2009)

One way to reduce gender inequalities is to achieve gender equity, which means justice and fairness in the treatment of women and men in terms of rights, benefits, obligations and opportunities. By establishing social relations in which neither sex suffers discrimination, gender equity aims to improve gender relations and functions and achieve gender equality. The essence of equity does not lie in equal treatment (treatment can be the same or different), but should always be considered equivalent in terms of rights, benefits, obligations and opportunities

The index or relation of femininity reflects composition by sex of the population and is the result of the demographic dynamics of a population. After birth, the ratio between number of women and men varies due to different patterns of mortality and migration of the sexes.

Definition of Femininity Index. - Relationship between number of women and number of men that make up a population. It is expressed as the number of women of all ages in a given year relative to every 100 men of all ages in that year.

The following table shows the femininity index obtained in the 2010 population census.

Gender analysis

| Etnia | Mujeres | | Hombres | | Índice de feminidad |
|-------------------|------------------|---------------|------------------|---------------|---------------------|
| | Número | % | Número | % | |
| Indígena | 517.797 | 7,1% | 500.379 | 7,0% | 103,5 |
| Afroecuatoriano/a | 513.112 | 7,0% | 528.447 | 7,4% | 97,1 |
| Montubio/a | 500.115 | 6,8% | 570.613 | 7,9% | 87,6 |
| Mestizo/a | 5.301.654 | 72,6% | 5.115.645 | 71,3% | 103,6 |
| Blanco/a | 448.740 | 6,1% | 433.643 | 6,0% | 103,5 |
| Otro/a | 24.398 | 0,3% | 28.956 | 0,4% | 84,3 |
| Total | 7.305.816 | 100,0% | 7.177.683 | 100,0% | 101,8 |

Table 1 The feminity index calculated in 2010 for Ecuador

With results of the population census carried out in 2010, it was concluded that the income of the economically active population is lower in rural areas, especially for women. This information is a basis for estimating women's income in parishes located in the project area. The following table summarizes the information on the average income of the employed population.

| Área | Ingreso promedio en USD | | Nacional | Desigualdad |
|----------|-------------------------|---------|----------|-------------|
| | Mujeres | Hombres | | |
| Urbana | \$ 421 | \$ 524 | \$ 483 | 80,3% |
| Rural | \$ 219 | \$ 293 | \$ 273 | 74,8% |
| Nacional | \$ 374 | \$ 445 | \$ 419 | 84,0% |

Fuente: INEC - Encuesta Nacional de Empleo, Desempleo y Subempleo - ENEMDU - Diciembre 2012
Población de 10 años y más

Table 2 Income of economically active population

The population composition in the Project area is as follows:

| Área | Men | Women | Total |
|-------------------|-------|-------|-------|
| Watershed | 21188 | 22012 | 43200 |
| Intervention Area | 5567 | 4975 | 10542 |

Table 3 Population in the Project Area

The most of population is located near main populations in the watershed and near the main roads.

| Área | 0-14 años | 15-64 años | 64 o más | Total |
|-------------------|-----------|------------|----------|-------|
| Watershed | 17504 | 22296 | 3400 | 43200 |
| Intervention Area | 3498 | 5996 | 1048 | 10542 |

Table 4 Disaggregated data of Population in the Project Area

Gender Analysis: Description of Social, Economic and cultural characteristics

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 Index⁵ (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 2012⁶, also 96,3% of births were attended by skilled health personnel in 2014⁷. 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 2015⁸.

However, maternal mortality rate⁹ presents a different 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 infrastructure; medical equipment; health care services model; poverty; gender violence; other. According to the World Health Organization, in 2015 this rate was 64 deaths per 100.000 live births.

Adolescent pregnancy rates¹⁰ descended in rural areas, between 2003 and 2013, however, they have increased slightly 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, especially in rural areas:

| | Illiteracy rates | | Functional 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% |

⁵ World Economic Forum

⁶ Data from Public Health Ministry, found in Logros de la revolución ciudadana en clave de género, Consejo Nacional para la Igualdad de Género.

⁷ World Health Organization.

⁸ World Health Organization

⁹ Public Health Ministry.

¹⁰ Women and Gender Equality National Agenda 2014 – 2017.

Gender analysis

Digital illiteracy refers to access and use of information and telecommunication technologies, while functional illiterates refers to people with 3 years or less of education¹¹.

In 2015, primary and secondary education enrolment rates and attainment rates¹² 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 tertiary¹³ studies, with 7% of female graduates against 26% of male graduates in STEM¹⁴. 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 offices¹⁵.

c. Income

In 2014, 28,7% of 3,8 million homes are led by women¹⁶, 70% of those are located in urban areas, and also 70% of those are single-parent households, with 2 to 4 family members. Within afro Ecuadorian community, the rate of female-led households increases, up to 32,2%, while the montubio community has the lowest proportion: 21,4%.

In Ecuador poverty affects more women than men¹⁷. More than one out of every woman (35,% from age 15 and above) do not have any sort of income of their own (and are not studying), more than tripling the amount of men in the same situation (9,1% of men in 2014). This lack of personal income correlates with the femininity index in poor households in 2013, of 117,6, which proves that more women than men, from the age of 20 to 59 years, lived in poor households.

d. Labour markets

In March 2017, according to the latest Employment, Unemployment and Underemployment National Survey¹⁸, 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

¹¹ Sistemas de indicadores sociales del Ecuador.

¹² World Economic Forum, Gender Gap Index, Ecuador 2016.

¹³ 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.

¹⁴ Science, Technology, Engineering and Mathematics.

¹⁵ WGENA

¹⁶ Agenda Nacional para las Mujeres y la Igualdad de Género, 2014 – 2017

¹⁷ CEPALSTAT, Gender Indicators

¹⁸ Instituto Nacional de Estadísticas y Censos (INEC), Ecuador

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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 job¹⁹, 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.

Also, women tend to concentrate in low-productivity jobs, more than men do²⁰:

| Productivity level | Low | Medium | High |
|--------------------|-------|--------|------|
| Women | 81,1% | 13,1% | 4,1% |
| Men | 57,5% | 34,2% | 6,7% |

However, underemployment²¹ 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 jobs²² : 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).

Regarding balance between professional life and personal life²³, women spend more hours in domestic chores and care-taking activities than men. In 2012, women dedicated more than 31 hours per week to non-remunerated work, compared to 9h spent by men doing same tasks. Gender gap in rural areas is even larger, reaching a 25h difference in disfavor of women. However, hours dedicated to remunerated jobs show little gender differences in rural areas: men work 50h per week, on average, while women work 47h. Subsequently, female's average total workload per week is greater than male's, with 82h and 59h, respectively.

e. Political participation

In general terms, women held about 23% of public elected offices in 2009²⁴. 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.

¹⁹ CAF Calculations based on tabulations from Encuesta Nacional de Empleo, Desempleo y Subempleo, 2017.

²⁰ CEPALSTAT, Gender Indicators.

²¹ 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.

²² 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.

²³ Encuesta de uso del tiempo, INEC 2012.

²⁴ Women and Gender Equality National Agenda 2014 – 2017, based upon data from INEC, CONAMU and Electoral National Council

f. Gender-based violence

According to data²⁵ from Gender violence and family relationships survey (2011), 61% of women has suffered, at least, an episode of any type of gender violence perpetrated by any person in their life's. 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 "sometimes") in the last 12 months.

The study²⁶ 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 aggressions (differences between 1st and 5th quintile are 10 percentage points and 9 percentage points, respectively);
- (b) Ethnicity: prevalence of intimate-partner gender violence varies with ethnicity: indigenous women (59,3%), afro Ecuadorian 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 permanent²⁷ disability²⁸ suffer more gender violence than women without disabilities, especially sexual aggressions (more than 7 percentage points), followed by physical aggressions (with 6 percentages points of difference).

According to CEPAL, Ecuador's femicides rate in 2014 was 1,2 deaths per 100.000 women.

²⁵ La violencia de género contra las mujeres en el Ecuador: Análisis de los resultados de la encuesta nacional sobre relaciones familiares y de violencia de género contra las mujeres, 2014.

²⁶ La violencia de género contra las mujeres en el Ecuador: Análisis de los resultados de la encuesta nacional sobre relaciones familiares y de violencia de género contra las mujeres, 2014.

²⁷ Permanent disability refers to disabilities suffered for at least a year, or longer.

²⁸ It includes the following types: cognitive, developmental, physical, mental, and deafness.

Gender Action Plan

As a result of this Gender Analysis, gender entry points for project Log Frame have been identified. To monitor project implementation, some gender-sensitive indicators have been suggested to be incorporated in the results matrix. The following actions are proposed:

-Initial Gender Assessment: to be presented before first disbursement. It should contain the following: (i) gender analysis of farming and agricultural value chains, including an assessment of gender division of labor in local farming and agricultural practices (land preparation, ploughing, manuring, seed purchase, sowing, weeding, harvesting, processing, grain storage, folder collection, water collection, feeding, cleaning/bathing, milking cows, milk processing, dung collection, marketing); (ii) gender assessment of existing differentiated needs and demands of farmers and local producers to benefit from project; (iii) identification of existence of gender-specific crops and produces.

- Sex-disaggregated project baseline; containing, at least: heads of households; land owners; farm owners; farm workers.

- Gender-responsive participatory processes, as part of the project communications plan with communities, should recognize women as primary users of forest resources in project design, implementation and evaluation. These mechanisms should effectively engage both men and women in decision making processes, additional training targeted to women may be needed in order to ensure their full and effective contribution. Also, gender-responsive processes may include the use of women-only interviews and gender-specific focus groups and group consultations (UNREDD 2013).

- Training and capacity building activities to be implemented under project components, with either local farmers, general population, parishes and other public officers, should promote women's participation and be gender-sensitive, taking into consideration specific demands (location, adequate schedules, childcare facilities and/or other special arrangements that may encourage women's assistance).

- Land titling processes: if such mechanisms are to be established through project implementation, joint tenure of land should be promoted. Also, it should be assessed whether widowers and single women face additional restrictions to own land, and introduce corrective measures to lift these barriers.

- Financing products: if new financing products, such as credit schemes and guarantees, are to be implemented as project outputs, they should be designed taking into consideration differentiated gender needs. Women tend to have less access to credit, usually due to lack of collateral, but also to lesser understanding of finance concepts, and may prefer collective credit schemes. These special needs should be taken into account when designing these products, to ease access for women to participate.

- Institutional governance mechanisms to be created under project implementation, such as committees for a Water Fund and/or for a Seed Fund, should incorporate a female quota (i.e. 20%) in their structure. Also, gender-sensitive hiring procedures should be taken into account.

- When sourcing staff and consultants, gender equality will 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.

Gender analysis

- It would be advisable to design and implement local development plans (for the parishes) to be gender-sensitive.
- Also, if other studies and assessments need to be made, it is recommended that they incorporate a gender perspective.

Gathering and Collecting Gender-Disaggregated Data

Below is an analysis of gender data from the parishes located in the Toachi Pilatón River watershed.

a. Sigchos

According to the Population and Housing Census conducted by INEC in 2010, the population is divided into: 50.08% men and 49.91% women. Following table shows a comparison of data obtained in 2001 and 2010 Population Censuses.

| | PARROQUIAS | CENSO 2001 | | | CENSO 2010 | | |
|----------|---------------------|------------|--------|---------|------------|---------|---------|
| | | Hombre | Mujer | Total | Hombre | Mujer | Total |
| SIGCHOS | CHUGCHILAN | 3.059 | 3.297 | 6.356 | 3.797 | 4.014 | 7.811 |
| | ISINLIVI | 1.591 | 1.719 | 3310 | 1.625 | 1.602 | 3.227 |
| | LAS PAMPAS | 1.053 | 1.001 | 2.054 | 1.024 | 919 | 1.943 |
| | PALO QUEMADO | 562 | 498 | 1.060 | 567 | 463 | 1.030 |
| | SIGCHOS | 3.969 | 3.973 | 7.942 | 3.978 | 3.955 | 7.933 |
| | Total Cantón | 10234 | 10488 | 20.722 | 10.991 | 10.953 | 21.944 |
| Cotopaxi | Total Provincia | 169303 | 180237 | 409.205 | 198.625 | 210.580 | 409.205 |

Fuente: INEC. 2010. Elaboración: Equipo Técnico GAD Municipal de Sigchos

Table 5 Comparison of the Population Censuses 2001 – 2010 in the Sigchos Parish

Considering the information of the Sigchos canton, and with results from Population Census carried out in 2010, the information in the PDOT was established that illiteracy is greater in the rural area. The illiteracy rate of women is 12.68%, out of a universe of 9,604 women older than five years, and is higher than that of men, which reaches 8.88% of a universe of 9570 men. The main reasons are: low economic, social and cultural conditions.

Parishes that have more illiterates are Sigchos and Las Pampas, but in the parish of Palo Quemado living conditions are better. Below is a summary of illiterates by gender, area and parish:

| PARROQUIA | Sexo | Sabe leer y escribir | Área Urbana o Rural | | Total |
|------------|--------|----------------------|---------------------|------------|-------|
| | | | Área Urbana | Área Rural | |
| SIGCHOS | HOMBRE | Si | 761 | 2.197 | 2.958 |
| | | No | 81 | 498 | 579 |
| | | Total | 842 | 2.695 | 3.537 |
| | MUJER | Si | 779 | 1.931 | 2.710 |
| | | No | 102 | 720 | 822 |
| | | Total | 881 | 2.651 | 3.532 |
| CHUGCHILAN | HOMBRE | Si | - | 2.530 | 2.530 |
| | | No | - | 633 | 633 |
| | | Total | - | 3.163 | 3.163 |
| | MUJER | Si | - | 2.395 | 2.395 |
| | | No | - | 991 | 991 |
| | | Total | - | 3.386 | 3.386 |

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| | | Total | - | 3.386 | 3.386 |
|---------------------|--------|--------------|-------|--------|--------|
| ISINLIVI | HOMBRE | Si | - | 1.108 | 1.108 |
| | | No | - | 338 | 338 |
| | | Total | - | 1.446 | 1.446 |
| | MUJER | Si | - | 993 | 993 |
| | | No | - | 461 | 461 |
| | | Total | - | 1.454 | 1.454 |
| LAS PAMPAS | HOMBRE | Si | - | 811 | 811 |
| | | No | - | 110 | 110 |
| | | Total | - | 921 | 921 |
| | MUJER | Si | - | 700 | 700 |
| | | No | - | 117 | 117 |
| | | Total | - | 817 | 817 |
| PALO QUEMADO | HOMBRE | Si | - | 460 | 460 |
| | | No | - | 43 | 43 |
| | | Total | - | 503 | 503 |
| | MUJER | Si | - | 374 | 374 |
| | | No | - | 41 | 41 |
| | | Total | - | 415 | 415 |
| TOTAL CANTON | | | 1.723 | 17.451 | 19.174 |

Table 6 illiterates by parish

The Ecuadorian state is working to incorporate and translate the gender approach into public policies under the principle of equality and non-discrimination established in the Constitution. Below is the statistical information obtained in the population census of the year 2010 for the canton of Sigchos.

| Código | Cantón | Indígena | | Afroecuatoriano/a | | Montubio/a | | Mestizo/a | | Blanco/a | | Otro/a | |
|--------|---------|----------|--------|-------------------|--------|------------|--------|-----------|--------|----------|--------|--------|--------|
| | | Mujer | Hombre | Mujer | Hombre | Mujer | Hombre | Mujer | Hombre | Mujer | Hombre | Mujer | Hombre |
| 0507 | Sigchos | 41,4% | 40,1% | 0,7% | 0,9% | 3,1% | 4,2% | 52,8% | 52,5% | 1,9% | 2,1% | 0,1% | 0,1% |
| 1703 | Mejía | 7,2% | 7,8% | 2,4% | 2,6% | 0,8% | 0,9% | 86,8% | 85,7% | 2,8% | 2,9% | 0,1% | 0,2% |

Table 7 Ethnic self-identification by cantons

| Código | Cantón | Tasa de analfabetismo | | Escolaridad | | *T.neta asist. Primaria | | *T.neta asist. Secundaria | | *T.neta asist. Superior | | *T.neta asist. Básica | | *T.neta asist. Educa. Media | |
|--------|---------|-----------------------|-------|-------------|------|-------------------------|-------|---------------------------|-------|-------------------------|-------|-----------------------|-------|-----------------------------|-------|
| | | Muj. | Hom. | Muj. | Hom. | Muj. | Hom. | Muj. | Hom. | Muj. | Hom. | Muj. | Hom. | Muj. | Hom. |
| 0507 | Sigchos | 29,7% | 19,3% | 4,5 | 5,5 | 92,4% | 92,8% | 55,7% | 59,0% | 6,5% | 5,9% | 89,2% | 88,8% | 37,8% | 42,7% |
| 1703 | Mejía | 9,6% | 4,2% | 8,6 | 9,4 | 94,5% | 94,1% | 71,6% | 73,8% | 23,7% | 22,1% | 91,0% | 91,0% | 58,4% | 56,8% |

Table 8 Education by cantons

| Código | Cantón | Tasa global de participación laboral | | Población en edad de trabajar (10 años y más) | | Población Económicamente activa PEA (10 años y más) | |
|--------|---------|--------------------------------------|---------|---|---------|---|---------|
| | | Mujeres | Hombres | Mujeres | Hombres | Mujeres | Hombres |
| 0507 | Sigchos | 49,4% | 66,9% | 8.079 | 7.978 | 3.989 | 5.338 |
| 1703 | Mejía | 44,3% | 68,3% | 33.180 | 31.320 | 14.688 | 21.393 |

Table 9 Labour Market

| Código | Cantón | % de las Mujeres Pobres por NBI | % de los Hombres Pobres por NBI | % de las Mujeres en viviendas INADECUADAS | % de los Hombres en viviendas INADECUADAS |
|--------|---------|---------------------------------|---------------------------------|---|---|
| 0507 | Sigchos | 93,8% | 93,7% | 38,0% | 38,0% |
| 1703 | Mejía | 57,9% | 58,7% | 3,5% | 3,4% |

Table 10 Poverty for unsatisfied basic needs by Canton

According to Population Census carried out in 2010, vulnerable groups are located in the project area, including female heads of household or single mothers. Data results are list in the following table:

| PARROQUIA | MADRES SOLTERAS |
|-----------------|-----------------|
| SIGCHOS | 119 |
| CHUGCHILAN | 67 |
| ISINLIVI | 52 |
| LAS PAMPAS | 10 |
| PALO QUEMADO | 6 |
| TOTAL CANTON | 254 |
| TOTAL PROVINCIA | 4.577 |

• Fuente: INEC. 2010. Elaboración: Equipo Técnico GAD Municipal de Sigchos

Table 11 Single Mothers

In the canton of Sigchos, 90.89% of the population is located in rural communities and 9.11% is located in the urban part of the canton. Economically active population accounts for 58%, and 42% of the population is inactive. Following figure shows a distribution of the population by gender:

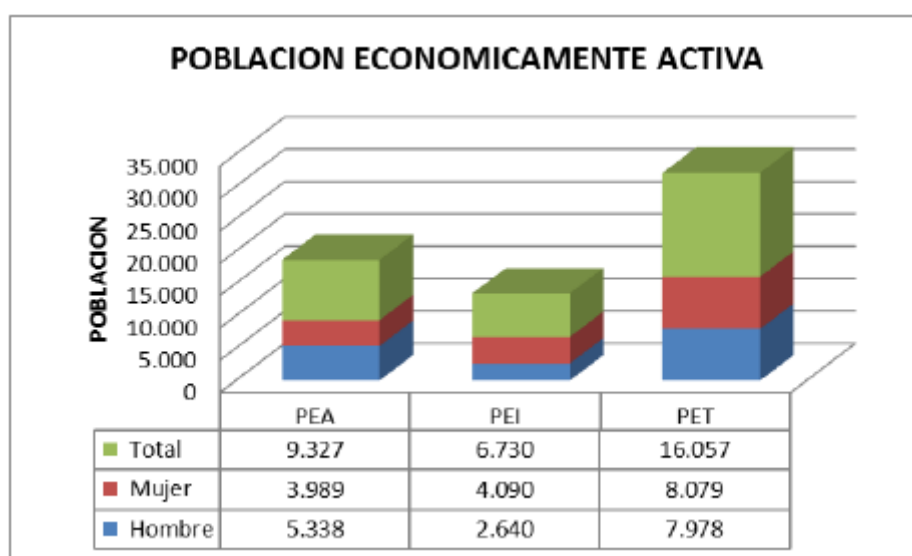


Figure 1 Distribution of the population by gender

According to the information presented in the PDOT, it is observed the distribution of the population by each parish that forms the canton of Sigchos. Following table shows disaggregated data by gender and population economically active and inactive.

| CHUGCHILAN | | PEA | PEI | PET |
|--------------|--------|-------|-------|--------|
| | Hombre | 1.678 | 824 | 2.502 |
| | Mujer | 1.642 | 1.076 | 2.718 |
| | Total | 3.320 | 1.900 | 5.220 |
| ISINLIVI | | PEA | PEI | PET |
| | Hombre | 689 | 493 | 1.182 |
| | Mujer | 649 | 603 | 1.252 |
| | Total | 1.338 | 1.096 | 2.434 |
| LAS PAMPAS | | PEA | PEI | PET |
| | Hombre | 576 | 214 | 790 |
| | Mujer | 217 | 479 | 696 |
| | Total | 793 | 693 | 1.486 |
| PALO QUEMADO | | PEA | PEI | PET |
| | Hombre | 318 | 117 | 435 |
| | Mujer | 186 | 173 | 359 |
| | Total | 504 | 290 | 794 |
| SIGCHOS | | PEA | PEI | PET |
| | Hombre | 2.077 | 992 | 3.069 |
| | Mujer | 1.295 | 1.759 | 3.054 |
| | Total | 3.372 | 2.751 | 6.123 |
| Total | | PEA | PEI | PET |
| | Hombre | 5.338 | 2.640 | 7.978 |
| | Mujer | 3.989 | 4.090 | 8.079 |
| | Total | 9.327 | 6.730 | 16.057 |

Table 12 Disaggregated data by gender and population economically active by parishes

In the Sigchos parish, 20% of the population is engaged in agriculture as a local consumption activity, 70% of the population is engaged in livestock, and 5% in community tourism. In the Sigchos parish, 20% of the population is engaged in agriculture as a local consumption activity. 70% of the population is engaged in livestock, and 5% in community tourism. The surplus agricultural products are for sale, among these include: the production of panela, beans, maize, zampo, pumpkin, mackerel, potatoes and the natural production of mortiño. On the other hand, traditionally livestock activity is often seen as a male activity and 70% of the population is engaged in this activity. The following table shows the distribution of the economic activities carried out in each of the parishes that make up the canton of Sigchos.

Gender analysis

| ACTIVIDADES PRODUCTIVAS CANTONALES | | | | | | |
|---------------------------------------|---------|------------|--------------|------------|----------|------------------|
| ACTIVIDAD | Sigchos | Las Pampas | Palo Quemado | Chugchilán | Isinlivi | Promedios Cantón |
| Ganadería | 70 | 80 | 85 | 15 | 30 | 56% |
| Agricultura | 20 | 15 | 10 | 40 | 55 | 28% |
| Turismo | 5 | 0 | 0 | 40 | 10 | 11% |
| Otros | 5 | 5 | 5 | 5 | 5 | 5% |

Table 13 Cantonal productive activities

Above information shows that livestock is economic predominant activity in parishes located in the project area and the Sigchos canton.

In the socialization workshops of the project, data and information were collected from members of associations, organizations or groups of women's existing in the parishes located in the project area. These data collect helps to analyze gender situation in the project area. In the meetings, participate 27 people, which 20 were women's and 7 men. Below a list of data collected:

- Name of association, organization or group
- Number of women's participants
- Main economic activities of association, organization or group
- Type products produced by association, organization of group
- Land ownership

With these disaggregated data obtained, an approach of gender analysis could be made to know the gender issues in the project area, conclusions are below:

- active role of women in the socioeconomic activities including agriculture and livestock
- Women's are more sensitive to the changes in the ecosystems bordering the project area
- Women's work to support and ensure family feeding
- Women's lead their homes with special advise and expertise
- Women's learn from elderly people
- Women's want to be listen
- Women's want to participate in all projects located in the watershed

Following table summarizes results for Sigchos, Las Pampas and Palo Quemado:

Table 14 Gender Dissagregate data

| Parish | Association, Organization or Group Name | Number of Women's | Main economic activity of the Association, Organization or Group | Type of products produced by Association, Organization or Group | Do you own any property? (At level of the Association or Individually?) |
|------------------------------------|---|-------------------|--|---|---|
| Sigchos, Las Pampas y Palo Quemado | Asojander | 20 | Organic farming Cleaning and Gardening | crops | individually |
| | Marianitas de Jesús | 19 | Silage Beef cattle | Pastures | Association and Individually |
| | De Naranjito | 7 | Beef cattle | Sugarcane Pastures | individually |
| | Asociación de Ganaderos | 12 | Beef cattle | Sugarcane Pastures Naranjilla | individually |
| | Asoapam | 15 | Beef cattle | Sugarcane Pastures | individually |
| | Sembrando un futuro | 5 | Beef cattle | Sugarcane Pastures Naranjilla | individually |
| | Campo Verde | 6 | Beef cattle | Sugarcane Pastures Naranjilla | individually |
| | Flor de Caña | 47 | Panela production | Sugarcane | Association and individually |
| | San Pablo | 6 | Panela production | Sugarcane | Association and individually |

Gender analysis

b. Las Pampas

As seen in the table 4 of illiteracy, the parish Las Pampas is a rural parish whose index is high, due to the poor economic and social situation of this parish.

Land use in the Las Pampas parish is used for livestock and agricultural activities. In the parish of Las Pampas its main activity is cattle raising with 80%, compared to 15% of the population that is engaged in agriculture with sugarcane, naranjilla, tomato, corn and beans.

According to the Population Census conducted in 2010, following indicators were obtained on the economically active female population and the number of women who receive income in this parish. Below a summary:

| Análisis Estadístico del Sistema Económico de Las Pampas | |
|---|----------|
| Año | 2010 |
| Indicador | Total |
| Población femenina asalariada | 41,00 |
| Población femenina de 10 y más años de edad | 696,00 |
| Población femenina económicamente activa | 217,00 |
| Población de 10 y más años de edad | 1.486,00 |
| Población económicamente activa | 793,00 |
| Población ocupada | 778,00 |
| Porcentaje de la población femenina asalariada | 19,16 |
| Porcentaje de la población femenina económicamente activa | 27,36 |
| Porcentaje de la población femenina asalariada en comercio al por mayor y menor | 0,47 |
| Porcentaje de la población femenina asalariada en manufactura | 2,34 |
| Porcentaje de la población femenina ocupada en el sector público | 5,14 |
| Porcentaje de la población femenina asalariada en agricultura, silvicultura, caza y pesca | 9,35 |
| Porcentaje de la población femenina ocupada en comercio al por mayor y menor | 6,07 |
| Porcentaje de la población femenina ocupada en agricultura, silvicultura, caza y pesca | 60,75 |
| Porcentaje de población femenina ocupada en manufactura | 20,56 |

Table 15 Economically active female in Las Pampas parish

In 2008, in the parish of "Las Pampas" was created the women's association "Marianita de Jesus", which is supervised by the Superintendence of Popular and Solidarity Economy (SEPS). At present, the association made up of 18 women and they are owns of land for economic activities. Those activities are agriculture and livestock. For this association the main objective is to generate income for their families.

In Las Pampas parish, there is an important role of women in the economic activities. In 2010, according to data from INEC, population distribution in the productive sector were as shown in the table below:

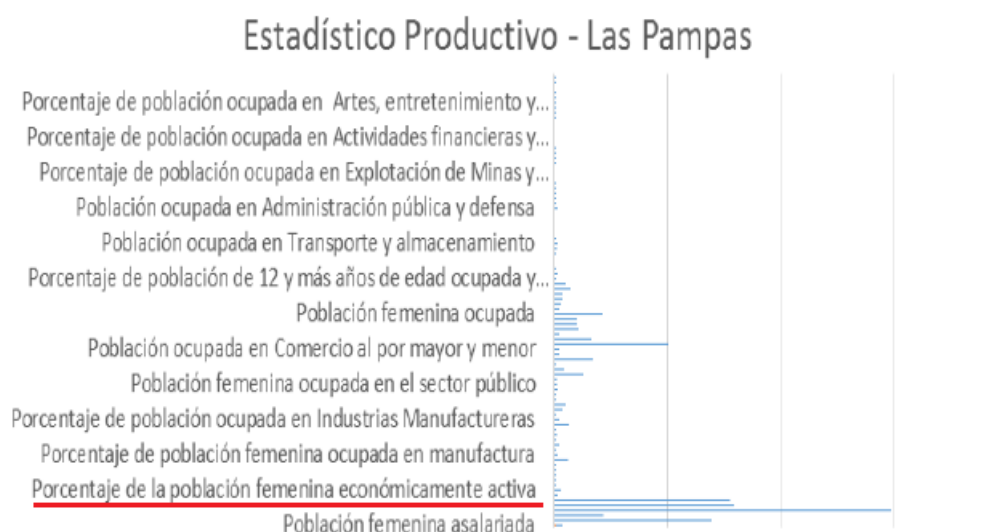


Figure 2 Population per productive sector in Las Pampas parish

In the parish of Las Pampas, at least 6 associations are located, where the role of women's is active for economic generation and for their family's economy. One of the most important associations is Flor de Caña Association whose main economic activity is the panela production and is made up of 47 women. Below information about economic situation for panela production:

| SECTOR | (#) EMPRESAS | (#) EMPLEADOS | VALOR PRODUCCION ANUAL (S/. POR AÑO) |
|--|---|---|--|
| - Fabricación y refinación de panela y panela granulada (Sigchos, Las Pampas y Palo Quemado) | Existen productores que lo realizan de manera artesanal | Disponen de la mano de obra conformada por miembros de la familia | No se puede cuantificar, pero en la parroquia de Sigchos y las Pampas el 80% y Palo Quemado el 99% de las familias se dedican a esta actividad para poder subsistir. |

Table 16 Economic Situation of Panela Production

Gender analysis

c. Palo Quemado

Population of this parish are view like small communities, which are identified as precinct. The ethnic groups living in the parish are mostly mestizo 2% and montubio 98%.

According to table 3, number of men and women in this parish has been reduced by 2.83% between census 2001 and 2010. In 2010, Palo Quemado had 1030 habitants, which were distributed in 567 men and 463 women, those data represent 55% of men and 45% of women. Following table shows the population distribution by gender.

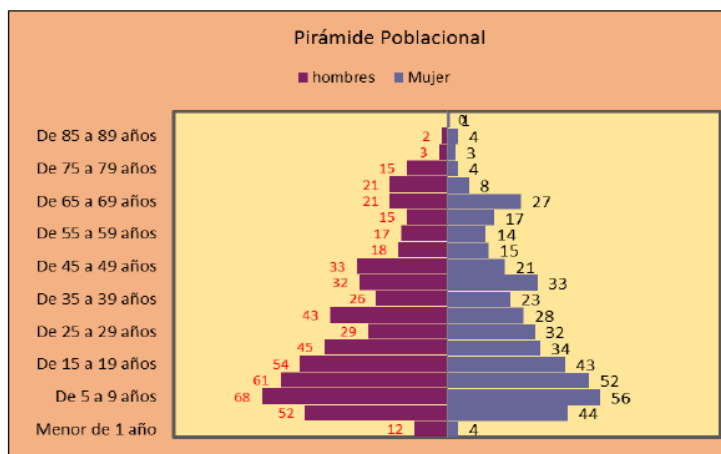


Table 17 Population Distribution by gender in Palo Quemado parish

According data from population census carried out in 2010, the economically active population was 318 men and 186 women that sum in total 504 people. While economically inactive population was 117 men and 173 women that sum 290 people. On the other hand, 91% of population can read and write.

Regarding poverty because unsatisfied basic needs 95,6% of population is poor.

In Palo Quemado parish, 46% of the population is engaged in agriculture, livestock and forestry and fishing; 28% is dedicated to industry and manufacturing, such as processing and industrialization, 1% of the population is dedicated to construction, 2% to wholesale and retail, 3% to transportation and storage, 1% is dedicated to the accommodation and food service, 1% is engaged in public administration activities, and 4% is dedicated to teaching.

In Palo Quemado parish is located the mining company MINAS DE LA PLATA, but population is not satisfied with the presence of this mining because operations has been generated serious environmental damage in the area.

Gender analysis

d. Alóag

According to the Population Census carried out in 2010, the total number of habitants of Mejía were 3.2% of the population. This number represents the total population of Pichincha province, and economically active population represents 2.90% of the province. The illiteracy rate, including men and women over 15 years old, reached 9.1%.

In 2010, according to the population census, the total number of habitants in Canton Mejía was 41,552 women, which represents 51.10%, and 39,783 men, which represents 48.90%. The rural population comprised 64,824 habitants (79.70%) and surpasses the urban population that had 16,511 inhabitants (20.30%). A summary of this information is presented in the following table:

| TABLA CEC 2 | | Población del Cantón Mejía | | | | | | | | |
|--|---------|----------------------------|---------|-------|--------|-------|--------|-------|--------|-------|
| Población | Mujeres | % | Hombres | % | Urbana | % | Rural | % | PEA | % |
| 81.335 | 41.552 | 51,10 | 39.783 | 48,90 | 16.511 | 20,30 | 64.824 | 79,70 | 45.466 | 55,90 |
| Fuente: INEC Censo de Población y Vivienda 2010 Elaboración: EQUIPO PDOT GAD MEJÍA 2014 | | | | | | | | | | |

Table 18 Mejía Canton Population

In relation to gender and economic activities, population census showed that there are 5,249 people as producers, which 3,273 are men and 1,976 are women. Of these total, 2,573 (49.01%) are engaged in agricultural activities and 2676 (50.99) are in non-agricultural activities. A summary is presented in the following table:

| TABLA CEC 3 | | Personas productoras por sexo y actividad | | |
|--|----------|---|------------------------------|-------|
| SEXO | | ACTIVIDADES AGROPECUARIAS | ACTIVIDADES NO AGROPECUARIAS | TOTAL |
| Masculino | Femenino | 2.573 | 2.676 | 5.249 |
| 3.273 | 1.976 | | | |
| Fuente: INEC, MAG, SICA III Censo Nacional Agropecuario Elaboración: EQUIPO PDOT GAD MEJÍA 2014 | | | | |

Table 19 Economically Active population by gender

Gender analysis

e. Manuel Cornejo Astorga (Tandapi)

According to the data obtained in the population census carried out in 2010, the rural territory of the parish consisted of 3661 habitants. These are distributed as follows:

| UBICACIÓN | POBLACIÓN TOTAL | HOMBRES | MUJERES |
|------------------------|------------------------|----------------|----------------|
| MEJIA | 81.335 | 39.783 | 41.552 |
| MACHACHI | 27.623 | 13.511 | 14.112 |
| MANUEL CORNEJO ASTORGA | 3.661 | 1791 | 1870 |

Table 20 Manuel Cornejo Astorga population

The economically active population represents 60% of the 2,197 people and the economically inactive population represents 40% of the 1,464 people.

| POBLACIÓN | HOMBRES | MUJERES | TOTAL | % |
|------------------|----------------|----------------|--------------|----------|
| PEA | 1.255 | 942 | 2197 | 60% |
| PEI | 785 | 679 | 1.464 | 40% |
| TOTAL | 2.040 | 1.621 | 3.661 | 100% |

Table 21 Manuel Cornejo Astorja Economically Active Population

The lands of this parish are suitable for development of agriculture and livestock economic activities, which are main sources of income and subsistence for population. Below table shows the main economic activities for this parish:

| RAMA DE ACTIVIDAD | CASOS | % |
|---|-------|-------|
| Agricultura, ganadería, silvicultura y pesca | 806 | 46,78 |
| Industrias manufactureras | 57 | 3,31 |
| Suministro de electricidad, gas, vapor y aire acondicionado | 9 | 0,52 |
| Distribución de agua, alcantarillado y gestión de desechos | 7 | 0,41 |
| Construcción | 71 | 4,12 |
| Comercio al por mayor y menor | 199 | 11,55 |
| Transporte y almacenamiento | 78 | 4,53 |
| Actividades de alojamiento y servicio de comidas | 134 | 7,78 |
| Información y comunicación | 5 | 0,29 |
| Actividades financieras y de seguros | 1 | 0,06 |
| Actividades profesionales, científicas y técnicas | 7 | 0,41 |
| Actividades de servicios administrativos y de apoyo | 42 | 2,44 |
| Administración pública y defensa | 14 | 0,81 |
| Enseñanza | 40 | 2,32 |
| Actividades de la atención de la salud humana | 6 | 0,35 |
| Artes, entretenimiento y recreación | 3 | 0,17 |
| Otras actividades de servicios | 12 | 0,70 |
| Actividades de los hogares como empleadores | 56 | 3,25 |
| No declarado | 155 | 9,00 |
| Trabajador nuevo | 21 | 1,22 |
| | 1723 | 100 |

Table 22 Manuel Cornejo Astorja Economic Activities

In the socialization workshops of the project, data and information were collected from members of associations, organizations or groups of women's existing in the parishes located in the project area. These data collect helps to analyze vulnerable group's situation in the project area. Below a list of data collected:

- Name of association, organization or group
- Number of women's participants
- Main economic activities of association, organization or group
- Type products produced by association, organization of group
- Land ownership

With these disaggregated data obtained, an approach of vulnerable groups' analysis could be made to know the group issues in the project area, conclusions are below:

- There is an association of the older adult
- The association has no legal status
- The association has no land for activities such as subsistence farming
- The association is made up of 30 women
- The association receives help from donations because it does not generate income

Gender analysis

Following table summarizes results for Tandapi.

| Parish | Association, Organization or Group Name | Number of Women's | Main economic activity of the Association, Organization or Group | Type of products produced by Association, Organization or Group | Do you own any property? (At level of the Association or Individually?) |
|----------------------------------|---|-------------------|--|---|---|
| Manuel Cornejo Astorga (Tandapi) | Association of agricultural products | 8 | Cattle raising | Cheeses | Association |
| | Pampas Argentinas | 11 | Cattle raising | Milk and panela | Individually |
| | Elderly Association | 30 | No | | Association |

Table 23 Vulnerable Group Dissagregated data

Gender analysis

f. El Chaupi

In PDOT document of the parish, it does not include information with gender analysis.

Agriculture and livestock have been the main sources of income and subsistence for this parish. A list of activities carried out in this parish are show below:

| RAMA DE ACTIVIDAD | CASOS | % |
|---|------------|---------------|
| Agricultura, ganadería, silvicultura y pesca | 369 | 59,23 |
| Explotación de minas y canteras | 2 | 0,32 |
| Industrias manufactureras | 44 | 7,06 |
| Suministro de electricidad, gas, vapor y aire acondicionado | 5 | 0,80 |
| Distribución de agua, alcantarillado y gestión de desechos | 1 | 0,16 |
| Construcción | 25 | 4,01 |
| Comercio al por mayor y menor | 41 | 6,58 |
| Transporte y almacenamiento | 23 | 3,69 |
| Actividades de alojamiento y servicio de comidas | 8 | 1,28 |
| Actividades financieras y de seguros | 3 | 0,48 |
| Actividades profesionales, científicas y técnicas | 5 | 0,80 |
| Actividades de servicios administrativos y de apoyo | 10 | 1,61 |
| Administración pública y defensa | 7 | 1,12 |
| Enseñanza | 10 | 1,61 |
| Actividades de la atención de la salud humana | 7 | 1,12 |
| Artes, entretenimiento y recreación | 3 | 0,48 |
| Actividades de los hogares como empleadores | 12 | 1,93 |
| No declarado | 28 | 4,49 |
| Trabajador nuevo | 20 | 3,21 |
| Total | 623 | 100,00 |

Table 24 El Chaupi Economic Activites

According to the PDOT document, El Chaupi parish promotes economic activities that include women. A community project was carried out at the farm Llovizna, where 20 women are engaged in activities such as fruit dehydration and tea production.

Project Beneficiaries by Component

| Component | Men |
|--|---------------------------------------|
| 1. Conserve vegetation cover | 2987 |
| 2. Adapt farming practices to new climate change conditions | 3191 |
| Component 3Sub-output | Responsible Party |
| 6. At least 6 parishes being trained to take care and use meteorological information generated by meteorol | |
| Producing climatological information. | INAHMI |
| 7. Six development plans of local parishes incorporate measures for ecosystem-based adaptation to climat | |
| Elaboration of development and territorial planning | GADs, SENPLADES, Association of Ecuad |
| 8. Strategic plan of communication, education knowledge transference and replication | |
| Preparation of communication and training plan | Project Manager of the Project |
| 9. Systematization of information gathered during the whole project design and implementation using inform | |

Gender analysis

| | |
|--|-----|
| Implementing technological platform to manage data, knowledge and information related to adaptation climate change | MAE |
|--|-----|

Gender analysis

Bibliography

FAO. (2009). Bridging the gap. Obtenido de FAO'S Programme for Gender Equality in Agriculture and Rural Development: <http://www.fao.org/3/a-i1243e.pdf>

(2014). Género y Adaptación al Cambio Climático.

(s.f.). Mujeres y Hombres del Ecuador en cifras III.

Stock, A. (2012). El cambio climático desde una perspectiva de género. Obtenido de <http://library.fes.de/pdf-files/bueros/quito/09023.pdf>



“Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed (Toachi-Pilatón watershed) with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management.”

ANNEX 14

Definition of beneficiaries of the Río Blanco upper basin

República del Ecuador

August of 2017

Annex 14. Definition of beneficiaries in the Río Blanco upper basin

Elaborated by: Juan Calles L. MSc.

Petitioner: YAPU Solutions & DSE Consultores

Date: July 28 of 2017

Methodology

To determine the beneficiaries of the project to be implemented in the Río Blanco upper watershed inside the scope of the Adaptation Fund, an analysis of the social and environmental conditions of the basin was carried out. The information provided by the Ministry of the Environment of Ecuador and official sources such as those of the 2016 Population Census was used. The process of information processing is described below.

Unit of analysis

The Río Blanco upper Basin is located in the territory of 3 provinces, and several parishes. However, for the present report the census sector was defined as the unit of analysis. The census sector is the smallest special unit defined by the INEC for the conduct of censuses. The use of the census sector was defined as the analysis basin shows a high dispersion of the population concentrated in the rural sector. Due to this condition, obtaining population information without field survey is very complex, and for this reason the estimate of the beneficiaries will be based on information from the available census of INEC (INEC, 2011).

Census information

The 2010 Population and Housing Census is a very important source of information as it contains details at the provincial, cantonal, parish and population and housing levels. Since 2011, these data are available for analysis and can be found on the official INEC website. In order to obtain INEC census data, ECLAC's REDATAM processor and the 2010 Census database were used. Using the REDATAM processor, data were collected at the parish level using the "Statistical Processor" function (Figure 1). The data obtained were exported to a spreadsheet and the values were assigned to the corresponding census code in the database of the variables.

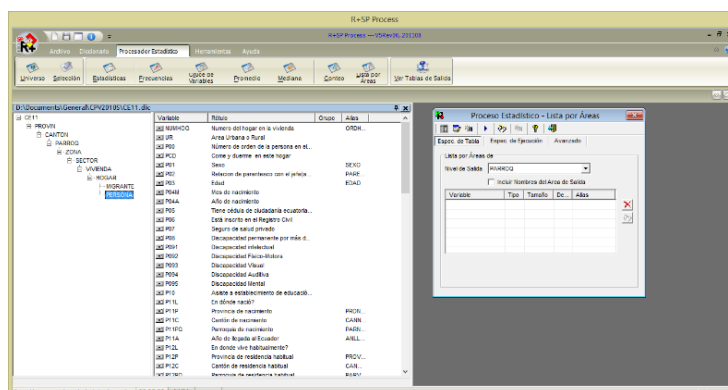


Figure 1. REDATAM Processor View.

Information processing

For the information processing was used the program ArcGis version 10.2 and Excel spreadsheets for the treatment of the data. The information collected was spatially analyzed based on the data available for the study basin.

To define the beneficiaries of the project, the following aspects will be considered:

- Location of defined villages to participate (points).
- Obtain population data of each point in relation to the census sector where it is located (polygons).
- Vulnerable areas (raster).
- Location of the measurements (polygons).
- Deforestation 2014-2016 (polygons).
- Data of the 2010 population census (INEC).

Outcomes:

Census tracts

A total of 186 census tracts were identified within the Río Blanco upper Basin (Figure 2). The project was located in the northern part of the basin, reaching a total of 54 census tracts, 50 in the rural area and 4 important population settlements (Sigchos, Palo Quemado, Tandapi and Las Pampas) Of the provinces of Cotopaxi and Pichincha (Figure 3).

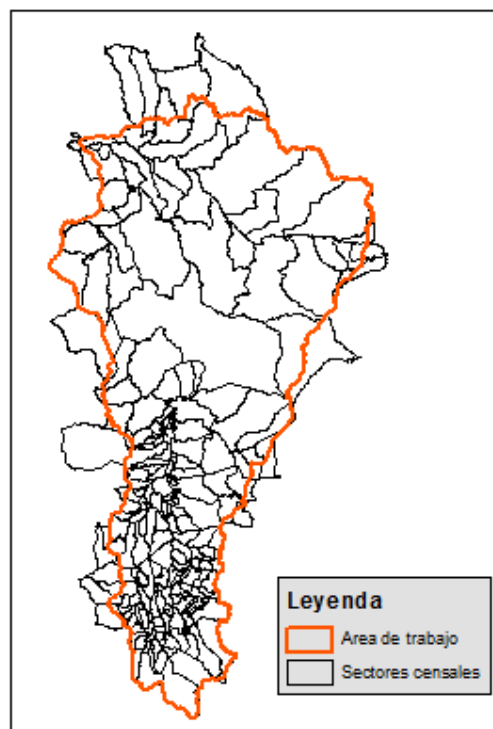


Figure 2. Census tracts in the Río Blanco upper watershed.

Annex 14. Definition of beneficiaries in the Río Blanco upper basin



Figure 3. Census sectors within the project intervention area in Río Blanco upper watershed.

A total of 234 human settlements of different sizes are located in the project's intervention area. The settlements are located mainly nearby of the Aloag-Santo Domingo road and on the road that leads to Sigchos (Figure 4).

Annex 14. Definition of beneficiaries in the Río Blanco upper basin

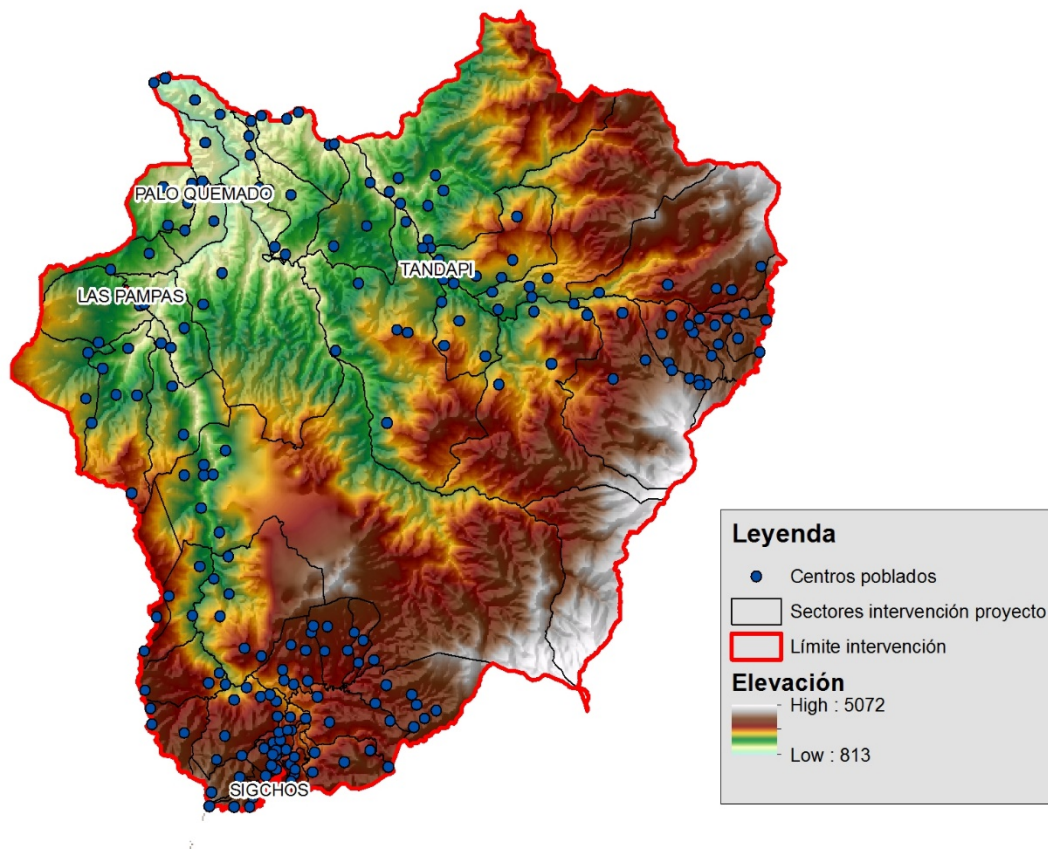


Figure 4. Location of human settlements within the project intervention area.

Population composition

In the analyzed basin there are a total of 43 200 inhabitants based on information from the census tracts present in the area. However, when defining the area of general intervention of the project, the number of inhabitants in this area is 10 450, with men 49.14% and women 50.86%.

Total population in the basin and in the project intervention area.

| Area | Men | Women | Total |
|-------------------------------------|-------|-------|-------|
| Basin | 24258 | 25109 | 49367 |
| Intervention area (rural sector) | 5567 | 4975 | 10542 |
| Intervention area (populated spots) | 3070 | 3097 | 6167 |

Population by age group

| Area | 0-14 years | 15-64 years | 64 or more | Total |
|-------------------|------------|-------------|------------|-------|
| Basin | 17504 | 22296 | 3400 | 43200 |
| Área intervención | 3498 | 5996 | 1048 | 10542 |
| Área intervención | 2075 | 3582 | 510 | 6167 |

Annex 14. Definition of beneficiaries in the Río Blanco upper basin

| | | | | |
|--------------------|--|--|--|--|
| (centros poblados) | | | | |
|--------------------|--|--|--|--|

Population density

The population settled in the basin is low and the majority of the population is located near the most important populated centers of the basin and near the main roads. The population density of the basin varies between 0.76 and 145 inhabitants per km² in rural areas of intervention. Population density is an important criterion since it shows the dispersion in the rural area of the basin (Figure 4).

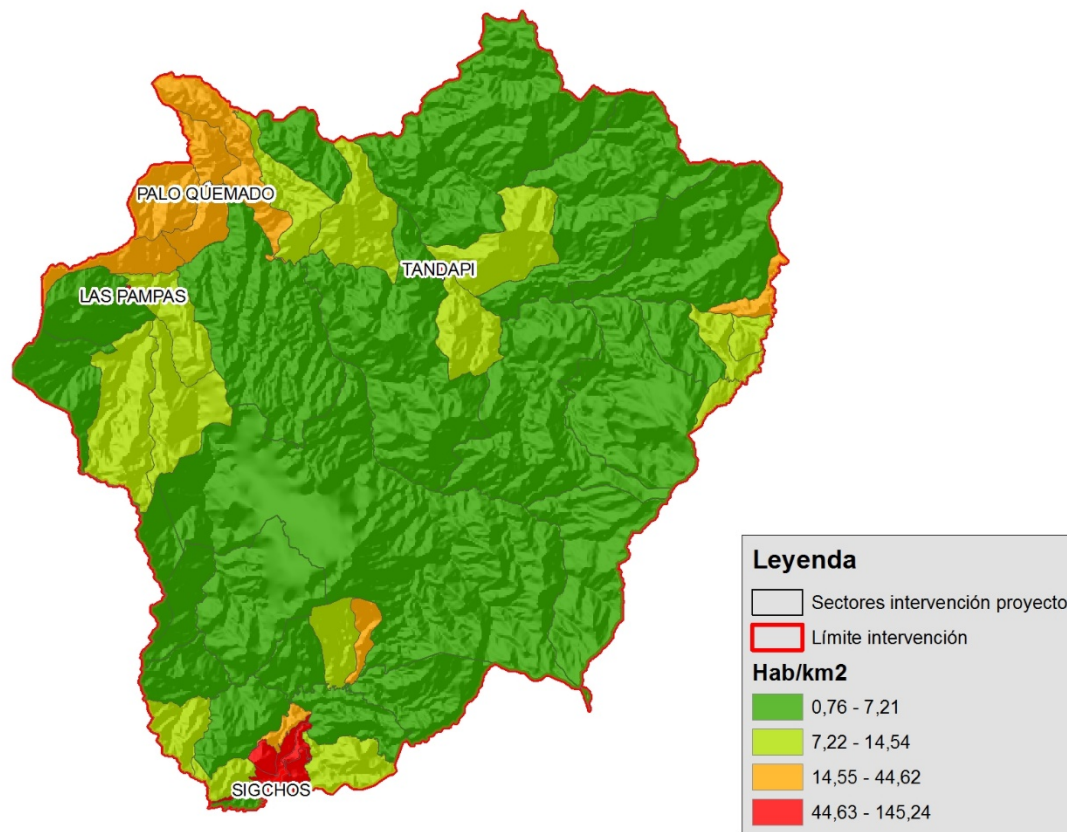


Figure 4. Population density in the intervention sectors of the project

Deforestation.

In the census tracts defined for component 1 between 2008 and 2014; 5.891,33 hectares were deforested, and between 2014 and 2016 a total of 2.200,14 hectares was deforested. This means deforestation of 8.091 hectares between 2008 and 2016 in the area in which the activities of component 1 (Figure 5).

Annex 14. Definition of beneficiaries in the Río Blanco upper basin

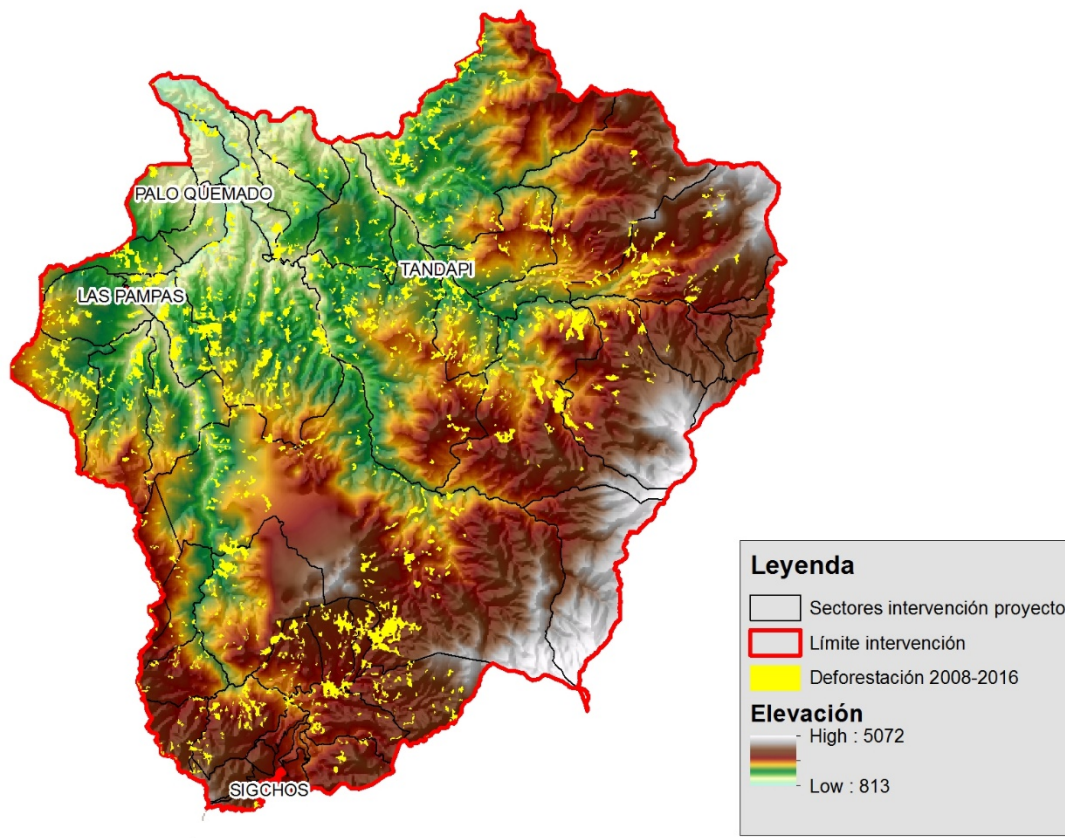


Figura 5. Cumulative deforestation between 2006 and 2016 in the intervention area.

In order to define the approximate number of beneficiary settlers per component, information was taken on the measures to be implemented and suggested by the vulnerability study of the basin and a spatial selection analysis was carried out to determine the census sectors to which the project components applies.

In the case of component 1, being a component of conservation and forests management the sectors selected are those with a higher remoteness, low population density and pressure for deforestation. The reference coverage used in this case was the so-called "Zonas_potenciales_regulacion_ciclo_hidrologico_protegidas_TOACHI" the same that was compared with the respective census sectors. A total of 30 sectors were selected from a total of 54 present in the project intervention area (Table 1). In the selected sectors they inhabit a total of 5.620 inhabitants. It is estimated that a total of 840 people would benefit directly from the activities of this component (Figure 6).

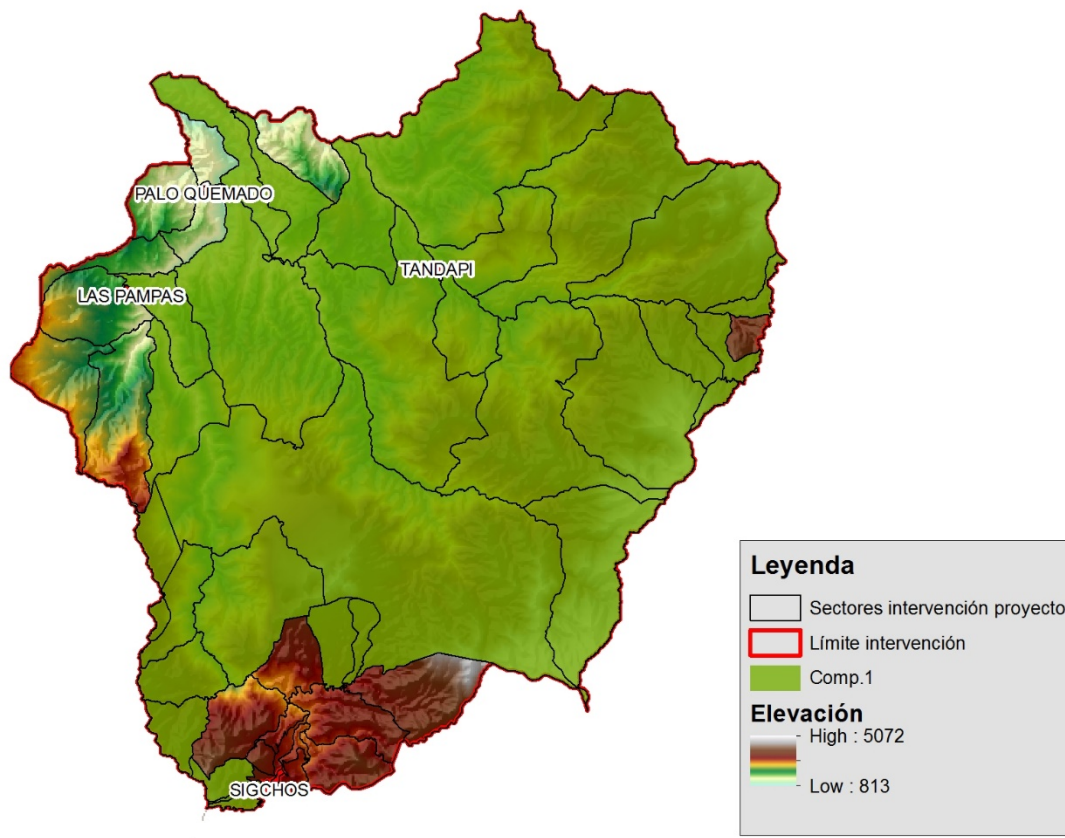


Figure 6. Location of sectors benefiting from the component 1.

In the case of Component 2, being a component of pasture and crop management, the selected sectors are those with a higher level of intervention, greater population density and pressure for deforestation due to the expansion of the agricultural frontier. The reference coverage used in this case was the so-called "Zonas_potenciales_sistemas_gestion_sostenible_TOACHI" which was compared with the respective census sectors. In this case, the project estimates an intervention in a total of 500 hectares. Considering 2 hectares per family for farmers we would need a total of 250 families to participate, the total direct beneficiaries would be approximately 1225 people. In the case of livestock farmers, the participation of 125 families is assumed, representing 625 people, giving a total of 1850 (Table 1). In this case, a total of 39 sectors were selected from the 54 present throughout the project intervention area.

Annex 14. Definition of beneficiaries in the Río Blanco upper basin

Table 1. Total population benefited by component (Total, total men, total women, senior citizens).

| Component | Men | Women | Total | Senior | Total direct beneficiaries |
|---|-------------|-------------|-------------|-------------|----------------------------|
| 1. Conserve vegetation cover | 2987 | 2633 | 5620 | 515 | 840 |
| 2. Adapt farming practices to new climate change conditions | 3191 | 2952 | 6143 | 671 | 1850 |
| 3. Strengthen local capacities and share lessons | Por definir | Por definir | Por definir | Por definir | Por definir. |

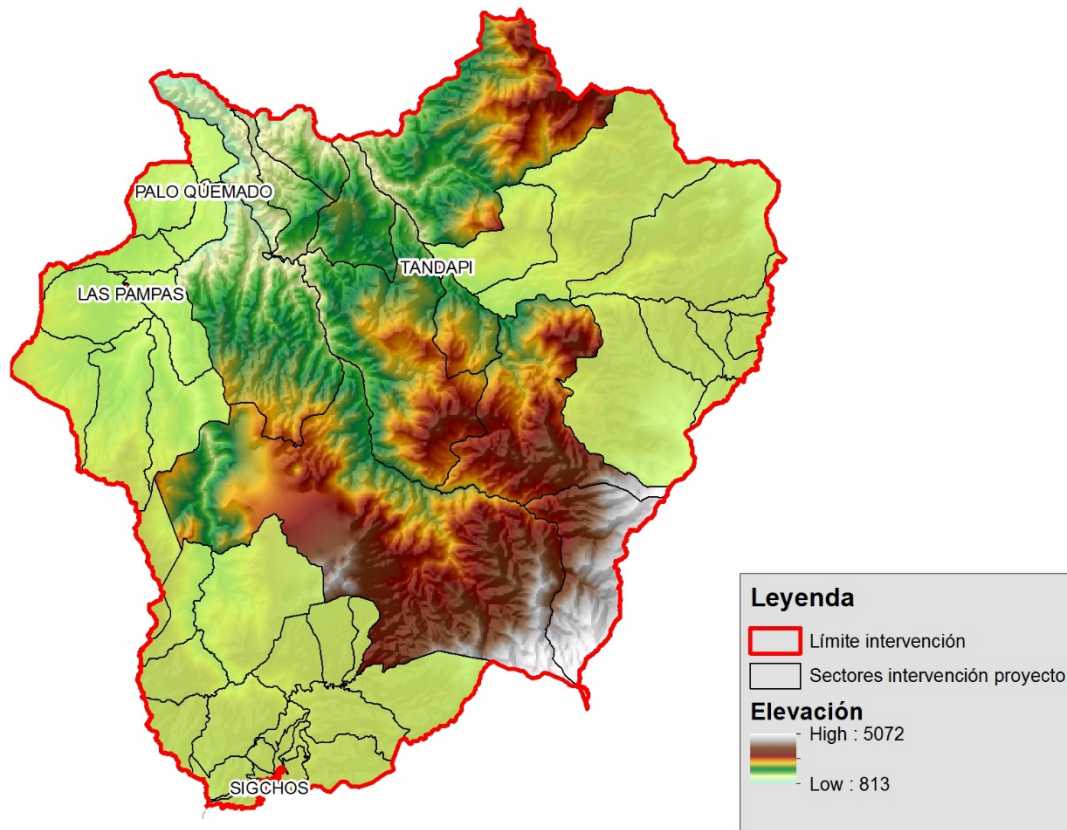


Figure 6. Location of sectors benefiting from the component 2.



**Environmental and Social Report (ESR)
“Increasing adaptive capacity of local communities,
ecosystems and hydroelectric systems in the Río
Blanco upper watershed (Toachi-Pilatón watershed)
with a focus on Ecosystem and Community Based
Adaptation and Integrated Adaptive Watershed
Management.”**

ANNEX 15
Environmental and Social Report

República del Ecuador

July of 2017

Environmental and Social Report (ESR) “Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Toachi & Pilatón watersheds with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management”

| | | |
|--------------------------------------|---|--|
| Name of the Operation | “Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management” | |
| Country | Ecuador | |
| Evaluation Date | June 12-13, 2017 | |
| Responsible for the Operation | Carolina Cortés | |
| Officer/Evaluator Consultant | Mauricio Velázquez | |
| DACC Officer Responsible | Mauricio Velázquez (Ecuador) | |
| UGAI Coordinator | Edgar Salas | |

Signature

Executive Summary

The proposed project aims to strengthen the adaptive capacity of vulnerable populations in the Río Blanco upper basins and develop a model of adaptation to climate change that can be replicated in a similar context in the country and in the region. The water collected in the area of influence of the Project flows to the Toachi Pilatón Hydroelectric Power Plant, which produces 228 MW.

The critical aspects in this area, which affect the ecosystems and populations of the parishes of the Municipalities of Sigchos and Mejía, which will have limitations regarding access to water quantity and quality are:

- a) Poor monitoring capacity in watersheds. The Toachi watershed has the worst monitoring system (few meteorological stations, minimum gauging stations and no sediment stations). Therefore, it is not possible to track the flow and sediment accurately, much less make a prediction that allows events to be anticipated with certainty.
- b) Unsustainable agricultural and livestock practices in the watershed increase deforestation, erosion and degradation of water quality. An example is the extensive use of firewood for panela [raw sugar cake] production. Most farmers have small areas of no more than 20 ha where they apply inappropriate farming practices and obtain very poor yields.
- c) Lack of knowledge of the ecological flow rate of rivers. The minimum flow rate recommended by the old regulation has been adopted, 10% of the average annual flow rate through the Toachi and Pilatón rivers at the dam sites.
- d) Lack of Fish Ladders in the project. This is mentioned very briefly in the Hydroelectric Plant EIA; the management of the Toachi and Pilatón reservoirs without this structure can block migrations of fish populations and affect other trophic species such as otters, and other fauna that make up aquatic ecosystems, and cause highly significant impacts on the availability of protein to local populations below the dams.
- e) Difficulty obtaining credit for sustainable productive activities. Farmers have little access to financing to improve their living conditions and thus carry out unsustainable activities that affect ecosystems and the quantity and quality of water in the watershed, reducing the resilience to climate change.
- f) Lack of awareness by the local population of climate-related impacts. Interviews with local stakeholders revealed that there is no clear understanding of the likely impacts of climate change, so communities do not insist that local authorities take adaptation measures as priority issues.

Environmental and Social Report (ESR) "Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Toachi & Pilatón watersheds with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management"

- g) Local development plans do not include measures for adapting to climate change. Local development plans (i.e. parishes and municipalities) mention climate change as a matter of concern, but do not have specific actions for mitigating or reducing the agents of deforestation, erosion, invasion of riverbanks, land use changes, and others. Generally, these plans do not have a gender perspective, and leave women more exposed to climate change.

The Project will contribute to breaking down the barriers that limit adaptation capacity in the lower basin of the Toachi and Pilatón rivers by strengthening local communities through the following actions:

- a) Conservation of the forest surface to maintain the hydrological cycle and to prevent a reduction of rainfall and avoid erosion on the slopes of the mountains;
- b) Introduction of sustainable practices to increase production per hectare, concentrate production in smaller spaces and thus reduce the expansion of the agricultural frontier, soil erosion and deforestation;
- c) Mainstreaming of adaptation to climate change in territorial development plans and involvement of the population by increasing their knowledge of the impacts of climate change.

In order to do this and at the same time guarantee the sustainability of the project, CAF has identified the following conditions for the agreement with the Adaptation Fund:

Preconditions for the first disbursement:

- i. Delivery of the TORs for the EIA Update to CAF for its approval, for the activities of components 1 and 2 of the Project.

Conditions for 150 days after first disbursement

- i. Submission to CAF's satisfaction of the EIA for the activities of components 1 and 2 of the Project.
- ii. Submission of a study of fish diversity in the Toachi and Pilatón rivers.

Conditions for 365 days after the first disbursement

- i. Submission of a study with a new calculation of the ecological flow rate of the Toachi and Pilatón rivers.
- ii. Submission of a study of the presence of Olinguitos [*Bassaricyon neblina*] in the area of influence of the Project, establishing (if its presence is confirmed) measures for conserving its habitat.

Conditions during the disbursement period:

- i. Contracting of an external environmental and social audit for components 1 and 2 of the Project, that submits annual reports.
- ii. Social study that incorporates the results of the consultation process, and a plan for the ethnic group in the project (in response to the activation of Safeguard S06).
- iii. The Ministry of Environment must notify Hidrotoapi of the need to design and implement fish ladders for the Toachi and Pilatón dams, activities that are to be included in the EMP's Next Compliance Audit.
- iv. Submission of quarterly reports on the Progress of the Project's Environmental and Social Management. This will be submitted no later than 30 days after the end of the reporting period (Jan-Mar, Apr-Jun, Jul-Sep or Oct-Dec).
- v. To notify CAF of any changes in the activities executed or to be executed in the project, or in the environmental or social situations occurring during the life of the project.

I. Description of the Borrower, Executing Agency and Operation

The proposed project seeks to strengthen the adaptive capacity of vulnerable populations in the Río Blanco upper basins and to develop a model of adaptation to climate change that can be replicated in a similar context in the country and in the region. The water collected in the area of influence of the Project flows toward the Toachi Pilatón Hydroelectric Power Plant, which produces 228 MW. The Toachi-Pilatón Hydroelectric Project has two plants, a 50 MW Sarapullo Power Plant and a 178 megawatt Alluriquín Power Plant. The average annual energy

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produced by the Sarapullo and Alluriquín plants under this scheme would total 1,120 gigawatt hours. The dam on the Pilatón River will be constructed of reinforced concrete approximately 23 m in height with a length of 138 m. and will allow the formation of a reservoir with a maximum normal operating level of 1,101.50 meters above sea level. The dam on the Toachi River will have a maximum height of 41 m and a width of approximately 150 m. Its discharge capacity is approximately 500 m³/s and a diversion tunnel will discharge a flood of 480 m³/s, giving a total discharge capacity of 980 m³/s. This discharge capacity is greater than a 25 year flood.

The Project will contribute to overcoming the barriers that limit the adaptation capacity of the lower Río Blanco upper basin by strengthening local communities through:

- a) Conservation of the forest area to maintain the hydrological cycle, prevent rainfall reduction and avoid erosion on the slopes of the mountains;
- b) Introduction of sustainable practices to increase production per hectare, concentrate production in smaller spaces and thus reduce the expansion of the agricultural frontier, soil erosion and deforestation;
- c) Mainstreaming of adaptation to climate change in territorial development plans and involvement of the population by increasing their knowledge of the impacts of climate change.

The project proposes an intervention framework (Table No.1) whose implementation presents many challenges due to existing barriers in the area, including the weakness of local actors, the size of the intervention area, budgetary constraints of the institutions of the area and others.

Table No. 1. Logical Framework of the Project.

| Project Components | Expected results | Expected Results (Specific) |
|--|---|--|
| 1. Conservation of plant cover | 1. Conservation of at least 230,000 ha of native vegetation to reduce the impact of climate change on the hydrological cycle of the watershed and implementation of control mechanisms. | 1. 1,000 ha of native vegetation are conserved through sustainable management of forests and conservation mechanisms |
| | | 2. Improved management of existing protected forests and private conservation areas (approximately 230,000 ha) |
| 2. Adaptation of agricultural practices to the new conditions of climate change and access to sustainable financing. | 2. Adoption of sustainable agriculture practices adapted to the local reality and implemented by local farmers by means of technical assistance based on innovative financing mechanisms for adaptation measures. | 3. Sustainable farming practices supported by economic incentives are implemented by small local farmers on at least 500 ha (250 ha of pasture and 250 ha of crops). |
| | | 4. At least 2 institutions have strengthened their institutional capacity to integrate sustainability criteria into their operations. |

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| | | |
|--|---|--|
| | 3. At least 1 innovative long-term funding mechanism is piloted and developed | 5. A Sustainable Investment Fund for the Watershed has been designed and is 100% operational. |
| 3. Strengthening of local capacities and shared lessons. | 3. Local populations and parish governments have increased capacity to implement measures for adapting to climate change. | 6. At least 6 parishes have been trained to safeguard and use meteorological information generated by currently installed meteorological stations. |
| | | 7. 6 parish council development plans incorporate measures to adapt to ecosystem-based climate change. |
| | | 8. A Strategic Plan for public communication, education and knowledge transfer and a replication scheme have been developed |
| | | 9. Systematization of information collected during the design and implementation of the project using existing IT platforms. |

The project has requested a budget of US\$2,489,373.00 from the Adaptation Fund, and during its implementation CAF is expected to exercise its catalytic role and allow other resources to be attracted that will help ensure the long-term sustainability of the initiatives implemented.

The National Implementation of the project will be carried out with the Ministry of Environment (MAE) as the Lead Implementing Entity to guarantee the effective use of the resources of the Adaptation Fund (AF).

MAE is the agency of the Ecuadorian Government that is in charge of designing environmental policies and coordinating strategies, projects and programs for protecting ecosystems and making sustainable use of natural resources. It proposes and defines regulations for achieving appropriate environmental quality, where development is based on the conservation and appropriate use of biodiversity and the country’s resources.

The conservation conditions of the watershed are being degraded by human intervention associated with deforestation to expand the agricultural frontier, among others.

The Project will be coordinated by the Undersecretary of Climate Change through its National Department of Adaptation, which for the integral management of the watersheds of the R rivers will coordinate actions with the Undersecretary of Natural Heritage, in particular, its National Forestry Department (its Socio Bosque program) and the Undersecretary of Environmental Quality, in particular with the National Department for the Prevention of Environmental Pollution.

Description of the environmental and social characteristics

The area of influence of the project includes the entire watershed that drains into the Toachi and Pilatón rivers, which are part of the Hydroelectric Project. In particular, the area located upstream of the catchment site or dam site, as it has a significant influence on the quantity and quality of the water reaching the intake or reservoir, and the influence of urban and rural development through water catchment and wastewater discharges, damming (for irrigation for agriculture) and land use, especially in relation to logging practices for the illegal timber trade or to expand the agricultural frontier. Also considered in the area of influence of the project are its population centers, including Canton Sigchos, the parishes of Alluriquín, Palo Quemado, Las Pampas, Praderas del Toachi, Tandapi (Manuel Cornejo Astorga) and Union del Toachi.

We also consider the area of influence to be the area located downstream of the dam, where the impacts on water quality and discharges on previously flooded lands and on agricultural, urban and industrial water consumers are usually felt; on fishing, the stability of the streambed and banks at discharge points and in the stretches between the dam and the discharge points¹.

The works of the hydroelectric power plant occupy approximately 204 ha, which includes the area flooded by the reservoir and a strip of river bank necessary for its protection and operation, as well as borrow pits, stream bypasses, dam structure, machine room, intake tunnels, discharge channels, access roads, camp and office areas and other permanent works.

a. *Physical environmental factors*

The watersheds of the Río Blanco river are located in the central part of the Ecuador in the western foothills of the Western Cordillera of the Andes, and are part of the Blanco river basin of the Esmeraldas river basin, and the slope to the Pacific Ocean. The rivers and streams that interact with the project are contaminated due to unsustainable land use practices.

The presence of total coliforms in the Pilatón river exceeds the range of analysis, so it is presented as "unquantifiable"; the concentration of these pathogens is directly related to the discharge of black and gray water by the communities of La Esperie and Tandapi located upstream of the sampling points. The Pilatón also contains ammonium, which is associated mainly with the use of detergents and agricultural activities.

In the Tránsito and Napa rivers, tributaries of the Pilatón River, the load of total coliforms is deemed unquantifiable; it is associated with the interaction of these rivers upstream with areas of livestock and domestic discharges from populated centers such as Pampas Argentinas and the parish of Mirabad.

The oxygenation of these resources is good, with dissolved oxygen values of 7.5 and 8.2 ppm, which allows good ecological development.

The concentration of ammonium in the Toachi river is higher below the town, and is related to the domestic and productive activities in the area, such as cattle, pig and poultry-raising. The Toachi river above the junction with the Pilatón river has high levels of fecal and total coliforms associated with livestock, agricultural and domestic activities in the upstream area. It collects runoff from areas used for those purposes.

Before emptying into the Toachi River, the Sarapullo River contains ammonium and total coliforms that are related to livestock activities and crops. The highest concentrations were found predominantly in water with

¹ Especially when they are located in a delta

higher flow rates, which is attributed to discharges of wastewater into the tributaries of the largest rivers from towns such as Praderas del Toachi, Pampas Argentinas, Mirabad, La Esperie, Alluriquín and Palo Quemado. This water should not be considered for agricultural use since the levels of total coliforms exceed the maximum limit detectable in a laboratory, .i.e. they are considered unquantifiable and exceed the maximum permissible limit for that purpose. Due to solid waste discharges into tributaries and swift-flowing rivers, the concentrations of aluminum and iron exceed the quality criteria.

Changes in sediment transport and deposition due to the implementation of the Toachi - Pilatón project could affect the river system or the project itself, which is why it is important to focus the analysis on the hydrographic system of the watersheds and their influence on the transport of sediment.

It is also considered relevant to ensure an ecological flow in the area of influence of the project (especially in the lower watershed, below the reservoirs) to conserve and maintain ecosystems, biodiversity and the quality of the fluvial environment, and to ensure the consumptive and non-consumptive use of water resources. Based on the information submitted in the EIA, and the Resolution on the right to use water for the Toachi - Pilatón hydroelectric project, issued by SENAGUA on March 17, 2011, the ecological flow is defined to be 10% of the average flow for each contributing river (Pilatón and Toachi, including the Sarapullo river). The EIA also indicates that the ecological flow defined is i) Ecological flow Pilatón River: 3 m³/sec, ii) Ecological flow Toachi River: 4.5 m³/sec. However, the environmental studies of this project indicate that studies of seasonal, physical and chemical variations of the rivers were not carried out during a period of at least 1 year or more, to define the ecological flow and ecological flow patterns with a more technical criterion.

In all the volumes of the Environmental Impact Study of the Hydroelectric Power Plant, only a small 2-line paragraph mentions that "... *there is no structure that allows the passage of fish...*" This lack in the Project will have an extreme effect on the diversity of the aquatic ecosystems downstream of the Project.

The Air Quality in the area of influence of the project is quite good. According to values recorded through measurements made during the preparation of the EIA of the Toachi Pilatón hydroelectric plant, the values of CO, NO_x, SO₂, O₃, PM₁₀ Particulate Matter and Settleable Particulate Matter, are within the maximum limits allowed by Ecuadorian environmental legislation. Even in towns crossed by the Quito - Santo Domingo highway, which has high traffic, acceptable air quality is maintained.

The climate is characterized by high precipitation varying from 2200 to 2800 mm of rain annually, distributed monthly throughout the year. It is influenced by the so-called "western regime" that produces greater rainfall from December to May. The average annual temperature is 20°C. Climatic conditions have been changing over time due to the aggressive deforestation of montane and high montane forest areas, which causes the so-called global warming. This aspect must be considered and evaluated in the area through continuous recording of climatic factors at stations located at project sites.

b. Biotic environmental factors

The study area corresponds to the life zone or plant formation known as "very wet Pre-Montane forest" according to Cañadas (1983). The types of forest in the area are "Evergreen Submontane Forest" and "Low Evergreen Montane Forest." The latter is predominant in the Toachi-Pilatón Project area (Sierra, 1999). It should be noted that the project area has been impacted by human activities, specifically changes in the use of natural land by the establishment of human settlements, crops and especially pastures.

An important ecosystem for protecting the watershed is riverside vegetation (up to 5 m from the bank) in the channels of the rivers involved. This space is the most important habitat for aquatic organisms as well as for

maintaining the integrity of the river. Being a sensitive area², it is also one of the areas most disturbed by human activities, especially for livestock access and the establishment of agricultural crops.

Toachi Pilatón project areas show evidence of aggressive deforestation of primary forest, seed trees and colonizing species. No plant communities or formations were found that are of interest, rather they are very common colonizing species. Land use in the area of influence of the project is diverse, ranging from migratory and marginal agriculture to degraded pastures subject to overgrazing, due mainly to a combination of several factors such as: rugged topography, soil fragility and others.

Several sensitive bird species were found within the project area, including ten endemic species with a distribution range of less than 50,000 km², as well as seven species threatened with extinction at the national level. These species were restricted to the forest fragments where they have their refuges and obtain their food, so these patches of forest should be considered as sensitive areas in future monitoring.

Among the most notable mammals are the *Mazama americana* "red brocket", *Leopardus pardalis* "ocelot", *Lontra longicaudis* "otter" and *Pecari tajacu* "collared peccary". They are considered indicators of stable ecosystems, since they are very sensitive to changes in their environment, and the discovery of these species in the study area, as well as their abundance, indicate that the Project area is home to important species, so vigilance and monitoring of these refuges is paramount. A separate chapter is the presence of Olinguitos (*Bassaricyon neblina*³), the first new species of carnivores identified in the Western Hemisphere in 35 years. It is a recently discovered mammal found in the cloud forest of the La Esperie reserve, and was considered one of the most important fauna finds of 2013.

In amphibians there are 2 species of frogs that are indicative of ecologically disturbed sites, including *Pristimantis achatinus*, which is found in open areas and pastures, and *Pristimantis walkeri* of the secondary forest.

As for ichthyofauna, 2 species were found in the inventories made by the Toachi Pilatón Hydroelectric Project: *Brycon dentex* and *Astroblepus chotae*, both endemic. The inhabitants of the area do not rely on fish for their survival; fishing is occasional and only for family consumption. In Ecuador CAF has financed a Hydroelectric Plant in a nearby watershed (Calope River), where the fish diversity involves more than 14 species. It is therefore important to expand the study of fish diversity in the Toachi and Pilatón rivers and take steps to avoid blocking the genetic flow of the populations in these rivers through the construction of dams.

The project crosses the Sarapullo (21,585 ha) and Toachi-Pilatón (14 900 ha) Protected Forests and Vegetation and the Los Illinizas Ecological Reserve (149,900 ha), thus activating institutional safeguard S03 for the Conservation of Biological Diversity. The 2 protected forests mentioned do not have management plans.

c. **Social, economic and cultural factors**

The project is located in the provinces of Pichincha, Santo Domingo de los Tsáchilas and Cotopaxi, in the cantons of Mejía and Sigchos, and the parishes of Manuel Cornejo Astorga (Tandapi), Alluriquín and Palo Quemado. The towns in the area of the civil works are: La Esperie, La Palma, Mirabad, Pampas Argentinas, Union del Toachi, Santa Rosa de Lima, Palo Quemado, Praderas del Toachi and La Libertad de Alluriquín. Communities are also located in the stretches where the flow of the Toachi and Pilatón rivers will be reduced,

² In general, in fish studies it is recommended that riparian vegetation be conserved and/or recovered to ensure the viability of aquatic organisms (Willink et al., 2005).

³ <https://www.youtube.com/watch?v=zecKn4qSErU>

including San Antonio Bajo (Chorrera del Napa and Praderas del Pilatón) and San Antonio Alto (Nuevo Machachi).

Table No. 2 Autonomous Decentralized Governments in the Project Area.

| Basin | Province | Canton | Parish | Total Population of the Parish | Population of the Basin |
|---------------------------------|--------------------------------|---------------|----------------------------------|--------------------------------|-------------------------|
| Toachi | Cotopaxi | Latacunga | Toacaso | 7,685 | 7,685 |
| | | Pujilí | Guangaje | 8,026 | 8,026 |
| | | | Zumbahua | 12,643 | 12,643 |
| | | Sigchos | Chugchilan | 7,811 | 7,811 |
| | | | Isinlivi | 3,227 | 3,227 |
| | | | Las Pampas | 1,943 | 1,943 |
| | | | Palo Quemado | 1,030 | 1,030 |
| | | | Sigchos | 7,933 | 7,933 |
| Pilatón | Pichincha | Mejia | El Chaupí | 1,456 | NA |
| | | | Aloag | 9,237 | NA |
| | | | Manuel Cornejo Astorga (Tandapi) | 3,661 | 3,661 |
| | Santo Domingo de los Tsáchilas | Santo Domingo | Alluriquín | 9,725 | 9,725 |
| Total population in 2010 | | | | 74.377 | 53.959 |

Highlighted in yellow are the intervention sites of the Project.

Solid wastes from communities are disposed of mainly by municipal collection services (in Alluriquín and Tandapi), but collection does not occur daily. In communities where this service does not exist, an open field or water bodies are used, or it is burned. In Las Pampas we visited a dump where the base was not waterproofed, so the leachate could seep and damage the nearby soil and aquifers.

Community schools have equipment that is in an acceptable state; the project can work with the schools on component 3 of environmental education to gain access to local families who work in the watersheds and make their productive practices more sustainable. The main schools are shown in Table No.3:

Table No.3. Main Schools in the Area of Influence of the Project.

| COMMUNITY | NAME |
|---------------------|--|
| La Esperie | "Sixto María Durán" school |
| Pampas Argentinas | "Princesa Toa" school |
| Mirabad | "Mirabad" school |
| Santa Rosa | "Pablo Neruda" school |
| Palo Quemado | "Juan Salinas" school "Monseñor Leonidas Proaño" high school |
| Praderas del Toachi | "Arcenio Hidalgo Cepeda" school |
| Alluriquín | "Dr. Alfredo Baquerizo Moreno" school "Nacional Mixto Alluriquín" high school |

The percentage of families with Unsatisfied Basic Needs (NBI) is very high for all parishes (<80%).

Due to their location the communities have problems with passenger transport, but not cargo, since there are specialized vehicles (trucks and vans) that bring cargo from different parts of the country. The access roads are in very bad condition, in particular, access to Palo Quemado and Pampas.

Livestock production in the area is extensive, milk cows represent 45% followed by beef animals at 37.50%. The average milk production of the Toachi-Pilatón Hydroelectric Project area is 11.91 liters/cow/day. Residents of all communities visited during the evaluation requested technical assistance to improve their meat and milk production.

In the Project area fish farming is not very widespread; however there is a significant presence of fish farms with acceptable technology such as Piscifactoria Acuimagg del Ecuador, Propesma, and others located mainly near Tandapi.

The main agricultural crops are naranjilla and sugar cane; in particular a large amount of panela is produced in the parishes, especially Palo Quemado and Las Pampas. There is a women's association, "Fundacion Flor de Caña", which is involved in exporting products derived from panela. The Foundation has 48 members and produces 600 quintals a month of ground panela [raw sugar cake]⁴. The product is called Panela Palo Di Rosa and is exported to Europe, although it has an interesting local market in Quito.

A significant part of the deforestation is due to the need for firewood as energy for the furnaces where the panela is produced. The inhabitants of Palo Quemado mentioned that the kilns use 4-5 trees/month. At the request of the communities, CAF conversed with those responsible for the environmental sustainability of the company Sociedad Agricola e Industrial San Carlos SA, and in particular with its administrative manager, who agreed to take part in exchanges with representatives of panela producers of Palo Quemado and Las Pampas, to share their experience with the use of bagasse as fuel in their boilers. (San Carlos generates 54 MW/year, consumes 30% of its generation and sells the remainder to the National Interconnected System). The San Carlos Sugar Factory also funds the Sugarcane Research Center of Ecuador (CINCAE), which has developed more efficient varieties of sugar cane for different regions of the country; this and other areas of collaboration could be taken to the Project area to increase the agricultural productivity of the communities and improve their quality of life, without expanding the agricultural frontier. Other areas of work of CINCAE are: Pest Management, Disease Management and Soil and Fertilizer Management.

There is presently mining exploration activity in the area of influence of these parishes carried out by the company Minera La Plata; the exploration covers 2,231 hectares, and generates discontent in the communities, especially in the parish of Palo Quemado⁵. There was extractive mining activity in the parish during the years 1976 to 1981, carried out by the company Buenaventura. Farmers in the area showed the destruction in the areas where extraction was carried out, "not even weeds grow, and the smell in the sector is similar to sulfur."

The area contains ancestral cultures. During the construction of the Alluquirin equilibrium chimney, an archaeological site was found with evidence and cultural remains that are exclusively fragments of local pottery of different sizes and thicknesses, such as pots clearly related to Cosanga (Panzaleo).

d. Institutional and Organizational Aspects

Interest groups identified during the citizen participation and social base line process:

⁴ <https://prezi.com/woshrkekdnaw/investigacion-de-mercado-palo-quemado/> [Palo Quemado market investigation]

⁵ <https://elproductor.com/2017/07/27/ecuador-productores-de-panela-en-sigchos-preocupados-por-mineria/> [Ecuador-panela producers in Sigchos worried about mining]

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- Local Governments, which include autonomous decentralized governments and local, communal and neighborhood committees, including the political leaders of each parish and those listed in Table No. 2.
- Grassroots community organizations, which are the most representative associations of the inhabitants, and in which the activities focus on improving existing living conditions (e.g. sports clubs, agricultural associations, women's associations (Flor de Caña), and others).
- Boards and water committees that represent a sector with competent administrative authorities, and they thus have political power in negotiations between the public sector and the inhabitants. These water committees are established by the National Water Secretariat (SENAGUA).
- Nongovernmental organizations (NGOs) that defend certain rights of the inhabitants, for example the Sisters of Charity, the Otonga Foundation, the Biological Station and the "La Hesperia" Reserve, among others.
- Entrepreneurs, who are individuals or associations that promote the development and implementation of projects and/or ventures that defend their group interests.
- The public sector, delegates from the Ministry of Agriculture, Livestock and Fisheries, Ministry of Health, among others, who are the main actors in planning, programming, management, supervision and control. In principle, their function is to implement regulations and promote the common good.

II. Assessment of Impacts and environmental and social risks.

a. Impacts of the project on the physical component

According to the Environmental Impact Studies of the Hydroelectric Power Plant, and the EIA of existing roads in the project area, the main impacts associated with the Project are:

- Degradation of Water and Soil Quality
- Degradation of Air Quality
- Direct discharge of water from washing heavy and super heavy vehicles, so contamination by lubricants is high.
- Impact on groundwater due to variations in the water table
- Erosion of the banks of the Toachi dam in the reservoir area.
- Reduction of the current availability of flow in the Pilatón and Toachi rivers downstream of the dams, changes in hydraulic characteristics.
- Modification of the hydraulic pattern downstream of the Toachi and Pilatón dams due to the water reservoir.
- Changes in the average speed and flow pattern of the Toachi and Pilatón rivers, leading to eutrophic processes in the new reservoirs.
- Changes in the bathymetry of the river in the reservoir area due to sedimentation processes during the life of the Toachi Dam.
- Contamination of the water due to an increase in the concentration of organic matter in the Toachi and Pilatón rivers due to a reduction of the self-cleaning capacity of the water, since the communities currently discharge their domestic waste into the rivers (sewage and gray water, dead animals, organic waste).

b. Impacts of the project on the biotic component

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- Alteration of native plant cover. The areas of direct influence of the Toachi-Pilatón Hydroelectric Project are disturbed areas, and there is almost no forest cover. Based on the forest inventory carried out in 2011, the basal area and the volume of standing timber in the Toachi river reservoir area is extremely low, despite being within two protected forests and an ecological reserve. The situation is much more critical in other areas of the project.
- Alteration of the habitat of native fauna species. This impact is directly associated with the previous impact.
- Soil erosion of the banks.
- Reduction of macroinvertebrate diversity due to reduced leaf litter caused by a reduction in vegetation due to the construction and operation of the Pilatón and Toachi dams, as well as the Power Plant in Alluriquín.
- Changes in the Otter habitat due to the construction of the Toachi Dam and Alluriquín Power Plant.
- Reduction in the biodiversity of the avifauna component and replacement of sensitive species (even if they are not indicators) by species from altered ecosystems, the case of the Torrent Duck.
- Changes in the Aquatic habitat due to the construction of dams on the Toachi and Pilatón rivers, downstream from the facilities as far as the Alluriquín Power Plant.
- Reduction in sensitive species in the Aquatic Ecosystem of the Pilatón and Toachi rivers due to a change in the system from lotic to lentic.

c. Impacts of the project on the socio-economic component

- Reduction of pasture areas by flooding the Pilatón and Toachi reservoir.
- Activation of the local economy due to the increased purchasing power of people associated with the project and contractor personnel during the construction phase.
- Perception of a flood risk by the population of Union del Toachi.
- Increase in the human settlements in the project area that choose to remain even during the Operation phase.
- Increase in basic needs (light, water, waste disposal for new human settlements).
- Reduction in the Demand for extreme sports due to the reduction in the Toachi River flow rate below the dam.
- Increase in Tourism Activities associated with the implementation and operation of the Toachi Dam

d. Impacts of the project on the institutional and organizational component

There is a weakness in the socio-organizational area that results in a lack of integral proposals that contribute positively to the management of the Toachi and Pilatón watersheds.

Social processes are not given the corresponding importance, which are crucial for the communities to continue developing after the project ends.

Therefore, the project will have component 3 with supporting activities for watershed governance, which will allow the existing water boards in the area, as well as the watershed council to better coordinate their work with other actors and strengthen their management by improving local capacities.

III. Environmental and social management of the operation

The Environmental and Social Management that is implemented in the project, is part of:

- Environmental and Social Management Plans of the Toachi Pilatón Hydroelectric Power Plant Project,

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- Flow rate Management Plan (document focused on guaranteeing water production by the micro watersheds that contribute to the project).
- Management Plan for the Illinizas Ecological Reserve
- Territorial Development Plans of GADs (in sections related to environmental management)
- Specific environmental policies and regulations issued by GADs.
- Organic Code of the Environment
- In the case of the participating Financial Institutions, these will have to apply their Environmental Risk Analysis Systems developed for their microcredit loans that are granted in the area of influence of the Project.

Although there is no Environmental and Social Management Plan for components 1 and 2 of the Project, the need to develop this document is identified as one of its activities due to the application of CAF Safeguard S03 on Conserving Biodiversity, notwithstanding the fact that the categorization of the Project in the Single Environmental Impact System (SUIA) does not establish a requirement to have this document.

The MAE and local GADs must comply with environmental and social management commitments also established in the environmental and social measures formulated in the agreement to implement the project approved by the Adaptation Fund and CAF, as well as emerging requirements from findings made by CAF (and/or the Adaptation Fund) during the monitoring of ongoing projects, and other emerging actions identified as necessary during the evaluation of the Project.

The Project Management Unit, therefore, must comply with the conditions established in each EMP, and implement the environmental budgets and the measures recommended by CAF. The external environmental and social auditors will also provide reports that verify compliance with the aforementioned commitments and will be responsible for putting this information in digital format on a web page for interested parties. Their work should be timely so that they will be able to recommend and condition the works executed by the contractor(s).

a. Preventive, mitigating and/or corrective measures

- Maintenance of a list of critical points from a geotechnical point of view both in the internal areas of the project and in its area of influence, on the basis of which it should undertake specific actions to stabilize the soil and prevent landslides and erosion
- Construction of slopes, gabions or other geotechnical means to prevent possible landslides on work fronts or access roads.
- Preparation of at least one operating forest nursery to ensure the rehabilitation of areas affected by the project.
- Implementation of the appropriate and necessary structures, such as canals and culverts for the protection of water channels on all the work fronts under its jurisdiction.
- Monitoring of aquatic species in the area where protective structures for the channels are created
- Development of location and monitoring studies of *Bassaricyon neblina* "Olinguitos" in the area of direct influence of the project.
- Salvage of native flora and fauna in the reservoir area.
- Monitoring of surface water quality of the following important rivers in the project area: a) Toachi river (upstream and at the junction of the Toachi with the Sarapullo), b) - Sarapullo river (upstream) and c) - Pilatón river (upstream, at the junction of the Toachi and downstream).
- Air Quality Monitoring: a) Particulate Material. PM10 and PM 2.5, b) Nitrogen Oxides, c) Sulfur Dioxide, d) Carbon Monoxide and e) Ozone during the operation phase of the reservoir.
- Monitoring of reservoir eutrophication.
- Determination of water quality annually by obtaining quality indices.

- Interinstitutional cooperation with GADs and Ministries involved in planning proposals for the regeneration of the banks of the Toachi river.
- Baseline survey and development of a study for calculating ecological flow rate and ecological flow rate regimes
- Determination of the regimes of the rivers in the study⁶ (Toachi river, Pilatón, Sarapullo and their significant tributaries), including: flow rate, speed, seasonal and annual variations, droughts, floods. Determination of biotic interactions in water and land-water: endemic species, exotic species, biotic population structure and trophic structure.
- Monthly monitoring by hydrological stations to determine the ecological flow rates and to compare them with the ecological flow rates determined for the project (both in the Toachi river at the Toachi dam discharge and in the Pilatón river at the discharge of the Pilatón catchment structure).

b. Mechanisms of citizen participation and communication strategy

By means of its 3 components the Project has to implement the citizen participation mechanisms established by Law (i.e. public consultations), although the development of these consultations was verified in this evaluation phase; once the Adaptation Fund approves the proposal, CAF will verify during the execution that the levels of citizen participation are respected and that the results are incorporated into the process; in Component 3 and in a cross-cutting manner, the implementers shall inform CAF in a timely manner about the communication strategy used with the community and the results obtained, such that there is full compliance with the obligations stipulated in the Regulations for the Application of Social Participation Mechanisms specified in the Environmental Management Law, promulgated in Executive Decree 1040 of April 22, 2008, and the Instructions for the Regulations for the Application of social participation mechanisms established in Executive Decree 1040.

The citizen participation component should be managed as a system that permits community involvement in the phases of information and incorporation of criteria, precisely in order to dilute potential expressions of discontent or complaints from the inhabitants of the areas of influence of the program who might feel adversely affected by the Projects.

The Strategic Environmental Assessment process of the Project will also serve to improve public participation in assessing the environmental consequences of the project's initiatives, in order to ensure that they are fully included and correctly communicated during the early decision-making stages, and placed at the level of social and economic considerations.

The activation of safeguard S06 of Ethnic Groups, due to the presence of the Tsáchila population, requires the involvement of ethnic groups through consultation and relationship, the development of measures to guarantee their access to the benefits of the project, and the communities will be informed through appropriate dissemination. This will be required during the initiation of the execution of the Project and in all its relevant areas.

IV. Main Risks and Critical Aspects

a. Main Risks

⁶ For this purpose, historical data for at least 10 consecutive years and data obtained during the year of study will be analyzed. Data obtained from existing hydrological and meteorological stations (hydrological and meteorological stations for the PHTP) will be used, although the study will define the need to establish new stations. For the monitoring year, monthly information and an annual compilation will be presented

- Accelerated deforestation of forest resources in the Toachi and Pilatón river basins caused by the expansion of the agricultural frontier at the expense of forest lands, cloud forests, moors, etc., since these uses provide very few advantages from a hydrological standpoint (low capacity for retention of flows and sediments)
- Intensive ranching and agricultural practices that can degrade the soil and cause landslides and erosion.
- Inefficient management of natural protected areas (Illinizas Ecological Reserve and Toachi-Pilatón and Zarapullo Protected Forests). The contributing watershed should have more and better protected space to facilitate the implementation of adaptation policies, to improve the implementation of lines of action proposed by the administrations with regard to conservation, forest restoration, etc.
- The potential development of mining in the area, which would affect the water quality of rivers and hence human populations and the abundance of flora and fauna, and reduce the ecosystems' capacity to adapt to climate change.
- The barrier effect that will be created in the Toachi and Pilatón rivers once the dams begin operation due to the absence of fish ladders in the designs of the works.
- High vulnerability of the watershed to climate change scenarios. Studies performed by TecNALIA in 2015 determined that the impacts on the flow rates of the tributary rivers and the high entrainment of sediment will particularly affect Toachi-Alluriquín hydroelectric generation (located in the Toachi basin). The power plant has a high production capacity (254 MW of power) but it does not have sufficient flow to make the most of it. Given this situation, the plant is sensitive to a future scenario of decreasing flow. The management of the plant can play an important role in increasing the adaptive capacity of the watershed.

b. Critical Aspects

- a) Poor monitoring capacity in the watersheds. In 2015, TecNALIA stated that the Toachi watershed had the worst monitoring system (few meteorological stations, minimum gauging stations and no sediment stations). Therefore, it is not possible to track the flow and sediment with confidence, much less make a prediction that would allow events to be anticipated with certainty.
- b) Unsustainable agricultural and ranching practices in the watershed that increase deforestation, erosion and water quality degradation. An example is the extensive use of firewood for panela production. Most farmers have small areas of no more than 20 ha where they apply inappropriate farming practices and obtain very poor yields.
- c) Lack of knowledge of the ecological flow rate of the rivers. So far, with no scientific basis, a recommended minimum flow rate of 10% of the average annual flow rate through the Toachi and Pilatón rivers at the dam sites has been adopted.
- d) Absence of Fish Ladders in the project. This aspect was mentioned very briefly in the Hydroelectric EIA. The management of the Toachi and Pilatón reservoirs without this structure can block migrations of fish populations and affect other trophic elements such as otters, and other species of fauna in aquatic ecosystems, and cause highly significant impacts on the availability of protein for local populations downstream of the dams.
- e) Difficulty accessing credit for sustainable production activities. Farmers have little access to financing to improve their living conditions and therefore undertake unsustainable activities that affect ecosystems and the quantity and quality of water in the watershed, reducing their resilience to climate change.
- f) Lack of knowledge by the local population of climate-related impacts. Interviews with local stakeholders revealed that there is no clear understanding of the likely impacts of climate change, so communities do not insist that local authorities take adaptation measures as priority issues.

- g) Local development plans do not incorporate measures for adapting to climate change. Local development plans (i.e. parishes and municipalities) mention climate change as a matter of concern, but do not have specific actions for mitigating it or reducing the agents of deforestation, erosion, invasion of riverbanks, changes in land use and others. Generally, these plans do not have a gender perspective, and leave women more exposed to climate change.

V. Main environmental and social opportunities

The cumulative impacts on the Toachi and Pilatón river basins and the actions proposed by this project to reduce vulnerability to climate change create opportunities for synergies that will allow the creation of more significant impacts in the area of direct and indirect influence of the project. It can be seen that coordination among the actors in a framework to strengthen the governance of the watershed could improve the management of the dams, the construction of steps (or ladders) for fish, a more reliable calculation of ecological flow rates and other activities which, although identified and budgeted in the environmental and social management plan of the Hydroelectric Project; without this project they will not receive the necessary prioritization for implementation in the short term.

The possibility of attracting catalytic funding from other sources such as Banco de los Pueblos, which has a CAF line of credit of US\$500,000, which could be invested in microcredit for farmers in the area of influence of the project.

Finally, the potential involvement of Sociedad Agrícola San Carlos to exchange experiences in the use of bagasse as an alternative fuel for boilers and ovens in the sugar and panela production process, as well as the potential participation of CINCAE to improve cane growing practices in the communities of Las Pampas and Palo Quemado.

VI. Environmental and social measures established by CAF

To ensure compliance with CAF environmental and social safeguards, conditions "identified by CAF" were established. They include the following:

- 1) Determination of ecological flow rates: a research program (established in the EMP) must begin as soon as possible, and will include at least one year of monitoring the river, based on the study and analysis of hydrological parameters, physical, chemical and biological quality of the water, biotic interactions and water uses in the area of influence of the project.
- 2) Poor hydrological and meteorological monitoring capacity, especially in the Toachi watershed, which could complicate the adaptation capacity of the communities that inhabit the watershed.
- 3) The Ministry of Environment of Ecuador must ask the Hidrotopi Company to include in the next environmental audit of compliance with the Environmental Management Plan Activities, the design and construction of fish ladders at the two dam sites (Toachi and Pilatón). This will prevent the interruption of the genetic flow of fish populations in the two rivers.
- 4) A Study of the diversity of fish present in the Toachi and Pilatón rivers. Samples taken during the EIA were scarce and showed no more than 2 species at all sampling points, although at hydroelectric stations near the project area, ichthyofauna studies have showed a wealth of more than 14 species of fish.
- 5) Development of an Environmental and Social Management Plan for components 1 and 2 of this project so that the negative environmental impacts of the proposed interventions can be mitigated, reduced or avoided, and the positive impacts maximized.
- 6) Exchanges of experiences among the sugarcane farmers in the area of influence of the project with technicians from the San Carlos Sugar Mill to learn about their experience in the use of bagasse for energy generation, as well as good agricultural practices developed by the research processes of

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CINCAE⁷ (Sugarcane Research Center of Ecuador), and to establish collaborative ties in the area to increase production without needing to expand the agricultural frontier.
7) A study of Olinguitos⁸⁹ (*Bassaricyon neblina*¹⁰) in the area of direct influence of the Project.

VII. Environmental and social budget

The budget requested from the Adaptation Fund is US \$ 2,489,373.00, distributed as follows:

| Project Components | Expected Results (Specific) | Adaptation Fund Budget | Budget Others |
|--|---|------------------------|---------------|
| 1. Conservation of plant cover | 1. 1,000 ha of native vegetation are conserved for sustainable forest management and conservation mechanisms * | 475,000 | |
| | 2. Improved management of existing protected forests and private conservation areas (approximately 230,000 ha) * | 475,000 | |
| 2. Adaptation of agricultural practices to the new conditions of climate change and access to sustainable financing. | 3. Farmers trained in successful implementation of sustainable farming practices on at least 500 ha | 220,000 | |
| | 4. At least 3 financial institutions have implemented loan mechanisms and products to support adaptation measures | 120,000 | |
| | 5. A Investment Fund has been established and is 100% operational | 500,000 | |
| 3. Strengthening local capacities and shared lessons. | 6. At least 6 parishes being built capacities and prepared to manage and use meteorological information. | 160,000 | |
| | 7. Six development plans of local parishes incorporate measures for ecosystem-based adaptation to climate change | 80,000 | |
| | 8. Strategic plan of communication, education, knowledge transference and scheme of replica, including demonstration farms. Plus training on adaptation finance to financial institutions | 120,000 | |

⁷ <http://cincae.org/>

⁸ <http://www.ambiente.gob.ec/ecuador-descubre-al-olinguito-nueva-especie-de-mamifero-de-los-bosques-ecuatorianos/> [Ecuador discovers the Olinguito, a new species of mammal in the Ecuadorian forests]

⁹ http://www.bbc.com/mundo/noticias/2013/08/130814_ciencia_nuevo_mamifero_colombia_ecuador_olinguito_tsb [science new mammal Colombia Ecuador Olinguito]

¹⁰ <https://www.youtube.com/watch?v=zecKn4qSErU>

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| | | | |
|----------------------------|---|--------|---------|
| | 9. Systematisation of information gathered during the whole project design and implementation using existing informatics platform | 40,000 | |
| Measures identified by CAF | 10. Fish diversity study (n = 2 rivers Toachi and Pilatón) | | 40,000 |
| | 11. Ecological Flow Study (n = 2 rivers Toachi and Pilatón) | | 30,000 |
| | 12. Design of Fish Ladders (n = 2 Toachi and Pilatón Dams) | | 16,000 |
| | 13. Implementation of Fish Ladders (n = 2 Toachi and Pilatón Dams) | | 400,000 |
| | 14. Exchange Experience in use of bagasse with San Carlos Sugar Mill | | 4,000 |
| | 15. Reports of wildlife specialists regarding the presence of Olinguitos " <i>Bassaricyon neblina</i> " in the area of direct influence of the Project. | | 30,000 |

* Both activities have a cross-cutting component involving the Development and Implementation of a strategic system of forest and wildlife control for the area (adaptation of infrastructure, logistics and equipment)

The above budget reflects project costs and costs budgeted in the final Management Plans of the Hydroelectric Project. It is expected that during the implementation CAF will exercise its catalytic role and help attract other funds that will help ensure the long-term sustainability of the initiatives that are implemented.

VIII. Environmental and social viability of the Operation

The viability of the operation from an environmental and social perspective will depend on timely follow-up by the CAF Institutional Environmental Management Unit in this area during the execution of the project, so as to ensure compliance with environmental and social institutional safeguards (See Annex 1) in all activities carried out by the Ministry of Environment with other beneficiaries of this project (Municipal GADs of Sigchos and Mejia, with the Parish Councils of Las Pampas, Palo Quemado, Tandapi, El Chaupi and Aloag). This monitoring will be carried out by the Chief Executive of the CAF Environment and Climate Change Directorate based in Ecuador and will be supervised by the UGAI Coordinator, who in turn will approve reports that will be periodically submitted to the Adaptation Fund.

The capacity and responsibility for implementation will be for CAF through the Climate Change Unit (UCC) with support from the Directorates of Development Cooperation Funds (DFCD) and the Operations Coordination Directorate (DCO) for logistical and administrative tasks.

The implementing agency, the Ministry of Environment (MAE), through the National Department for Adaptation to Climate Change, will have the task of executing project implementation activities with the local GADs and verifying the implementation of the Environmental Management Plans of the Projects which are: a) EAP of the final EIA, b) EAP of the highway EIA, c) EAP of components 1 and 2 of the Project that is presented to the Adaptation Fund. This compliance must be in accordance with the environmental and social principles of the Adaptation Fund, the Environmental and Social Safeguards of CAF and current national environmental policy and

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legislation. In addition, the Environmental Protection Unit of the National Police, which has the role of environmental control authority, will support the Ministry of the Environment in the tasks of conserving natural resources and ecosystems, protected forests and the Illinizas Reserve.

Component 2 will involve financial institutions such as the People's Development Bank, which has no Environmental and Social Risk Analysis System for financial operations (SARAS), but has lists of excluded activities that are ineligible for financing. BANEcuador (former National Development Bank) has similar conditions and works with agricultural productive sectors and livestock farmers. A successful microfinance institution working in the area is Banco Pichincha's CrediFe. It has a successfully implemented SARAS, so it can help a lot with the use of SARAS to ensure good environmental and social management of projects submitted by farmers from the area.

Compliance with environmental and social measures identified by CAF will ensure the environmental and social viability of the Project.

| Environmental and Social Safeguards | | | | |
|--|---|-----------------|-----------|--|
| No. | Aspect | Complies | | Observations (*) |
| | | Yes | No | |
| i. | Evaluation and Management of environmental and social impacts | X | | Although the Hydroelectric project has an EIA for the power plant, and for the construction of roads, which was prepared and submitted to the authorities, CAF feels it is necessary to develop an Environmental Management Plan for the Project due to the intervention in protected forests and protected areas by surface reforestation activities >230,000 ha. This is despite the category of the project according to Ecuadorian environmental legislation, which only calls for an environmental certificate. |
| ii. | Use of Renewable Natural Resources | X | | Although the project is implemented in areas which, according to available official technical information, have high levels or risks of erosion, the project proposes measures to counteract that erosion and reduce climate vulnerability. |
| iii. | Conservation of biodiversity | X | | For the proposed reforestation and conservation of forest areas in protected areas and their areas of influence, the safeguard is activated and mitigating measures are identified. |
| iv. | Pollution Prevention and Management | | X | Due to the nature of the Project, this safeguard is not activated. |
| v. | Cultural heritage | X | | The project does not activate this safeguard; however, it is known that the Hydroelectric Power Plant Project included large earth movements and that its EMP submitted a protocol that was applied by the Contractor in the case of archaeological discoveries. |

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| Environmental and Social Safeguards | | | | |
|--|---------------------------------|-----------------|-----------|--|
| No. | Aspect | Complies | | Observations (*) |
| | | Yes | No | |
| vi. | Ethnic groups | X | X | In the area of Union del Toachi, there is a small settlement of Tsáchila indigenous people, which carries out ethnic and ecological tourism. This activates the safeguard so during the execution of the Project measures will be taken to ensure the participation and consultation of this ethnic group. |
| vii. | Resettlement | X | | No resettlements will take place. |
| viii. | Working conditions and training | X | | National and international labor regulations will be fulfilled. There is no risk of children working in the activities of this project. |
| ix. | Gender equality | X | | Gender equality is not violated by any action of this Project; rather it offers opportunities to promote gender equality and the empowerment of women through some of its components |

The Executing Agency fully complies not only with Ecuadorian legislation, but with the safeguards and policies of CAF and the Adaptation Fund. It should be noted that environmental and social conditions have been identified in the evaluation that ensure compliance with national environmental legislation and CAF institutional safeguards and policies.

IX. Action plan. Environmental and social conditions for financing

Notwithstanding CAF's acceptance of the performance of the Ministry of Environment as an executing agency, DACC recommends that to ensure the environmental and social sustainability of the Project, the following Environmental and Social Conditions be established in the CAF Agreement - Adaptation Fund:

Preconditions for the first disbursement:

1. Delivery to CAF for its approval of TORs for Updating the EIA for the activities of components 1 and 2 of the Project.

Conditions for 150 days after the first disbursement

1. Submission to CAF's satisfaction of the EIA for the activities of components 1 and 2 of the Project.
2. Submission of a study of fish diversity in the Toachi and Pilatón rivers.

Conditions for 365 days after the first disbursement

- 1) Submission of a study with new calculation of the ecological flow rates of the Toachi and Pilatón rivers.
- 2) Submission of a study of the presence of Olinguitos in the area of influence of the Project, which establishes (if its presence is confirmed) measures for conserving its habitat.

Conditions during the disbursement period:

- 1) Contracting of an external environmental and social audit for components 1 and 2 of the Project that will submit annual reports.

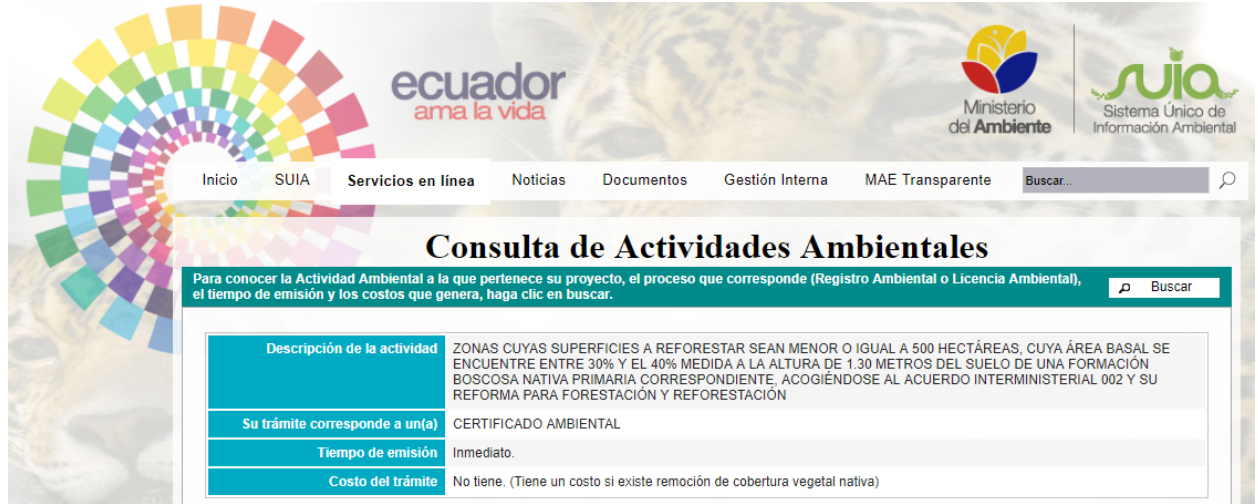
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- 2) Social study incorporating the results of the consultation process and a plan for the ethnic group in the project (in response to the activation of Safeguard S06).
- 3) The Ministry of Environment must inform Hidrotoapi of the need to design and implement fish ladders for the Toachi and Pilatón dams; these activities should be included in the EAP of the Next Compliance Audit.
- 4) Submission of quarterly reports on the Progress of the Environmental and Social Management of the Project. This will take place no later than 30 days after the end of the reporting period (Jan-Mar, Apr-Jun, Jul-Sep or Oct-Dec).
- 5) Notification of CAF about any changes in the activities executed or to be executed in the project or in the environmental or social situations that occur during the life of the project.

Environmental and Social Report (ESR) "Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Toachi & Pilatón watersheds with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management"

Annex 1. CAF Environmental and Social Safeguards

Annex 2. Categorization of the Project



[Translation]

Consultation of Environmental Activities

To see the environmental activity to which your Project pertains, the corresponding process (Environmental Record or Environmental License), issuance time and costs generated, click search.

| | |
|------------------------------------|---|
| Description of the activity | AREAS WHOSE SURFACE TO BE REFORESTED IS LESS THAN OR EQUAL TO 500 HECTARES, WHOSE BASAL AREA IS 30% TO 40% MEASURED AT A HEIGHT OF 1.30 METERS ABOVE THE GROUND FOR THE CORRESPONDING PRIMARY NATIVE FOREST FORMATION, UNDER MINISTERIAL ACCORD 002 AND ITS AMENDMENTS FOR FORESTATION AND REFORESTATION |
| Your procedure is an | ENVIRONMENTAL CERTIFICATE |
| Issuance time | Immediate |
| Cost of the procedure | None. (There is a cost if the native plant cover is removed) |

Environmental and Social Report (ESR) "Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Toachi & Pilatón watersheds with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management"



[Translation]

Consultation of Environmental Activities

To see the environmental activity to which your Project pertains, the corresponding process (Environmental Record or Environmental License), issuance time and costs generated, click search.

| | |
|------------------------------------|---|
| Description of the activity | OTHER CROPS CAN QUALIFY FOR ENVIRONMENTAL INCENTIVES |
| Your procedure is an | ENVIRONMENTAL CERTIFICATE |
| Issuance time | Immediate |
| Cost of the procedure | None. (There is a cost if the native plant cover is removed) |



“Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed (Toachi-Pilatón watershed) with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management.”

ANNEX 16
Socio Bosque and ACUS mechanisms

República del Ecuador

July of 2017

SocioBosque program of the Ministry of Environment (MAE)

The Constitution establishes in Art. 14.- It recognizes the right of the population to live in a healthy and ecologically balanced environment, which guarantees sustainability and good living, Sumak Kawsay. The preservation of the environment is declared a public interest, as well as the conservation of ecosystems, biodiversity and the integrity of the country's genetic heritage, prevention of environmental damage and recovery of degraded natural areas. Based on this, the MAE initiated the SocioBosque program in 2008 whose main objective is to promote forest preservation through the payment of an incentive to farming and indigenous communities owner of a land located in a primary forest and native paramos with the objective of reducing CO2 emissions caused by deforestation and improving the conditions of local communities that comply with the conditions of sustainable forest management.

Objectives

The SocioBosque program has the following objectives:

1. Incentivize afforestation, reforestation and re-vegetation with native species in areas affected by deforestation, degradation, fragmentation, erosion, desertification, forest fires and other human impacts.
2. Incentivize the conservation and protection of native vegetation cover and of primary, and/or fragile forest, shrub and hybrid ecosystems.
3. Incentivize the production and sustainable trade of biodiversity and non-timber forest products.
4. Incentivize forest management focused on the four main links of the value chain of wood (procurement, production, processing and commercialization).
5. Facilitate the adjudication of lands of the State Forest heritage and protected forests and vegetation to guarantee their conservation and / or sustainable use.

Areas of Conservation and Sustainable Use (ACUS - GADs)

The Constitution establishes in Art. 14. - It recognizes the right of the population to live in a healthy and ecologically balanced environment, which guarantees sustainability and good living, Sumak Kawsay. The preservation of the environment is declared a public interest, as well as the conservation of ecosystems, biodiversity and the integrity of the country's genetic heritage, prevention of environmental damage and recovery of degraded natural areas.

In addition, the National Development Plan for Good Living provides in the Strategy 7.2. Strengthen about SNAP and other forms of conservation, several tools for the establishment of local conservation initiatives as ACUS. In the same context, the conservation and sustainable use areas contribute to the consolidation of the SNAP, becoming one of the complementary conservation strategies, and contributing to comply with the Result 13 of the National Biodiversity Strategy 2015-2030.

What is an area of conservation and sustainable use?

ACUS is an area of local importance created by the Autonomous Governments Decentralized (GADs), communities or private owners, being the main purpose the biodiversity conservation and the develop of sustainable activities, promoting the maintenance and balance between ecosystem, environment and society.

Objectives

The ACUS mechanism has three general objectives:

1. To promote actions for the biodiversity management and protection thought long-term criteria that includes conservation, restoration monitoring of species and ecosystem in the territory.
2. To implement sustainable management practices of natural resources, ensuring their conservation and well-relationship between local population, livelihoods and environment.
3. To increase and encourage the active participation of Governments Decentralized, self-employed, private owners and communities in the environmental conservation and management.

As reference currently the national laws promotes the corridors and buffered zones based in ACUS mechanisms, examples of these are executed by the project Wildlife Corridors - SNAP Effectiveness (PNUD-MAE) described in the following table:

Annex 16. Socio Bosque and ACUS mechanisms

| ACUS Process | Extension ha |
|--------------------------------------|---------------------|
| ACUS Cordillera Oriental Carchi | 16.300 |
| ACUS Urcuquí | 18.617 |
| ACUS Pimampiro | 18.000 |
| ACUS Cordillera del Toisán Cotacachi | 18.000 |
| Consevation Área Cóndor | 34.000 |
| Consevation Área Taita Imbabura | 7.200 |
| Total | 112.117 |



Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed (Toachi-Pilatón watershed) with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management

Overview adaptation measures and selection methodology

ANNEX 17

República del Ecuador

August of 2017

Annex 18: Overview adaptation measures and selection methodology

The following adaptation measures have been reviewed and identified as potential solutions to be implemented with local populations in the Río Blanco upper watershed. Their selection has been done on an “a priori” basis and was drawn from the UN Environment MEbA project’s catalogue of 40 EbA measures as published on the respective website

The Microfinance for Ecosystem-based-Adaptation to Climate Change (MEbA) project published a systematization to identify adaptation measures that could be promoted through microfinance products and services. The 40 selected principles may be implemented independently or in conjunction to support smallholder producers in adapting to climate change effects. The applied criteria to pick them between multiple ancestral and current practices were:

1. Have a positive impact on household economies in the short term;
2. Increase social and/or economic resilience of human populations vulnerable to climate change;
3. Diminish the pressure on ecosystems and the services they provide;
4. Reduce risks associated with climatic events in productive activities;
5. Protect, restore or use biodiversity and ecosystems in a sustainable way.

A total of 40 measures has been identified by the MEbA project as suitable EbA activities:

| | |
|--------------------------|--------------------------------|
| ORGANIC FERTILIZERS | SUSTAINABLE FOREST MANAGEMENT |
| SOIL CONDITIONING | INTEGRATED NUTRIENT MANAGEMENT |
| CONSERVATION AGRICULTURE | INTEGRATED PEST MANAGEMENT |
| AGROECOLOGY | NATURAL RETAINING WALLS |
| ORGANIC AGRICULTURE | PERMACULTURE |
| BEEKEEPING | AQUACULTURE |
| SEED BANKS | FILTER DAMS |
| WINDBREAKS | RAINWATER RESERVOIRS |
| BIODIGESTERS | SOIL RESTORATION |
| FOG CATCHERS | DRIP IRRIGATION |
| SOLAR DEHYDRATORS | CROP ROTATION |
| CROP DIVERSIFICATION | AGROSILVOPASTORAL SYSTEMS |
| DRAINAGE SYSTEMS | AGROFORESTRY SYSTEMS |
| ECOTOURISM | SILVOPASTORAL SYSTEMS |

Annex 18: Overview adaptation measures and selection methodology

| | |
|--------------------------|-----------------------|
| EFFICIENT BIOMASS STOVES | NATURAL SHADE |
| FIREBREAKS | AGRICULTURAL TERRACES |
| SOLAR HYDROPONICS | INFILTRATION PITS |
| FAMILY ORCHARDS | MIXED-PLANT NURSERIES |
| GREENHOUSES | WARU-WARUS |
| VERMICOMPOST | CONTOUR TRENCHES |

The measures were organized in descriptive fact sheets that contain the required information to put into practice each EbA option as well as to detail economic and ecosystem benefits where respective research was available. The fact sheet binder demonstrates that adaptation to climate change cannot be addressed from a unique front or with a single approach.

- Conservation agriculture

Conservation agriculture attempts to conserve natural resources and ensure that they are used efficiently, through the integrated management of soil, water and biological resources available on the farm, while using residual biomass to keep soil covered during crop production. It contributes to environmental conservation in three fundamental ways: through minimal-till farming to reduce soil disturbances, through permanent covering of the soil with mulch or cover crops to conserve moisture and nutrients and through crop rotation to avoid the dissemination of pests, diseases and weeds. Conservation agriculture diminishes the impact on crops of frost, drought, strong winds, intense rainfall, changes in rainfall patterns and sudden temperature changes. This is mainly due to the protection of the soil by the establishment of a permanent layer of organic matter that helps regulate moisture and temperature in the root zone. Impacts such as the greater need for agricultural inputs and erosion can be mitigated by improving soil structure and fertility, whereas pest incidence is decreased by interrupting the pest cycle through crop rotation. Conservation agriculture could reduce the amount of sediments released to a nearby water source by up to 70%.

- Seed banks

Seed banks are a mechanism set up by groups of local producers to store and classify, in safe, dry and dark locations, the most resilient and adaptable seeds offering the best product quality. The aim of a seed bank is to maintain a reserve of the local genetic diversity to strengthen small farmers' autonomy, sustainability and food security. Seed banks operate like money banks: farmers borrow seeds before planting and return them with interest after the harvest. Seed banks enhance food security by preserving seeds with high agricultural and ecosystemic value that adapt to changing climate conditions. They make it possible to develop and preserve varieties that are more resistant to drought, flooding, extreme heat, frost and other climate events. Seed banks also offer the potential to diminish the impact of phenological changes on agricultural production. If they are set up as a business, they diversify income, which enhances overall producer resilience

Annex 18: Overview adaptation measures and selection methodology

- Windbreaks

Windbreaks comprise one or more rows of trees and shrubs of different heights placed perpendicular to the prevailing wind direction. Their purpose is to reduce the force of the wind close to the ground, and thus its mechanical action on crops, pasture and livestock. They are used to curb wind erosion and to help regulate climate conditions on farms. Windbreaks may also be used as living fences that demarcate the boundaries of a property or zones within it. In addition to their main purpose, they provide benefits such as climate regulation and landscape improvement. Windbreaks are used mainly to diminish the impact of strong winds that may damage crops and cause soil erosion. They also reduce the effect on crops of drought, extreme heat and even frost, due to the microclimate that trees foster. Strong winds may cause 70% to 100% of a crop to be lost or damaged, especially in the case of bananas, sugar cane, vegetables and fruit trees. Windbreaks may reduce wind speed by 60% to 80%. Other benefits include the generation of a favorable microclimate for plant development and the reduction of wind erosion. These barriers also help regulate soil and air temperatures, reduce evapotranspiration and improve the distribution of soil moisture and the provision of such marketable products as fruits, seeds, timber and firewood.

- Crop diversification

Crop diversification refers to growing various agricultural products on a single plot, especially two or more crops in alternating rows. Various diversification models exist but they can all be broadly referred to as polyculture, including: intercropping, mixing annual crops with fruit and forest trees and planting different vegetable varieties. Several objectives may be sought, including controlling herbivorous insects, achieving biological control by cultivating antagonist species, efficiently using horizontal and vertical spaces in a plot or increasing farmers' income. Diversified systems are generally more resilient than single-crop systems. Through the growing of a variety of crops, diversification increases food security and reduces the need for agricultural inputs. Mixed systems are more resilient to pests, extreme temperature changes, drought and changing rainfall patterns. Diversification is an alternative for distributing losses in the event of crop damage or if harvest yields decrease. Crop diversification has a series of benefits for a plot, including the recycling of nutrients, the establishment of microclimates, the regulation of local hydrological processes and the management and control of pests and plant diseases. Another advantage of mixed systems is the greater stability of the yield when climate conditions change, with a variability coefficient 30% lower, on average, than with monoculture.

- Vermicompost

Vermicompost is an organic, nutrient- rich fertilizer that results from the degradation of organic matter. Vermicompost contributes nutrients and adds organic matter to the soil while improving its structure, with a positive effect on fertility, infiltration capacity and moisture retention. Applying vermicompost to poor soils slows their deterioration and considerably increases their productivity. This minimizes the need to resort to chemical fertilizers and pesticides and increases food security. Vermicompost lessens the impact of sudden temperature changes on crops and conditions the soil, making it more resilient

Annex 18: Overview adaptation measures and selection methodology

to drought and changing rainfall patterns. Improving the soil structure through vermicompost application also reduces the likelihood of erosion. The systematic application of vermicompost restores poor and unfertile soils. The solid and liquid vermicompost produced is a high-quality organic fertilizer and a substitute for chemical fertilizers.

- Drip irrigation

Drip irrigation allows for the optimal usage of water and fertilizers through their application close to crop roots. This is achieved by delivering small water flows at low pressure through a variable number of emission points, called drippers, and at a high application rate, which saves water. Water is saved in two ways: it is made to seep into the soil without evaporating or running off, and it is delivered at the root zone, just where the plants need it. The effects on crops of drought, extreme heat and changing rainfall patterns may be mitigated with drip irrigation systems through the efficient water use. The water savings allows production to continue where and when less water is available, which increases food security. The primary ecosystemic benefit is efficient water use. Drip systems have been able to reduce water consumption by up to 70% compared with conventional irrigation systems.

- Crop rotation

Crop rotation consists in sequentially producing plant species in a given location by alternating crops every year, every two years or every three years. This diversified production system prevents the build-up of pests and diseases as well as the exhaustion of the soil that usually occur with production of a single crop (or crops of a single family) in successive agricultural cycles. The rotation sequence is planned such that the requirements of one crop complement those of the next in order to maintain the soil nutrient balance. The threats of changing rainfall patterns, drought, frost and intense rainfall may be managed on a single piece of cropland, but at different times in the year, by rotating crops resistant to adverse climate conditions. Crop rotation increases food security and decreases the need for agricultural inputs, in addition to being an efficient way to control pests and diseases. Crop rotation keeps the soil covered, promotes biological equilibrium, diminishes pest cycles and diseases, incorporates nutrients and conserves energy. Benefits also stem from reduced pesticide and fertilizer use due to the greater availability of nutrients, the breaking of pests' life cycles and the intensification of biologic activity in the soil.

- Agrosilvopastoral systems

Agrosilvopastoral systems combine techniques that associate tree species (forest or fruit) with livestock and crops on the same land, with the aim of bringing about significant ecologic and economic interaction. These combinations may coexist in the same space and time or be arranged sequentially, and the aim is to optimize output and ensure sustained yields with less environmental impact. Each element in the system contributes to the others: the trees provide shade to the animals and crops; the animals fertilize the soil and propagate the seeds; and the crops constitute food for the animals. Regenerating the forest cover establishes a microclimate that helps mitigate the impacts on crops of

Annex 18: Overview adaptation measures and selection methodology

sudden temperature changes, changes in rainfall patterns, extreme heat, intense rainfall and strong winds. Trees generate organic matter that rebuilds the soil. This augments its infiltration and moisture-retention capacity, which reduces the effect of droughts. Animal manure raises the soil nutrient content, reduces the need for agricultural inputs and has positive effects on productivity. Carbon sequestration and the potential for climate change mitigation also increase. Diversified production associated with restoring arboreal vegetation in livestock areas is the main benefit of this system. This allows small producers not only to improve the conditions in their environment but also to reduce the risk of financial loss to which they are frequently exposed.

▪ Agroforestry systems

An agroforestry system consists of a series of techniques designed and implemented to utilize multiple strata of an agroecosystem: from timber-yielding trees, fruit trees and annual crops to shrubs, herbs, creeper species and tubers. The aim is to raise productivity in a diversified system that will have less of an environmental impact than conventional agriculture. The process makes the system more resilient and promotes the sustainable use of agricultural and forest products. Timber species are replenished with native varieties which are mostly grown in nurseries and later transplanted. The presence of trees reduces exposure to the sun, wind and rain and regulates air and soil moisture. These factors promote the establishment of a microclimate and mitigate the effects on crops of extreme heat, wind and intense rainfall as well as drought and frost. This diversified system enhances food security, decreases the potential for soil erosion by wind or water and reduces the need for greater agricultural inputs, due to beneficial interactions among species in different strata. These systems have reversed the loss of productivity stemming from environmental degradation associated with conventional cultivation practices. For example, yields of agroforestry systems have been found to be more than 100% higher than those of slash and burn practices.

It is assumed that all proposed EbA options have clear and measurable benefits for the health of ecosystems and the services they provide. Additional scientific data gathering should form part of periodic reviews for Monitoring and Evaluation to support the still limited availability of academic studies on the actual impact of EbA.

Selection criteria for implementation with individuals

Selection criteria for the identification of suitable adaptation measures for individual farmers need to be flexible and take into account each farmer's specific situation, such as:

- Access to important infrastructure such as roads
- Inclination of plots or grazing grounds
- Soil texture and quality
- Actual crops cultivated or livestock bred, including varieties and types
- Availability of critical inputs
- Pricing of inputs in each area

Annex 18: Overview adaptation measures and selection methodology

The combination of these critical productivity drivers will not only determine the productivity of farmers under business-as-usual scenarios in face of adverse climate impacts, but also define what adaptation measures promise not only the optimum results, i.e. economic and ecosystem benefits, but also if their implementation is feasible at all. For example, if certain inputs for the implementation of adaptation measures are not available, cannot be transported to the farm due to the lack of access roads or are prohibitively priced, must be analyzed on a case by case basis.

The proposed project to be funded by the Adaptation Fund will seek the cooperation with the UN Environment's MEbA project which has successfully been implemented with five microfinance institutions in Colombia and Peru between 2013 and 2017. Currently, the UN Environment's office in Panama is assessing the possibility to implement its solutions in Ecuador and is analyzing interested financial institutions. The MEbA project has developed a set of 18 tools and solutions that are intended to be adjusted to any given environment. It has been verified with the responsible project coordinator that a simple request to apply the solutions in Ecuador y the Ministry of Environment would be sufficient to provide access.

The solutions of the MEbA project are detailed as follows:

1. Publication: Microfinance for Ecosystem-based Adaptation: Options, Costs and Benefits. This document contains the descriptive, systemized factsheets of 40 EbA/CSA options. It is mainly aimed at financial intermediaries.
2. Publication: Andean agriculture in the face of climate change. This document serves as a reference on key project concepts and is the basis of awareness-raising materials for FIs and clients.
3. MEbA economic game: board game for awareness-raising and marketing activities to promote investment in EbA options. This game is applicable and adaptable for FIs and clients.
4. Set of simplified EbA/CSA fact sheets: a graphic summary of the methodology for the effective implementation of EbA/CSA measures, for use in awareness-raising among clients and credit officers of financial intermediaries.
5. MEbA credit methodology: financial lending method containing policies, procedures and tools to increase the capacity of FIs to finance EbA/CSA measures autonomously.
6. CEUS software: a financial credit analysis tool that incorporates climate and market criteria to obtain a client's cash flow adjusted to climate risks.
7. Quick analysis for FIs (QuickScan): a tool that enables FIs interested in the MEbA concept to conduct a quick assessment of their portfolio, processes and procedures that are susceptible to climate risks.
8. Prioritization of EbA/CSA measures: allows FIs to select the measures most appropriate to the local context according to a cost-benefit analysis.

Annex 18: Overview adaptation measures and selection methodology

9. Cost matrix and systematization of EbA/CSA measures: itemized database with costs of EbA/CSA options that may be parameterized.
10. Demonstration farms: model farms with examples of EbA/CSA options that are developed with financial intermediaries and their strategic allies for training activities and credit promotion to clients.
11. EbA capacity index: tool that estimates the adaptive capacity of clients with an ecosystem-based approach.
12. Verification tool: allows financial intermediaries or technical allies to validate the correct implementation of EbA/CSA measures.
13. Publication: Microcredits to reduce the vulnerability of small agricultural producers to climate risks - the perspective of the Colombian Andes and the Peruvian Andes. Supporting documents for decision-makers in the promotion of public policies on microfinance and ecosystem-based adaptation.
14. MEbA Training Program: curricular material on MEbA basic concepts for staff of financial intermediaries and strategic partners.
15. Training of trainers manual: practical activities to train staff on the provision of technical assistance to farmers on EbA/CSA alternatives. Its use is linked to demonstration farms or plots.
16. Criteria for the selection of strategic allies: a document that details the concept and requirements to develop strategic alliances between FIs and training providers in EbA/CSA measures.
17. Communication guidelines: general communication guidelines for financial intermediaries to share information with small-scale farmers to raise awareness on climate change and sustainable adaptation options.
18. Guidelines on agro-climate risk: a document that has been prepared to identify, classify, manage and monitor possible climate impacts in the agricultural credit portfolio of microfinance institutions.

In the current context, i.e. the definition of suitable selection criteria and prioritization methodologies for actionable EbA measures to be introduced by the proposed project, tools number 8 (Prioritization of EbA/CSA measures) and 9 (Cost matrix and systematization of EbA/CSA measures) provide all necessary bases to introduce a case by case which can be executed by trained personnel.

The following components are being analyzed in the framework of the Cost-Benefit Analysis (CBA) as developed by the MEbA project:

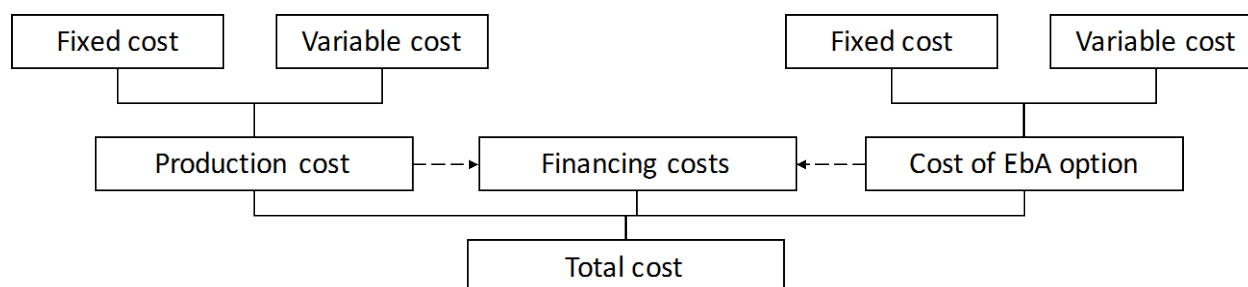
A. Costs:

In order to perform the CBA, farmers' costs and cash flow data are required in their production system, information that is obtained by an MFI agent directly from the

productive unit through the semi-structured survey developed by FS (V2.2).

1. **Production Costs:** Production costs are divided into fixed costs and variable costs. Fixed costs correspond to the purchase or rental of equipment, machinery and land or production plots, in addition to other inputs that do not vary with production. And variable costs are all costs that vary with production such as labor, seeds, fertilizers, pesticides, etc.
2. **EbA option implementation cost:** corresponds to the cost of implementing an EbA adaptation measure. These costs have to be identified from detailed investigation of the items required to implement an EbA measure in the context of specific area.
3. **Financing costs (if applicable):** Costs that represent the financing of the production and the implementation of an EbA option, as well as the interest rates charged by said financing. These costs depend on the actual production as well as the EbA option to be implemented

The different cost categories define the total cost of an EbA-aligned production, taking all necessary elements into account:



B. Sales price:

To calculate the benefits generated by the production process it is necessary to know the average selling price of the harvested product. This information will be collected by the project in the process of developing the implementation.

C. Yield:

The yield corresponds to the ratio between the total production of a crop harvested per hectare of land used. This information will be collected by the project in the process of developing the implementation.

D. Benefits:

4. **Potential yield increase (%):** corresponds to the potential increase in crop productivity given the implementation of an EbA adaptation measure. This information per EbA adaptation measure will be obtained from the MEbA project or developed by the proposed project.
5. **Avoided costs (%):** corresponds to the costs that are no longer generated due

Annex 18: Overview adaptation measures and selection methodology

to the implementation of an adaptation measure, for example there could be a reduction in the use of inputs, water and even agricultural machinery. This information per EbA adaptation measure will be obtained from the MEbA project or developed by the proposed project.

Following the proposed methodology, the different cost and benefit items are being displayed over time, discounted according to standard investment analysis and result in the final value of the investment into EbA to be carried out over a given time period of typically three or five years.



**Increasing adaptive capacity of local communities, ecosystems
and hydroelectric systems in the Río Blanco upper watershed
(Toachi-Pilatón watershed) with a focus on Ecosystem and
Community Based Adaptation and Integrated Adaptive
Watershed Management**

Overview reference initiatives and projects

ANNEX 18

República del Ecuador

July of 2017

Reference 1: SocioBosque program of the Ministry of Environment (MAE)

The Constitution establishes in Art. 14.- It recognizes the right of the population to live in a healthy and ecologically balanced environment, which guarantees sustainability and good living, Sumak Kawsay. The preservation of the environment is declared a public interest, as well as the conservation of ecosystems, biodiversity and the integrity of the country's genetic heritage, prevention of environmental damage and recovery of degraded natural areas.

Based on this, the MAE initiated the SocioBosque program in 2008 whose main objective is to promote forest preservation through the payment of an incentive to farming and indigenous communities owner of a land located in a primary forest and native paramos with the objective of reducing CO2 emissions caused by deforestation and improving the conditions of local communities that comply with the conditions of sustainable forest management.

Objectives

The SocioBosque program has the following objectives:

1. Incentivize afforestation, reforestation and re-vegetation with native species in areas affected by deforestation, degradation, fragmentation, erosion, desertification, forest fires and other human impacts.
2. Incentivize the conservation and protection of native vegetation cover and of primary, and/or fragile forest, shrub and hybrid ecosystems.
3. Incentivize the production and sustainable trade of biodiversity and non-timber forest products.
4. Incentivize forest management focused on the four main links of the value chain of wood (procurement, production, processing and commercialization).
5. Facilitate the adjudication of lands of the State Forest heritage and protected forests and vegetation to guarantee their conservation and / or sustainable use.

Reference 2: The MEbA project in Colombia and Peru

The Microfinance for Ecosystem-based Adaptation (MEbA) project aims to provide vulnerable rural and peri-urban populations in the Andean region of Colombia and Peru with microfinance services and products that will allow them to invest in activities related to ecosystem sustainability, improving their income and resilience towards climate change effects. In its initial phase, MEbA is working with five microfinance institutions (MFIs) in Peru and Colombia. On the basis of the results achieved, the project could potentially be expanded to other countries or regions.

Vision

To enhance the climate resilience of vulnerable rural communities through microfinance products and services that promote sustainable management of ecosystems and their services.

Mission

To strengthen the capacities of microfinance institutions and small-scale agricultural producers in the northern tropical Andes to adapt to climate change through an ecosystem-based approach.

Objectives

The Microfinance for Ecosystem-based-Adaptation to Climate Change (MEbA) project has the following objectives:

1. To provide technical assistance to at least four microfinance institutions for the development of climate-smart lending methodologies, including innovations in climate risk management.
2. To create and implement microfinance products tailored to the needs of customers and aimed at promoting Ecosystem-based-Adaptation (EbA).
3. To foster awareness-raising and training initiatives, through partnerships, focused on reducing the vulnerability of small-scale agricultural producers in the Colombian and Peruvian Andes regions.
4. To promote the inclusion of alternative financing schemes in public policies as well as private investment in sustainable climate change adaptation.

Reference 2: The Proyecto CAMBio project in Nicaragua, Guatemala, Honduras, El Salvador, Costa Rica.¹

The project promoted biodiversity conservation through the provision of credits and the offering of technical assistance and conditional incentives for rural micro, small and medium enterprises (MSMEs). It cooperated with 26 FIs that financed around 25,000 farmers and SMEs for investment in sustainable rural practices for a total of 52 millions dollars. It provided non-refundable funds in technical assistances for a total of 2.08 million dollars benefiting around 24,000 producers, and it provided 1.4 million dollars in environmental award to around 4,000 farmers.

The project uniquely combined green credits with ecosystem smart incentives and technical assistance, it indeed constituted of:

- a credit line for FIs, with lower interest rate for long term lending, to finance rural environmentally friendly income generating activities;
- technical assistance for rural producers that want to engage in environmentally friendly practices;
- an environmental reward (payment for environmental services) of 20% of the credit: 14% for the clients and 6% for the FIs, for producers that successfully implement the environmentally friendly investment according to some previously agreed indicators;
- Partial guaranty for credits.

¹ From: http://www.universitymeetsmicrofinance.eu/uploads/2/5/8/2/25821214/poster_forcella.pdf



Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed (Toachi-Pilatón watershed) with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management

Investment Fund ESP guidelines

ANNEX 19

Executive Summary

The proposed project aims to strengthen the adaptive capacity of vulnerable populations in the Río Blanco upper basins and develop a model of adaptation to climate change that can be replicated in a similar context in the country and in the region. The water collected in the area of influence of the Project flows to the Toachi Pilatón Hydroelectric Power Plant, which produces 228 MW.

The present document lays the foundation for the future Social and Environmental policy of the Investment fund. Based on these general considerations, the ESP of the fund will be developed and in consequence be broken down into operational guidelines and management processes. It will also include specification for Monitoring & Evaluation as a key activity to document achieved progress.

1 Reference documents

The present guidelines for the development of a Social and Environmental Policy for the Investment Fund (“the Fund”) to be established as component of the proposed project (“Increasing adaptive capacity of local communities, ecosystems and hydroelectric systems in the Río Blanco upper watershed with a focus on Ecosystem and Community Based Adaptation and Integrated Adaptive Watershed Management”) are:

- The Adaptation Fund’s “Environmental and Social Policy”¹, see also 5.1.1
- The CAF “Environmental and Social Safeguards for CAF/GEF Projects Manual”², see also 5.1.2

2 Objective/purpose of the present document

The present document provides the guidelines to be followed in the development of a Social and Environmental Policy for the Fund to be developed as part of its set-up and constitution. The following guidelines provide the framework for such a development, and it is expected that the resulting policy will also make the development of respective procedural guidelines as well as standard formats enabling its execution mandatory for the operations of the fund.

3 Applicability

The applicability of the below described guidelines for the development of an Environmental and Social Policy of the Investment Fund address the necessity to comply with the Environmental and Social Policies and Standards as defined by the Adaption Fund and the Executing and Implementing entities of the project, as well as applicable national standards and laws.

The following presented main risks and guiding principles will have to be respected for the elaboration of the Fund’s Environmental and Social Policy in two dimensions:

¹ To be accessed here: https://www.adaptation-fund.org/wp-content/uploads/2013/11/Amended-March-2016_-OPG-ANNEX-3-Environmental-social-policy-March-2016.pdf

² To be accessed here: https://www.caf.com/media/2759391/d0-7_s_e_safeguards_manual_to_caf-gef_projects_may_2015_28.pdf

3.1 Investment Fund internal management

The operations of the fund itself shall exclusively focus on and support activities, that comply with the presented principles and will ensure the mitigation and minimization of identified risks.

3.2 Investee management

A due diligence of each Investee is to be carried out to ensure that these comply with and do not violate under any circumstance the presented principles, contribute to the risk mitigation of identified environmental and social risks as well as proactively support the overall project objectives.

Investees financing unidentified sub-projects (USPs) will need to ensure to implement sound due diligence processes on their own as well as ensure proper monitoring and evaluation of financed projects, that are verifying, documenting and enabling reporting on the financed adaptation measures.

4 Main risks identified

In the framework of the Environmental and Social Report elaborated for the project, the following main risks have been identified for the project:

1. **Accelerated deforestation** of forest resources in the Toachi and Pilatón river basins caused by the expansion of the agricultural frontier at the expense of forest lands, cloud forests, moors, etc., since these uses provide very few advantages from a hydrological standpoint (low capacity for retention of flows and sediments)
2. Intensive ranching and agricultural practices that can **degrade the soil and cause landslides and erosion**.
3. **Inefficient management of natural protected areas** (Illinizas Ecological Reserve and Toachi-Pilatón and Zarapullo Protected Forests). The contributing watershed should have more and better protected space to facilitate the implementation of adaptation policies, to improve the implementation of lines of action proposed by the administrations regarding conservation, forest restoration, etc.
4. **The potential development of mining in the area**, which would affect the water quality of rivers and hence human populations and the abundance of flora and fauna, and reduce the ecosystems' capacity to adapt to climate change.
5. The barrier effect that will be created in the Toachi and Pilatón rivers once the dams begin operation due to the absence of **fish ladders** in the designs of the works.
6. **High vulnerability of the watershed to climate change scenarios**. Studies performed by TecNALIA in 2015 determined that the impacts on the flow rates of the tributary rivers and the high entrainment of sediment will particularly affect Toachi-Alluriquín hydroelectric generation (located in the Toachi basin). The power plant has a high production capacity (254 MW of power) but it does not have sufficient flow to generate optimum results. Given this situation, the plant is sensitive to a future scenario of decreasing flow. The management of the plant can play an important role in increasing the adaptive capacity of the watershed.

5 PRINCIPLES AND MAIN GOALS OF THE ENVIRONMENTAL POLICY

The Environmental and Social Policy of the investment fund will be developed taking into consideration the above presented main risks identified, additional risks as they become known as well as the below presented reference principles, safeguards and standards.

5.1 References from Adaptation Fund, CAF and MAE

5.1.1 Adaptation Fund

In its Environmental and Social Policy, the Adaptation Fund has defined the following 15 principles which will form one of the foundations of the investment fund's ESP:

Compliance with the Law

Projects/programmes supported by the Fund shall be in compliance with all applicable domestic and international law.

Access and Equity

Projects/programmes supported by the Fund shall provide fair and equitable access to benefits in a manner that is inclusive and does not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, and land rights. Projects/programmes should not exacerbate existing inequities, particularly with respect to marginalized or vulnerable groups.

Marginalized and Vulnerable Groups

Projects/programmes supported by the Fund shall avoid imposing any disproportionate adverse impacts on marginalized and vulnerable groups including children, women and girls, the elderly, indigenous people, tribal groups, displaced people, refugees, people living with disabilities, and people living with HIV/AIDS. In screening any proposed project/programme, the implementing entities shall assess and consider particular impacts on marginalized and vulnerable groups.

Human Rights

Projects/programmes supported by the Fund shall respect and where applicable promote international human rights.

Gender Equality and Women's Empowerment

Projects/programmes supported by the Fund shall be designed and implemented in such a way that both women and men

- (a) have equal opportunities to participate as per the Fund gender policy; (b) receive comparable social and economic benefits;
- (b) receive comparable social and economic benefits; and
- (c) do not suffer disproportionate adverse effects during the development process.

Core Labour Rights

Projects/programmes supported by the Fund shall meet the core labour standards as identified by the International Labor Organization.

Indigenous Peoples

The Fund shall not support projects/programmes that are inconsistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples and other applicable international instruments relating to indigenous peoples.

Involuntary Resettlement

Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids or minimizes the need for involuntary resettlement. When limited involuntary resettlement is unavoidable, due process should be observed so that displaced persons shall be informed of their rights, consulted on their options, and offered technically, economically, and socially feasible resettlement alternatives or fair and adequate compensation.

Protection of Natural Habitats

The Fund shall not support projects/programmes that would involve unjustified conversion or degradation of critical natural habitats, including those that are (a) legally protected; (b) officially proposed for protection; (c) recognized by authoritative sources for their high conservation value, including as critical habitat; or (d) recognized as protected by traditional or indigenous local communities.

Conservation of Biological Diversity

Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.

Climate Change

Projects/programmes supported by the Fund shall not result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change.

Pollution Prevention and Resource Efficiency

Projects/programmes supported by the Fund shall be designed and implemented in a way that meets applicable international standards for maximizing energy efficiency and minimizing material resource use, the production of wastes, and the release of pollutants.

Public Health

Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids potentially significant negative impacts on public health.

Physical and Cultural Heritage

Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids the alteration, damage, or removal of any physical cultural resources, cultural sites, and sites with unique natural values recognized as such at the community, national or international level. Projects/programmes should also not permanently interfere with existing access and use of such physical and cultural resources.

Lands and Soil Conservation

Projects/programmes supported by the Fund shall be designed and implemented in a way that promotes soil conservation and avoids degradation or conversion of productive lands or land that provides valuable ecosystem services.

5.1.2 CAF

Environmental and Social Impact Assessment

The overall objective of the Environmental and Social Assessment (ESA) Safeguard is to ensure that all projects implemented by CAF, as a GEF Partner Agency, undergo the necessary assessments to identify, evaluate and manage the associated environment and social risks and impacts in a manner consistent with the Environmental and Social Safeguards herein established. The ESA Safeguard recognizes and will utilize national environmental and social institutions, systems, laws, regulations and procedures in the assessment, development and implementation of projects.

Natural Habitats

Bearing in mind that conservation of natural habitats is essential to sustainable development in Latin America and the Caribbean, CAF fosters project funding and execution activities as set out below: (i) the protection, maintenance and restoration of natural habitats (see definition in Annex A) and the roles they play; (ii) the sustainable harnessing of natural habitats and forests to reduce poverty and protect the environmental values and services of these resources, at local, regional and global level; (iii) the application of a precautionary principle in natural resources management.

Involuntary Resettlement

These Guidelines and its corresponding procedures and instruments aim to ensure that involuntary resettlement is reasonably and realistically avoided or minimized. Where conditions do not allow it, adequate measures shall be implemented to assist the community and/or people bound to displacement to attain better living standards, income sources and social networks, in comparison to those prevalent before the displacement or the beginning of project development, or at least as satisfactory as them.

Indigenous Peoples

These Guidelines and its corresponding procedures and instruments aim to proceed in consistency with its mission of promoting sustainable development and regional integration, and with the principle of recognizing and supporting the identity, culture, and interests of Native populations and other ethnic communities, and of promoting their participation in achieving sustainable development. In the view that these communities play a fundamental part in environmental sustainability by virtue of their ancestral knowledge and practices, CAF, at the design and execution of projects under its responsibility, will implement the adequate measures to promote complete respect to the cultural distinctiveness, dignity and human and social rights of Indigenous People, in ways that assure their access to economic and social benefits, avoiding adverse impacts all through the process of development and in consideration of their own culture.

Pest Management

These guidelines aim to ensure that the environmental and health risks associated with pesticide use, in the context of a project development, are minimized and managed by implementing a safe, effective, and environmentally comprehensive pest management. It is highly recommended to consider the use of biological or environmental control methods, prioritize the use of substances with less harmful impact on human health and the environment and reduce reliance on synthetic chemical pesticides.

Physical Cultural Resources

These guidelines aim to ensure adequate preservation of physical cultural resources (PCR) and the appropriate avoidance of their destruction or damage. The impacts on physical cultural resources resulting from project activities and their mitigating measures must fulfill these requirements, the recipient country's national regulations and/or its compromises under relevant international environmental treaties and agreements.

Safety of Dams

These Guidelines aims to ensure adequate quality and safety in the design and construction of new dams, in the rehabilitation of existing dams and in the performance of existing dams on which the project may have an impact or that may affect the outcome of the project. The suitability of resources provided for the safety of the dam is included among the measures to ensure.

Accountability and Grievance System

To strengthening up transparency and institutional responsibility processes, and to foster greater public accountability, a Grievances and Complaints System ensuring enforcement of CAF's own environmental and social safeguard guidelines in projects in which CAF is acting as a GEF Partner Agency, has been made available to communities and individuals.

Gender Mainstreaming

CAF's institutional mission is to promote sustainable development and regional integration of its member countries, through social inclusion and gender equity, the latter understood as equal treatment of women and men and equal access to resources and services through its operations.

5.2 Principles for the Fund's ESP (preliminary definition)³

Five principles with underlying main goals will guide the activities in establishing the investment fund's environmental performance. They are further specified by detailed objectives and activities which will be compiled and explained in a comprehensive version of the intended environmental policy. The investment fund will aim for a step-by-step procedure for implementation making sure that the organization and its partners will be able to comply with the requirements of the intended policy. The policy will be drafted for a 10-year period and be reviewed annually as well as adjusted if necessary.

PRINCIPLE I: Environmental Management for internal operations

³ The final principles for the investment fund's ESP will be developed as part of the proposed project and the presented principles serve as starting point for such development.

The Fund safeguards natural resources, ecosystems and climate in all its operations. The Investment Fund complies with all applicable rules, laws and regulations for environmental protection. Additionally, all employees will be incentivized to ensure that potential adverse or negative impacts of internal operations on the environment are avoided or reduced as far as possible through resource saving and energy efficient management of offices, procurement, transportation and all other operations.

Main goals:

I.1: The Investment Fund regularly assesses its internal processes and procedures to ensure the limitation of any adverse impact resulting from its operations to the environment, ecosystems in its areas of operations and climate change.

I.2: The Investment Fund will define priorities for further action and review these priorities regularly, will identify strategies and solutions for improving internal operations, and set appropriate environmental objectives and targets.

I.3: The Investment Fund will nominate personnel responsible for implementing the measures, as well as monitor processes and elaborate regular reporting on key performance indicators and results of initiatives in that realm.

PRINCIPLE II: Environmental Impact Assessment (EIA) of financing activities

For any project finance, the investment fund will ensure the assessment of adverse environmental impacts following the defined standards and plans set up to avoid, mitigate and compensate these impacts and ensure that only projects will be financed that pose no adverse effect on environment, ecosystems and climate. The investment fund will specifically promote and target projects with positive environmental impact.

The investment fund will ensure that all project proposals of unidentified sub-projects will be assessed and analyzed according to the principles defined in the intended ESP, where applicable via responsible agents, partners or finance providers.

Main goals:

II.1: The Investment Fund will develop, test and implement an Environmental Impact Assessment procedures for financing projects.

II.2: The Investment Fund has established a working procedure based on an Environmental Check List to ecologically improve (running) financing projects.

II.3: The Investment Fund will encourage its partners to follow an organizational exclusion policy for ecologically harmful investments.

II.4: The Investment Fund will elaborate a corporate concept for actively promoting the development of financing projects with special environmental focus.

II.5: The Investment Fund provides a portfolio of production projects with special environmental focus.

II.6: The Investment Fund will promote “green microfinance” with a specific focus on the support of Ecosystem-based Adaptation and Climate-smart Agriculture solutions, ensuring that project financed comply with the following basic criteria for EbA-aligned microfinance:⁴

⁴ From UNEP, 2013:
https://www.dropbox.com/s/r4j66t8rwie0iwh/1.%20Microfinance%20for%20Ecosystem%20based%20Adaptation_Options%2C%20costs%20and%20benefits.pdf?dl=0

Annex 1: Investment Fund ESP guidelines

1. Reducing pressure on ecosystems and the services they provide
2. Enhancing the social or economic resilience of human populations vulnerable to climate change
3. Reducing risks associated with climate events in production activities
4. In their implementation, protecting, restoring or using biodiversity and ecosystems in a sustainable manner
5. Having a positive impact on individuals' economy in the short term

PRINCIPLE III: Gender equality and mainstreaming

The investment fund will promote gender equality and women empowerment through all its operations and activities and prioritize respective investment activities.

Main goals:

III.1: The Investment Fund will pro-actively foster women empowerment and gender equality in its internal operational as well as external financing activities.

III.2: The Investment Fund has established a working procedure based on an Environmental Check List to ecologically improve (running) financing projects.

PRINCIPLE IV: Monitoring and Evaluation

The investment fund will make the implementation of sound monitoring and evaluation (M&E) processes pre-condition to respective disbursements. Further, the investment fund ensures transparency in the financing operations of its resources throughout all intended activities. All financing activities will have to have an EIA before

Main goals:

IV.1: All financing projects, specifically their environmental impact assessment will be properly documented and monitored.

IV.2: The establishment of sound M&E mechanisms will be condition precedent for investees to obtain financing form the fund.

PRINCIPLE V: Awareness raising

The investment fund actively promotes raising awareness on environmental issues, climate change and sustainable use of natural resources among staff, project partners and final recipients of its resources.

The investment fund aims to raise awareness on sustainable development and sustainable use of natural resources and climate change amongst all its stakeholders

Main goals:

V.1: The Investment Fund will make environmental issues an integral part of its internal communication.

V.2: The Investment Fund will build up professional capacity and expertise in the field of environmental and climate protection.

V.3: The Investment Fund will make environmental issues an integral part of its external communication.

6 Implementation of the ESP

The investment fund will develop standard formats and procedures that guide the measurable and transparent implementation of the above indicated and further to be developed principles.