ADAPTATION FUND

AFB/PPRC.16/13
19 March 2015

Adaptation Fund Board
Project and Programme Review Committee
Sixteenth Meeting
Bonn, Germany, 7-8 April 2015

Agenda Item 6 i)

PROPOSAL FOR PERU

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.

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 “Adaptation to the Impacts of Climate Change on Peru's Coastal Marine Ecosystem and Fisheries” was submitted by the Peruvian Trust Fund for National Parks and Protected Areas (PROFONANPE), which is the National Implementing Entity of the Adaptation Fund for Peru. This is the third submission of the project but only the first by PROFONANPE. It was submitted as a concept by the Inter-American Development Bank (IDB) to the seventeenth meeting of the Adaptation Fund Board but was withdrawn. It was then resubmitted by IDB as a concept to the eighteenth meeting, and the Board decided to:

> *(a) Endorse the project concept, as supplemented by the clarification response provided by the Inter-American Development Bank (IDB) to the request made by the technical review;*
>
> *(b) Request the secretariat to transmit to IDB the following observations:*
>
> *(i) The fully-developed project document should consider whether it would be beneficial to include activities that would actively address the industrial fisheries, and should ensure that the approach taken is comprehensive enough and adequately addresses the need to make the overall fisheries management policies, and institutional and legal framework in Peru more adaptive by including not only the artisanal part of the fisheries but also the industrial part, even if “on-the-ground” concrete adaption measures would focus, as proposed, on the artisanal fisheries;*
>
> *(ii) At the level of individual components, the fully-developed project document should reassess and strengthen, wherever possible, the adaptation reasoning, seeking the possibility of including additional measures that go beyond ecological fisheries management;*
>
> *(iii) During project development consultations should be held with the Humboldt Current project, being funded by the Global Environment Facility (GEF), to ensure that the two projects are complementary and do not overlap, and that the activities contributing to development of national policies in the proposed project are aligned with the transboundary framework that is being developed under the GEF project.*
>
> *(c) Request the IDB to transmit the observations in paragraph (b) above to the Government of Peru; and*
>
> *(d) Encourage the Government of Peru to submit through IDB a fully-developed project proposal that would address the observations in paragraph (b) above.*
>
> *(Decision B.18/8)*

10. IDB did not submit the proposal as a fully-developed project document but instead agreed with the Government of Peru to transfer ownership of the project to the Peruvian

National Implementing Entity, PROFONANPE. A letter to this effect was sent by IDB to the Adaptation Fund Board secretariat on 19 June 2014.

11. The present submission was received by the secretariat in time to be considered in the twenty-fifth Board meeting. The secretariat carried out a technical review of the project proposal, with the diary number PER/NIE/Coastal/2015/1, 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 PROFONANPE, 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.

Project Summary

Peru – Adaptation to the Impacts of Climate Change on Peru's Coastal Marine Ecosystem and Fisheries

Implementing Entity: *PROFONANPE*
Project/Programme Execution Cost: USD 555,750
Total Project/Programme Cost: USD 6,405,750
Implementing Fee: USD 544,489
Financing Requested: USD 6,950,239

Project Background and Context:

The overall objective of the proposed project is to support the Government of Peru in reducing the vulnerability of coastal communities to impacts of climate change on the coastal marine ecosystems and fishery resources. This will require the implementation of a group of adaptation measures that include: (i) activities that contribute to the enhancement of current adaptive capacity of artisanal fishing communities living along the Peruvian coast, and reduce the vulnerability of coastal ecosystems, while increasing the income of the communities and their participation in managing and protecting their natural resources; (ii) deployment of a modern and efficient surveillance, prediction and information system of climate and environmental key factors at regional and local scales, supporting fishing, aquaculture and ecotourism activities, as well as fisheries adaptive management based on long-term prevision under climate change scenarios; and (iii) development of a knowledge framework to facilitate capacity building at different levels and the dissemination of project's lessons learned.

Component 1: Implementation of interventions in pilot strategic areas to improve resilience of target coastal communities and key coastal marine ecosystems to climate change and variability-induced stress (USD 3,124,800)

The first component would aim at increasing the resilience and reducing the vulnerability of targeted coastal marine ecosystems to observed effects of climate change and variability-induced stress, by adopting sustainable fishing methods to tackle non-selective fishing gear based on Ecosystem Approach to Fisheries (EAF) principles directed to target species vulnerable to climate change, and by restoring and co-managing natural banks. It would also aim at improved the adaptive capacity of local participating communities through diversifying and strengthening their livelihoods and sources of income as they face climate change induced modifications of biomass and fish distribution. This would be achieved by planning and developing sustainable aquaculture through small-scale concessions; creating ecotourism enterprises; improving market power capacities for sustainable artisanal fisheries; starting up a certification process for local artisanal fisheries; and producing bio-fertilizers from fishery and aquaculture residues.

Component 2: Deployment of a modern and efficient environment surveillance and prediction system in the coastal marine ecosystems at regional and local scales supporting fisheries adaptive management under the EAF principles (USD 2,055,200)

This component would aim at increasing the response capacity of the government at a national and local level at pilot areas to address climate change induced physical and ecological stresses on the coastal marine environment, ecosystem services and resources availability. This would be achieved by developing a climatic and an oceanographic surveillance system;

establishing marine environment surveillance programs in pilot areas in coordination with local stakeholders; developing a modeling and prediction system at local scales; and building capacity on monitoring and development of new science-based tools such as Ecological Risk Assessments (ERA) for climate change directed to IMARPE, decision makers and academia.

Component 3: Capacity building and knowledge management system for implementing the EBA and the EAF, and for the dissemination of project's lessons learned, targeting government officials, academia, local communities and other stakeholders (USD 420,000)

This component would strengthen the institutional capacity to assess the extension and magnitude of climate change impacts on fisheries and effective actions to cope with these changes, providing limits on climate induced loss of income in local communities. It would also strengthen awareness and ownership of adaptation and climate risk reduction processes on impacted communities in the project target areas, by training and sensitizing beneficiaries on key topics such as formalization, entrepreneurship, normative and fishing gear; and by designing and implementing early warning systems through a participatory process at local and regional scales.

Component 4: Management policies, regulations and measures promoting the resiliency of coastal ecosystems and local communities to climate change and variability-induced stress (USD 250,000)

This component would aim at improving governance, policies and regulations at a national and local level to enhance the sustainable use and resilience of coastal marine resources. This would be achieved through support the cross-sector working group for the promotion of common actions addressing coastal ecosystems' resilience to climate change impacts; developing regulations and proposals for co-management in coastal marine areas; and developing regulations to implement incentives for the participation of artisanal fishermen, adopting sustainable practices, in the National Direct Human Consumption Program.

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular-sized Project

Country/Region: **Peru**
Project Title: **Adaptation to the Impacts of Climate Change on Peru's Coastal Marine Ecosystem and Fisheries**
AF Project ID: **PER/NIE/Coastal/2015/1**
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): **6,950,239**
Reviewer and contact person: **Mikko Ollikainen**
Co-reviewer(s): **Christian Severin**
IE Contact Person: **Humberto Cabrera**

Review Criteria	Questions	Comments on 21 February 2015	Comments on 16 March 2015
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.	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes.	

	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?	The proposed project has potential to assist the country in adapting to climate change. However, several issues require clarification. An overall finding and clarification request: It is not very clear how the proposed activities link to each other, and in some cases it is not very clear exactly what the output(s) of an activity would be. **CR1:** Please elaborate on the specific activities and expected results planned to be implemented, through examples if feasible, and how the activities link to each other. If possible, please quantify the expected results. An overall comment: When the Adaptation Fund Board endorsed the project concept for this project in June 2012, then submitted by the Inter-American Development Bank, it made three observations that would need to be addressed in a fully-developed proposal: *i. The fully-developed project document should consider whether it would be beneficial to include activities that would actively address the industrial fisheries, and should ensure that the approach taken is comprehensive enough and adequately addresses the need to make the overall fisheries management policies, and institutional and legal framework in Peru more adaptive by including not only the artisanal part of the fisheries but also the industrial part, even if "on-the-ground" concrete adaption measures would focus, as proposed, on the artisanal fisheries;* *ii. At the level of individual components, the fully-developed project document should reassess and strengthen, wherever possible, the adaptation reasoning, seeking the possibility of including additional measures that go beyond*	**CR1:** Addressed.

		ii. At the level of individual components, the fully-developed project document should reassess and strengthen, wherever possible, the adaptation reasoning, seeking the possibility of including additional measures that go beyond ecological fisheries management; *iii. During project development consultations should be held with the Humboldt Current project, being funded by the Global Environment Facility (GEF), to ensure that the two projects are complementary and do not overlap, and that the activities contributing to development of national policies in the proposed project are aligned with the transboundary framework that is being developed under the GEF project*. The current proposal has not addressed observation (i) and has only partly addressed observation (ii). With regard to observation (i), the considerable concern is, whether failure to curb overfishing by larger vessels and further ashore would deplete stocks, especially of the key species of Peruvian anchovy, so that fisheries based livelihoods in the near-shore zone would become unviable. The main reason for the Peruvian fisheries being the largest in the world is the anchovy stock that follows the upwelling. It is unclear if the project focuses on directly targeting the anchovy stock, or other signature/predatory species, such as yellowfin tuna or hake.	

		CR2: Please explain what measures are being taken towards regulating overfishing, by industrial and small fishing fleets, especially of the already depleted stocks of the Peruvian anchovy, which is an important species also for the artisanal fisheries targeted by this proposed project (both as a catch species and as food source of the larger species). Please analyse and elaborate the risks to coastal fisheries and to this proposed project resulting from possible failure of those regulatory measures. **CR3:** Please clarify whether the project focuses on directly targeting the anchovy stock, or other signature/predatory species, such as yellowfin tuna or hake, and reconsider whether the focus of the project and its proposed interventions should be shifted accordingly. The project is focusing on sustainable management of the coastal marine ecosystems and its fisheries resources. Increased understanding of the system (through component 2) will inform adaptation of current practices that eventually will improve resilience of the ecosystem. However, currently overfishing and unsustainable fishing methods are present also in the coastal 5-mile zone, and weak enforcement has been identified as a risk in the risk management framework. However, it is not clear what measures are being taken to actively curb those illicit activities, and why such measures have not been included in the	**CR2:** Mostly addressed. **CR3:** Addressed.

		proposed project, to complement the measures that encourage and support positive practices. **CR4:** Please explain what measures are being taken in the coastal zone to actively curb overfishing and unsustainable fishing methods, and whether this project would include activities targeting fishing practices. Please consider including such measures in the proposed project design. The logic description in the proposal outlining what, especially the activities under Component 1, would be addressing and how these activities would be supporting each other, is not very clear. It would also need to be clarified how these activities would be supported by activities under Component 2. **CR5:** Please elaborate on the logic description on the explicit outcome-level target and mutual linkages of Component 1 activities. Please also elaborate how activities under Component 2 would support Component 1 activities. **CR6:** Regarding the surveillance systems planned under Component 2 and the early warning systems planned under Component 3, please elaborate on their expected products, both from the perspective of which phenomena are targeted and in terms of how the communities would benefit from this information.	**CR4:** Not fully addressed. The response is slightly confusing: on one hand several measures have been listed. On another, it is said (p. 33) that "It is clear that the GoP does not have the capacity to control this artisanal activity, and that new approaches are needed. One such approach is to empower the community, and create incentives for the management of the natural resources upon which their livelihoods depend." The proposal should elaborate how effective the listed control measures are, what gaps or inadequacies in those measures exist and how the project could address those issues. Supporting positive measures such as livelihoods diversification may not be sustainable if the overall viability of the system is jeopardized by inadequately controlled unsustainable practices. **CR5:** Addressed. **CR6:** Addressed.

	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 of the Fund?	Yes, however, with the identified issues related to the project design, it is unclear how effectively those benefits could be delivered.	

	4. Is the project / programme cost effective?	Requires clarification. Component 4 has activities to develop regulations but it is unclear how closely those activities would be developed and implemented in collaboration with the relevant levels of government, which would seem crucial for their effectiveness. **CR7:** Please clarify how activities in Component 4 would be developed and implemented in collaboration with the relevant levels of government, with their participation. Activity 1.2.5 aims to develop fishery and aquaculture residues into biofertilizers, biodiesel and food. It is understood that fishery residues are already commonly converted to fertilizers and oil, so it is not clear what additional this activity would provide. **CR8:** Please elaborate which type of aquaculture would be involved, and what the methods of conversion would be. **CR9:** Please clarify what additional activity 1.2.5 would bring compared to the baseline. **CR10:** Please clarify what "satellite products" under output 2.1.1. are and how they would benefit the project and be necessary for it to reach its targets.	**CR7:** Addressed. **CR8:** Addressed. **CR9:** Addressed. **CR10:** Addressed.

	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?	Yes.	
	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	Yes, apparently. However, there are some remaining questions related to environmental assessments (cf. below).	

	7. Is there duplication of project / programme with other funding sources?	Requires clarification. There is a new initiative funded by the Inter-American Development Bank taking place partly in the same location and having some similar interventions but the proposal does not explain the relationship of the two in detail. **CR11:** Please elaborate on goals, activities and budget of the IDB funded project "Adaptation to climate change in the fishery sector and marine-coastal ecosystem of Peru", and consider incorporated such information in the background section of this proposal to highlight where the proposed project could build upon and complement the IDB project. **CR12:** Please explain how coordination between different initiatives would be achieved.	**CR11:** Addressed. **CR12:** Addressed.
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Yes. However, **CR13** please consider including activities that would ensure sharing of lessons learned between the demonstration project stakeholders. Bringing practitioners together is a very powerful tool to transfer and replicate successful activities.	**CR13:** Addressed.

	9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations?	Requires clarification. It seems that no community consultations have been arranged since September 2012. **CR14:** Please elaborate, whether there is confidence in the community still approving the proposed project. If necessary, please carry out additional consultations. **CR15:** Please clarify, whether and how women and any other vulnerable groups were involved in consultations. If yes, please explain whether there were specific concerns expressed by women that would have influenced the project design. Please elaborate more how gender concerns have been taken into account in project design. **CR16:** Please explain how communities could effectively participate in project management.	**CR14:** Not fully addressed. The proposal includes a statement of confidence but the reasoning is not completely clear. It is recommended that the proponent carries out additional consultations directly with the target communities. Those consultations should be informed by the recent developments since the 2012 consultations. **CR15:** Not fully addressed. It seems women and other vulnerable groups were not specifically targeted for consultations, though some women participated. It is stated that gender concerns are being paid attention to but there are no separate activities targeting women. It is recommended that as additional consultations directly with the target communities are carried out (CR14 above) there would be an appropriate analysis of vulnerable groups within the communities, including women, and that project activities would take the needs and priorities of those groups into account. **CR16:** Addressed. A participative consultation and reporting mechanism will be used.
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Possibly yes, however, there are questions (above) about the design of the project, which also influence the adaptation reasoning.	
	11. Is the project / program aligned with	Yes.	

	AF's results framework?		
	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Requires clarification. It is not clear whether the material support to the fishermen would be tied to any commitment from the recipients. As a general lesson learned, recipients tend to appreciate and invest more in the maintenance of materials and equipment against which they have made some, even small, own investment or commitment (often in the form of work input). This in turn supports sustainability. **CR17:** Please clarify, whether commitments or (monetary or non-monetary) investments from recipients have been considered in exchange for material support. There is not much information on the planned maintenance of the proposed outputs after the end of the project. **CR18:** Please elaborate on the sustainability of the project in terms of maintenance of the project outputs. As applicable, please explain maintenance from the point of view of both financing and the responsible institution.	**CR17:** Addressed. Several types of commitment have been listed. **CR18:** Not adequately addressed. The clarification provided by the proponent refers to the assets to be produced or supported by this project falling under responsibility of the relevant ministries but it fails to elaborate on practical arrangements. A revised proposal should comprehensively explain the maintenance of the project outputs, including institutional arrangements and responsibilities, financial resources, and for outputs at the community level, commitment by those stakeholders/communities.
	13. Does the project / programme provide an overview of environmental and social impacts / risks identified?	The proposal includes a checklist. However, the information provided is not adequate (please see below).	
Resource Availability	1. Is the requested project / programme	Yes.	

	funding within the cap of the country?		
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	Yes.	
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes.	
Eligibility of IE	4. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes.	
Implementation Arrangements	1. Is there adequate arrangement for project / programme management?	Yes, broadly. However, the proposal uses the word “implement” and its derivatives incorrectly in the management arrangements section. Implementation is a role that brings with it responsibilities, for which the Implementing Entity is solely responsible, and which cannot be delegated to the executing entity or other partners. **CR19:** Please revise the wording on implementation and execution.	**CR19:** Addressed.

	2. Are there measures for financial and project/programme risk management?	Yes.	

	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy of the Fund? Proponents are encouraged to refer to the draft Guidance document for Implementing Entities on compliance with the Adaptation Fund Environmental and Social Policy, for details.	Requires considerable clarification. The proposal does not provide comprehensive analysis of management of environmental and social risk in line with the policy (ESP). The identification and assessment of environmental and social risks is not carried out according to the requirements of the AF ESP. The arguments for the categorisation of the project as a category C project are based on the size of the activities rather than the risk of adverse impacts: the absence of large infrastructure elements and aquaculture activities that are considered 'minor scale'. Environmental and social risks need to be identified and assessed for all of the 15 ESP principles that are relevant to the project. The proposal does not provide adequate justification for the identification of environmental and social risks as reported in the table under section K. This also contradicts the environmental and social risks that are reported in Table 13. **CR20:** Please conduct a comprehensive screening of environmental and social risk in line with the AF ESP and include in section II.K a brief explanation for each standard whether further assessment is needed. Please report on such assessments in Section III, and include assessment reports as annexes, as applicable.	**CR20:** Partly addressed. The information requested is to a large extent presented in the proposal and the annexes V and VI. The risk identification was carried out using the MINAM system. This covers most but not all of the specific ESP points of attention, and has a few other limitations in that risks are assessed by environmental component rather than project activities or outcomes. Risk identification is also to some extent mixed with assessment and an appreciation of the extent of the risk. In general, most of the risks for the ESP principles have been identified. Risks that have not been addressed adequately include: - Child labour. It is mentioned in the proposal that the project will not generate child labour in any way. The Social Management Plan appears to be mum about child labour, even as a risk. - Access and equity – the process of direct beneficiary selection - Bycatch of birds, marine mammals and turtles with the longline fishing gear that the project will provide. Clearly, this gear is far superior to the nets they will replace in terms of risks of bycatch but other than monitoring there is little in the proposal to further reduce the risk. The risk is particularly for birds larger with longlines than with nets, and there are important bird colonies in the project areas. Hence, additional measures should be considered.

		It is already known that some of the project activities (e.g. improvement of the tourism dock) will require an environmental assessment under national regulations, yet these do not appear to have been carried out, and there is no specific budget allocation. **CR21:** Please clarify whether environmental assessments for project activities (such as the tourism dock) have been carried out and if yes, please provide a copy of each. If they have not been carried out, please clarify the plan in terms of scheduling and budget. If there is a risk that such assessments would result in non-clearance by authorities, please provide plans for alternatives. Some of the activities under Component 1 are generic at this stage and will be specified during project implementation (e.g. 'creation of ecotourism enterprises'). The process of identifying environmental and social risks for the unidentified activities is not described. Risks appear present for the following principles of the ESP: a. *Principle 2: access and equity*. The process of identifying and selecting direct beneficiaries of the project (e.g. the recipients of fishing gear) is not described.	**CR21:** Not fully addressed. The assessments have not been done yet. They have been planned and budgeted. However, it remains unclear to what extent the risks of the conditioning of the tourist dock have been included in the risk assessments. The proposal should further show that the required environmental impact assessment that will be carried out will also meet the requirements of the ESP and schedule an update of the ESMP accordingly. The main content of the ESMP, as a minimum, should be presented in English. The Ministry of Production requires an environmental impact statement for the aquaculture concessions. It should be clarified whether there is a risk of conflict of interest as the ministry is also the executing entity and if yes, how it is addressed.

		b. *Principle 3: marginalised and vulnerable groups*. These are not identified in the proposal, and could be at risk of disproportionate impacts of the project. c. *Principle 5: gender equity and women's empowerment*. The role of women in the project appears limited to involvement in pre-processing fishery by-products and secondary activities in ecotourism. d. *Principle 6: core labour rights*. Child labour in the Peruvian fishery sector has been documented[1]. The analysis should address also the other core labour principles. e. *Principle 9: protection of natural habitats* and *Principle 10: conservation of biodiversity*. The project will operate with fisheries that have been, and likely still are, exploited at unsustainable levels, compromising the long-term future of the stocks and of the fishery. The anchovy fishery is severely over-capitalised and the size of the fishing fleet is too large. While the project will reduce some of the negative impacts of the current fishing practices, it will not contribute to a reduction of fishing capacity but actually invest in maintaining it, at least for	

[1] http://www.dol.gov/ilab/reports/child-labor/peru.htm
http://daccess-dds-ny.un.org/doc/UNDOC/GEN/G11/154/72/PDF/G1115472.pdf?OpenElement

		the boats that will receive project benefits. It is not inconceivable that there is a risk that the development of markets and improving the value of the catches may lead to an overall increase in fishing pressure. Further there are risks of bycatch or shifts in bycatch species with the new fishing gear that will be provided. These could affect species of biodiversity concern that are present in the area. The mollusc aquaculture that is envisaged takes place inside protected areas, presenting a risk of environmental impact. The project does include management provisions to study and manage such impacts. Based on the risks identified, the categorisation as C of the project is not justified. An environmental and social management plan (ESMP) commensurate with the risks identified should be prepared for the project. The process of identifying and managing environmental and social risks associated with the activities that will be specified during project implementation needs to be integrated in the ESMP. **CR22:** Please consider recategorization of the project. **CR23:** Please develop an environmental and social management plan commensurate with the risks.	**CR22**: Addressed. Project is categorized as B. **CR23:** Mostly addressed, though some further clarifications/adjustments are still needed as outlined above (e.g. risk assessment of the dock, impact statement for aquaculture concessions, and mitigation of bycatch with new gear).

		Monitoring for unexpected environmental and social impacts is absent from the proposal. **CR24:** Please explain the monitoring of unexpected environmental and social impacts. The proposal does not describe the grievance mechanism the project would have in place. **CR25:** Please describe the grievance mechanism, which is accessible by employees and affected communities. The mechanism should be designed to receive and facilitate grievances in a transparent manner and will be scaled to the severity of the risks.	**CR24:** Addressed. **CR25:** Not adequately addressed. A grievance mechanism is not mentioned in the proposal, only in the social management plan there is a statement on intention to have a complaints mechanism. The revised proposal should elaborate on the grievance mechanism.
	4. Is a budget on the Implementing Entity Management Fee use included?	No. According the proposal (p. 95) this would be in Annex VI but such annex has not been provided. **CAR1:** Please provide budget on the Implementing Entity Management Fee use.	**CAR1:** Addressed.
	5. Is an explanation and a breakdown of the execution costs included?	No. According the proposal (p. 95) this would be in Annex V but such annex has not been provided. **CAR2:** Please provide an explanation and a breakdown of the execution costs.	**CAR2:** Addressed.
	6. Is a detailed budget including budget notes included?	Yes.	

	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators?	The M&E arrangements have been provided, together with a budget. However, the indicators show no disaggregation by gender. **CR26:** Please include sex-disaggregated data, targets and indicators.	**CR26:** Not fully addressed. Some sex-disaggregated targets have been included as percentages but these are not very clear (e.g. setting a target that 10% of women adopt adaptation measures, without mentioning which group of women is being talked about). Following the additional consultations to take into account the views of women and vulnerable groups (CR 15 above) it is recommended that specific indicators are added.
	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. As noted above, budget on the Implementing Entity Management Fee use has not been provided.	
	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	The overall objective of the project is to support the Government of Peru in reducing the vulnerability of coastal

Summary	communities to impacts of climate change on the coastal marine ecosystems and fishery resources. This will require the implementation of a group of adaptation measures that include: (i) Implementation of a group of activities that contribute to the enhancement of current adaptive capacity of artisanal fishing communities living along the Peruvian coast, and reduce the vulnerability of coastal ecosystems, while increasing the income of the communities and their participation in managing and protecting their natural resources. (ii) Deployment of a modern and efficient surveillance, prediction and information system of climate and environmental key factors at regional and local scales, supporting fishing, aquaculture and ecotourism activities, as well as fisheries adaptive management based on long-term prevision under climate change scenarios. (iii) Development of a knowledge framework to facilitate capacity building at different levels and the dissemination of project's lessons learned. The initial technical review made two corrective action requests: **CAR1:** Please provide budget on the Implementing Entity Management Fee use. **CAR2:** Please provide an explanation and a breakdown of the execution costs. The review made also a number of clarification requests: **CR1:** Please elaborate on the specific activities and expected results planned to be implemented, through examples if feasible, and how the activities link to each other. If possible, please quantify the expected results. towards regulating overfishing, by industrial and small fishing fleets, especially of the already depleted stocks of the Peruvian anchovy, which is an important species also for the artisanal fisheries targeted by this proposed project (both as a catch species and as food source of the larger species). Please analyse and elaborate the risks to coastal fisheries and this proposed project resulting from possible failure of those regulatory measures. **CR2:** Please explain what measures are being taken towards regulating overfishing, by industrial and small fishing fleets, especially of the already depleted stocks of the Peruvian anchovy, which is an important species also for the artisanal fisheries targeted by this proposed project (both as a catch species and as food source of the larger species). Please analyse and elaborate the risks to coastal fisheries and to this proposed project resulting from possible failure of those regulatory measures. **CR3:** Please clarify whether the project focuses on directly targeting the anchovy stock, or other signature/predatory species, such as yellowfin tuna or hake, and reconsider whether the focus of the project and its proposed interventions should be shifted accordingly. **CR4:** Please explain what measures are being taken in the coastal zone to actively curb overfishing and unsustainable fishing methods, and whether this project would include activities targeting fishing practices. Please consider including such measures in the proposed project design. **CR5:** Please elaborate on the logic description on the explicit outcome-level target and mutual linkages of Component 1 activities. Please also elaborate how activities under Component 2 would support Component 1 activities. **CR6:** Regarding the surveillance systems planned under Component 2 and the early warning systems planned

	under Component 3, please elaborate on their expected products, both from the perspective of which phenomena are targeted and in terms of how the communities would benefit from this information. **CR7:** Please clarify how activities in Component 4 would be developed and implemented in collaboration with the relevant levels of government, with their participation. **CR8:** Please elaborate which type of aquaculture would be involved, and what the methods of conversion would be. **CR9:** Please clarify what additional activity 1.2.5 would bring compared to the baseline. **CR10:** Please clarify what "satellite products" under output 2.1.1. are and how they would benefit the project and be necessary for it to reach its targets. **CR11:** Please elaborate on goals, activities and budget of the IDB funded project "Adaptation to climate change in the fishery sector and marine-coastal ecosystem of Peru", and consider incorporated such information in the background section of this proposal to highlight where the proposed project could build upon and complement the IDB project. **CR12:** Please explain how coordination between different initiatives would be achieved. **CR13** please consider including activities that would ensure sharing of lessons learned between the demonstration project stakeholders. Bringing practitioners together is a very powerful tool to transfer and replicate successful activities. **CR14:** Please elaborate, whether there is confidence in the community still approving the proposed project. If necessary, please carry out additional consultations. **CR15:** Please clarify, whether and how women and any other vulnerable groups were involved in consultations. If yes, please explain whether there were specific concerns expressed by women that would have influenced the project design. Please elaborate more how gender concerns have been taken into account in project design. **CR16:** Please explain how communities could effectively participate in project management. **CR17:** Please clarify, whether commitments or (monetary or non-monetary) investments from recipients have been considered in exchange for material support. **CR18:** Please elaborate on the sustainability of the project in terms of maintenance of the project outputs. As applicable, please explain maintenance from the point of view of both financing and the responsible institution **CR19:** Please revise the wording on implementation and execution. **CR20:** Please conduct a comprehensive screening of environmental and social risk in line with the AF ESP and include in section II.K a brief explanation for each standard whether further assessment is needed. Please report on such assessments in Section III, and include assessment reports as annexes, as applicable. **CR21:** Please clarify whether environmental assessments for project activities (such as the tourism dock) have been carried out and if yes, please provide a copy of each. If they have not been carried out, please clarify the plan in terms of scheduling and budget. If there is a risk that such assessments would result in non-clearance by authorities, please provide plans for alternatives. **CR22:** Please consider recategorization of the project.

	CR23: Please develop an environmental and social management plan commensurate with the risks. **CR24:** Please explain the monitoring of unexpected environmental and social impacts. **CR25:** Please describe the grievance mechanism, which is accessible by employees and affected communities. The mechanism should be designed to receive and facilitate grievances in a transparent manner and will be scaled to the severity of the risks. **CR26:** Please include sex-disaggregated data, targets and indicators. The proponent submitted a revised proposal, and the final technical review finds that a revised version of the project should pay particular attention to following issues: - The proposal should elaborate how effective the listed existing measures to control overfishing and unsustainable fishing methods are, what gaps or inadequacies in those measures exist and how the project could address those issues. - It is recommended that the proponent carries out additional consultations directly with the target communities. Those consultations should be informed by the recent developments since the previous consultations carried out in 2012, there should be an appropriate analysis of vulnerable groups within the communities, including women, and design of project activities should take the needs and priorities of those groups, as expressed in the consultations, into account. Also specific indicators for women and vulnerable groups should be added as possible. - The proposal should comprehensively explain the maintenance of the project outputs, including institutional arrangements and responsibilities, financial resources, and for outputs at the community level, commitment by those stakeholders/communities. - The assessment of environmental and social risks, as well as plans for a grievance mechanism should be elaborated, and the proposal should show that the required environmental impact assessments that will be carried out will also meet the requirements of the Adaptation Fund Environmental and Social Policy, and schedule an update of the Environmental and Social Management Plan accordingly. The main content of the ESMP, as a minimum, should be presented in English.
Date:	16 March 2015

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

Project/Programme Category:	REGULAR PROJECT
Country/ies:	**PERU**
Title of Project/Programme:	**ADAPTATION TO THE IMPACTS OF CLIMATE CHANGE ON PERU' S COASTAL MARINE ECOSYSTEM AND FISHERIES**
Type of Implementing Entity:	**NIE**
Implementing Entity:	**PROFONANPE**
Executing Entity/ies:	**MINISTRY OF PRODUCTION**
Amount of Financing Requested:	**US$ 6,950,239** (in U.S Dollars Equivalent)

Project / Programme Background and Context:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.

Peru sustains the most productive fisheries in the world, yielding nearly 10% of world's fish catch. The main driving factor for this enormous productivity is the physical and chemical characteristics of its coastal upwelling[1] (Chavez et al., 2008), which allow the efficient growth of primary producers, high survival rates of larvae and the efficient trophic transfer to foraging fish and top predators.

Two main coastal marine ecosystems are present off Peru. The Peruvian Coastal Upwelling Ecosystem (PCUE) extends from about 4°30'S to the south all along the coast and about 50-100 km offshore (though its influence can reach further) and is the one that sustains the large fisheries of the Peruvian anchovy (*Engraulis ringens*). In the north, limited by a narrow and dynamic transition zone, there is the southern tip of the Eastern Pacific Tropical Coastal Ecosystem that extends up to Central America. This ecosystem is characterized by high marine biodiversity, including large predatory fishes and vertebrates, and is important in terms of artisanal fishing (Hooker, 2009).

The scope of this proposal encompasses these two coastal marine ecosystems: the PCUE and the Tropical Eastern Pacific Coastal Ecosystem. It should be stressed that their marine boundaries are intrinsically dynamic, and they are loosely associated with the extension of the continental shelf and of the upwelling plumes (in the case of the PCUE), about 50 to 100km offshore. Circulation processes in this coastal domain are highly affected by local factors related to the bottom topography, coastal geomorphology and local winds; giving rise to both alongshore and cross-shore mesoscale flows. Due to its dynamics, water depth and proximity to nutrient sources (upwelling or riverine fluxes), the productivity and biodiversity is concentrated in this domain and the key parts of the living cycles of the resources take place here. The offshore

(western) boundaries of these ecosystems interact with the large-scale water masses and current systems, which are maintained by basin-scale ocean-atmosphere interactions and do not depend on local factors. The Humboldt Current system flows off Peru and Chile and is composed by equatorward and poleward surface and subsurface currents that link the tropics with the subtropics[1], extending hundreds of miles away the coast. The onshore (eastern) boundary is the desert but densely populated coastal fringe, which is a source of several anthropogenic stressors.

The two targeted ecosystems are subject of significant climatic variability that range from the interannual scale (El Niño Southern Oscillation, ENSO) to the scale of decades or centuries, as palaeoclimatic research has revealed. For example, during strong El Niño events, the warm and nutrient-poor water masses extend along the coast and the overall coastal productivity decrease. Due to thermal stress and scarcity of food sources, anchovy populations become highly vulnerable and experience high natural mortality. Meanwhile, warm-water, tropical fish species migrate along the coast. The opposite responses occur during the cool La Niña events. Therefore the climatic ecological impacts can have dramatic socio-economic consequences for the fishing industry and for the artisanal fishing communities.

The main uses of the coastal ecosystems services are fishing and aquaculture, and they account for around 3% of Peru's GDP (CSA, 2011; BCRP, 2010). Within the last decade, the contribution of fisheries to the national GDP has increased from 1.9 billion soles to 2.3 billion soles (at currency values of 2007), thus indicating a positive trend. The bulk of sector economic impact is related to anchovy fishing for fishmeal and fish oil industry, in which Peru provides around 35% of the global supply. According to official figures, in 2013, the fishing industry generated almost 30 million US dollars of tax revenues and sold more than 2 billion US dollars as exports[2]. In 2014, the anchovy stock was impacted by anomalous warm conditions brought by an intensified activity of Kelvin waves, reducing the biomass in more than 50%, but the current previsions estimate a recovery of the stocks during 2015. It is estimated that, between 150,000 and 170,000 people depend directly on the Current's productivity for their daily income. The large-scale industrial fishery dedicated to export production sustains approximately 30,000 employees according to IMARPE.

Fishing pressure represents a critical source of stress to the ecosystems and their fisheries resources. In the early 1970's inadequate management led to an extreme vulnerability of the anchovy stock, which collapsed upon the occurrence of a moderate El Niño event in 1972/1973. This crisis, with all subsequent social impacts, has been an important historical lesson. Since then, several regulations and policies have been put into place by the Government of Peru (GoP) to improve the management and prevent the overexploitation of the anchovy[3] (Box 1).

[1] Note that the 'Humboldt Current Large Marine Ecosystem' (HCLME) consists on the complex system of currents, water masses and biotic components extending as far as 200 to 300 miles, and from Northern Peru to Southern Chile. The criteria for defining this LME include fisheries management for transboundary resources and not only ecological/oceanographic reasons. Upon these criteria the PCUE is embedded within the HCLME. Therefore its scale is beyond the scope of this project.

[2] Besides being processed to fish meal and fish oil, the use of anchovy for direct human consumption has been promoted by the Peruvian government in recent years and thus become increasingly important.

[3] Anchovetas (or Peruvian anchovies – *Engraulis ringens*) represent 60-80% of the total marine fish catch, and about 90% of it is converted to fish meal for consumption by cultured fish and livestock.

Box 1. Current Regulations and Policies for the management of the anchovy stocks

The primary legal framework is the General Fishery Law. Since 1971 three general laws have been promulgated (DL N° 18810, L. N° 24790 and DL N° 25977), each one with new approaches according to different ecological, political, socioeconomic settings. Secondary regulations control specific issues of the anchovy fishery, such as reproductive processes, recruitment limits, fishing pressure, access to catch quotas, fate of catches, use of rights in different spatial areas, management, scientific and comercial bodies and protection of other ecosystem components. Regulations establish mínimum catch size, mínimum net size, proportion of juveniles in the catch, prohibition of discards of juveniles and fishing bans in nursery areas. Other regulations include controls to freeze the fishing fleet (which has an overcapacity related to the stock size), and random inspections of physical storage capacity to monitor compliance with capacity limitations. In June 2008, GoP adopted Legislative Decree No. 1084, which regulates anchovy fishing quotas by vessel, regulating all anchovy fishing for indirect human consumption. In December 2008, the government-enacted regulations to define the maximum catch limits for anchovy fishing vessels (industrial fisheries). The quotas system has alleviated the fishing pressure on the main stock and a precautionary policy for the overall quota has allowed a slow recovery of the populations of some top predators, as the guano birds and seals; however the fleet overcapacity still persists and most of other fisheries are not subject to the individual quotas system, remaining under high risk of overexploitation, so they will greatly benefit from more selective fishing gears. The interference between the industrial and artisanal fisheries of anchovy was regulated by allocating the area between 0 to 5 nm for artisanal fishery, and the area between 5 to 10 nm for minor scale fishery oriented to direct human consumption. Environmental events such as Kelvin waves or El Niño episodes are taken into account through adaptive regulations establishing precautionary catch quotas with temporal restrictions when stock vulnerability is increased. Recently, a new regulation about anchovy artisanal fishery for direct human consumption has been promulgated (DS 006-2015-PRODUCE)

It should be highlighted that the artisanal fishery accounts for a larger number of employees than industrial fishing, of which near 57,000 people are directly engaged in fisheries and 19,200 are employed by fishery-based food processing for direct human consumption, according to the Ministry of Production sources. Artisanal fisheries maintain approximately 16,000 vessels and contribute greatly to the country's food security ('Censo Nacional de la Pesca Artesanal, 2012, unpub. report), by producing between around 700,000 tons of catch per annum on average in the past five years (data from records of IMARPE for scientific use). Artisanal or 'medium-scale' fisheries sector is made up of small vessels with a hold capacity of up to 32.6 m^3. These mostly harvest resources along the coast, which include an estimated 220 species, of which some 80 percent are finfish, 17 percent invertebrates, 2 percent algae and the remaining 1 percent other resources. There are some 200 fishing settlements involved in this fishery along the Peruvian coast, whose catches are mainly for direct human consumption (DHC) (FAO 2010). The largest proportion of artisanal fishery catches comes from species such as scallop, hake, dolphinfish and jumbo squid (55%), and also anchovy for the PCUE. Yellowfin tuna is one of the most important species for artisanal fisheries at the TEPCE. While the industrial fishery has a quotas system preventing overexploitation of anchovy, the artisanal fishery requires a co-management community-authority system for conservation of important fisheries such as tuna and hake.

Land-based and marine-based activities are another important source of stress on the coastal marine ecosystems. Pollution, coastal development and resource exploitation are major stressors. Solid and liquid residues derived from domestic sources and from fishing and landing, aquaculture (e.g. biofouling and organic wastes) and other industrial activities in the coastal

border are major stressors for the quality of the marine coastal environment. In addition, many oil platforms are installed onshore the Northern coast, and there are seismic explorations and plans to extend this economic activity by the private sector. Therefore oil/gas exploration and exploitation are emerging threats for the coastal ecosystems. Peru has taken some steps to address these anthropogenic pressures. These include coastal zone management initiatives and establishment of sectorial regulatory and normative frameworks and mechanisms to reduce the impact of land-based activities on coastal and marine assets. However these efforts are largely focused within single sectors, have limited scope, and are inadequate to address this highly complex, variable and linked ecosystems.

Climate change is affecting the heat content, thermal stratification, productivity, acidity and oxygen content in the oceans so that it becomes an additional stressor for the global marine ecosystems. As shown in Figure 1 the communities of the Peruvian coast, including 15% of the nation's urban population, are highly vulnerable to eventual changes in the fish production due to variables such as climate exposure, sensitivity or fisheries dependence and limited adaptive capacity (Allison et al., 2009), thus a reduction of the fisheries' productivity would mean a significant drawback in Peru's economy.

Current oceanographic trends for the last 30-40 years indicate a strengthening of coastal upwelling and related primary productivity near shore Central to Southern Peru, whereas warming and increasing thermal stratification off Northern Peru and the rest of the coast (Gutiérrez et al., 2011). On the other hand, current regional climate change scenarios (Brochier et al., 2013) suggest a weakening of upwelling and increased stratification along the Peruvian coast by the mid twenty first century (Gutiérrez et al., 2014). These conditions should lead to changes in the distribution, life-cycle and catch potential of marine resources. For example, the species may adjust their distribution towards the best range of temperature, food availability, wind-driven turbulence and oxygenation, leading in some cases to the expansion or to the contraction of their range of distribution (Cheung et al., 2009, 2010). Therefore warm-water species as tuna might expand its distribution southward and become more available for fishing. Nevertheless the overall fish potential in the Peruvian coastal ecosystems will ultimately depend on the fate of the primary productivity (e.g. carrying capacity). Since global models predict an increase of thermal stratification and weakening of the trade winds that control the potential productivity in the Eastern Pacific (Vecchi & Soden, 2007; Echevin et al., 2011), a decrease in the Peruvian fishing yields is expected in the long-term.

Summarizing, even though there is still uncertainty about the near-future evolution of upwelling and water mass distributions, there is no doubt that these would impact significantly on habitat distribution and carrying capacities of the resources for fisheries and aquaculture at sea. These impacts would add additional stress to the coastal ecosystems that are already threatened by the non-climatic factors such as those described above.

The main challenge thus consists in increasing the resilience of the coastal marine ecosystems and the coastal communities (particularly the artisanal fishing communities) to climate change impacts (e.g. the Ecosystem Based Adaptation, EBA; CBD, 2009). Therefore the **main beneficiaries** of this proposal are the artisanal fishing communities, whose livelihoods largely depends on the status of the coastal marine ecosystems, which are already subject to a number of non-climatic threats.

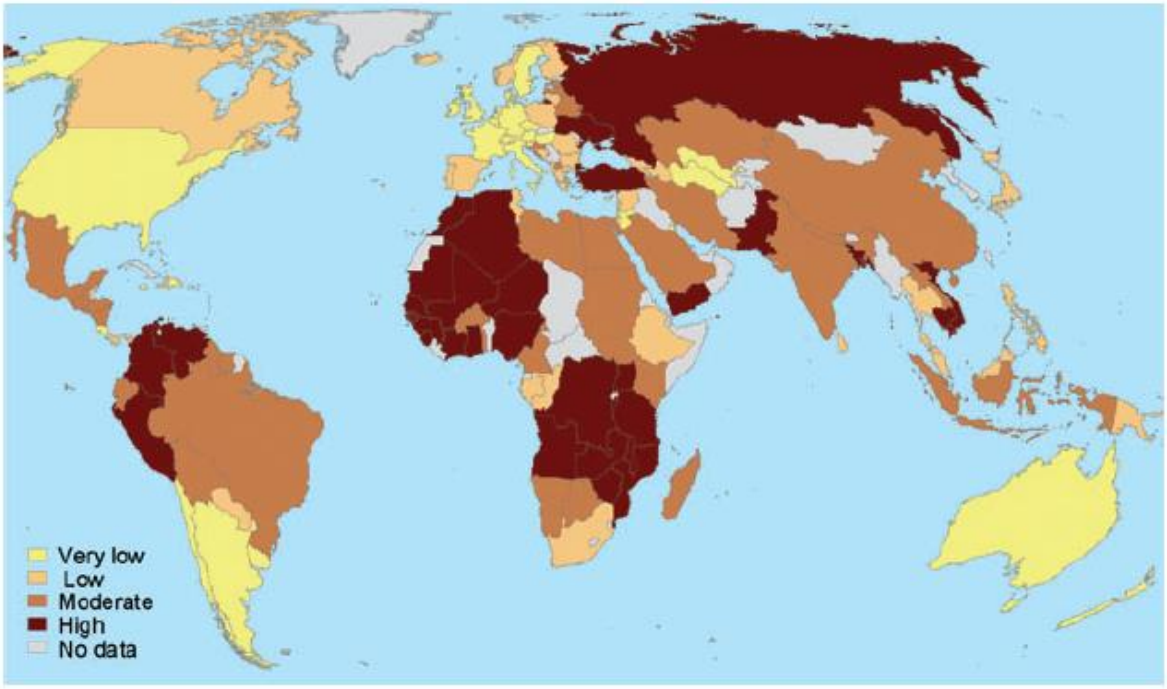

Figure 1: Vulnerability of national economies to potential climate change impacts on fisheries under IPCC scenario B2 (Allison et al., 2009)

The approach of the proposal is to focus the adaptation measures in two pilot areas, one associated to the southern tip of the Tropical Eastern Pacific Coastal Ecosystem, and the other, a typical representative of the PCUE. The project will carry out adaptive 'win-win' measures to improve the resiliency to climate change of both the ecosystems and of the artisanal fishing communities. The measures will help, on one side, to reduce fishing pressure through adoption of environmentally friendly gears while developing incentives from the human direct consumption market. On other side, economic diversification through aquaculture and ecotourism, will strengthen resilience of fisher communities. Bio-conversion of fish landing and aquaculture residues will aid to economic diversification as well, while mitigating pollution for the coastal marine ecosystem. All the adaptation measures will be sustainable in the long-term through active participation of local communities empowered through by co-management framework. The ultimate purpose of the proposal is that these adaptive measures at local level can be upscaled or replicated to other zones of the coastal domain, combining governance, capacity building and interventions sponsored by the government and the private sector.

Activities that include an improved ecosystem management by those with vested interests in its long-term sustainability, allowance of sustainable fishing quotas, adoption of environmentally friendly fishing and harvesting practices, and the promotion of the sustainable use of other ecosystem services with minimal impact in the ecosystem health, should improve the livelihoods of the fishers communities, thus reducing their vulnerability to climate change and variability-induced stress. This requires an improved climatic and environmental surveillance and

enhanced capabilities on modelling to enable the diagnosis and constant monitoring as well as the prediction of likely changes of the ocean currents and the resulting development of the fish stocks due to climate change.

As mentioned above, pollution from several sources is one important non-climatic stressor for the coastal marine ecosystems and resources. For the last decade, the GoP has implemented measures and regulations to reduce pollution from the industrial fishing processing plants; nevertheless pollution derived from fish landings, fish harbours and aquaculture still needs to be addressed. The project will transfer know-how to the artisanal fishing in order to convert residues from fishing and aquaculture sources to bioproducts, thus reducing pollution to the marine coastal ecosystem, while improving their incomes and generating economic diversification.

As well, the proposal recognizes the presence of other land-based ecosystem stressors, such as changes in land-use and building of infrastructure, and coastal marine exploration and exploitation of gas and oil fields. For these hazards, the project will support and strengthen the efforts of the GoP in developing and implementing land use plans in coastal areas. Working with the municipalities and their agencies responsible for developing territorial plans, under the general guidance and coordination of the Ministry of Environment, the project will support developing the processes required to formulate and adopt local territorial plans. This effort also includes developing management plans for Marine Protected Areas (MPA) as needed to secure "no-take" zones.

The proposed project attempts to put in place the required technical systems as well as enhance the necessary regulatory adjustments at national and local levels in order to support the coastal communities and Peru's economy to adapt to the likely impacts of climate change on the productivity of their marine and coastal ecosystems. It will give particular emphasis on artisanal fishery. This emphasis of course, does not ignore nor seek to diminish the role that industrial fishing plays in the Peruvian economy and its impacts to fish stocks. On the contrary, the proposed project seeks to complement on-going efforts of national authorities to regulate industrial fishing. It will complement climatic monitoring and will build regulations and capacities to implement the Ecosystem Approach to Fisheries for coastal marine ecosystems adding to ongoing efforts comprising mostly the Humboldt Current Ecosystem. As it will be explained along the proposal, the project will contribute to implement sustainable fishing practices, targeting fish products for direct human consumption with better income for fishers, support co-management of benthic fishing ground areas and natural banks, and incentive extensive aquaculture and ecotourism as alternative economic activities. All together, these measures will contribute to lower the fishing pressure over the stocks and improve the fisheries sustainability and their resiliency to climate change.

It should be noted that an adaptation project has been launched recently, entitled "Adaptation to climate change in the fishery sector and marine-coastal ecosystem of Peru", which is funded by the Interamerican Development Bank (IADB) for 2014-2016, with a budget of US$ 2.5 million. The IADB-funded project main expected outcomes are: i) the development of climate change scenarios for anchovy biomass and catch potential; ii) the test and implementation of environmentally friendly gears for anchovy fishery by the artisanal and medium-scale fleets (<30 tons of store capacity), first at Huacho and later to Pisco, both at the PCUE; iii) the support of governance to help creating incentive market mechanisms for ensuring the sustainability of good fishing practices, among others. Thus the IADB project will not overlap but complement the present proposal which will build upon the activities initiated with the IABD project, extending

adaptation measures to other marine species (tuna, hake, scallop, razor clam) and to the other main coastal marine ecosystem, the ETCPE. Close coordination between both projects is ensured as the same coordination team in PRODUCE will be in charge of the AF project.

Project / Programme Objectives:

List the main objectives of the project/programme.

The overall objective of the project is to support the GoP in reducing the vulnerability of coastal communities to impacts of climate change on the coastal marine ecosystems and fishery resources. This will require the implementation of a group of adaptation measures that include:

- **(i)** Implementation of a group of activities that contribute to the enhancement of current adaptive capacity of artisanal fishing communities living along the Peruvian coast, and reduce the vulnerability of coastal ecosystems, while increasing the income of the communities and their participation in managing and protecting their natural resources.
- **(ii)** Deployment of a modern and efficient surveillance, prediction and information system of climate and environmental key factors at regional and local scales, supporting fishing, aquaculture and ecotourism activities, as well as fisheries adaptive management based on long-term prevision under climate change scenarios.
- **(iii)** Development of a knowledge framework to facilitate capacity building at different levels and the dissemination of project's lessons learned;
- **(iv)** Adjustment of the institutional framework (legal, regulatory and organizational) to facilitate EBA for the coastal marine domain at country-level and to implement an Ecosystem Approach to Fisheries (EAF) including artisanal fishing.

As compared to classical (non-climatic) good fisheries management, the proposed project considers three aspects directly related to adaptation capacities: a) the implementation of a monitoring system that allows the continuous adjustment of the management actions; b) a multi-sectorial approach for the governance of the coastal marine domain (fisheries, environment and local authorities); and c) a socio-economic approach towards the improvement of the livelihoods of artisanal fishing communities through 'win-win' measures that also benefits ecosystem resilience.

Specifically, the presented group of adaptation measures is built upon the following key foundational concepts:

- **A key to successful adaptation of vulnerable communities is promoting the diversification of livelihoods**. Livelihood diversification helps ensure that, if one economic option temporarily closes, people can resort to other options for making a living. Poverty reduction strategies that help diversify livelihoods and improve poor people's access to natural resources also help build adaptive capacity for climate change (*FAO, Fisheries report No. 870*). In this context **component 1** encompasses a group of activities, selected by the communities themselves, aimed at diversifying current livelihoods of coastal communities contributing to reduce their vulnerability to climate change impacts.

- **A sustainable dynamic surveillance, prediction and information system to fill the existing gap of reliable climatic and non-climatic data is key to an effective adaptation process of marine and coastal ecosystems**. Based on the premise that adaptation is a non-static continuous process, requiring a multi-sectorial approach, the use, visualization and proper interpretation of data for decision making and the elaboration of natural resources management plans becomes a structural pillar of any EBA strategy, in which coastal communities are directly involved. In this context, **component 2** is aimed at designing a modern system of climatic and oceanographic surveillance, forecasting and long-term prediction, including biological, physical and chemical variables, which will be used for early warning and for supporting ecotourism, aquaculture and fishing activities as well as adaptive fishery management.

- **An effective and efficient adaptation process should be implemented in parallel at different levels, involving clear customized strategies to disseminate lessons learned and build capacities for replication and up-scaling successful measures**. Although resource-dependent communities have adapted to change throughout history, projected climate change poses multiple additional risks to fishery dependent communities that might limit the effectiveness of past adaptive strategies. Adaptation strategies will require to be context and location-specific and to consider impacts both short-term (e.g. increased frequency of severe events) and long-term (e.g. reduced productivity of aquatic ecosystems). All three levels of adaptation (community, national and regional) will clearly require and benefit from stronger capacity building, by raising awareness on climate change impacts on fisheries and aquaculture, promoting general education, and targeting initiatives in and outside the sector. (*FAO, Fisheries report No. 870*). In this context **component 3** is designed so that lessons learned from the project could be disseminated to the general public and project stakeholders in an efficient manner. Similarly, capacity building activities on the use of new science-based tools for decision making and ecological risk assessments will be developed for government officials, academia and stakeholders.

- **An ecosystem stressed by overfishing is more likely to collapse when subjected to climate change**. Policies to prevent overfishing and ensure the sustainable use of fish stocks help build ecosystem resilience to climate change (*WorldFish Center 2007*). In this sense **component 4** builds on current national efforts to prevent overfishing caused by industrial fleets and seeks the development of sustainable management of coastal ecosystems, following the EAF and the transfer of management rights to local artisanal fishing communities but limiting open access to resources. The concrete adaptation activities for small-scale aquaculture, co-management of benthic fishing ground areas and the implementation of “no–take” zones are all aligned with this philosophy.

Moreover, in terms of climate change adaptation and building resilient systems (i.e. including reducing exposure and increasing adaptive capacities), the application of the EAF would be an important contribution to maintaining biodiversity, preserving the resilience of human and aquatic systems to change, and improving our capacity to anticipate and adapt to inevitable climate induced changes in aquatic ecosystems and the related fisheries production systems.

The adaptation interventions will focus both on the national level and on two specific pilot areas, one in the southern tip of the Tropical Eastern Pacific Coastal Ecosystem-in the northerly Piura Region and the other one representative of the PCUE located in the central coast. In accordance to the main fishing towns in both areas (north and center), pilot sites will be named Máncora and Huacho, respectively.

Project / Programme Components and Financing:

Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.

For the case of a programme, individual components are likely to refer to specific sub-sets of stakeholders, regions and/or sectors that can be addressed through a set of well defined interventions / projects.

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
Component 1. Implementation of interventions in pilot strategic areas to improve resilience of target coastal communities and key coastal marine ecosystems to climate change and variability-induced stress.	OUTPUT 1.1.1. Adoption of sustainable fishing methods to tackle non-selective fishing gear based on EAF principles directed to target species vulnerable to climate change OUTPUT 1.1.2. Restoration and co-management of natural banks OUTPUT 1.2.1 Planning and development of sustainable aquaculture through small-scale concessions OUTPUT 1.2.2. Creation of ecotourism enterprises OUTPUT 1.2.3 Improvement of market power capacities for sustainable artisanal fisheries OUTPUT 1.2.4. Start-up of certification process for local artisanal fisheries OUTPUT 1.2.5. Production of bio-fertilizers from fishery and aquaculture residues	OUTCOME 1.1. Increased resilience and reduced vulnerability of targeted coastal marine ecosystems to observed effects of climate change and variability-induced stress OUTCOME 1.2. Improved adaptive capacity of local participating communities through the diversification and strengthening of their livelihoods and sources of income as they face climate change induced modifications of biomass and fish distribution	3,124,800

Component 2. Deployment of a modern and efficient environment surveillance and prediction system in the coastal marine ecosystems at regional and local scales supporting fisheries adaptive management under the EAF principles	OUTPUT 2.1.1. Development of a climatic and an oceanographic surveillance system. OUTPUT 2.1.2. Establishment of marine environment surveillance programs in pilot areas in coordination with local stakeholders OUTPUT 2.1.3. Development of a modeling and prediction system at local scales. OUTPUT 2.1.4. Building capacity on monitoring and development of new science-based tools such as Ecological Risk Assessments (ERA) for climate change directed to IMARPE, decision makers and academia.	OUTCOME 2.1.Increased response capacity of the government at a national and local level at PAs to address climate change induced physical and ecological stresses on the coastal marine environment, ecosystem services and resources availability	2,055,200
Component 3. Capacity building and knowledge management system for implementing the EBA and the EAF, and for the dissemination of project's lessons learned, targeting government officials, academia, local communities and other stakeholders	OUTPUT 3.1.1. Development and implementation of a Knowledge Management Strategy (KMS) OUTPUT 3.2.1. Training and sensitizing of beneficiaries on key topics such as formalization, entrepreneurship, normative and fishing gear OUTPUT 3.2.2. Design and implementation of early warning systems through a participatory process at local and regional scales	OUTCOME 3.1. Strengthened institutional capacity to assess the extension and magnitude of climate change impacts on fisheries and effective actions to cope with these changes, providing limits on climate induced loss of income in local communities. OUTCOME 3.2. Strengthened awareness and ownership of adaptation and climate risk reduction processes on impacted communities in the project target areas	420,000

Component 4. Management policies, regulations and measures promoting the resiliency of coastal ecosystems and local communities to climate change and variability-induced stress.	OUTPUT 4.1.1. Support of the cross-sector working group for the promotion of common actions addressing coastal ecosystems' resilience to climate change impacts. OUTPUT 4.1.2. Development of regulations and proposals for co-management in coastal marine areas OUTPUT 4.1.3. Development of regulation to implement incentives for the participation of artisanal fishermen, adopting sustainable practices, in the National Direct Human Consumption Program.	OUTCOME 4.1. Improved governance, policies and regulations at a national and local level to enhance the sustainable use and resilience of coastal marine resources	250,000
6. Project/Programme Execution cost			9.5% of TPC (555,750)
7. Total Project/Programme Cost			5,850,000
8. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			8.5% of TPC+PEC (544,489)
Amount of Financing Requested			**6,950,239**

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Start of Project/Programme Implementation	March 2016
Mid-term Review (if planned)	March 2018
Project/Programme Closing	September 2020
Terminal Evaluation	October 2020

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

A.1 INTRODUCTION TO PROJECT COMPONENTS

The proposed adaptation project consists of four components, namely: 1) Implementation of interventions in pilot strategic areas to improve resilience of target coastal communities and key coastal marine ecosystems to climate change and variability-induced stress; 2) Deployment of a modern and efficient environment surveillance and prediction system in the marine-coastal marine ecosystems at regional and local scales supporting fisheries adaptive management under the EAF principles; 3) Capacity building and knowledge management system for implementing the EBA and the EAF, and for the dissemination of project's lessons learned, targeting government officials, academia, stakeholders and local communities and 4) Management policies, regulations and measures promoting the resiliency of coastal ecosystems and local communities to climate change and variability-induced stress.

These adaptation actions will be carried out both at the national and sub-national levels involving a variety of stakeholders including local fishers's associations, local development agencies and other governmental agencies. Interventions in the first component are centred in two pilot areas, namely Máncora and Huacho, while the other three will have in addition a national area of action, necessary for the success of this project.

The adaptation approach which will be adopted for the proposed project, responds to the recommendations presented by international experts from developed and developing countries during the workshop "*The Economics of Adapting Fisheries to Climate Change*" organized by the OECD in Busan, Korea in 2010 to address challenges of climate change for fisheries and to provide practical insights to policy makers.

It is expected that climate change will impact on the biodiversity, habitat quality, carrying capacities and life cycles of marine ecosystems and organisms, as well as on socio-economic services, such as fish catch potential, fishing efforts and fishers incomes, increasing the vulnerability of the ecosystem and the human local communities. Other anthropic stressors, as by-catch, discard practices and pollution can further amplify climate change impacts through effects on ecological processes, as spawning rates and distribution of nursery grounds[4]. Consequences on catch and fishing effort also imply changes in the mean trophic levels of the fishery community (Pauly et al., 1998)

[4] The economics of adapting fisheries to climate change, OECD 2010

A combination of replicable actions at local scale (targeting affected communities) and national policies (need to be developed for a long-term and effective enabling environment) are both required to ensure a successful adaptation process. Benefits from these adaptation measures could be distributed along the short and the long-term. Of special interest are those contributing to the welfare of local communities, preserve or restore key ecosystems while bringing immediate and concrete development co-benefits. Adaptation measures bringing long-term benefits, such as coastal marine zoning or implementation of marine protected areas, contribute to create an enabling environment for the successful execution of adaptation measures and to the sustainability of the results. The proposed project is designed to follow this strategy, by articulating four types of adaptation measures (as mentioned before) benefiting two pilot areas in the short and long-term. This will also bring benefits nationwide, by strengthening existing governmental capacity to learn from the pilots and direct apply lessons learned to decision making, enhancing climate change adaptation.

Specifically, the group of short to long-term adaptation measures proposed by the project are aimed to help local communities living in the coastal areas of Huacho and Máncora to cope with climate change impacts and threats that include: (i) vulnerable resource stocks and fisheries productivity, (ii) increased variability and uncertainty of fishery yields, (iii) changes in distribution of fisheries, (iv) increased vulnerability of communities and infrastructure to climatic extremes (precipitation, floods), (v) trade and market shocks (Table 1).

Climate change impacts and threats	**Adaptation measures at target pilot areas**
Vulnerable resource stocks and fisheries productivity	Reduction of fishing pressure through improved fishing selectivity and implementation of the Ecosystem Approach to Fisheries (EAF) (Component 1) Restoration and co-management of natural banks (Component 1). Improved value of fish and other resource products for human consumption, through sustainable gears, fishery certification and access to high value markets (Component 1)
Increased variability and uncertainty of fishery yields	Diversification of economic activities (ecotourism, aquaculture and conversion of residues to bioproducts) (Component 1) Implementation of Ecosystem Based Adaptation (EBA) and Ecosystem Approach to Fisheries (EAF) (Component 4)
Changes in distribution of fisheries	Bio- oceanographic monitoring and ecological modelling to predict changes in resource availability (Component 2) Ecological risk assessments of key species for integrated adaptive management (Component 2) Precautionary management based on ecological risk assessments and model predictions (Component 2)
Increased vulnerability of communities and	Improved climatic and oceanographic surveillance and deployment of early warning system (Component 2) Use of scenarios of climate change impacts for ecosystem based

infrastructure to climatic extremes (precipitation, floods) Trade and market shocks	adaptation and infrastructure planning (Component 3) Improved self-organization of local fishing communities to make use of science based information, market opportunities and diversification of economic activities (Component 1)

Table 1. Climate change impacts and adaptation measures to be applied in the project (adapted from Daw et al., 2009)

Figure 2 below shows project's components' inter-relations under a climate change impacts framework. Starting from the top of the figure, climate change affects directly the provision of services by the coastal marine ecosystems in Peru at multiple levels (productivity, distribution, biodiversity, etc.), which will put in danger coastal communities' livelihoods in areas already vulnerable (e.g. with significantly high poverty levels) partly due to other non-climatic stressors.

As shown in the figure below, components 2 and 4 tend to share the same "area" of action, that is improving the understanding of climate change impacts on distribution, growth and reproduction of fish-stocks through the deployment of a monitoring system and applied research sub-component seeking to develop long-term scenarios for adaptive planning and also the know-how required for the sustainable exploitation of the selected environmental services; and develop the regulation, policy and administrative capacity to create the enabling environment for the fishing communities effective management of the selected "area of exploitation".

For example, the information from monitoring and modelling activities in component 2 will feed the early warning system, which in turn will contribute to propose regulations of adaptive management considering environmental changes in component 4.

Similarly, components 1 and 3 will be focused on the implementation of a group of site-specific productive activities to enhance the income of the associated fishing community also providing alternative livelihoods and assuring the means to disseminate lessons learned and strengthening the community to execute its role as main partners in the management of their "area of exploitation". Component 3 will have in addition a national area of action.

For example, capacity building about selective fishing, aquaculture, ecotourism and co-management in component 3 will be immediately and directly applied to adaptation measures of economic diversification in component 1 (e.g. scallop aquaculture, razor clam co-management in Huacho, tuna selective fishing and whale watching in Máncora).

As the Peruvian coast is a region of exceptionally high and sustained upwelling, it likely sustains a larger artisanal fishery than less productive coastal areas in other countries. Also, the GoP has defined exclusive fishing rights for an artisanal fishery (boats less than 10 tons, and up to the 5 nautical miles of the coast) and for a minor scale fishery (boats between 10 and 32.5 tons, and from 5 to 10 nm), but they are not restricted to this area and often capture fish as far offshore as 200 nautical miles. They therefore contribute to existing environmental and economic pressures on the Peru's coastal marine ecosystem. Studies carried out by IMARPE

between 1996 and 2006 confirmed that natural phenomena like El Niño events had a significant effect on abundance, range and availability of the dominant species in the artisanal fishery catch. It can therefore be expected that changes in the climate with subsequent impacts on the ecosystems' capacity will put at risk the long-term sustainability of artisanal fishing. Their flexibility in responding to variations in type and location of catch, however, could be an important asset in adapting to future changes.

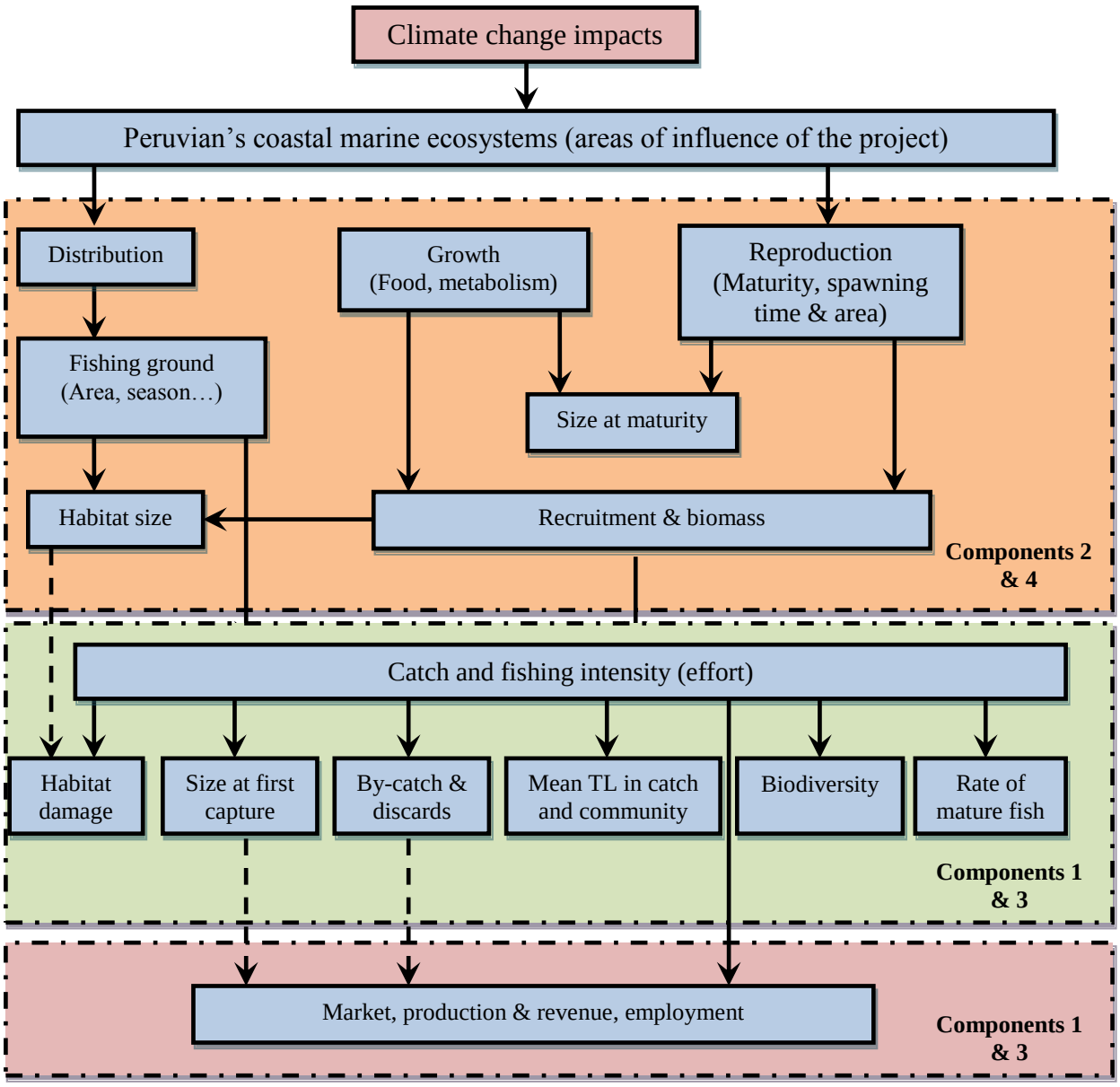

Figure 2. Flowchart indicating climate change impacts in marine ecosystems and areas of influence for the project. Source: adapted from Grafton (2010).

of volume but also for its socioeconomic effect, being a source of employment and sustenance for a significant number of Peruvians. Its rate of growth has, however, been

slower than other sectors of the economy and the artisanal fisheries sector has not received the needed support to achieve sustainable growth. Nonetheless, the number of fishers has increased 17% in the last 8 years to almost 44,161, while the number of vessels has increased 66% to almost 16,045 (IMARPE 2004, INEI 2012).

A.2 DESCRIPTION OF PROJECT COMPONENTS

Component 1. Implementation of interventions in pilot strategic areas to improve resilience of target coastal communities and key coastal marine ecosystems to climate change and variability-induced stress

Selection of Pilot Areas

The Peruvian coast is affected by two main climate and oceanographic systems. The Northern coast is partly under the influence of warm tropical waters and high precipitations on land, whereas the rest of the coast is subject to the cold coastal upwelling waters and arid conditions on the continent. Current trends in coastal SST exhibit significant warming for the Northern coast (<06°S), contrasting with strong cooling from the central coast to the south (Gutiérrez et al., 2011). This behavior is also associated with different trends in productivity and possibly subsurface water oxygenation (Demarcq, 2009; Quipúzcoa et al*.,* accepted).

The selection of pilot sites is the result of a multidisciplinary analysis based on the different types of exposure to climate change impacts and variability, general ecological characteristics of the Peruvian coast, the presence of artisanal fishers' communities and the availability of resources. It was determined that within the existing resource envelope only two sites could be incorporated. It was also decided that one site should be located in the Northern part of the coast at the southern boundary of the Tropical Eastern Pacific Coastal Ecosystem, subjected to the interplay between the warm tropical waters and the northward intrusion of upwelling waters, currently under a warming trend. The second site is representative of the Peruvian Coastal Upwelling Ecosystem, currently under a cooling trend (Gutiérrez et al., 2011) (Figure 3).

The northern pilot area includes the following towns and/or fishing coves: Máncora, Los Órganos, El Ñuro and Cabo Blanco (04°05 – 04°15'S), from which Máncora is the largest, and therefore this area will be referred as Máncora from here on. In oceanographic terms, Máncora faces the seasonal north-south displacement of the Equatorial Front (EF), where the surface tropical waters (with high temperatures and low salinities) mix with the colder waters and higher salinities that characterize the coastal upwelling. The position of the EF is highly dynamic, exhibiting also interannual shifts in its latitudinal position. A summary presentation of the main characteristics of Máncora as pilot site is shown in Table A1 (Annex I).

The second pilot area is distributed from Don Martín Island to cape Punta Salinas (11°01'S – 11°19'S), and includes the following towns and/or fishing coves: Végueta, Huacho and Carquín, from which Huacho is the main one, and therefore this area will be referred after its name from here on. Here coastal upwelling is the driver for coastal marine life. The islands and Cape Punta Salinas are part of the Guano Islands and Capes National Reserve. The coastal-marine zone of Huacho and Carquín has nutrient rich waters with several important fishing grounds for artisanal fishers. This area has also sandy shores that are used in summer by local population as recreational places, wetlands rich in migratory birds and islands with

abundant areas for natural banks of marine invertebrates. A brief of the Huacho pilot area is given in Table A1 (Annex I).

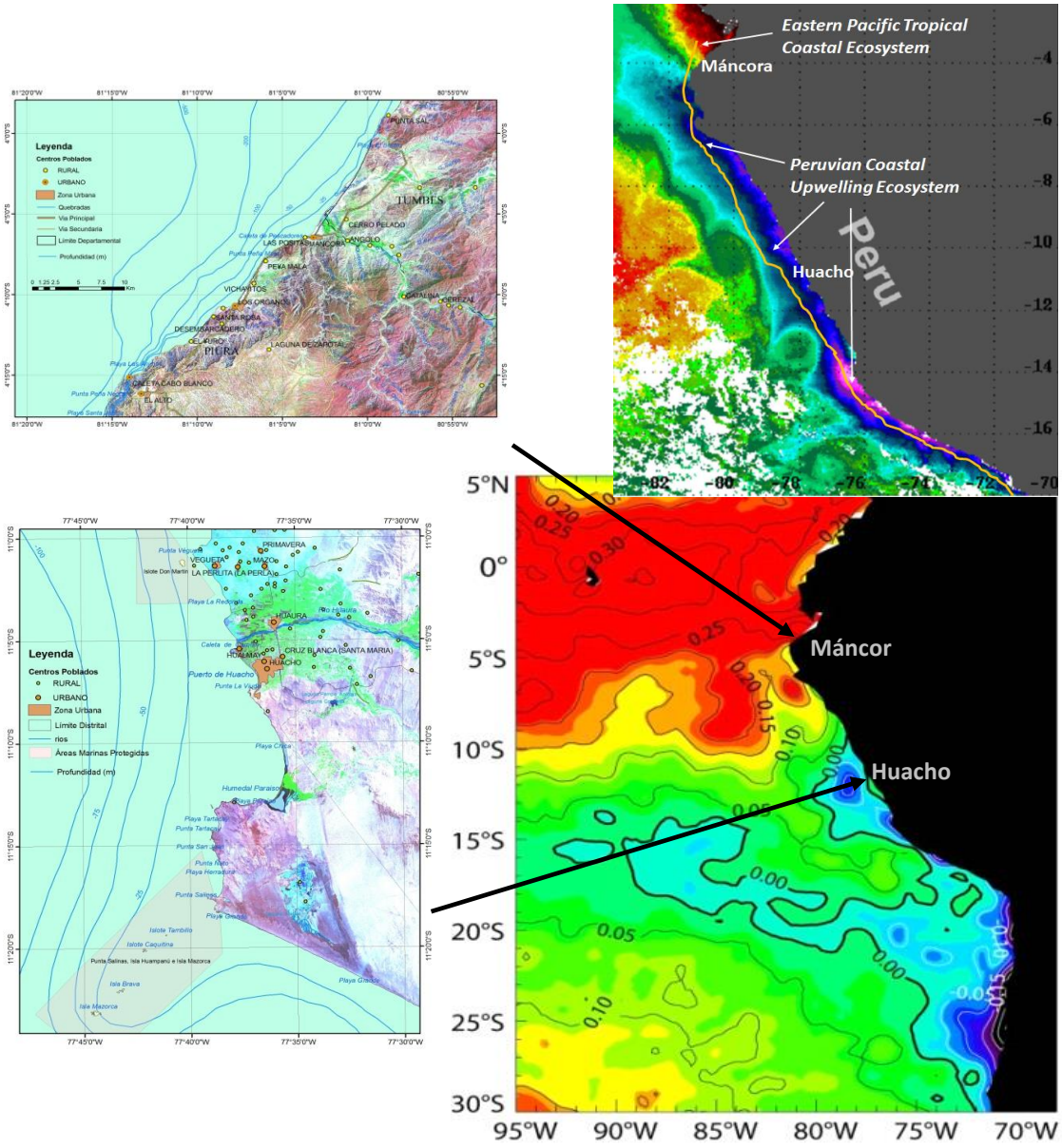

Figure 3. On left: Satellite maps of Máncora (above) and Huacho (below) coastal areas. On right, above: distribution of sea surface temperature (°C) along the Peruvian coast, for April 2005 (modified from Bakun & Weeks, 2008); the approximate distribution of the target ecosystem is shown; the dark yellow line is the continental shelf extension; below: SST trends along the coast (Gutiérrez et al., 2011).

In general terms, the group of adaptation measures to be implemented under component 1 can be classified in four different types: (i) expansion of improved fishing practices and promotion of environmentally friendly gears; (ii) facilitating the emergence of ecotourism activities, (iii) development of sustainable aquaculture banks in selected areas, and (iv) conversion of fishery and aquaculture residues into biofertilizers.

In order to facilitate the presentation of key information for each of the two specified pilot sites, two summary sheets have been developed, highlighting specific adaptation interventions per site. These are presented below, while additional detailed information can be found in the Annex I.

MÁNCORA

Coastal Marine Zone Characterization

The following table summarizes main factors that define Máncora coastal marine zone.

Factor/feature	General characterization of the pilot area
Area of intervention	Máncora to Cabo Blanco
Key physical forcing	Equatorial front
Coastal marine habitat	Vulnerability to climatic extremes (floodings, ENSO). Domestic (sewage) water pollution
Coastal biodiversity	Panamanian province and ecotone to Peruvian province (south); migration route of cetaceans and turtles
Main target species	Giant squid (*Dosidicus gigas*), Yellowfin Tuna (*Thunnus albacares*), hake (*Merluccius gayi peruanus*)
Main artisanal fishery resources/landings rank (Máncora)	Giant squid, hake, Yellowfin Tuna (rank 21)
Anthropogenic pressure on top predators	Gillnet fishing – cetaceans and turtles
Hazards or conflicts in coastal marine management	Territory use/planning and climatic vulnerability and coastal marine pollution
Climatic projection hypothesis up to 2030	Sea Surface Temperature (SST) has already increased by +0.4 ºC, further increases are associated with increase probability of extreme precipitations and invasions of the sea to estuarine areas

Table 2. Characterization of Máncora pilot site

Fishery

The following table presents a summary of main fishing factors per cove or area of influence of the project, including the number of employed vessels, number of fishers and types of fishing gears used. Use of traditional fishing gears continues to be prevalent, with the use of non-specific gears and poor processing practices. It is estimated that 35 percent of all fishing boats use non-environmentally friendly gears.

Cove	Population	Number of fishers	Number of vessels	Associated to trade unions	Type of fishing gears	Infrastructure	Main target species	Level of poverty
Cabo Blanco	7,101	600	200	496	Purse seine, long-line, hook	Breakwater, pier	Hake *(Merluccius gayi)* and scombrids *(Scomber japonicus)*	Poor
El Ñuro	1,200	450	170	200	Long-line, hook	Breakwater, pier	Hake, Yellowfin tuna	Poor
Los Órganos	8,283	450	120	223	Gillnet, hook	Breakwater, pier	Hake/giant squid	Moderately Poor
Máncora	12,619	700	130	320	Gillnet, longline, hook	Breakwater, pier	Yellowfin tuna, scombrids, Hake	Moderately Poor

Table 3. Summary of fishing data for Máncora, updated to 2012 (Source: IMARPE)

This area is nowadays not a landing zone for the industrial fishery, but lies within the main distribution area of hake (*Merluccius gayi peruanus*), which is the main demersal[5] resource of the Peruvian coast. Also it is the most important artisanal fishing zone for the Yellowfin Tuna, Marlins and for other oceanic large-sized species.

Artisanal vessels perform nearly all of the fishing activities in the coves. They exhibit a high diversity of fishing gears (gillnets, long-line, hook and purse seine) and fishing targets, dominated by the giant squid *Dosidicus gigas* (but with very high variability) and large oceanic fishes, as tunas, sharks, marlins (*e.g*. *Makaira indica* and *Tetrapturus audax*), giant manta (*Mobula thurstoni*), scombrids and coastal demersal fishes, including hake.

In general, the landings are characterized by a large variability in species composition and amount of landings, according to the highly variable oceanic conditions. Among the top three resources in landing statistics for the past decade is the Yellowfin Tuna (*Thunnus albacares*). Its landings have shown an increasing tendency in the past decade. It is worth mentioning that the

[5] Describing a fish that lives either close to the seafloor, or that are temporarily in direct contact with the sea bottom (Lalli and Parsons, 2006)

fluctuations of the landings of Yellowfin Tuna, and of other tropical oceanic species are related to ENSO. For instance, higher catches in 2003, 2007 and 2010, followed the moderate El Niño events in the past decade.

Banks and fishing grounds

Banks of several benthic resources are present in the pilot area but they are not well studied. There have been reports on small banks of the Pearl oyster (*Pteria sterna*), from Máncora to Los Órganos, and of the Oyster (*Crassostrea iridescens*), from north of Máncora to Punta Sal (Carbajal et al., 2010; Ordinola et al., 2010).

Socio-economic conditions

The coast of Máncora is characterized for having several coves and bays from which fishing communities develop their activities. The main settlement is Máncora with a population of 10547 people, composed mainly by fishers (10.3%), drivers of transport vehicles (9.7%), shopkeepers and dealers (9.5%), followed by cooks, hotel personnel and bricklayers (about 5% each). In recent years Máncora has received an increasing number of national and foreign tourists, leading to a rapid building of hotels along its coastal line. Poor sanitary infrastructure (only 58.3% of houses are connected to the public sewer system) cause serious risks of pollution affecting coastal marine activities. Other fishing communities are located in Cabo Blanco (population 7,137, socio-economic level: poor), El Ñuro (population 9,612, socio-economic level: moderately poor), and Los Órganos (population 9,612, socio-economic level: moderately poor).

Proposed adaptation response

Environmentally friendly fishing gears

Currently, tuna fishing is carried out using gillnets, which are not selective enough. The project will finance the installation of new selective fishing gears (long-lines) in 45 boats in Máncora cove. Using these new gears will reduce fishing pressure of non-target species and will improve the quality of the target species while protecting their juvenile stages, thus opening access to high-value markets for artisanal fishers. Also, fish food fairs will be promoted to expand local consumption of artisanal fish products ensuring food security in vulnerable communities. Participation of women will be promoted in this activity.

Ecotourism

Northern Peru has a high marine diversity (e.g. whale-watch) favoring the creation of ecotourism enterprises by artisanal fishers. The project will promote the participation on women in activities related to ecotourism in a wide range of roles like business management, tourist guide, production and selling of handicraft souvenirs. Fishers will be trained on good practices of ecotourism and monitoring incidental catch of marine vertebrates, as well as in recovery, rehabilitation and release of incidentally caught species (e.g. seabirds, turtles and mammals). Agreements with fishers and continuous monitoring will ensure that good practices of ecotourism operations, noise control and pollutants disposal will be accomplished.

HUACHO

Coastal Marine Zone Characterization

Factor/Feature	General characterization of pilot site
Area of intervention	Don Martín Island/Végueta to cape Punta Salinas
Key physical forcing	Coastal winds
Coastal marine habitat	Subjected to chemical pollution (fisheries, agriculture) and domestic sources. Vulnerability to climate extremes (El Niño)
Coastal biodiversity	Wetlands, islands and inlets; habitats for migratory birds, colonial guano bird and marine mammals
Main resources	Anchovy (Central-Northern stock)
Main artisanal fishery resources, landings rank	Anchovy, scombrids, coastal fishes
Anthropogenic pressure on top predators	Pressure on habitat areas of marine birds and mammals
Hazards or conflicts in coastal marine management	Territory use/planning and climatic vulnerability, coastal marine pollution
Climatic projection hypothesis up to 2030	High degree of uncertainty (cooling or warming)

Table 4. Characterization of the Huacho pilot site

Fishery

The recent coastal cooling trend of Central and Southern Peru has not been translated in a positive trend of anchovy's biomass, which has exhibited interdecadal fluctuations following changes in upwelling and oxygenation (Bertrand et al., 2011). Since year 2000, the biomass is rather stable at about 10 to 12 million of tons (Fréon et al. 2008). Nevertheless acoustic biomass estimations suggest a northward shift in the gravity center of the population, from about 12 – 14 °S in the 1970's to 6 – 8 °S in the last decade (M. Gutiérrez et al., accepted). The large fishing capacity by the industrial fleet (Fréon et al., 2008) might have limited the biomass growth, but other ecological factors linked to the environmental change could also have limited the carrying capacity.

Historically the Huacho harbor has been an important landing point for the industrial fishing of anchovy and several factories for fishmeal and oil production are established. Since 2009, the artisanal fleet is fishing the anchovy, encouraged by the government policies to increase the direct human consumption, and now anchovy landings represent over 90% of the total artisanal fishery landings in the Huacho area. As other areas subjected to coastal upwelling, the waters are cold and very productive, being the natural habitat of the Peruvian anchovy *Engraulis ringens*. The topography favors the existence of natural banks of benthic invertebrates, among which there are several subtidal mollusk species of high commercial value and demand.

However, the use of purse seines with a mesh size of only 38 mm, which is adequate for anchovy, has an impact on the higher prized species because it extracts mostly juveniles and

creates conflicts with the gillnet fishers which target the same species. Furthermore, this fishing gear is not appropriate for the pretended use of direct human consumption, because the product arrives in damaged condition due to the character of the fishing practice, so that it is offered for the fishmeal factories. The final effect is adding fishing pressure and increasing the vulnerability of this resource and of other coastal species. Therefore the IDB funded project has initiated an adaptation strategy to effectively reduce the fishing pressure on anchovy, while improving the incomes of the fishing communities, which all together would improve the socio-ecological resiliency to climate change impacts.

Exploitation of natural banks of benthic[6] invertebrates

The topography favors the existence of natural banks of benthic invertebrates, among which there are several subtidal mollusk species of high commercial value and demand. Some of the major banks are located onshore Don Martín Island, and in the cape Punta Salinas which are protected areas, offering a chance for their sustainable management. Two of the main benthic resources with high commercial value (for export and for national consumption) are the Peruvian scallop (*Argopecten purpuratus*) and the razor clam (*Ensis macha*).
In the Huacho area, the main natural bank of the razor clam is in cape Punta Salinas, whereby hydraulic dredging has also been reported. Even though law forbids this practice, it is still a threat over the population and its habitat due to the lack of effective control and attractive fishing gears for economic profit. In Punta Salinas, a ban established in 2008 has allowed the recovery of the adult population but the restoration of the silty sand bottoms are slow, putting in danger the renewal of the bank (IMARPE, 2011).
The following table presents a summary of main fishing factors per cove or area of influence of the project, including the number of employed vessels, number of fishers and types of fishing gears used.

Cove	Population	# of fishers	# of vessels	Associated to trade unions	Type of fishing gears	Infrastructure	Type of catch	Level of poverty
Végueta	18,265	160	50	160	Gillnet	No breakwater pier available	Small coastal fish	Poor
Huacho	53,998	907	243	907	Gillnet, purse seine, long-line, hook	Breakwater pier, standard generation set, areas for fish manipulation	Chilean Jack Mackerel and Peruvian anchovy	Acceptable
Carquín	6,091	250	150	250	Gillnet	No breakwater pier available	silverside and lorna drum	Poor

Table 5. Summary of fishing data for Huacho, updated to 2012 (Source: IMARPE)

[6] Benthic means "bottom", which encompasses the seafloor (Lalli and Parsons, 2006)

Socio-economic conditions

In Huacho, the main economic activity is small scale trade (9.2 % of population), teaching (7.9 %, mainly related to the Huacho University), restaurants (6.1 %), construction (4.6 %), transport (4.6 %) and fishery (3.2 %). In Carquín, economic activities comprise small-scale trade (17.5 %) and fishery (15.3 %), with two fishmeal plants, and artisanal harvest for direct human consumption. Also, in Carquín other activities such as agriculture, cattle, poultry, bovine and pork industries are developed.

Administratively, this pilot area belongs to the Huaura province (197,384 inhabitants), from which the main district, harbor and population center is Huacho (53,998 inhabitants). The two other districts with coastal populations and fishing coves are Carquín (6,091 inhabitants) and Végueta (18,265 inhabitants). The number of people working in artisanal fishery is 907, 250 and 160, respectively, so that the families that depend directly from this economic activity are about 1,300.

Proposed adaptation response

The three main artisanal fishery resources for Huacho coastal communities (i.e. Anchovy, Peruvian scallop and razor clam) are sensitive to climate-driven oceanographic changes and their distribution have responded to the recent environmental changes, but their future behavior is uncertain due to the non-linear character of the climate change impacts in the upwelling ecosystem (Echevin et al., 2011). Therefore adaptation measures need to be applied to maximize the opened opportunities and to minimize the vulnerabilities of the resources driven by the current fishing practices, limited information of the coastal ocean dynamics/ future regional climate change scenarios, and management limitations.

Aquaculture

Aquaculture of scallops will be carried out in bottom pens as an economic alternative to fishing. The first year, scallop seeds will be acquired from hatcheries located in the Central coast of Peru (*e.g*. Pisco or Casma) and later re-stocking of natural banks in protected areas will serve as sources of larval supply. In addition, fishers will be trained in good aquaculture practices and pollutants disposal. Agreements with fishers and continuous monitoring will ensure the longterm commitment that good practices of aquaculture will be accomplished. Environmental impact of bottom pens will be studied through research thesis.

Co-management

Effective sustainable use and conservation of natural banks need the implementation of a co-management approach, in which the government allows participation of the fishers community in some aspects of management: monitoring, protection, territorial exclusivity, etc. Restoration of scallop banks in protected areas and co-management planning of razor clam banks will contribute to set the technical and legal basis of this approach. Power sharing arrangements between fishers and government will promote participation of local communities in natural banks monitoring and harvest control.

Bioproducts

Currently, liquid and solid residues of artisanal fishery and aquaculture are disposed to the sea, generating pollution problems. Fishery residues generated during landings at harbors and biofouling residues generated in suspended aquaculturecan be converted into biofertilizers, biodiesel and food for animals. The Universidad Nacional Agraria La Molina (UNALM) has developed the technique of bioconversion through a process of crushing, homolactic anaerobic fermentation and stabilization. This technique has not been applied to large scale yet. UNALM will provide this technical support to the project. Conversion of residues into bioproducts is a sound adaptation measure which can be a source of income for artisanal fishers, through commercialization of these organic bioproducts which are highly effective on agriculture, and at the same time it can reduce environmental impacts generated to the sea. , These activities can be carried out by women thus enabling the gender approach in the project.

<u>Component 2.</u> Deployment of a modern and efficient environment surveillance, prediction and information system in the coastal marine ecosystems at regional and local scales supporting marine economic activities and fisheries adaptive management under the EAF principles

The output of this component is a modern system of climatic and oceanographic surveillance, forecasting and long-term prediction, including biological, physical and chemical variables, which will be used for early warning and for supporting ecotourism, aquaculture and fishing activities as well as adaptive fishery management. Local stakeholders will contribute through the protection of instruments and loggers as well as fishers as observers.

Component 2 will support Component 1, by offering opportune information of processes such as harmful algal blooms, sulphidic plumes and extreme events such as El Niño. This information will be quite useful for planning, preventing and correcting actions for decisionmakers and fishers.

The ocean climate and the marine productivity of Peru are controlled by a few main factors, namely: 1) the Walker Circulation, which sets the depth of the thermocline[7], influencing the fertility of the subsurface waters; 2) the intensity of coastal winds that drive upwelling of those subsurface waters and promote mixing in the upper water column; and 3) the spatial distribution of surface to subsurface water masses. In turn, air-sea interactions feedback on the continental climate; e.g. on the precipitation anomalies in the North or on the low-atmosphere cloud cover in the rest of the coast. Current information deficits[8], originated by the lack of: (i) sufficient ground

[7] As one descends from the surface of the ocean, the temperature remains nearly the same from the surface down to a certain depth, but decreases rapidly from that point downward. This boundary is called the thermocline. (NOAA http://www.weather.gov/glossary/)

[8] Current land-ocean climate monitoring platforms are insufficient to determine the key parameters at the right timing for a proper warning system on meteorological and oceanographic conditions, as well as potential events triggered by the warming or cooling processes (e.g. possible increase of El Niño events, more frequent wind storms). Subsurface fields of currents, temperature and salinity (which influence upwelling) are measured in seasonal to semiannual intervals, but little is known on the synergy between large-scale anomalies with smaller-scale local to regional atmospheric processes that can amplify the anomalies physically or ecologically.

Moreover, it is also known that coastal winds over the first 50 km offshore are poorly sampled by satellite data and occasional scientific cruises (Echevin et al., 2011). The meteorological network at the coast is restricted to a few airports, which are not necessarily located in exposed areas to have a better representation of the upwelling winds.

measuring stations and (ii) remote observation and monitoring data, limit the understanding of the interaction among the main factors mentioned above. The proposed adaptation measure is designed to fill the gaps of information, through an improved system of climatic/oceanographic surveillance and prediction.

For the surveillance component, at each pilot area, this system will consist of: a) periodic (weekly) 80 km onshore-offshore oceanographic sections (0 – 200 m) carried by autonomous devices (gliders), equipped with sensors of temperature, salinity, oxygen, pH and chlorophyll-a; b) continuous (e.g. hourly) SST and surface salinity recording within bays, capes, islands, oil platforms and/or intervention sites (natural banks or aquaculture areas); c) continuous (e.g. real-time) recording of the weather conditions, coastal winds velocities and directions, by coastal marine meteorological stations located on capes or islands, which will be complementary to the national meteorological stations network; d) periodic bio-environmental monitoring at selected sites and/or the intervention sites, for ecosystem health indicators in plankton, benthic habitat quality, distribution of key species, and supportive chemical variables as pH and oxygen. The latter will enable the development of baseline studies needed to provide the science-basis for management of natural banks and sustainable aquaculture practices.

In addition, IMARPE's facilities will be improved for storing, analyzing and disseminating international satellite data (e.g. winds, temperature, chlorophyll, altimetry and turbidity). These products will allow to monitor generation of Kelvin waves by winds, temperature changes due to El Niño, color changes due to harmful algal blooms or sulphidic plumes, and currents or eddies with altimetric data. These events will in turn trigger preventive and corrective actions beneficial to fishers and decisionmakers.
Data of the marine and meteorological stations will be exchanged with other climate research institutions, and a proper near real-time interface to disseminate the information to the community will be opened in the IMARPE's information center webpage. The data will be accompanied by periodic reports oriented to the early warning on weather, climatic or oceanographic conditions, including those related with ecosystem health, as red tides, anoxia, or jellyfish blooming. These reports will be delivered to all stakeholders (see also Component 3).

Artisanal communities will be sensitized in order to support the operation and maintenance of meteorological and oceanographic equipment, in the context of a participatory early warning system and establishment of marine environment surveillance programs in pilot areas in coordination with local stakeholders. In the longterm, regional governments could contribute to co-finance monitoring programs.

The repetitive oceanographic sections will deliver useful information both at regional and at local scales, since they will cover from near to the coast to beyond the continental shelf extension down to 200 m of water depth. Therefore the main coastal circulation processes will be monitored. In the North, the meridional displacement of the Equatorial Front and the Equatorial Undercurrent activity will be determined. Off Huacho, the zonal displacement of the upwelling front as well as the cross-shore advection processes and the activity of the Peru-Chile undercurrent will be tracked. It is important to note that the fronts' positions are related with the

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Nearly real-time surface water masses distribution is currently inferred from remote-sensing Sea Surface Temperature (SST) fields, but this is severely limited by salinity information, particularly in the North, where a large salinity gradient occurs with the Equatorial Front. Finally, current monitoring of properties, which are not conservative such as oxygen and pH is still sparse in time and in space.

habitat size of nektonic resources[9], as the anchovy, the giant squid or the yellowfin tuna in the North. Monitoring of chlorophyll-a and dissolved oxygen will indicate the status of biological productivity, as well as the vertical habitat size for pelagic resources and the habitat quality for aerobic demersal and benthic organisms. Measurements of pH will allow recording the response of the acidity conditions that might be amplified or buffered due to variations in SST and coastal productivity.

The implementation of the gliders' platform will require a sustained system to ensure proper buoyancy and navigation of the devices, as well as basic capacities for their electronic maintenance. Also, at least one backup device is needed in order to guarantee a continuous surveillance at each pilot area. Therefore five gliders will be acquired by the project, and facilities will be installed at IMARPE headquarters for the maintenance and tests of the equipment. Recruitment and training of personnel will lead to implement an electronics team in IMARPE that will contribute to give sustainability to the surveillance platform beyond the end of the project. Furthermore, the oceanographic instrumentation of the coastal laboratories of IMARPE will be improved in order to complement the surveillance at local level and ensure the data quality from near shore areas.

On the other hand, local weather forecasting will be improved by the information provided by the meteorological stations and the satellite data mentioned above. The meteorological data will be integrated in the network of the Peruvian Survey of Meteorology and Hydrology (SENAMHI), which is the official institute that delivers weather forecast in the country.

For long-term prediction purposes, trained human resources at the modeling laboratory of IMARPE will allow to yield: (i) implemented, calibrated and verified high resolution local models of the physical processes in the coastal marine environments; (ii) implemented, calibrated and verified high-resolution bio-physic-chemical coupled local models representing impacts on high and low trophic levels of ecosystems; (iii) analyses of impacts of climate change by 2030 on biomass production under a pessimistic and optimistic IPCC climate scenarios and (iv) economic valuation of the predicted impacts of climate change on artisanal fisheries (jointly with Component 4).

Currently, there is great uncertainty about the specific impacts of climate change on Pacific coastal upwelling ecosystems. On one hand, the hypothesis of coastal warming (Vecchi, 2010) is based on a potential weakening of the Walker Circulation[10]. On the other hand, the hypothesis of upwelling enhancement (Bakun, 1990) is based on the expected strengthening of the costal winds due to the increase of thermal gradients between the land and adjacent coastal ocean. Recent simulations suggest a warming scenario, but the retrospective trends suggest a cooling scenario for the Central-Southern Peruvian coast.

Therefore this component, through the deployment of state of the art monitoring technology and complementary modeling activities, will help reducing uncertainty of current available estimations of climate change impacts on the Peru's coastal marine ecosystems. This will be achieved with the help of local high-resolution simulations of the physical manifestations like

[9] The collection of marine and freshwater organisms that can swim freely and are generally independent of currents, ranging in size from microscopic organisms to whales. (http://www.thefreedictionary.com/nektonic)

[10] Being the result of a difference in surface pressure and temperature over the western and eastern tropical Pacific Ocean, the Walker Circulation is an ocean-based system of air circulation that influences weather on the Earth. http://www.windows2universe.org/earth/Atmosphere/walker_circulation.html&edu=mid

temperatures, salinities and currents, and the biological responses to climate change at local spatial scales, and for short-term and long-term climate scenarios and decision-making.

The physical processes in the Peru's coastal marine ecosystems will be modeled with the Regional Ocean Modeling System (ROMS)[11] (Shchepetkin & McWilliams, 2005; Penven et al., 2005) that will be forced by high resolution data extracted from the Weather Research and Forecasting (WRF) model[12]. Outputs from models of the Intergovernmental Panel on Climate Change (IPCC) (Marti et al., 2010) will be used to provide the initial and boundary conditions for the WRF model. A pessimistic (RCP8.5) and an optimistic (RCP3PD) scenario will be used at different time-slices as required.

This physical model will be coupled to a bioclimate envelope model (Cheung et al. 2008, 2009) in order to predict future changes in habitat distribution, relative abundances and catch potentials of characteristic species from the coastal upwelling systems along the Peruvian coast. The bioclimate model consists in identifying a set of physical (e.g. SST, oxygen) and biological conditions that are suitable to a given species. Thus, shifts in species distributions can be predicted by evaluating changes in bioclimate envelopes under climate change scenarios. The application of this approach has allowed the prediction of global and regional changes in fish biodiversity, biogeography and fisheries production under climate change scenarios (Cheung et al., 2009, 2010). For the achievement of this goal, IMARPE's modeling unit will need to be reinforced so the required technical capacity needed to perform the modeling is met.

Finally, a bio-economic model, characterized by the use of economic information of prices and costs, as well as fishery information of catches and biomasses will be applied to assess the economic impact of climate change on the main fishery resources for both IPCC scenarios (Van den Bergh et al., 2006). These predictions will provide the scientific basis for a better understanding of the economic impacts of climate change on the Peru's coastal marine ecosystem and the assessment of suitable and cost-effective adaptation measures.

Altogether, monitoring, modeling and prediction will contribute to the development of Ecological Risk Assessments (ERAs) related to climate change impacts on biotopes, natural banks and key selected species (see below).

In addition, undergraduate/graduate theses will be carried out on: a) population studies related to the most important artisanal fishing resources in order to guarantee its sustainable use; b) studies of alternative economic activities for artisanal fishers and their families for each pilot area; and c) studies about risks and vulnerability of fishing and aquaculture activities as well as of the coastal communities. These theses will provide support to sustainable management of coastal resources, natural banks and aquaculture, as well as study-cases of ecological risks assessments under climate change, and vulnerability assessments of local coastal communities.

[11] ROMS is a free-surface, terrain-following, primitive equations ocean model widely used by the scientific community for a diverse range of applications http://www.myroms.org/

[12] A next-generation mesoscale numerical weather prediction system designed to serve both operational forecasting and atmospheric research needs http://www.wrf-model.org/index.php

<u>Component 3.</u> Capacity building and knowledge management system for implementing the EBA and the EAF, and for the dissemination of project's lessons learned, targeting government officials, academia, stakeholders and local communities

The main outputs of this adaptation measure include:

1. Development and implementation of a Knowledge Management Strategy (KMS).
2. Training and sensitizing of beneficiaries on key topics such as good fishing practices, formalization, entrepreneurship, fishery surveillance and control.
3. Design of an early warning system through a participatory process and implementation at local and regional scales.

Output 2 directly support the proposed interventions in the Component 1 (sustainable fishing practices, ecotourism, aquaculture and fishery certifications). Output 3 will directly support the monitoring activities, by building capacities for their operation and sustainability beyond the project (Component 2). Output 1 will be key to build capacities for improving the regulation framework, and the decision-making processes (Component 4).
The project's approach is to increase the resilience of the ecosystems and of the coastal communities by supporting win-win adaptation measures at different levels, in which the main tools are the partnership between the state and the communities for the rational use of the resources, the co-management on the target resources or the incentives for entrepreneurial activities leading to economic diversification.

Thus, a primary condition for the feasibility and sustainability of the adaptation measures and their up scaling to country-level is to build the self-organization capacities of the affected communities. For achieving this goal, seminars and courses will be given to artisanal fishers at each pilot site to increase their awareness of the benefits of having legal recognition, providing the law requirements and regulations which should be followed by establishing formal organizations. In addition, local promoters will provide assistantship to fishers associations that undertake the process, and also will work on engaging other community members for joining the self-organization process. The Direction of Artisanal Fishery in the Ministry of Production has experience in organizational strengthening and they will collaborate in the project during training courses for fishers. As well, the Direction of Biological Diversity of the Ministry of Environment will support the capacity building of fishers.

Replacement of non-selective for selective fishing gears will require demonstrative training. Through agreements with fishers associations, one or a limited number of fishing boats will be equipped with new fishing gears for training the fishers until they acquire the necessary skills; they will also be provided with all the information of the gear life-cycles, maintenance costs and adaptation needs in the fishing units. In parallel, seminars will be offered to fishing communities to transfer the knowledge on the benefits of adopting new fishing practices in terms of resource sustainability, quality of their incomes, and compliance with management policies. The gears' replacement for the target fleet will take place once the training phase will be achieved. In addition, artisanal fishery will benefit from surveillance of fishery operations from fishers.

Technical assistance will be given for fishery certification, first by disseminating the benefits of certification such as improving the value of the fish products, then by giving assistantship during the different phases of the process (pre-certification assessments, steps to encompass to meet the requirements, etc.), including those requirements related to the improvement of management plans for target species. For the latter, technical training will also be given to

policy-makers and management scientists in order to ensure that management plans meet the certification standards.

IMARPE will improve a system of dissemination of fishery and environmental information through cellphones of fishers ("INFOMAR" program). This system will allow fishers to know prices, biological data and other valuable information coming from monitoring devices.

In pilot sites, assistantships for enterprise management, marketing and for business plans will be provided to ensure a profitable demand of the fish products. For those small enterprises to be constituted for ecotourism and aquaculture, training and/or assistantships will not be limited to know-how and technological needs, but also to give the basic skills for an adequate enterprise management, marketing and business plans. Seminars and short course cycles will be organized and offered to local communities and fishermen' family members, particularly local students about these issues. Finally, education and training will also be provided for tasks of basic environmental monitoring, surveillance and control. These responsibilities will be offered as means of partnership with the project, and they will help to internalize the co-management approach.

Given these elements, it is clear that the capacity building component is an essential part of the adaptation project. Training communities imply a major effort in terms of awareness campaigns, courses, seminars and assistantships. An approach that will be applied is to carry out training and education for local promoters, who will be able to disseminate the education contents for a larger universe of potential beneficiaries, following a well structured Knowledge Management Strategy (KMS). The KMS also includes a continuous, opened and friendly web information system reporting local weather conditions and early warnings for oceanographic or environmental events as red tides, jellyfish blooming, or anoxia for local stakeholders, scientific community and general public (see also Component 2). In addition, the website will publish news, guidelines, technical material, information on good practices and program's lessons learnt targeting the fisheries community and including the general public, stakeholders, local communities and academia (see also section G).

It should be noted that all of these efforts will be articulated with existing agencies or actions plans on entrepreneurial capacity building in the local, regional and government levels. For example, the Ministry of Production, to which the Vice ministry of Fisheries belongs, includes a Vice ministry of Small and Medium Enterprises and Industries, whereby several programs to reduce poverty and increase social inclusion take place. In addition, the project will support communities and fishers associations to make use of the consultation mechanisms for planning annual budget, in order to get funding support for actions oriented to multiply training and education programs for artisanal fishing communities giving sustainability to the project in the longterm.

On the other hand, training and continuous formation of technical and scientific staff are needed to achieve a sustainable expertise in the application and/or implementation of the principles of the EBA and the adoption of an Ecosystem Approach to Fisheries[13] (EAF) by the fishery management system. EAF recognizes the interdependence between ecosystem health and human well-being and the need to maintain ecosystems productivity for present and future

[13] EAF is defined by Ward et al. (2002) as "an extension of conventional fisheries management recognizing more explicitly the interdependence between human well-being and ecosystem health and the need to maintain ecosystems productivity for present and future generations, e.g. conserving critical habitats, reducing pollution and degradation, minimizing waste, protecting endangered species".

generations.[14] This effort will encompass a more intense collaboration with the academic system, and national and international scientific institutions.

The Ecological Risk Assessment methodology will form the basis for an effective implementation of the Ecosystem Approach to Fisheries (Fletcher et al., 2002; FAO, 2003, 2005). The ERAs are currently being used for assessing climate change impacts in fisheries and key species of marine ecosystems. The ERAs can provide thorough assessments of the sensitivity and tolerances of critical life history stages, habitats and phenology of key species to climate change drivers. Then they contribute to identify key issues that will affect policy decisions and management arrangements. These risk assessments and the targeted scientific studies that may follow from this prioritization will be necessary for ensuring that the potential impacts of climate change on key marine resources are also communicated effectively to the government and stakeholders. This approach will help to ensure the development of policies and intervention measures to mitigate existing or future risks, by optimizing adaptation responses (e.g. by providing flexible management arrangements) and seizing opportunities as they arise (e.g. for species where productivity increases) (Pecl et al., 2011).

As this is a relatively new approach to fishery management, adequate training will have to be provided for staff from the Vice Ministry of Production and IMARPE in order to ensure a widespread understanding of its value and effectiveness as well as its correct implementation.

Component 3 will receive inputs from Component 2 as s stakeholders will be trained in the use of outputs from scientific models, ocean monitoring and ocean surveillance system, in particular information of local climate change scenarios, harmful algal blooms, sulphidic plumes, and extreme events such as El Niño. .

<u>Component 4.</u> Management policies, regulations and measures promoting the resiliency of coastal ecosystems and local communities to climate change and variability-induced stress

Two major external factors are likely to shape Peruvian fisheries in the future: (a) the continuous growth in global demand for fishmeal and fish oil (Merino et al*.,* 2010), and (b) the expected influence of climate change on the frequency and intensity of ENSO events (Tsonis et al., 2003). The degree to which these factors will affect the economic, environmental and social sector's performance will depend largely on the capacity to build a legal and regulatory environment conducive of a more economically viable and biological resilient sector.

In this regard, the business as usual system regarding the management and governance of fisheries, especially the artisanal, is not an option. Currently, artisanal fishery possesses right to fish within 5 nautical miles of the coastline and small scale fishery from 5 to 10 nm. However, due to changes in location and abundance of catch, artisanal and industrial fisheries frequently interfere leading to conflict and increased pressure on the natural resources. Leaving the current system of weak governance and major regulatory gaps in place will likely create

[14] In terms of climate change adaptation and building resilient systems (i.e. including reducing exposure and increasing adaptive capacities), the application of the EAF would be an important contribution to maintaining biodiversity, preserving the resilience of human and aquatic systems to change, and improving our capacity to anticipate and adapt to inevitable climate induced changes in aquatic ecosystems and the related fisheries production systems. (***Fisheries and aquaculture in our changing climate: adaptation and mitigation measures in fisheries and aquaculture,* 29th Session of the Committee of Fisheries, Italy 2011)**

additional stress in the biological system and accentuate the cycles of collapse and slow recovery. These will further increase inefficiency in the utilization of the fishing and processing investments, exacerbate stress on the ecosystem and result in poor returns from the sector to Peru's economy. Strengthening the governance of the sector could reduce some of the losses and capture significant benefits in ecosystem resilience to the expected impacts of climate change.

The main objectives of this component is to create the enabling condition for the successful implementation of community based management of coastal marine ecosystems in Peru, and to strengthen the current trans-sectoral institutional arrays for the integrated coastal management (p. 49).

Diagnostics and analysis of the current situation with fisheries and artisanal fishing indicate that a great challenge is posed by the fishery surveillance and control of landings in many sites, by many boats targeting different species in the most productive marine ecosystem in the world. It is clear that the GoP does not have the capacity to control this artisanal activity, and that new approaches are needed. One such approach is to empower the community, and create incentives for the management of the natural resources upon which their livelihoods depend. Co-management of coastal marine ecosystem is not new, but its application and implementation in Peru to artisanal fisheries is.

However, project activities are in line with the legal framework of the "General Law on Fisheries" (Ley General de Pesca) which states that fishing management systems should conciliate the principle of sustainability in order to obtain social and economic benefits (article 10). This law, also considered as a measure ordering systems to preserve the hydrobiological resources, in order to achieve sustainability and sustainability of fishing activities; Accordingly, the GoP, through public policy, has determined the regulation of fishing effort, catch quotas permissible, minimum sizes of extraction, methods of fishing and other rules that lead to the preservation and rational exploitation of the hydrobiological resources, which, from being violated, are punished in accordance with the Texto Unico Aprobado del Reglamento de Inspecciones y Sanciones pesqueras y Acuícolas approved by the Decreto Supremo No. 019-2011-PRODUCE.

On the particular control measures that ensure compliance with the established policies have been adopted:

1. Measures of conservation of "juvenile" and prohibition of the disposal of hydrobiological resources. Regulatory framework: D.S. No. 008-2012-PRODUCE. Through this legal device, the fishing permit holders are forced to suspend their fishing labors when captured hydrobiological resources surpass the limit of tolerance of juvenile fish, reporting to the competent authority the area in which it had extracted these specimens to facilitate the suspension of extractive activities in the area. Similary it is forbidden strictly to discard hydrobiological resources at sea.

2. Schedule of inspectors on Board of the Ministry of production. Regulatory framework: D.S No. 008-2012-PRODUCE. Using the reference regulatory framework is implemented program inspectors on board fishing vessels, allowing State to verify in the sea, the proper development of the extractive activities and the compliance with fisheries regulations, giving priority to obtaining information about the presence of copies in less than the permitted sizes; It also obliges holders to allow the monitoring and supervision of inspectors.

3. Fishing vessels monitoring satellite (SISESAT) system. Regulatory framework: D.S.No. 012-2001-PE, D.S.No. 001-2014-PRODUCE. Using the referred legal device undertakes to the vessels of larger scale and smaller-scale fishing permit holders (only extraction of Engraulis ringens and anchovy nasus) to having a satellite tracking system that will allow its monitoring and constant monitoring during fishing activities, allowing to identify incursions in prohibited areas or booking.

4. Signing of agreements of supplying resources for anchovy and white anchovy for direct human consumption. Regulatory framework: D. S. N° 010-2010-PRODUCE, R.M. N ° 309-2013-PRODUCE, R.D. N° 133-2014-PRODUCE/DGCHD and its modifications. In order to ensure the traceability and comprehensive utilization of resource hydrobiological intended for direct human consumption, preventing the intrusion of the "black fishing" within the productive chain and the illegal diversion of resources, has established the signature of agreements between holders of fishing permits and owners of processing plants of fishery products for human consumptionthe same who obey directives from subscription and fulfilment.

5. Issuance of certificates of origin (macroalgae and products of processing products for indirect human consumtion). Regulatory framework: D.S.No. 019-2009-PRODUCE, Directoral Resolution No. 019-2013-PRODUCE/DGSP . Through the certificate of origin is credited the origin and destination, the traceability of the quantities extracted, collected or produced ant the existing stocks as well as movement for it transport or marketing.

6. Program of surveillance and Control of fishing activities and aquaculture at the national level. Regulatory framework: D.L. N° 1047, D.L N ° 25977, D.S. No. 012-2001-PE, D.L N ° 1084, D.S No. 027-2003-PRODUCE, D.S.No. 008-2013-PRODUCE. : The referral program provides supervision at the level of entire coastal area actions, carried out by inspectors accredited by the Ministry of production, as well as inspectors of certifiers hired for that purpose, for the purpose of combating illegal activities of extraction, landings, production, processing and marketing of hydrobiological resources, their discards and waste, as well as illegal activities in the aquaculture fieldcoordinating joint actions with the maritime, environmental, regional and local authority at all times.

7. Management plan for anchovy (D. S. 006-2015-PRODUCE), including quotas for direct human consumption.

Specific regulations on certain fish stocks will be considered. Currently legal ordinances for seven fisheries exist:

- Giant squid – D.S. N° 013-2001-PE
- Tunas and species alike – D.S. N° 14-2001-PE
- Mackerel and Jack Mackerel – D.S. N° 24-2001-PE
- Patagonian toothfish (Dissostichus eleginoides) – R.M. N° 236-2001-PE
- Hake – D.S. N° 016-2003-PRODUCE
- Anchovy (only for direct human consumption) – D.S. N° 010-2010-PRODUCE
- Common snake eel – D.S. N° 013-2011-PRODUCE

The proposed project is fully aligned with at least five of the eight recently proposed strategic objectives of the fisheries sector developed by the current government (Ministerio de la Producción, 2012):

- Contribute to growing food security, consumption of abundant fishery resources in highlands and zones of extreme poverty.
- Manage and develop competitively aquaculture activity.
- Manage and develop competitively artisanal fishery.
- Accomplish sustainable fisheries based on the best scientific information of hydrobiological resources, and following an ecosystem approach.
- Strengthen the ordinance of fishing and aquaculture activities with an ecosystem approach.

Several of these objectives aim for the transformation of the sector through the adoption of policies focused on the development of artisanal fisheries according to an ecosystem approach to fisheries which will make them more resilient to future climate variability and change. For example, to achieve the objective of developing competitive artisanal fishery, some of the selected strategies are to improve the levels of formalization of the artisanal fishing community and to promote the strengthening of the organization of fishing associations, cooperatives and small enterprises. For aquaculture, the strategies include supporting a diversified and environmental sustainable activity, as well as encouraging research, development, adaptation and technological transfer. For sustainable fisheries, a program will be developed for risk assessments, prevention and mitigation of impacts by natural disasters, El Niño and climate change, over fisheries and aquaculture (Ministerio de la Producción, 2012).

The project will provide the scientific basis and strategic guidance for developing the recently proposed guidelines for the fisheries sector established by the current government. These guidelines aim the transformation of the sector through the adoption of policies focused on the development of artisanal fisheries according to an ecosystem-based-management approach, which will make them more resilient to future climate variability and change. As part of such orientation, management documents such as the Fisheries Sector Strategic Plan, the National Artisanal Fisheries Plan and the National Aquaculture Plan 2010-2021 propose climate adaptation mainstreaming as a priority action in their environmental sustainability components.

The project is also aligned with the National Environmental Policy, the National Environmental Action Plan 2010-2021 and the results and conclusions of the Second National Communication to the UNFCCC, the three of them having identified marine and coastal ecosystems as well as local communities as a priority in the country's adaptation agenda due to their high vulnerability level to future climate change impacts.

Since 1994, Peru has gone through important steps in the environmental agenda, as productive sectors such as mining, energy and fishery have generated legislation to mitigate, protect and recover the environment. The creation of the National Environmental Council was fundamental for the inter-institutional environmental work; also environmental units were created in the Ministries and interactions among them were initiated. A multidisciplinary and transversal work between governmental institutions and non-governmental organizations was carried out in the technical Working Group for the establishment of Water Quality Standards (GESTA AGUA). After several years of discussions the Supreme Decree 02-2008-MINAM approved the water quality standards for different uses including productive sectors. The fishery sector, in order to accomplish the water quality standards, had to establish maximum allowable limits for the fishmeal industry, through the Supreme Decree N°010-2008-PRODUCE, based on technical research of IMARPE. These standards will be taken into consideration and reinforced by the proposed project.

Therefore, this component seeks to work with all key stakeholders in creating the legal framework and the organization set up required empowering the community in their responsibility to manage their source of income and wealth. As the institutional framework is developed the community will be trained (component 3) to strengthen their organization; to better understand the functioning of the ecosystem to anthropogenic activities; to execute the tasks of surveillance and control; to collaborate in the ecosystem monitoring; in developing effective relations with government agencies involved in coastal marine areas; and, in managerial habits and skills to run community organizations and to co-manage the area under their administration. Co-management plans will define clearly the access mechanisms to hydrobiological resources within these areas in order to avoid conflicts with other communities.

This component seeks to frame the creation of community management of coastal marine ecosystem within efforts developing and implementing a science-based decision-making process concluding in a comprehensive implementation of the EAF[15] in the Peruvian coastal marine ecosystems. In addition to components 1-3, described above, this component will particularly focus on the support to the national and local governments for developing and implementing a governance strategy that takes into consideration all relevant stakeholders, empowers the community to manage the coastal marine ecosystem, regulates the access to the riches of the ecosystem under community management, and creates an enabling environment for the long-term sustainability of artisanal fishery. This governance strategy will include the improvement of current land use policies, e.g. through technical support in adequate risk assessments which consider coastal vulnerabilities to climate change. In addition, it will include the equitable allocation of property and fishing rights in order to ensure sustainable development, the effective application of surveillance and control on the exploitation of the coastal marine ecosystem, a community agreed distribution of social benefits of the common uses of the ecosystem, and the exclusivity of the fishing rights. This will require intense collaboration with artisanal fisheries in order to jointly develop alternative, non-traditional sources of income.

This will be accomplished through: (i) Supporting national and regional governments and trans-sectoral programs enacting regulations and executing policies facilitating the EBA and applying the EAF, such as empowering communities to participate in the management of coastal marine areas, implementation of the Economic and Ecological Zoning of the coastal marine environment, planning and investing on pollution abatement and conservation of coastal habitats; and introducing regulations and policies empowering local communities to co-manage marine concession areas; (ii) Supporting the formulation and implementation of the Master Plan for the Reserve of Islands, Islets and Capes in the Máncora and Huacho areas and improve its control capacity over its radius of competence, establishing permanent ”no–take” areas, and other regulations on the use of coastal marine resources; (iii) Supporting local, regional and national agencies for the sustainable management of fishing grounds and fisheries resources, through incentives for community management and improved use of scientific information and knowledge to inform decision-making (i.e. optimal catching volumes) according to EAF; and, (iv) Supporting the implementation of ERAs for selected key species that inhabit the pilot area, incorporating climate change impacts, as tools for adaptive management.

[15] EAF recognizes the interdependence between human well-being and ecosystem health and the need to maintain ecosystems productivity for present and future generations.

The project governance activities will take place in coordination with the Multisectoral Commission of Environmental Management of the Coastal Marine Medium (COMUMA), created in 2013 by the Ministry of Environment with the aim to coordinate, articulate and monitor the environmental management of the coastal marine medium.

In addition, the project is in agreement with the Multiannual Sectorial Strategic Plan (PESEM) 2012-2016, in particular with the axis: "Promotion of productivity and added value" which is related to the strategic objective 3: "Order and develop competitively the artisanal fishery" and to Policy 5: "Strengthen competivity of the agents of artisanal fishery".

The Ministry of Production (PRODUCE), through the General Direction of Sustainability fisheries - DGSP, has among its functions the elaboration of the sectoral strategy on climate change, forming the working group responsible for formulating the strategy of adaptation to the climate change in the Fisheries Sector and aquaculture, which will be responsible for leading the process of formulation of the strategy. In this context, the DGSP, scheduled for 2015, the development of the diagnosis of current vulnerability of the fishing Sector to climate change, which is a step prior to the strategy.

Also, in the framework of functional competencies, the DGSP has been capacity strengthening workshops in management of the climate change to regional Governments, with the purpose of, on the one hand, raise awareness about the potential effects that cause climatic variables on fisheries and aquaculture, and on the other hand, to collect information on the vulnerabilities identified by themselves from their own activities.

Summary of adaptation measures at both pilot areas

The tables below provide a summary of the main adaptation actions in Máncora and Huacho, which aim to improve the resilience capacity of the main fishing resources and of the local fishing communities. A more comprehensive description is available in Annex I.

COMPONENT	ADAPTATION ACTIVITIES IN MANCORA
Component 1	✓ Expansion of improved fishing practices and promotion of environmentally friendly gears. ✓ Promotion of market incentives for the good practices in the artisanal fishery of yellowfin tuna and hake, following principles of : i) fish stock sustainability; ii) minimal environmental impact; and iii) effective management and access to high-value markets. ✓ Developing alternative and additional sources of income by facilitating the emergence of ecotourism (e.g. boat trips, whale-watching, recreational fishing). ✓ Conversion of fishery residues into biofertilizers.
Component 2	✓ Deployment of a climatic and oceanographic onshore-offshore surveillance system, coupled with local bio-environmental monitoring. ✓ Output of models of local circulation, biochemical fields (oxygen, chlorophyll-a) and habitat distribution for key species, as forced by climatic changes of boundary oceanographic conditions.

	✓ Baseline assessments leading to the management of natural banks and know-how for sustainable aquaculture of selected species. ✓ Development of Ecological Risk Assessments (ERA) of key target species and other science based tools for climate change
Component 3	✓ Support and technical assistances to fishers associations for building self-organization and attain formal registration in the legal system. ✓ Training and technical assistances to fishers associations for building management and marketing skills for ecotourism and fish products commercialization in order to access directly to high value markets. ✓ Training fishers in environment friendly practices facilitating access to improved fishing gears, and certification process. ✓ Education and training for basic environmental monitoring and for tasks of fishery surveillance and control. ✓ Education and training to students and communities leading to sustainable management of coastal resources, natural banks and aquaculture, taking into account ecological risks under climate change. ✓ Training and strengthening government institutions responsible for creating the enabling environment for long-term sustainability. ✓ Training local scientists and key stakeholders in the use of science based information and tools related to the coastal marine ecosystem, following the EAF and EBA. ✓ Design and implementation of early warning systems of weather conditions, red-tides and extreme events.
Component 4	✓ Support local, regional and national agencies in the selection, analysis, development of management plans and management of marine protected areas. ✓ Support local, regional and national agencies for the sustainable management of fishing grounds and fisheries resources, by introducing incentives for community management and improved information and knowledge to inform on optimal catching volumes, according to EAF. ✓ Support the implementation of an ecological risk assessment process for selected key species that inhabit the pilot area, in relation to climate change impacts, as tools for adaptive management. ✓ Supporting national and regional governments enacting regulations and executing measures for facilitating the EBA and applying the EAF, as: a) pollution abatement and conservation of coastal habitats; and b) introduction of regulations and policies empowering local communities to co-manage marine concession areas.

Table 6. Summary of adaptation measures showing the articulation among project components in the pilot site of Máncora

COMPONENT	ADAPTATION ACTIVITIES IN HUACHO
Component 1	✓ Following-up of sustainable fishing practices and use of environmentally friendly fishing gears for anchovy with profitable products (initiated through the IBD funded project); ✓ Promotion of extensive aquaculture of scallops as an economic alternative and restoration of natural banks in protected areas to create sources of larval supply for new aquaculture projects. ✓ Co-management of natural banks for controlled extraction of razor clam. ✓ Promotion of start-up of the fishery certification process for the artisanal fishery of razor clam, following principles of : i) fish stock sustainability; ii) minimal environmental impact; and iii) effective management and access to high-value markets. ✓ Conversion of fishery and aquaculture residues into biofertilizers.
Component 2	✓ Deployment of a climatic and oceanographic onshore-offshore surveillance system, and a bio-environmental monitoring of the islands, capes, banks and culture systems within and outside the protected areas. ✓ Output of models of local circulation, biochemical fields (oxygen, chlorophyll-a) and habitat distribution for key species, as forced by climatic changes of boundary oceanographic conditions. ✓ Strengthening applied research activities leading to the management of natural banks and know-how for sustainable aquaculture of selected species. ✓ Development of Ecological Risk Assessments (ERA) of key target species and other science based tools for climate change
Component 3	✓ Support and technical assistances to fishers associations for building self-organization and attain formal registration in the legal system. ✓ Training and technical assistances to fishers associations for building management and marketing skills for sustainable aquaculture and fish products commercialization. ✓ Training fishers in environment friendly practices facilitating access to improved fishing gears, and certification process. ✓ Education and training for basic environmental monitoring and for tasks of fishery surveillance and control. ✓ Education and training to students and communities leading to sustainable management of coastal resources, natural banks and aquaculture, taking into account ecological risks under climate change. ✓ Training and strengthening government institutions responsible for creating the enabling environment for long-term sustainability. ✓ Training local scientists and key stakeholders in the use of science based information and tools related to the coastal marine ecosystem, following the EAF and EBA. ✓ Design of an early warning system through a participatory process.

Component 4	✓ Supporting the formulation and implementation of the Master Plan for the Reserve of Islands, Islets and Capes in the Huacho area and improve its control capacity over its radius of competence, leading to the establishment of permanent 'no-take' areas, transient 'no-take' areas for the re-stocking of natural banks, areas for special concessions for extensive aquaculture to artisanal fishers, areas for ecotourism use, and also areas for scientific experimentation and environmental monitoring. ✓ Supporting national and regional governments enacting regulations and executing measures for facilitating the EBA and applying the EAF, as: a) implementation of the Economic and Ecological Zoning of the coastal marine environment; b) pollution abatement and conservation of coastal habitats; and c) introduction of regulations and policies empowering local communities to co-manage marine concession areas. ✓ Support local, regional and national agencies for the sustainable management of fishing grounds and fisheries resources, by introducing incentives for community management and improved information and knowledge to inform on optimal catching volumes, according to EAF. ✓ Support the implementation of an ecological risk assessment process for selected key species that inhabit the pilot area, in relation to climate change impacts, as tools for adaptive management.

Table 7. Summary of adaptation measures showing the articulation among project components in the pilot site of Huacho.

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.

The fishing sector employs around one hundred sixty thousand (160,000) people. Fish products make up 11% of Peru's exports. Artisanal fishing is an activity that employs many people. They provide the basic source of protein and food for people living along the coastline. Despite the importance of artisanal fisheries in food production, 54% of artisanal fishers[16] are under the poverty line, lacking basic health and education. Therefore artisanal fishing communities are very vulnerable communities to climate change impacts.

Direct beneficiaries of this proposal will include fishermen receiving environmental friendly fishing gears, support for fishery certification, material and support for ecotourism,

[16] Latarsha Dansie "Socioeconomic status and prospects of the fishing industry", Riso Centre, available at: http://www.centrorisorse.org/socioeconomic-status-and-prospects-of-the-fishing-industry.html

aquaculture and restocking of natural banks. The artisanal fishing communities that will benefit from these interventions are: Máncora, El Ñuro, Órganos and Cabo Blanco in northern Peru, and Végueta, Huacho and Carquín in central Peru.

An initial number of beneficiaries per type of adaptation measure is summarized in the following table 8.

Intervention	**Beneficiaries**
Sustainable fishery	500 fishers of Máncora, El Ñuro, Los Órganos and Cabo Blanco coves.
Ecotourism	At least 50 fishers, organized in at least 2 small cooperative enterprises.
Aquaculture	At least 50 fishers of 2 fishers associations involved in aquaculture, creation of aquaculture enterprises owned by the artisanal communities.
Co-management	At least 100 fishers of 2 fishers associations involved in natural banks restoration and co-management.

Table 8. Direct beneficiaries of the project.

Indirect beneficiaries include fishers from other coves which will learn successful lessons from the pilot areas and family members of direct beneficiaries. According to updated information from IMARPE sources (Tables 3 and 6), by 2012 the Máncora cove had about 650 fishermen and125 boats, El Ñuro cove had 350 fishers and 170 boats, Los Órganos cove had 600 fishers and 105 boats, and Cabo Blanco cove had 600 fishers and 200 boats. These numbers give around 2000 fishers in all coves, and taking into account the direct family members, at least 8000 people depending on fishery activities, will be indirect beneficiaries in this pilot area.

Similarly, by 2012 the Végueta cove had 160 artisanal fishers and 50 boats, the Huacho fishing harbor had 907 fishers and 243 boats, and Carquín cove had 250 fishers and 150 boats. These numbers give around 13107 fishermen in all the coves, and taking into account the direct family members, at least 6000 people depending on fishery activities, will be indirect beneficiaries in this pilot area.

An initial group of benefits per type of adaptation measure is summarized in the following table.

Sustainable fishing and marine certification	
Economic benefits	Increased income of fishermen due to increased quality and value of fishes, higher price of fishery products
	Savings in operative costs of fuel associated to change of fishing gear
	Increase of employment for processing and marketing fishery products
	Improved management of fishery resources

	Fishery certification allows access to international market
Environmental benefits	Increased biodiversity, resilience of marine ecosystems and recovery of depleted species
	Increased selectivity of fishing gears and reduction of by-catch
	Reduction of greenhouse gases coming from savings of fuel associated to change of fishing gear
	Improved precautionary and adaptive management of natural banks and fishing grounds using the Ecosystem approach to Fisheries
Sociocultural benefits	Improved food security providing high quality seafood
	Conservation of fishery resources for recreation, ecotourism, education and ethical value
Gender considerations	Participation of women in preprocessing and commercialization of fishery products.
Ecotourism	
Economic benefits	Economic diversification by means of a fee for using the boats, harbour, tourist circuit, guidance
	Improved local infrastructure, generation of positive externalities (handcraft, food, etc.)
Environmental benefits	Promote creation or expansion of future marine protected areas and implementation of Master Plans at islands and capes
Sociocultural benefits	Increased environmental consciousness of local communities and visitors
Gender considerations	Participation of women in marketing handicraft souvenirs made of marine materials and in tourist guiding or business management.
Aquaculture	
Economic benefits	Increased income due to increased offer of high quality fishery products for exportation to international market
	Increased employment, through processing and marketing activities.
Environmental benefits	Co-management of natural banks and aquaculture ensure production sustainability
	Restoration of natural banks complementing aquaculture activities with “no-take” zones in marine protected areas
	Better knowledge of environmental and biological parameters of species under intervention through monitoring and modelling
Sociocultural benefits	Encourage fishermen to develop their own enterprise, with competitive advantages, potential certification and access to national and international markets
	Improved management of fishery resources
	Availability of marine resources for future generations
Gender considerations	Participation of women in preprocessing and commercialization of aquaculture products.

Table 9. Tangible and intangible benefits derived from interventions

It is expected that incorporating new concepts of operation and management of marine resources, will develop a sustainable and stable production, will increase the commercial value of the catch, and will also contribute to the creation of new and complementary sources of employment, improving the socioeconomic conditions of fishers and their families.

If no interventions are made in a short-time period, the fishery sector of Peru, and the coastal fishing communities that depend on it will be strongly affected. Low ecosystem productivity, foreseen species migrations and changes in their habitats due to changes in ocean temperatures, will lead to a smaller fish stock availability in the ecosystem, directly affecting artisanal and industrial fishers catches and resulting in strong economic losses and an increased unemployment rate. Furthermore, artisanal fishers, with small boats, limited fishing areas and few alternatives, will bear relatively greater socioeconomic impacts than industrial fishers with their larger and more mobile boats and greater access to financial capital and substitute fisheries (Brander, 2007; FAO, 2009; Grafton, 2010).

Through the development of science-based information that will guide policies and management in the ecosystem and the deployment and operationalization of an effective surveillance system that will support fisheries management, the project will contribute to a better understanding of the potential impacts of climate change on the ecosystem productivity and habitat distribution for marine resources along the coast as well as to improve the capacity to predict short-term events and long-term changes in the coastal marine ecosystem triggered by climate change.

Furthermore, by strengthening institutions and governance at national and local levels the project will provide environmental benefits to fishermen by contributing to guarantee the sustainability of fishing practices under a highly variable climate system. Moreover, the project will contribute to the improvement of the adaptive capacity of vulnerable coastal communities to climate change by performing specific interventions in the pilot areas.

Additionally, through the development of a framework that will facilitate capacity building and the dissemination of project's lessons learned, the project will improve the availability to generate and interpret data and information on the potential impacts of climate change on marine ecosystems, and this will help to better identify long-term adaptation measures.

The project does not involve large infrastructure that could alter natural habitats, thus it is a project with few adverse environmental or social impacts. The proposed activities related to extensive aquaculture and stocking/re-stocking of natural banks are considered as minor scale. Instead the project will contribute to improve environmental and social conditions in the target areas, in compliance with the Environmental and Social Policy of the Adaptation Fund.

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

As already indicated the Adaptation to the Impacts of Climate Change on Peru's Coastal Marine Ecosystem and Fisheries applies the concept of piloting community based ecosystem management for artisanal fishers through the introduction of "areas of

exploitation" in the regulation. These areas of exploitation are well-defined coastal marine zones upon which the government agrees giving the community the rights for an exclusive use of the marine natural resources and creates the incentives for the community to manage their area in a sustainable manner. To do this the government will also provide training, knowledge and accurate information as well as the implementation of tangible and very specific adaptation measures, selected from the list of good practices recommended by FAO and complementary interventions to provide alternative sources of employment and income to the fishers community (for example ecotourism activities). These no-regret activities will be complemented with actions to enhance the enabling environment (working with local governments in developing land use plans compatible with and reinforcing the long-term sustainability of the productivity of the coastal marine ecosystem). Furthermore, the Project includes activities to monitor the ecosystems, their productivity and the wellbeing of the fishers community to provide feedback to the day to day operation as well as to secure that lessons learned are identified and used by local and national government in guiding further policy development and facilitating the scaling up of similar interventions.

The Cost effectiveness argument for this integrated approach runs a two prone track. On one hand each individual investment will be tested to produce benefits greater than the costs, on the other hand, the overall program of activities is a pilot at selected sites from which the GoP could learn on the effectiveness and sustainability of empowering local communities to manage coastal marine ecosystems sustainably. Community management will be flexible to the input from science and the information collected through the monitoring system, creating an adaptive management environment to incorporate and cope with the impacts of climate change.

Pilot interventions are proven approaches through which governments experiment complex management options, collect information and lessons learned before embarking in scaling-up (large investment) the initiative. This is a sound and effective way to explore new policy and management options without risking large volume of resources. The approach selected is therefore cost effective.

As indicated, each single adaptation measure will be selected only if it proves to be financially viable. Although at this time there are only preliminary cost benefit analyses for the proposed adaptation measures, the GoP has indicated the need for each individual measure to demonstrate that benefits generated are greater than the costs incurred. Some measures are presented as examples of the cost benefit analysis expected by the GoP.

Sustainable fishing

From the economic assessment point of view this intervention seeks to introduce sustainable fishing practices and promotion of environmentally friendly fishing gears combined with the access to high-value markets for local artisanal fishers.

The cost structure of this intervention includes: Cost of environmentally friendly fishing gears for each boat in the program; costs of installation of the new gears in the existing fleet (45 boats); maintenance and operation costs; reduction of cargo space due to refrigeration needs (as required for certification) implying a reduction in potential catch volume; training costs and incidental expenses such as developing business plans and strengthening community leaders to proactively participate in the development of coastal marine ecosystem management plans.

Benefits are associated with changes in marine activities and the higher value of the catch. For example in the case of yellow fin tuna the price difference is from US$ 6,000/ton to US$ 32,900/ton. These high values are only achievable if the fleet is internationally certified following the principle defined by FAO.

The resulting stream of costs and revenues are calculated based on historical landing statistics and costs figures found in field surveys. The comparison between the costs and revenues stream for a period of 10 years with and without project was calculated. Results are summarized in Table 10. As shown, this no-regret investment has a high rate of return on investment, which is a condition for its long-term sustainability. The investment required is, nonetheless, beyond the financial capabilities of the individual artisanal fisherman. As a financially viable measure this activity will contribute to improved environmental management in the coastal marine ecosystem, create awareness on environmental management and climate change impacts, strengthen quality control activities and contribute to community management of their fishing grounds. This activity will also benefit from the flow of information from component 2 even if such considerations have not been included in this preliminary benefit and costs analysis.

Sustainable aquaculture

Aquaculture of scallops in bottom pens will generate economic incomes for fishers, part of the harvest will be used to sustain natural banks restoration, and benefits will be invested in capacity building of fishers and monitoring of the larvae. The intervention will include a concession of 10 ha outside the marine protected área. Investment costs cover bottom pens, boats, initial seeds and an artisanal hatchery. Operation costs cover human resources, monitoring of banks, harvest, transport and administrative fees.

Promotion of Ecotourism Activities

Ecotourism is a site-specific activity and a function of the available natural resources upon which the activity could be anchored. Ecotourism as a global industry is growing at rates near 20% per year, as more people become aware of the beauty of nature and the importance of ecological preservation for future generations. The ecotourism specific activities were identified for Máncora pilot area taking into account its particular characteristics. In general the proposed activities are summarized in boat trips with the purpose of: touring and sightseeing; fishing with different gears (fishery-tourism); wildlife sighting (whales and other cetaceans). Although many complementary activities are included in the ecotourism business (food and drink services, handcrafts, clothing, etc.) the economic analysis is centered only in the boat rides component.

The cost structure of this no-regret activity includes all the cost associated with the improvement of a touristic dock at Los Organos cove, with enough space to allow for complementary activities to develop. In addition costs have been estimated for training, improvement of boats, implementation of adequate safety measures and gears, and operational and administrative costs associated with the activity.

Natural banks restoration and co-management

Restoration of a natural bank of scallops in a marine protected area (Don Martin Island) will be beneficial as a source of larvae for aquaculture. Seed for restoration will be initially acquired from nearby hatcheries, and later will come from larval collectors and from a part of

aquaculture harvests. Cost fluxes consider a life span of scallop of four years. Social rentability is calculated with an index of cost-effectivity as no private rentability exists for restoration of natural banks in marine protected areas.

Production of biofertilizers from fishery residues

Fishery industry for human consumption and aquaculture generate residues with a high nutrient content and a great potential of conversion into organic fertilizer for agriculture or into animal food. In this context, the present project aims to valorize fishery residues through a homolactic fermentation process using bioprotecting microorganisms (Bio-Lac), and in addition it will solve the environmental problem of fishery residues disposals and reduce dependency from chemical fertilizer in agriculture.

Table 10. Cost/benefit analysis for the different adaptation measures

Cost-Benefit Analysis using Net Present Value Method

1. Sustainable Fishing & Certification

Máncora

(in Nuevos Soles)

Description	Period 0	1	2	3	4	5	6	7	8	9	10
Cash Outflows											
Investment	61,927	520,991	516,465	355,436							
Operation Costs without Project											
Fuel		-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883
Change of Fishing Gear											540,000
Sub total		-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-1,282,883	-742,883
Operation Costs with Project											
Fuel		-1,349,005	-1,349,005	-1,349,005	-1,349,005	-1,349,005	-1,349,005	-1,349,005	-1,349,005	-1,349,005	-1,349,005
Annual Audit for Certification					-100,000	-100,000	-100,000	-100,000	-100,000	-100,000	-100,000
New Certification Process									-140,000		
Sub total		-1,349,005	-1,349,005	-1,349,005	-1,449,005	-1,449,005	-1,449,005	-1,449,005	-1,589,005	-1,449,005	-1,449,005
Maintenance without Project											
Maintenance Fishing Gear (gillnet, purse seine)		-204,100	-204,100	-204,100	-204,100	-204,100	-204,100	-204,100	-204,100	-204,100	-204,100
Maintenance with Project											
Maintenance Fishing Gear (long line, hook)		-54,000	-54,000	-54,000	-54,000	-54,000	-54,000	-54,000	-54,000	-54,000	-54,000
Cash Inflows											
Benefits without Project											
Income: Local Sales of Fresh Yellowfin Tuna		1,901,001	1,901,001	1,901,001	1,901,001	1,901,001	1,901,001	1,901,001	1,901,001	1,901,001	1,901,001
Benefits with Project											

Income: Export Sales of Fresh Yellowfin Tuna		1,901,001	2,023,488	2,145,974	2,268,460	2,390,947	2,513,433	2,635,919	2,758,405	2,880,892	3,003,378
Net Flow	-61,927	-437,012	-310,000	-26,484	351,437	473,924	596,410	718,896	701,382	963,869	546,355
VAN	1,451,181										

Notes

1. Discount rate 10% *10%*

2. Project duration - 10 years *10*

3. Artisanal fishery is not subject to IGV or IR taxes

Cost-Benefit Analysis using Net Present Value Method

2. Sustainable aquaculture

Huacho

(in Nuevos Soles)

Description	**Period**										
	0	1	2	3	4	5	6	7	8	9	10
Cash outflows											
Investment costs	398,320	796,640	796,640	0	0	0	0	0	0	0	0
Operation & maintenance costs			1	437,012	437,012	437,012	437,012	977,012	437,012	437,012	437,012
Sub total		796,641	1,233,652	437,012	437,012	437,012	977,012	437,012	437,012	437,012	437,012
Cash inflows											
Income		525,000	525,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000
Net flow		-271,641	-708,652	612,988	612,988	612,988	72,988	612,988	612,988	612,988	612,988
Net Present Value (NPV)	1,166,937										

Notes

1. Discount rate 10%
2. Project duration - 10 years
3. Period for replacement of lines - 5 years
4. Years 1 and have only one harvest
5. Years 3 - 10 have two harvests
5. Artisanal fishery is not subject to IGV or IR taxes

Cost-Benefit Analysis using Net Present Value Method

3. Ecotourism enterprises

Máncora

(in Nuevos Soles)

Description	Period										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Cash Outflows											
Investment	449,265	1,150,848	61,078	61,078	0	0	0	0	0	0	0
Operation costs		61,928	61,928	61,928	61,928	61,928	61,928	61,928	61,928	61,928	61,928
Maintenance costs		16,200	16,200	16,200	16,200	16,200	16,200	16,200	16,200	16,200	16,200
Sub total		1,228,976	139,206	139,206	78,128	78,128	78,128	78,128	78,128	78,128	78,128
Cash Inflows											
Growth of demand		0.20	0.40	0.60	0.80	1.00	1.00	1.00	1.00	1.00	1.00
Income		142,730	285,460	428,189	570,919	713,649	713,649	713,649	713,649	713,649	713,649
Net flow		-1,086,246	146,254	288,984	492,791	635,521	635,521	635,521	635,521	635,521	635,521
Net Present Value (NPV)	1,128,297										

Notes

1. Discount rate 10% *10%*

2. Project duration - 10 years *10*

3. Artisanal fishery is not subject to IGV or IR taxes

Cost-Benefit Analysis using Net Present Value Method

4. Natural Banks Restoration and co-management

Huacho

(in Nuevos Soles)

	Period										
Description	0	1	2	3	4	5	6	7	8	9	10
Cash outflows											
Investment	216,600	201,600	191,200	191,200	0	0	0	0	0	0	0
Operation & maintenance costs		117,375	117,375	117,375	117,375	0	0	0	0	0	0
Sub total		318,975	308,575	308,575	117,375	0	0	0	0	0	0
Cash inflows											
Income		0	0	0	0	0	0	0	0	0	0
Net flow		-318,975	-308,575	-308,575	-117,375	0	0	0	0	0	0
Net Present Value (NPV)	-1,073,604										

Notes

1. Discount rate 10%	*10%*
2. Project duration - 10 years	*4*
3. Artisanal fishery is not subject to IGV or IR taxes	

Repopulation	480,000	
Losses	0.2	
Effective / net repopulation	384,000	
Density	38.4	ind/m2

VAN	1,073,604
Effectiveness Index (EI)	38.4
Effectivenes Cost (EC)	27,958.4

Cost-Benefit Analysis using Net Present Value Method

5. Production of biofertilizers

Huacho

(in Nuevos Soles)

Description	Period										
	0	1	2	3	4	5	6	7	8	9	10
Cash outflows											
Investment	1,658,584	0	0	0	0	0	0	0	0	0	0
Operation & maintenance costs		2,132,276	2,132,276	2,132,276	2,132,276	2,132,276	2,132,276	2,132,276	2,132,276	2,132,276	2132276.04
Cash inflows											
Income		-3,496,933	-4,041,755	-4,671,460	-5,399,274	-6,240,481	-7,212,747	-8,336,493	-9,635,319	-11,136,502	-12871568.91
Net flow		-955,260	-1,336,635	-1,777,429	-2,286,898	-2,875,743	-3,556,330	-4,342,952	-5,252,130	-6,302,958	-7517505.008
Net Present Value (NPV)	18,913,704										

Notes

1. Discount rate 10%	*10%*
2. Project duration - 10 years	*4*

3. Artisanal fishery is not subject to IGV or IR taxes

Revenues were estimated for each type of activity (at least three types of boat rides) and demand forecasts are based on the analysis of tourism surveys and studies conducted by PROMPERU and local universities. Costs per ride are taken from tariffs use in locations with similar characteristics in or near the pilot sites. Moreover, a simple progression was used for estimating the capture of the potential demand from tourisms, with an initial attraction factor of 20% growing to 90% by year 5 and 100% by year 7. A 10-year horizon was used in the benefit costs analysis. The economic analysis also includes an estimate of the additional resources the tourists spend in the community for complementary services, some of which might be capture by the fishing community.

Table 10 summarizes the economic analysis, based on a potential demand of only 536 boat trips and a fleet of 8 boats to serve these tourists (12 per ride). The activity shows a very good return on investment (around 20%) confirming the potential to generate additional income and employment opportunities for the artisanal fishing community. This activity will also contribute to create awareness on environmental issues, the need for sustainable use of coastal marine ecosystems, enhance the use of scientific information and strengthen the exclusivity characteristic of the community based management of their fishing grounds.

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.

The proposed project is fully aligned with at least five of the eight recently proposed strategic objectives of the fisheries sector developed by the current government (Ministerio de la Producción, 2012):

- Contribute to growing food security, consumption of abundant fishery resources in highlands and zones of extreme poverty.
- Manage and develop competitively aquaculture activity.
- Manage and develop competitively artisanal fishery.
- Accomplish sustainable fisheries based on the best scientific information of hydrobiological resources, and following an ecosystem approach.
- Strengthen the ordinance of fishing and aquaculture activities with an ecosystem approach.

Several of these objectives aim for the transformation of the sector through the adoption of policies focused on the development of artisanal fisheries according to an ecosystem approach to fisheries which will make them more resilient to future climate variability and change. For example, to achieve the objective of developing competitive artisanal fishery, some of the selected strategies are to improve the levels of formalization of the artisanal fishing community and to promote the strengthening of the organization of fishing associations, cooperatives and small enterprises. For aquaculture, the strategies include supporting a diversified and environmental sustainable activity, as well as encouraging research, development, adaptation and technological transfer. For sustainable fisheries, a program will be developed for risk assessments, prevention and mitigation of impacts by natural disasters, El Niño and climate change, over fisheries and aquaculture (Ministerio de la Producción, 2012).

Project adaptation measures such as environmentally friendly gears, fishery certification, aquaculture and resources co-management will contribute to achieve food security and sustainable fisheries.

The project will provide the scientific basis and strategic guidance for developing the recently proposed guidelines for the fisheries sector established by the current government. These guidelines aim the transformation of the sector through the adoption of policies focused on the development of artisanal fisheries according to an ecosystem-based-management approach, which will make them more resilient to future climate variability and change. As part of such orientation, management documents such as the Fisheries Sector Strategic Plan, the National Artisanal Fisheries Plan and the National Aquaculture Plan 2010-2021 propose climate adaptation mainstreaming as a priority action in their environmental sustainability components.

The project is also aligned with the National Environmental Policy, the National Environmental Action Plan 2010-2021 and the results and conclusions of the Second National Communication to the UNFCCC, the three of them having identified marine and coastal ecosystems as well as local communities as a priority in the country's adaptation agenda due to their high vulnerability level to future climate change impacts. In this regard the proposed project, through the implementation of key adaptation measures will help coastal communities of Huacho and Máncora improve their coping capacity to climate change impacts. In general terms, the group of measures can be classified in four types, as follows: (i) expansion of improved fishing practices and promotion of environmentally friendly gears; (ii) facilitating the emergence of ecotourism activities; (iii) development of sustainable aquaculture banks in selected areas; and (iv) training of local fishers. Please see additional details for each site in Annex I.

In this context, the project governance activities will take place in coordination with the Multisectoral Commission of Environmental Management of the Coastal Marine Medium (COMUMA), created in 2013 by the Ministry of Environment with the aim to coordinate, articulate and monitor the environmental management of the coastal marine medium.

Given the importance of the fishmeal and fish oil production in the export sector, the National Strategic Export Plan 2003 - 2013 identified the need for improved management practices in the sector, including the development of capacities of research institutions such as IMARPE. Thus, the proposed project will give sustainability to this request.

In addition, the project is in agreement with the Multiannual Sectorial Strategic Plan (PESEM) 2012-2016, in particular with the axis: "Promotion of productivity and added value" which is related to the strategic objective 3: "Order and develop competitively the artisanal fishery" and to Policy 5: "Strengthen competivity of the agents of artisanal fishery".

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.

According to Peruvian law any infrastructure or concession area at sea should have allowance of the Regional Production Agency (DIREPRO) and of the Authority of Ports and Harbors (DICAPI). If these are built or requested in a Marine Protected Area (MPA), then the MPA administration, namely the National Service of Natural Areas Protected by the State (SERNANP), should approve it, besides the allowances mentioned above. The regulation, requirements and license costs are well established. Only if the infrastructure is big enough or the activity is considered as large-scale (over 50 metric tons/year), an Environmental Impact Assessment is necessary. Activities at sea (fishing, tourism, science) require the permission of DICAPI by routine. Therefore marine monitoring activities should be informed to DICAPI. For meteorological stations, they will be connected to SENAMHI and if they are installed in the MPAs, they should be approved before by SERNANP, which is a partner of this proposal.

In the case of the project, proposed activities related to extensive aquaculture and stocking/re-stocking of natural banks are considered as minor scale with low environmental impact; and, according to the existing regulations an environmental impact declaration (DIA) is required to be submitted to the DIREPRO. The DIA consists in the description of the environmental effects of the proposed action. Specifically it must include: general background of the project (name, amount of the investment, duration, etc.), location, and project's description (goals, phases, infrastructure, activities, and main emissions, effluents and residues). Upon the evaluation of the DIA, the DIREPRO issues an Environmental Certification, that along other requirements to be approved by the DICAPI, enable to initiate the activity.

Although the project does not conceive carrying out large infrastructure works *per se*, some of the proposed adaptation measures such as the ecotourism activities (e.g. improvement of small touristic dock) will need an environmental assessment or license according to national regulations, complying with the Adaptation Funds Environmental and Social Policy. The proposed project has followed a regular PROFONANPE investment project approval track, which required by default an environmental and social screening to identify potential project's impacts. In the case environmental and social impact studies are required (projects' categories B and C), PROFONANPE will provide to the project team required technical counseling and supervision for the development of said environmental and social assessments.

This proposal has been prepared in accordance with the guidelines provided by the National Strategy for Climate Change (2003), the National Environmental Policy (2009), the Environmental National Action Plan (2010), the Action Plan for Adaptation and Mitigation of Climate Change (2010) and the Scientific Research Agenda for Climate Change (2009). In addition, the proposed activities will be performed under the legal framework established by the Supreme Decree (DS. 02-2008-MINAM) about the water quality standards in marine areas.

Project activities are in line with the legal framework of the "General Law on Fisheries" (Ley General de Pesca) which states that fishing management systems should conciliate the

principle of sustainability in order to obtain social and economic benefits (article 10). Specific regulations on certain fish stocks will be considered. Currently legal ordinances for seven fisheries exist:

Giant squid – D.S. N° 013-2001-PE
Tunas and species alike – D.S. N° 14-2001-PE
Mackerel and Jack Mackerel – D.S. N° 24-2001-PE
Patagonian toothfish (*Dissostichus eleginoides*) – R.M. N° 236-2001-PE
Hake – D.S. N° 016-2003-PRODUCE
Anchovy (only for direct human consumption) – D.S. N° 010-2010-PRODUCE
Common snake eel – D.S. N° 013-2011-PRODUCE

Project activities will strengthen the current system for the management of anchovy stocks based on individual quota per vessel (Maximum Catch Limits per Vessel, MCLV, established in 2009), by improving the quality of the system, and by incorporating climate change considerations in its calculation process. It is important to mention that to date, the results of the MCLV have alleviated the fishing pressure on anchovy, by: (i) longer fishing seasons, which went from around 40 days to more than 100 days a year, (ii) reduced daily captures, from 97,087 to 33,866 metric tons, and (iii) less vessels fishing at the same time, from 1,200 to around 500.

The project promotes environmental awareness as an adaptation measure to increase the resilience of the coastal marine environment. Since 1994, Peru has gone through important steps in the environmental agenda, as productive sectors such as mining, energy and fishery have generated legislation to mitigate, protect and recover the environment. The creation of the National Environmental Council was fundamental for the inter-institutional environmental work; also environmental units were created in the Ministries and interactions among them were initiated. A multidisciplinary and transversal work between governmental institutions and non-governmental organizations was carried out in the technical Working Group for the establishment of Water Quality Standards (GESTA AGUA). After several years of discussions the Supreme Decree 02-2008-MINAM approved the water quality standards for different uses including productive sectors. The fishery sector, in order to accomplish the water quality standards, had to establish maximum allowable limits for the fishmeal industry, through the Supreme Decree N°010-2008-PRODUCE, based on technical research of IMARPE. These standards will be taken into consideration and reinforced by the proposed project.

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

Activities included in this project, especially those related to early-warning systems and response, have no duplication with other existing or planned programs or projects, but highly complement other interventions currently implemented or designed by the Peruvian government:

1) Towards Ecosystem Management of the Humboldt Current Large Marine Ecosystem (HCLME, 2011-2015): It is a regional Global Environmental Facility (GEF)-funded project, implemented by the United Nations Development Programme (UNDP) in close coordination with IMARPE in Peru and the Instituto de Fomento Pesquero (IFOP) of Chile. The Project's completion date is 2016. There is no overlap, but complementarity, between the GEF-HCLME funded project and the AF funded proposal, as shown in Table 11. The main target of the GEF-HCLME is the protection of biodiversity and strengthening of marine protected areas, while the proposed project aims to increase adaptive capacity and resilience of artisanal fishing communities and associated coastal ecosystems, complementing the GEF-HCLME project through the following activities: i) pilot areas chosen based on social and resources vulnerability to climate change criteria; ii) support of the science-based decision-making related to climate change adaptation (e.g. climatic surveillance and prediction) and capacity building in these issues; and iii) specific emphasis on the integration of artisanal fisheries into the regulatory system.

   Also, as the GEF-HCLME will finish in 2015, it is expected that coordinations will be established with the second part of this project GEF-HCLME II, which is currently being planned.

	GEF-HCLME project	AF proposal
Main target/beneficiary	Protection of biodiversity and strengthening of Marine Protected Areas	Artisanal fishing communities and associated coastal ecosystems.
Scope	Humboldt Current Large Marine Ecosystem (HCLME)	Peruvian Coastal upwelling ecosystem and Northern Tropical Coastal Ecosystem
Concrete interventions for improving the resilience of coastal communities to climate change impacts	No	Yes
Pilot areas	Three marine protected areas in Peru: San Juan cape, Ballestas Island and Lobos de Tierra Island.	Two coastal areas where artisanal fishing communities live, namely Máncora and Huacho.

Ecosystem approach	EBM[17]	EAF and EBA
Surveillance, early warning and Prediction System	No	Yes
Capacity building	Management of marine protected areas	Adaptations to climate change in the fishery sector

Table 11. Complementarity between the AF proposal and the GEF-HCLME project.

The ambit of the GEF-HCLME is the whole Peru-Chile Humboldt Current Ecosystem, while the AF project is focused on the Peruvian Coastal upwelling ecosystem and the Northern Tropical coastal ecosystem.

The GEF-HCLME project will not implement concrete interventions for adaptation to climate change, but it will coordinate the management of the shared stock of anchovy between Peru and Chile as well as develop a legal framework for implementing marine protected areas. The AF proposal will complement this project by applying concrete interventions for climate change adaptation on fishery artisanal communities as main beneficiaries. The general framework implemented by the GEF project will facilitate the concrete interventions on artisanal communities.

The GEF-HCLME project has selected marine protected areas as pilot sites: San Juan cape, Ballestas Island and Lobos de Tierra Island. The AF proposal targets on artisanal fishing communities living in the north of Peru (Máncora and others) and in the central region (Huacho and others), which are associated to different coastal marine ecosystems. Climatic surveillance and early warning are not considered in the GEF-HCLME project, but the outputs provided in these issues by the AF proposal will also contribute to the adaptive management along the coast, including the GEF-HCLME pilot areas.

Finally, the GEF-HCLME project uses the Ecosystem Based Management (EBM) approach, while the AF proposal will use both the Ecosystem Approach to Fisheries (EAF) which focuses explicitly on the fisheries communities and their harmonization with the ecosystems; and the Ecosystem Based Adaptation (EBA) to enhance ecosystem services to adapt to impacts of climate change. It should be stressed, that compared to the EBM which is area-based, the EAF's paradigm is sector-based and focused on target resources and people. In addition, in the EAF the stakeholders are clearly identified as the fishing communities but opened to other stakeholders, while the EBM considers a much broader, but loosely defined universe of stakeholders. Finally, instead of considering protection of specified areas or habitats as the main measures strategy (EBM), the EAF is based on regulation of human activity inputs (gears, effort, capacity), which can also include "no-take" zones as measures to reduce fishing pressure, or output (removals, quotas) and trade (FAO, 2003).

[17] Ecosystem-Based Management (EBM) is a globally recognized approach for better understanding and managing the interactions between uses and the natural system, and integrating multi-sectorial interests into decision making for the -whole marine ecosystem.

2) “Support to the Climate Change Agenda in Peru” is an Inter-American Development Bank (IDB) Policy Based Loan (PBL) which was disbursed in three tranches during 2010–2013. The PBL focused on the (i) development and strengthening of the basic institutional framework for climate change management at national, sector and regional levels, (ii) implementation of a GHG mitigation agenda, and (iii) implementation of an adaptation agenda. This operation included policy commitments by the General Directorate for Environmental Issues of the Vice Ministry of Fisheries and by IMARPE, such as the formulation of a national plan for climate change adaptation at the sector level, the development of coastal and oceanic climate change scenarios, the identification and characterization of the major impacts associated with such scenarios and the economic valuation of those impacts. This Policy Based Loan will serve as an important basis for the implementation of the proposed project which will build on the political commitment and generated climate change scenarios.

3) Adaptation to climate change in the fishery sector and marine-coastal ecosystem of Perú (PE-G1001/PE-T1297): It is a national IDB-funded project (2014-2016), with a budget of US$ 2.5 million, executed by the Ministry of Production and technical support of IMARPE. Its goal is to reduce vulnerability of coastal communities to climate change impacts through interventions with artisanal fishers in the areas of Huacho-Chancay and Pisco-Ilo (central and southern Peru). This project will complement the present proposal, with activities of modelling and implementing environmental friendly gears for anchovy fishery at Huacho. Close coordination between both projects is ensured through execution of both projects by PRODUCE through the same coordination team Unidad Ejecutora 003 “Fomento al consumo Humano Directo – A Comer Pescado” of PRODUCE (UE-003).

   Important sinergies and complementarities will arise from the IDB funded project for this proposal. The modelling infrastructure will set the basis to build national climate change scenarios, which will be used by this proposal for applying these scenarios to the pilot areas with higher spatial resolution. The initial replacement of environmentally friendly fishing gears will allow this proposal to learn lessons acquired during experiences with fishers and other stakeholders for implementation of the co-management framework

On the non-profit side, several initiatives are being implemented by national and international organizations such as:

1) Strengthening Sustainable Management of the Guano Islands, Isles and Capes National Reserve System Project (P129647): It is a regional Global Environmental Facility (GEF)-funded project, implemented by PROFONANPE in close coordination with SERNANP.
   The project’s global environmental objective is to improve the overall management of marine and coastal ecosystems of the Guano Islands, Islets, and Capes National Reserve System of Peru (RNSIIPG) and protect its biological diversity in representative pilot sites. It will complement the present proposal because it includes as pilot area Don Martín island (with a tourism plan and economic and ecological zoning) and Punta Salinas (with a sport fishery plan, management plan of fishery resources and economic and ecological zoning), both at Huacho area.

2) Climate Change Adaptation and Mitigation in Coastal Zones (ADMICCO): A 2010-2014 regional project, under implementation by a network of NGOs from Chile, Ecuador and Peru and with financial support from the European Commission. The project aims to reduce the negative impact of climate change among poor populations in terrestrial

coastal zones, mainly associated to drainage basins of the three countries, and to promote adaptation and mitigation actions in those areas. Activities of the project in Peru are concentrated in two pilot areas: Huaral-Huaura (Huacho province) in the north and Ilo, Mollendo and Camaná in the South, thus sharing the Huacho pilot area with the present project. The proposed project will build on the experience of this project especially in diversifying income generating activities of poor coastal communities, especially artisanal fishers. The integration of these communities into the regulatory framework, which will be based on the modeling and monitoring network, is considered as utterly important.

3) Towards an ecosystem-based management of the anchovy fisheries in Peru (November 2009 - November 2011): It was a project of the Environmental Sustainability Center of the Cayetano Heredia University (CSA-UPCH) with technical support of the Fisheries Center of the University of British Columbia and IMARPE. It sought to contribute to an EAF in Peru, by using a model that would integrate existing information (results of IMARPE and university investigations), generating benchmarks on fisheries needed by decision-makers and stakeholders. Nevertheless, the CSA-UPCH project was not related to climate change, does not involve adaptation measures or interventions in local areas, and capacity building activities are very limited.

4) The Humboldt Current Program: An initiative by The Nature Conservancy (TNC) launched in 2008 and aimed to provide information, tools and know-how to: (i) enable the creation of new marine protected areas and the strengthening of existing ones, and (ii) promote sustainable fishing measures to conserve marine ecosystems and resources. This effort includes a research partnership by IMARPE, TNC, the Sustainable Fisheries Group (SFG) and the University of California Santa Barbara (UCSB) to address sustainable fisheries and marine conservation issues in Peru through improved knowledge of how fish stocks will behave given certain environmental changes other than climate change (e.g. El Niño). Proposed project differs in scope from the TNC project and perfectly complements it by focusing on climate change adaptation measures involving modeling and monitoring interventions in local areas and improvement of governance systems.

5) The International Joint Laboratory 'Dynamics of the Humboldt Current system' (LMI 'DISCOH') is a research program that was launched in 2009 (to be closed in 2014) by a partnership between IRD (French Institute for the Development) and IMARPE. The main objective of the LMI is to study the ocean-atmosphere, biogeochemical and ecological dynamics in the Humboldt Current System off Peru in order to understand and anticipate the effect of intra-seasonal, seasonal, inter-annual, decadal variability and climate change on the dynamics of the coastal ecosystem. Therefore it contributes by providing scientific basis for the implementation of the EAF. From a scientific point of view, the LMI 'DISCOH' complements current ongoing projects between IRD and IMARPE in five working packages: (i) metadata, tools and data analysis methods; (ii) physical forcing; (iii) dynamics of the Oxygen Minimum Zone (OMZ) and productivity at multiple scales; (iv) ecosystem approach to fisheries; and (v) socio-economy and environmental impact of industrial and artisanal fisheries and supply chains. In particular, the LMI aspires to orient part of the scientific activities towards key transversal scientific questions. The proposed project will take advantage from the current training that the LMI 'DISCOH' is providing to the scientific staff of the Modeling Laboratory of IMARPE (e.g. WRF, ROMS and PISCES models). Additionally, outputs from the socio-economy working package

will feed the bio-economic modeling and also will contribute to the proper identification of technological adaptation measures for fishing gears.

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

As described in Section II-F this project interacts with and complements a variety of existing and planned programs. Therefore, knowledge management and exchange is of primary importance in order to ensure that activities are not replicated and that generated information and experience will feed into existing programs and provide the basis for future activities. To this end, the planned project will apply and Knowledge Management Strategy (KMS) which will include a fixed knowledge management structure as well as selective dissemination activities to extend lessons learned and raise awareness of the issue at hand (Figure 4).

As part of its KMS, this project will, on one hand disseminate the monitoring products to the local communities and general public, and on the other, promote the creation, dissemination and re-use of key knowledge on climate change impacts on coastal marine ecosystems and coastal communities' livelihoods and will facilitate a better understanding of its main challenges with the final aim of promoting economic, social and environmental development in the Region.

More specific objectives of the KMS includes the promotion of: (i) up to date knowledge that contribute significantly to the understanding of main ecosystems and local communities' vulnerability drivers; (ii) promoting relevant activities conducive to the dissemination of knowledge in community and ecosystem-based adaptation allowing for improved responses to the most pressing challenges posed by climate change to the region; and (iii) the coordination between the various stakeholders of the project in such a way that the generation and dissemination of knowledge activities are developed and implemented in line with their initiatives and actions.

The KMS will add value to the Project's effort by:

- Providing the right information/knowledge to local communities on ways to address climate change issues, at the right time, increasing their local adaptive capacity;
- Collecting and sharing good/best practices and tools;
- Learning from the project successes/failures to design/innovate and improve related actions and programs;
- Facilitating cross-project learning inside the project team;
- Guiding the production of updated and properly packaged knowledge products to its intended audiences;
- Connecting the knowledge demand/needs of the audiences with the knowledge offer/production of the project.

The process leading to the production of the KMS consists of the general steps illustrated in Figure 5 and described as following:

Knowledge must first be **created** within or outside the project scope, until it is ready for distribution to stakeholders. The creation process involves the conversion of tacit knowledge into documented explicit knowledge. The explicit knowledge created should be easily understood outside its linguistic, organizational and cultural context. It should facilitate the transfer of this newly categorized knowledge into a form that will be of use to groups beyond the creators of the knowledge.

Once created, knowledge should be **validated** to ensure the highest level of quality. This process will involve project specialists, external experts from universities, centers of excellence or development practitioners.

For the project, knowledge is an essential factor in developing innovation capacity, and its capacity to identify risks on a timely basis and to take steps to mitigate them. Development effectiveness and results-driven programming require that decisions be based on information, evidence, and knowledge on impacts, outputs, and performance.[18] In this context, knowledge needs to be **organized and stored**, but also renewed and brought up to date continuously, so they do not become obsolete or irrelevant.
The objective of dissemination is to publicize the existence of new knowledge in order to promote its re-use. The method and format of dissemination depends on the audience and their needs. In some cases, the knowledge needs to be adapted from its original form.

Figure 4. Proposed project KMS under a "user needs" perspective

[18] Inter-American Development Bank, IDB. Institutional Knowledge and Learning Strategy Proposal (2008-2010). April, 2008, Washington DC.

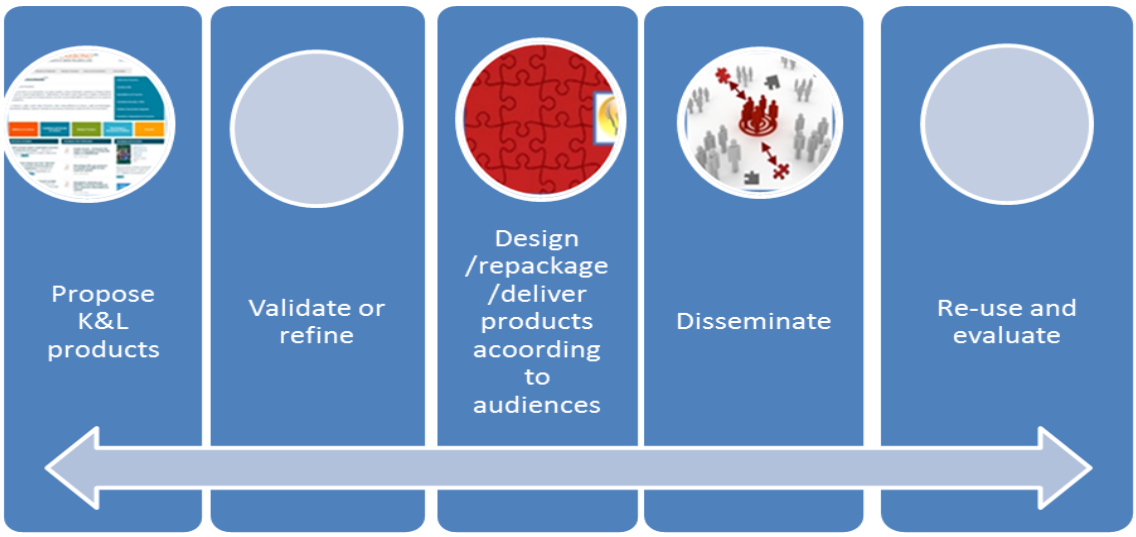


Figure 5. Proposed project KMS building process

Re-use is the process by which knowledge is applied in other experiences and / or contexts. It requires a major effort to ensure that this knowledge will be accessible to interested users. It also needs systematic documentation to ensure a demonstration effect. The re-use will ensure the achievement of the project's goal of contributing to the improvement of development results.

The Project will issue technical documents for decision-makers and stakeholders on governance, EBM/EAF implementation in the policies, and progress in monitoring key bio-physical variables. Two workshops will be organized, one at the project start, and the other one near its end, each at the two different pilot areas. The workshops will involve scientists, stakeholders and decision-makers (local and national) associated to this project and also to other ongoing initiatives, in order to promote synergies, exchange of information and knowledge, and also planning for new projects and/or upscaling successful pilot experiences at national level. Furthermore, a digital network of information exchange and discussion about climate change vulnerability and adaptation will be supported, through an internet website developed by the project.

The project will also organize workshops and awareness raising campaigns in regular intervals during the project directed to the public and especially fishers communities and social groups from both pilot areas (Huacho and Máncora) which livelihoods are primarily impacted by climate change. The objective of the workshops and awareness raising campaigns is to exchange lessons learned and extend information on the value of proper management of marine resources and impacts of climate change to the local communities in order to promote support/participation in the program activities. The target audiences include (i) fishers, (ii) ecotourism operators, (iii) coastal communities, (iv) private sector, and

(v) students from both pilot areas. The campaigns will include the following activities: Seminars and public debates for fishers and the local communities, meetings with local authorities, associations of artisanal fishers and other local stakeholders as well as lectures and other educational activities for local schools (e.g. knowledge and artistic contests and announcement of awards for students). Furthermore, the campaigns will include the distribution of booklets and flyers, broadcasting of audiovisual information on climate change as well as on adaptation measures, ecosystems and conservation.

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.

Senior government officials, including the staff at the Ministry of Environment, Ministry of Production and Vice Ministry of Fishery, and at specialized agencies, such as IMARPE, fully support the proposed project.

A consultative workshop with local and national stakeholders took place at IDB headquarters in Lima, on September 22, 2011. The goal was to present the project and to survey for inputs and suggestions, particularly those related with the adaptation measures at pilot areas. For this, seven to nine people from each pilot area were invited to the workshop, including local fishers, town mayor's representative, and other local authorities. From the government there were invited several directors from the Vice Ministry of Fishery and from the Ministry of Environment. Also, experts from universities and science institutions (Peruvian Geophysical Institute and the Peruvian Meteorological Service), and a number of NGOs that are involved in other initiatives related to climate change and marine conservation issues participated in the meeting.

In addition, various interviews were carried out at each pilot site, from March 6 to March 11, 2011 in the fishing coves of the Máncora pilot area, and from March 22 to April 9, 2011, in the coves of the Huacho pilot area. The goal was to collect first-hand information from local communities, authorities, academia, NGOs and regulatory agencies, on potential adaptation measures they could identify that would help them cope with climate observed and anticipated impacts on natural resources (fish stocks), a big contributor to their livelihoods. At the same time interviews were very helpful to better identify main stakeholders and potential local contacts during project execution phase within local communities. A map of stakeholders was generated together with summaries of issues raised by the communities that include also the identification of external factors outside of climate change that could be of threat to the success of the project. These reports are available in the project preparation files.

The consultation workshop of the Máncora pilot area took place in Máncora town in March 10, 2011, with the participation of representatives of the local and regional governments, the official from the local IMARPE station, including the Production and Environmental Regional Agencies, as well as fishers associations from each cove. For the Huacho area, the workshop took place in March 23, 2011, at the Huaura provincial government auditory. Participants also included representatives of the local and regional governments, fishers

associations from each cove, IMARPE local station and a group of professors from the local University (Universidad Nacional José Faustino Sánchez Carrión).

Results from the interviews and workshops contributed to the elaboration of the intervention proposals, as well as to map the risks and strengths for the sustainability of the adaptation measures. Interventions proposals include participation of women in preprocessing of fishery and aquaculture products, as well as in marketing of handicraft souvenirs made of marine materials. These workshops allowed finishing the Conceptual Note, which was approved by the Adaptation Fund in June 2012.

Later, in order to identify capacity building activities for implementation of adaptation measures, two Workshops were carried out in Huacho (September 10th, 2012) and Máncora (September 6th, 2012). The list of stakeholders consulted in 2012 is presented in Annex IV (Workshops at Huacho and Máncora).

In addition, several coordination meetings have been carried out with stakeholders from other projects, such as the IADB, PROFONANPE, SERNANP and GEF-Humboldt. In particular, in May 2014 IMARPE and IADB organized an inception meeting for capacity building on management tools for project execution.

During the beginning of the project and elaboration of the Project Implementation Plan a participative consultation and reporting mechanism will be used to gather inputs from the communities. There is great confidence in this proposal project approval by the community as IMARPE has coastal laboratories in Huacho and Paita (near Máncora) with permanent interaction with fishers and previous coordinations about the project.

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

Justification for full funding is divided into two elements. First the importance of the project is highlighted, as part of the GoP priorities associated with climate change, adaptation and economic development. The second element discusses the logical framework for the project design. It is argued that all activities are integrated (and are necessary) and linked to produce an adaptation program that gives due attention to climate, climate monitoring and its impact on the primary productivity of the Peruvian coastal marine ecosystems and fisheries, while at the same time support policy definition and management decisions towards a sustainable and productive utilization of the most productive fishing ground in the world.

Background: Expected climate change impacts on fisheries

As indicated previously, there is mounting evidence that climate change and changes in the chemical composition of the atmosphere are altering the physical and chemical characteristics of the oceans. The IPCC in its Fourth Assessment Report devotes an entire chapter of its Climate Change 2007 | The Physical Science Basis, to “Observations: Ocean Climate Change and Sea Level”. It concludes as unequivocal from observations of increases in global average ocean temperatures and widespread changes in ocean salinity, wind patterns, heat waves and the intensity of tropical cyclones. Moreover, changes in

ocean biogeochemistry have been observed; including increased total inorganic carbon content, changes in acidity and reductions in oxygen content.

Locally, studies by IMARPE and others (Chávez et al., 2008; Demarcq, 2009; Gutiérrez et al., in press) have verified the presence of these global trends and explored the ecological response to such changes. Their conclusions point to a reduction in primary productivity that leads to a decrease in anchovy production, which impact the food chain with expected reductions in predators (fish, mammals, and birds) that feed on the anchovy. The process described is expected to accentuate with further global warming.

The proposed project is in line with the new strategic guidelines (PRODUCE, 2010) that the GoP has outlined for the fisheries sector, with clear emphasis in improving the conservation and management of fish resources, especially at the artisanal and aquaculture segments of the sector, in order to improve the resilience to the impacts of future climate change on marine ecosystems and the resources associated with them. It will also help in the implementation of national and local level policies regarding coastal land-use planning and in the identification and pilot testing of income diversification alternatives for coastal population that will need to leave the fishing activity due to the application of sustainable fish management measures.

A recent study (Libélula, 2011) has calculated the amount of financial resources needed to mainstream climate change adaptation in the freshwater, agriculture and fisheries sectors in Peru, identifying a set of basic adaptation measures and the costs related to their development. In the case of fisheries, the study focused in anchovy fishing for direct human consumption and aquaculture, finding investment needs reaching to US$ 678 million and US$ 175 million, respectively, for the 2010-2030 period.

The following description will provide a more detailed justification for each of the planned adaptation measures.

Component 1 Implementation of interventions in pilot strategic areas to improve resilience of target coastal communities and key coastal marine ecosystems to climate change and variability-induced stress and **Component 2** Deployment of a modern and efficient environment surveillance and prediction system in the coastal marine ecosystems at regional and local scales supporting fisheries adaptive management under the EAF principles.

Baseline (without AF financing):

Component 1. The current problematic of the two pilot strategic areas is described in Annex I and summarized in Table A1. Vulnerability of coastal communities to climate change in those areas is amplified by other stressors, as fishing practices, pollution and improper territory use. Current development plans for the fisheries industry in these regions fail to consider climate change as a risk factor.

Component 2. In the recent past the GoP has adopted a quota system associated with greater control on the fleet size but it only covers the industrial fleet, and follows a mono-specific approach and an empirical use of environmental information. On the other hand, there are advances in the knowledge of the resource variability related to climatic conditions, but gaps persist in terms of monitoring cover of circulation changes and downscaling of global warming impacts at the upwelling ecosystem level.

With AF financing:

Component 1. This component aims at conducting the identification, feasibility and implementation of alternative productive options for those displaced by the implementation of the new management strategy in pilot areas selected by the GoP as areas where reallocation of fishers will be needed. The project aims at developing those options that are found to be environmentally, socially and financially sound. Incentives for early adoption of these opportunities will be studied and developed to facilitate broad acceptance. Also, environmental awareness and environmental education will be promoted in local communities, as part as a wide range of measures, which are fully described in Annex I.

Component 2. The GoP, with the scientific advice from IMARPE, is required to define the sustainable quota for each fishing season. Defining this target capture is the core scientific and technical task of the adopted management strategy. This component is aimed at building this capability within Peru. It is envisioned that once the project is implemented the sustainable quotas will be estimated following the EAF framework, through the use of proven and verified ecological models, and utilizing oceanographic and climatologic data from field stations and satellite information properly organized as an indicators' dashboard. The continued collection of field data, including physical, chemical and biological will provide the inputs required to improve the quality of the analysis and the ability to model and project ecosystem behavior, which is not currently possible. The execution of this component would allow for a science based/data based policy and management alternative.

Component 3 Capacity building for implementing the EAF as a means for dealing with the consequences of climate change and to disseminate and inform project's lessons, targeting government officials, academia, stakeholders and local communities and **Component 4** Management policies, regulations and measures promoting the resiliency of coastal ecosystems and local communities to climate change and variability-induced stress as well as other anthropogenic stressors such as pollution, coastal marine infrastructure construction and operations, and exploration and exploitation of oil and gas resources.

Baseline (without AF financing):
The GoP has been developing policies and management options for the sustainable use of the natural fisheries resources for many years, but without an integrated governance framework that ensures the application of these policies and disseminates the outputs for the stake-holders and the community. Coordination with other government agencies is poor at best, with limited resources devoted to deal with stressors outside the scope of their legal mandate. Emphasis has been on industrial fishing, with artisanal fisheries receiving less attention due to the smaller volumes of catch and the enormous difficulty for adequate inspection, fishery surveillance and control. Within the context of climate change, the limited application and enforcement of the GoP management policies increases the vulnerability of resources, particularly those that support artisanal fishing. One of the current obstacles is the limited human resources for the generation of science-based information for decision-makers, and also the limited human resources at the managerial level specialized in the EAF and in the climate vulnerability criteria.

With AF financing:

Detailed modeling and extensive data collection is not enough to assure a sustainable management of fisheries. Both, environmental policy and management require equal attention. The GoP is prone to implement EAF in the decision-making process including

artisanal fishing. Adaptation measures (iii) and (iv) therefore focus on the development of a framework to facilitate capacity building, both at scientific and managerial levels, with a particular emphasis on the development of policy and regulatory tools as the Ecological Risk Assessment and other EAF methodologies, applied to the industrial and artisanal fisheries. Also, the support that the project will give for the development of the information exchange network with local and national stakeholders, will promote the dissemination of the project's lessons, and the synergies with other ongoing initiatives. The project also recognizes the need to respond to other stressors or threats to long-term sustainability of coastal ecosystems, such as pollution and exploitation of gas and oil. The approach taken is to work with the authorities in charge of land use/territorial planning to support the implementation of existing regulations, so municipalities define detailed land use plans, in consultation with all stakeholders. The project will support such planning processes and will aim at incorporating provisions promoting long-term sustainability of critical coastal marine ecosystem in pilot areas.

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

As it was explained before in section H, different visits have been made to Huacho and Máncora to meet with the different project's stakeholders and obtain first-hand information on their immediate needs and priorities to facilitate an effective adaptation process. This has allowed the project team to develop a map of stakeholders and better understand main community's climate vulnerability drivers and non-climate threats that could compromise the successful accomplishment of project objectives. Dialogues with local communities have been instrumental to have a better idea of perceived present and future risks of climate change on their livelihoods and initially identified solutions to improve their adaptive capacity. Likewise, project activities have been socialized with officials from the different involved ministries (e.g. production and environment) to ensure their alignment with national priorities for the project areas and ensure long-term sustainability.

The main identified actions that need to be enforced during project preparation and execution to guarantee the sustainability of project outcomes are:

1) *Ensure access to information, technical assistance and commitments with local stakeholders.* The proposed project includes a component that will allow the dissemination of knowledge and lessons learned generated by the project through various tools that include Internet and workshops. The design of a project knowledge management strategy will allow the identification, organization and prioritization of different types of users and their information needs, including a validation phase.

   The project considers active participation of fishers during the design of early warning system and environmentally friendly fishing gears. Fishers will commit themselves with the project by providing their boats for fishing experiences, field monitoring, and surveillance of resources under co-management approach. Sustainability of the project will also be achieved through scaling-up of good fishing practices in other areas, under microcredits scheme and direct human consumption programs.

The combination of investment, training and certification through technical assistance becomes a very attractive program with direct and tangible benefits for local communities that depend on fisheries. For example new investments on environmentally friendly fishing gears and aquaculture activities, accompanied by a training program to fishers followed by a certification represents an approach through which they may have access to new markets and get better prices for their products, while helping to conserve an already stressed natural resource. If this model proves to be as economically successful in practice as the initial cost-benefit analyses have shown, it could be attractive enough for other communities to replicate and maintain even after the project is finished. In this regard the financial help from national or regional government through established fisheries programs connected to the project is a key to guarantee long-term sustainability. This brings to the following two key factors.

2) *Create an enabling environment that allows the **ownership** of the project by local communities.* The proposed project is full attuned to the notion of a plurality of interest. On one hand, individual aspirations are legitimized through the trend towards specialization in the use of environmental friendly fishing gears and additional economic activities such as aquaculture and ecotourism. On the other hand, common interest (protecting the environment and fish resources through co-management practices lead by the community) creates a sense of cohesion that encompasses the entire community.

3) *Ensure the compromise and active involvement of national and regional governments' highest levels*. A solid project implementation unit will help maintain a constant and effective flow of information regarding the accomplishment of project milestones to the different governmental stakeholders engaged to the project such as the Environment and Production ministries, as well as regional designated authorities. Long-term sustainability of project outcomes is guaranteed as long as these are aligned with current and planned strategies to develop the fishing sector by regional authorities. In this sense the adaptation process presented by the project should build on current national work on fisheries' sustainability and contribute to start building climate resilience within the fishing sector. In addition, the project will support communities and fishers associations to make use of the consultation mechanisms for planning the annual budget, in order to get funding support for actions oriented to complement and replicate the project's experiences.

In particular for component 2*,* the following points are to be highlighted in order to guarantee long-term sustainability:

The Peruvian Institute of Marine Research (IMARPE) has the mission to provide science-based information to the government related to the status of the marine ecosystems, the fishery resources and the oceanographic and environmental conditions off the Peruvian coast. Currently IMARPE is divided in several research departments, oriented to fisheries evaluation and monitoring, aquaculture, environmental quality and oceanography, among others. The research activities matrix of IMARPE includes oceanographic monitoring and modeling, though they are currently limited in frequency, spatial resolution and human resources. In addition, there are several coastal laboratories of IMARPE along the coast. Two of them are located close or within the pilot areas. Máncora site is under the domain of Paita coastal laboratory, whereas Huacho site is studied and monitored by Huacho coastal laboratory.

IMARPE ensures the sustainability of the climatic surveillance and prediction system, by optimizing human and material resources from the centralized research platforms and the coastal laboratories, and also by providing the additional resources needed beyond the project. Thus, improving the facilities of the coastal laboratories will be prioritized to sustain the local monitoring tasks. For this, development proposals will be presented for consideration to the regional governments of Piura (Máncora site) and Lima (Huacho site), so that additional funding can be accessed. The capacity building given by the project will be used by IMARPE to expand the data acquisition, the information system and the prediction capacities beyond the project. The weather monitoring stations will be operated in agreement with the National Meteorological Service (SENAMHI), and access to additional funding for the maintenance costs and data sharing will be obtained.

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

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	X	
Access and Equity	X	
Marginalized and Vulnerable Groups	X	
Human Rights	X	
Gender Equity and Women's Empowerment	X	
Core Labour Rights	X	
Indigenous Peoples	N/A	
Involuntary Resettlement		X
Protection of Natural Habitats	X	
Conservation of Biological Diversity		X
Climate Change	X	
Pollution Prevention and Resource Efficiency	X	
Public Health	X	
Physical and Cultural Heritage	X	
Lands and Soil Conservation	X	

An analysis of the implementation of the15 environmental and social principles of the Adaptation Fund in the project design is presented down below:

Compliance with the Law:

The design and formulation of the project has taken as reference the law of Peru, both the environmental sector as production (fishery).

Access and Equity:

The project promotes equal access to the benefits thereof, in particular through the participation of artisanal fishermen (main beneficiaries) in the following activities:

- Adoption of sustainable fishing methods.
- Restoration and co-management of natural banks.
- Sustainable aquaculture through small-scale concessions.
- Creation of ecotourism enterprises.
- Production of bio-fertilizers from fishery and aquaculture residues.
- Access to the benefits of ocean climate information to be generated through the program implementation of component 2.
- Training and sensitizing on key topics such as formalization, entrepreneurship, normative, fishing gear and fishing surveillance and control.
- Design and implementation of early warning systems.
- Social equity seeks to promote a process of advocacy to improve governance including participation of artisanal fishermen in the sector.

Marginalized and Vulnerable Groups

Artisanal fishermen are considered in poor strata of the population. In addition, the project promotes the participation of women in all profits generated by it.

Human Rights

The project is oriented to expand access of marginalized and vulnerable population to greater human rights, since it promotes food security of these groups and the country as a whole through the strengthening of artisanal fisheries in environmentally and socially sustainable practices.

Gender Equity and Women's Empowerment

The project promotes the participation of women in income diversification activities such as ecotourism, aquaculture and production of bio-fertilizers, promoting the empowerment of women and men alike, to assume the management, organization and social sustainability in the initiatives diversification of family income.

Core Labour Rights

The project is not designed to promote employment under the standards of the International Labor Organization. However, by promoting ecotourism, aquaculture and bio-fertilizers initiatives, definitely it will create jobs for artisanal fishing families (wives of fishermen), under the principle of equal pay for equal work.Therefore, the project will ensure that the associations with which implements economic activities are officially registered. The project will not generate in any way child labor.

Indigenous Peoples

This principle does not apply to the project, since in both pilot sites, there is no presence of indigenous peoples, as artisanal fishermen are not identified as such.

Involuntary Resettlement

The project will not be implemented on land or population centers. In that sense, it will not generate involuntary resettlement. However, it is likely to restrict the use of resources due to the delimitation to be held for the strict protection of benthic species natural banks as well as the establishment of aquaculture concessions. This restriction may involve a level of conflict between the project beneficiaries and those fishermen who do not participate in the project (social risk). Therefore a set of mitigation measures to manage these risks have been proposed:

- *Develop economic alternatives for income generation*.- With those affected by the restriction of use of fisheries resources it should be implemented compensation measures, such as: (i) registration of affected to determine how many there are, (ii) develop income-generating initiatives with registered, such as bio-fertilizers production, ecotourism, etc., and (iii) implement a training plan for income generation initiatives.

Protection of Natural Habitats

The project will contribute to the protection of marine and coastal habitats within protected areas, as it will promote the restoration of natural banks of benthic species in islet Don Martin and Punta Salinas which belongs to the Guano Islands, Islets and Capes National Reserve System, in co-management with artisanal fishing communities and authorities to protect these banks. Furthermore, it will support the governance of marine protected areas.

Conservation of Biological Diversity

The project will not cause significant reduction or loss of biological diversity, or introduce exotic species. On the contrary, the proposed activities will contribute to the conservation of marine and coastal biodiversity, since the project will promote the development of sustainable economic activities, as well as policy and management instruments for the conservation and responsible use of marine ecosystems. However, it have been identified minor environmental impacts and risks outlined below and which mitigation measures to avoid or mitigate them, are presented in Table 13:

- Mortality of marine vertebrates (mainly birds and sea turtles) associated with bycatch in fishing gears due to the replacement of nets for longlines.
- Seawater pollution by solid and oil waste generation from aquaculture activities.
- Change in the composition of benthic species and possible population decline of these species due to aquaculture infrastructure installation (sea cages).
- Seawater pollution by solid and oil waste generation from ecotourism activities.
- Disturbance of marine vertebrates (mammals, birds and turtles) due to the noise of boat engines and human presence (wildlife watching and experiential fishing). It is noteworthy that ecotourism is already been conducting in Mancora pilot site, therefore with the proposed mitigation measures the project will also help to mitigate this impact in the area.

- Generation of solid waste due to installation of weather stations in guano islands. This impact will not result in any risk, since the impact will be timely and momentary and the installation will be coordinated with the staff of the protected area in order to do it in non-breeding season of guano seabirds.

The conditioning of a tourist dock could also generate environmental impacts and risks, however, the environmental management tool that requires the competent authority will be elaborated during project implementation. Moreover, for the establishment of aquaculture concessions the Ministry of Production requests an environmental impact statement. Therefore mitigation measures arising from the environmental assessment will be included in Profonanpe´s environmental and risks management program.
In case of unforeseen environmental impacts and risks are identified during project implementation they will be incorporated in Profonanpe´s program.

Climate Change

The project will not have activities which involve a significant increase in emissions of greenhouse gases or other stressor climate change.

Pollution Prevention and Resource Efficiency

Project activities include the development of good practices in the management of solid and oily waste, so the risk of environmental pollution should be avoided.

Public Health

Project activities involve no risk to human health. On the contrary, the promotion of bio-fertilizers, will be made under an efficient use of waste from fishery and aquaculture, which means in practice to implement actions of recycling solid waste pollutants and harmful to health, making them products of commercial value.

Physical and Cultural Heritage

In the project intervention area there are no cultural heritage sites. Only some activities are proposed within Guano Islands, Islets and Capes National Reserve System (Huacho pilot area). However, the protected area will not be affected.

Lands and Soil Conservation

Project activities will be conducted mainly in marine ecosystems, therefore there will be no soil degradation or conversion.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

The project will be implemented through a simple and efficient structure that will facilitate the active participation and coordination of all project stakeholders as presented in figure 6. PROFONANPE will serve as the **National Implementing Entity (NIE)** responsible for the oversight of the project. In its role, PROFONANPE will contribute to the preparation, implementation and monitoring of the project, through its headquarters and country office in Peru. These will include among others the following activities: (i) support project preparation and evaluation, (ii) guide the definition of monitoring and evaluation arrangements including outcome and output indicators, (iii) contribute building local capacity through specialized training/workshops on fiduciary and procurement-related aspects of project execution in accordance with PROFONANPE's policies and guidelines, (v) provide sectorial policy advisory as requested, (vi) provide support on technical and quality assurance issues in accordance to PROFONANPE's policies.

The Republic of Peru will be the Beneficiary of the project, and the Ministry of Production of Peru (PRODUCE) will be the **Executing Agency (EA)** responsible for the execution of the project in its fiduciary aspects. The EA will execute the project in accordance with the purposes and activities agreed upon with PROFONANPE, following its policies and procedures.

The EA will carry out its responsibilities through the Unidad Ejecutora 003 "Fomento al consumo Humano Directo – A Comer Pescado" (UE-003) of the Vice-Ministry of Fisheries of PRODUCE, which will host a **Project CoordinationTeam (PCT)**, financed through the project. The UE-003 is currently responsible of carrying out the project "Adaptation to climate change in the fishery sector and marine-coastal ecosystem of Perú" (PE-G1001/PE-T1297) financed by the IADB (see Part II F). In order to facilitate the complementarity of both projects, PRODUCE decided to assign the same UE-003 to execute this proposal. The UE-003 will program and facilitate the meetings of the Project Steering Committee and will distribute the project reports to the members of the PSC (PRODUCE, IMARPE, MINAM, SERNANP).

The PCT will be led by a Project Coordinator and consists of a group of professionals who will give support to the EA in all project related administrative and fiduciary aspects, in order to execute the following tasks: (i) preparation and execution of project work plans; (ii) contracting external annual audits and preparing required documentation for this purpose; (iii) preparation and monitoring of annual project budgets including periodical budget revisions; (iv) administration of funds including the preparation of disbursement requests to PROFONANPE; (v) carrying out procurement processes according to PROFONANPE procurement policies; (vi) carrying out financial and progress reporting; (vi) prepare the project's operations manual, which will be approved by the Project Steering Committee (PSC); with the prior non-objection of PROFONANPE; (vii) hire the external audit of the project's financial statements for submission to PROFONANPE; and (viii) compliance with monitoring and evaluation protocols established in the project's operations manual (POM) to be designed following PROFONANPE´s procedures.

Additionally, the EA will coordinate the collaboration with PSC members, such as IMARPE, for technical support during project execution and the implementation of specific components,

including the local governments of Máncora and Huacho. The coordination between the entities involved in the execution of the project will be further detailed in the POM.

The **Project Steering Committee (PSC)** will be established to provide high-level technical and managerial guidance to the PCT in charge of the project. The PSC will be composed of designated senior-level representatives from the EA (PRODUCE), the Ministry of the Environment (MINAM), the Peruvian Marine Research Institute (IMARPE) and the Peruvian National Service of Protected Areas (SERNANP). Presided by the Ministry of Production and with the participation of IMARPES's Executive Direction, MINAM, and SERNANP, the PSC will provide strategic guidance to the project by: (i) approving Project Operations Manual (POM) and required updates or modifications; (ii) supporting the Project Coordinator by ensuring an enabling environment to assure technical quality, financial transparency and overall development impact of the project; (iii) serving as forum for the analysis of policy implications, political feasibility and building consensus for policy and regulation implementation among project stakeholders; (iv) maintaining, through its presidency, regular communication among its members and ensuring that their interests are addressed and communicated effectively to project stakeholders.

The PCT includes a procurement specialist, an administrative assistant and a local project coordinator. The PCT main responsibilities include: (i) assure compliance with all fiduciary requirements (both financial and procurement) of PROFONANPE, including also the Adaptation Fund Social and Environmental policy; (ii) provide support as required by the Project Coordinator and EA in the preparation of the POM, AOPs, Procurement Plans, Project Execution Plans, disbursement requests for submission to PROFONANPE, prepare and update project financial balance sheet and (iii) monitor project's disbursement against goals established in the POM. The local coordinator based in Máncora will have a key role in disseminating knowledge and exchanging information with all stakeholders and the public in general, including other units within IMARPE, PRODUCE, MINAM, universities, other national science institutions, NGOs, CBOs, local governments, as well as associations of artisanal fishermen from local areas.

The **Project Coordinator (PC)** will be a dedicated professional hired by the project and designated for the duration of the project (4 years) to lead the PCT. The PC's prime responsibility is to ensure that the project produces the results specified in the agreement between the PROFONANPE and the EA. With the support of the local coordinators, the PC will oversee progress of technical project components, including day-to-day operations of the project, and the overall operational and financial management and reporting. The PC will count on the support of both the TS and PCT for the successful execution of project activities. PC's core functions include: (i) lead the preparation and execution of the POM and present it to the PSC for its approval; (ii) lead the preparation and present annual reports of project status to the PSC, PROFONANPE, following the indications highlighted in the POM; (iii) revise and approve project disbursement requests to be presented to PROFONANPE; (iv) coordinate with local project coordinators and discuss with them the POM; (v) lead the preparation of project's final evaluation; (vi) serve as the liaison between the project and other national, regional or local activities that could complement or generate synergies with the objectives of the project.

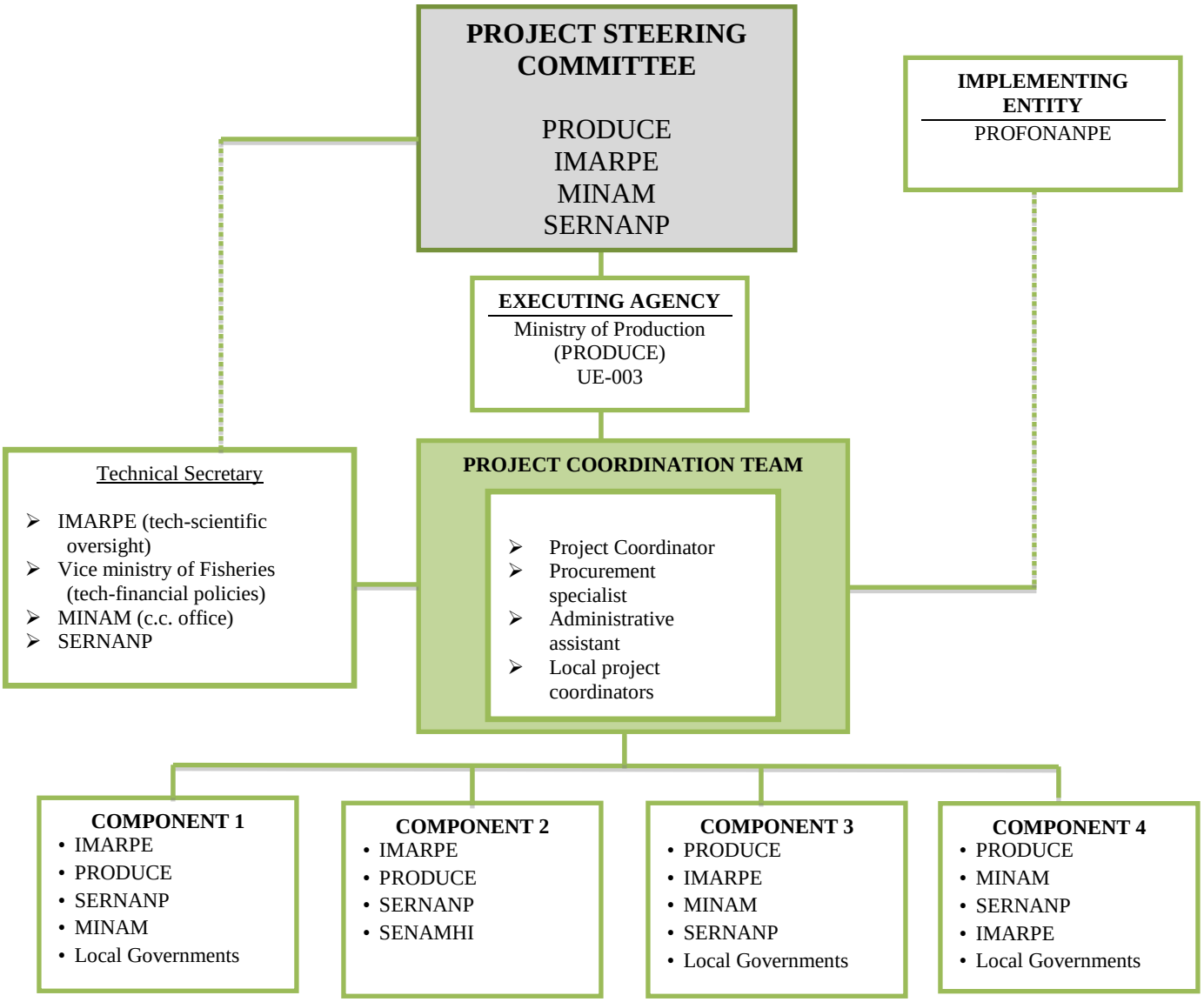


Figure 6. Project Implementation structure

The **Technical Secretary (TS)** will oversee critical technical decisions and will make sure that the technical quality of project outputs has the highest standards. The TS will be composed by a group of professionals from the Vice-ministry of Fisheries and the Ministry of Environment (MINAM), and IMARPE will preside it. IMARPE, as the chair of the TS, will be responsible of the approval of the terms of reference for the procurement of all goods and services.

On the other hand, MINAM will provide technical guidance in the mainstreaming of the climate change adaptation approach in the activities of all the involved institutions. Specifically, the TS will be responsible for: i) technical and scientific oversight of the project; ii) monitor the technical implementation of services and other contracts; iii) coordination with other national science institutions to complement the surveillance and prediction system, iv) give direct technical

support to the PCT in the preparation of the Annual Operating Plans (AOP) and the Project Implementation Plan that will define the execution timeframe for each activity and the responsible parties for their supervision, and v) review and approve the POM that incorporates project activities and results to be delivered through the plan.

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

A risk management strategy is a key component of project management activities. This is in line with PROFONANPE risk management approach. PROFONANPE should provide support to the PCT and EA in the monitoring and mitigation of risks; the results should be tracked and reported as agreed with PROFONANPE. Risks should also be systematically monitored as part of the Monitoring & Evaluation (M&E) Plan by PROFONANPE staff carrying out the oversight related tasks. Reporting on risks and mitigation strategies should take place as part of the semi–annual reports. In addition to this and keeping with PROFONANPE practices, a dedicated budget lines exists for M&E, to ensure that the necessary resources are allocated to execute such framework.

The correct and ongoing management of risk will not eliminate risks, but will help improve the probability of satisfactorily achieving project results and impacts. For this reason project risk management will include the following principles: (i) integrated approach, (ii) on-going process that takes into account all of the information that is created during periodic evaluations and decisions adopted, (iii) decisions taken during the risk management process must be documented, (iv) inclusion of effective communication with interested parties in all aspects of the process, (v) guarantee of integrity of risk evaluation process, (vi) regular assessment of quality risk management standards and procedures becomes an integral part of project's supervision and monitoring tasks.

Potential risks for the development of the proposed project are limited, and measures to control them have been defined in the following table 12.

#	Type	Risk Description	Lev	Mitigation Strategy
1	Regulatory	Climate change adaptation has not been incorporated in the policies, strategies, and plans of the Ministry of Production (PRODUCE) nor local governments.	L	PRODUCE recently presented its new strategic guidelines and climate change adaptation is one of the main lines of action proposed. Additionally, IDB and the Ministry of Economics and Finances (MEF) have discussed with PRODUCE in order to advance the formulation of the climate change adaptation strategy for the fisheries subsector. Participation and consultation of local policy and decision makers in workshops, field visits and meetings during the project preparation, implementation and evaluation phases. Communication plan for disseminating the project strategy, its components, expected

				outcomes, results and lessons learned from the adaptation processes in order to promote awareness and understanding of adaptation and climate risk reduction processes. Capacity building actions (for example how to use scientific information/results/lessons learned in the formulation of policies/strategies/plans).
2	Political	Artisanal fishing has not been included into national development policies; the focus of the sector has been directed to industrial fishing and exports.	L	Influence policy makers for the inclusion of artisanal fishing (and its relation to climate change) into national development policies. Assure the active participation and consultation with artisanal fishing communities and decision makers in workshops, field visits and meetings during the project preparation, implementation and evaluation phases. Communication plan for disseminating the project strategy, its components, expected outcomes, results and lessons learned from this project. Capacity building actions (for example how the artisanal fishing is a key player in the formulation of the national policy.
3	Regulatory	Insufficient regulation proposing environmental friendly fishing practices and the sustainable use of ecosystems.	L	Promote through workshops, the application of environmental friendly fishing practices and the sustainable use of ecosystems in the artisanal fishery sector. Provide support/technical assistance to the governmental agencies to develop regulation and enforce its implementation.
4	Regulatory	Weak enforcement and lack of compliance with regulation; various gray areas in the interaction between artisanal and industrial fishing.	M	Ensure the participation of the DICAPI (Port stewards and Coastguard), COREVIPAS (local delegate for the surveillance of fishing activities), regional governments and regulatory agencies in the enforcement of and compliance with sector specific regulation, through the active support of the Ministry of Production and the Ministry of Environment (for example workshops, meetings and field visits to the project showing the problematic between artisanal and industrial fishing).
5	Financial	There may be insufficient financial resources for the sustainability of the project activities once the grant financing the project is spent.	M	The EA will take advantage of current and rising opportunities of public funding for climate change adaptation, risk management, food security and sustainable fishery management national programs in order to give sustainability and scale up the adaptation measures launched

				during the project. Fundraising capacity of key stakeholders for accessing public and private funding is further enhanced; the benefits to have a portfolio with several donors and the opportunities from the lessons learned from this project need to be highlighted. The fisheries certification processes once accomplished will provide higher incomes to beneficiaries, favouring sustainability of adaptation measures.

Table 12. Financial and regulatory risks of the project and respective response measure (L=low, M=medium, H=high).

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

The project execution may generate few potential environmental and social impacts that should be reversible and easy to avoid or mitigate. Therefore, the project is categorized as Category B. Potential environmental and social risks and measures to control them have been defined in the following table 13.

During the environmental and social assessment of the project (Annex V and VI), the corresponding management plans were developed. These plans contains 2 programs:

a) Environmental and social mitigation and prevention program, which set mitigation measures for each environmental and social impact and risk identified, and
b) Monitoring, evaluation and oversight program, which set the protocol for monitoring and evaluating compliance of mitigation measures.

Moreover, the assessments established a procedure for the management plans that will be implemented by Profonanpe.

#	Type	Risk Description	Lev	Mitigation Strategy
1	Social	Resistance from specific artisanal fisheries or groups within those areas to the proposed measures.	M	Support the marketing of fishing products. The project will work with the wives of fishermen in activities of selection, handling and preparation of artisanal fisheries products, in order to canalize them to direct consumer market through weekly and / or daily fairs of fishing products, promoted by PRODUCE, local and regional governments. This means working previously in coordinated action and establishing agreements for cooperation between the stakeholders involved: fishermen, PRODUCE, local and regional

				governments. Stage workshops and training programs for community leaders and civil authorities to raise awareness of important local issues related to climate change and adaptation. Work through local associations to promote dialogue and build trust among stakeholders, as well as facilitate the incorporation of lessons learned and replication in specific geographical areas. Ensure visibility of climate adaptation strategies and economic benefits in the eyes of all beneficiaries, through workshops, training, field visits. Provide technical assistance to the key stakeholders of the project for formalization and certification of artisanal fisheries.
2	Social	Beneficiaries not adequately trained in environmental concepts and sustainable practices.	L	Train and increase awareness and knowledge of beneficiaries via workshops and community education. Work permanently through training workshops before and during project implementation with the goal of increasing awareness and knowledge of stakeholders on the benefits of the project.
3	Social	Few or lack of coordination instances for the key stakeholders involved does not ensure the adequate prioritization of project activities.	L	Ensure the participation and consultation of key stakeholders and decision makers via workshops and meetings during the project preparation, introduction, implementation and evaluation phases. Implement a strategy among regional and local governments, IMARPE, PRODUCE and representative fishermen organizations, to inform, validate and execute the actions provided by the project in a participatory way.
4	Social	Conflicting interests among stakeholders regarding the rights, access and restriction of use of natural resources.	M	Two working groups (one for each pilot area in the project) will work towards promoting dialogue and building trust among key stakeholders to assure equity conditions and promote auto-regulation through co-management strategies. With fishermen affected by the restriction of use of resources due to natural banks delimitation and strict protection and aquaculture concessions, compensation measures will be implemented, such as: (i) registration of affected to determine how many there are, (ii) develop income-generating initiatives with registered, such as bio-fertilizers production, ecotourism, etc., and (iii) implement a training plan for income generation initiatives.

				Promote women participation in aquaculture and bio-fertilizers production. Design and implement a sustained information program prior to project initiation targeted to fishermen communities involved in the project.
5	Environmental	Mortality of marine vertebrates (mainly birds and sea turtles) associated with bycatch in fishing gears due to the replacement of nets for longlines.	L	Establish an on board monitoring program to track bycatch of marine vertebrates (mammals, birds and turtles), which will contribute to provide recommendations to reduce bycatch of species and their associated mortality and improve fishing practices. Train artisanal fishermen in recovery techniques, rehabilitation and release of bycatch species.
6	Environmental	Seawater pollution by solid and oily waste generation from aquaculture activities.	L	Elaborate the Environmental Impact Statement requested by the competent authority (Ministry of Production – PRODUCE). Develop and implement a solid and oily waste mangement plan, which must be part of the management plan of the fishing area or concession. Consider within the component of the project on capacity building (component 3), training modules on solid and oily waste management and good aquaculture practices. Oversee the appropriate development of aquaculture.
7	Environmental	Change in the composition of benthic species and possible population decline of these species due to aquaculture infrastructure installation (sea cages).	L	Develop research aimed to generate information on the impact of aquaculture on benthic species and implement recommendations.
8	Environmental	Seawater pollution by solid and oil waste generation from ecotourism activities.	L	Develop and implement a solid and oily waste mangement plan from ecotourism activities. Conduct periodic revisions of boat engines to avoid spills of oils or lubricants. Develop training for beneficiaries on solid waste management.
9	Environmental	Disturbance of marine vertebrates (mammals, birds and turtles) due to the noise of boat engines and human presence (wildlife watching and experiential fishing).	L	Develop codes of conduct of good practices for watching marine wildlife, to be implemented by conformed ecotourism enterprises. Subscribe agreements or commitments with beneficiaries to comply with the best practices of sighting.

				Develop training for beneficiaries on good ecotourism practices. Ensure compliance with legal standards relating to tourism operation. Oversee the adequate development of ecotourism operation of beneficiaries.
10	Environmental	Environmental pollution associated with sewer waste from the coastal cities and industrial activities have a negative effect on the implementation of interventions related to natural banks, and aquaculture activities.	L	Avoid polluted or polluted-threatened areas when designating potential aquaculture and co-management areas for the project.
11	Environmental	El Niño events, other climatic events and red tides affect the PAs habitats and local communities.	M	Ensure that the design and implementation of early warning system, as well as local strategies on dissemination, are part of the project's goals. Contingency plans to be included in the interventions design and costs so that losses for the beneficiaries are lowered.

Table 13. Environmental and social risks of the project and respective response measure (L=low, M=medium, H=high).

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

The Monitoring & Evaluation (M&E) Plan will be conducted in accordance with PROFONANPE standard procedures. The Results Framework defines execution indicators for project implementation as well as the respective means of verification. The monitoring and evaluating system for the Project will be established based on these indicators and means of verification. Monitoring activities will seek progress of processes and project milestones completion, while the evaluation will focus on the achievement of results and overall project impact based on the stated objective.

Monitoring and evaluation at the project level, including the day-to-day monitoring of project activities, will be responsibility of the Project Coordinator, with support from the procurement specialist assigned for this operation. Periodic monitoring of implementation progress will be undertaken by the PROFONANPE through quarterly meetings with the Project Coordinator, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

Resources targeted for M&E are represented in a portion of the time of the Project Coordinator, Procurement specialist, Administrative assistant and the technical staff from the participant institutions working in the various Components, this is estimated at one quarter of their work time. Dissemination of project progress is part of the estimated communication and information dissemination plan. An external financial audit will be performed each year by a firm approved

by the PROFONANPE, which will be contracted by the Executing Agency and paid by the project.

The project will have a Project Implementation Plan (PIP) to support project management through a multi-year proposal for the execution of the entire project. The PIP is based on the results matrix and includes the activities and responsibilities throughout the project timeframe. A proposed Annual Operating Plan (AOP) will be developed at the middle of each year of project execution, and approved by the PSC. A Project Initial Report will include a detailed description of first year's AOP execution, divided in quarterly sections, related budget and progress indicators to guide the project implementation during the first year.

The M&E Plan

The Project Steering Committee (PSC), presided by Ministry of Production and with the participation of the Vice-Minister of the Ministry of Environment, IMARPES's Executive Direction and SERNANP's Direction(as described in section A of Part III) will be part of the project's evaluation activities and will be informed of the progress of the monitoring process. Annual Progress Reports (APR), as well as the Mid-Term and Final Evaluations (including lessons learned and good practices) will be presented to the PSC, and shared with other relevant stakeholders (i.e. government, civil society and participating organizations or beneficiaries). In the APRs comparison between the baseline and the indicators will be carried out.

Initial evaluation

- The Project Inception Workshop (PIW) will be held within the first 2 months of project start-up with all stakeholders. The IW is crucial to build ownership of the project results and to plan the first year annual operating plan. A fundamental objective of the IW will be to present the modalities of project implementation and execution, document mutual agreement for the proposed execution arrangements amongst stakeholders, and assist the PCT to understand and take ownership of the project's goals and objectives. Another key objective of the IW will be the introduction of the PCT which will support the project during its implementation. An IW Report will be prepared and shared with participants to formalize the various agreements taken during the meeting.

- Within the first six months of the project, the Project Coordinator will also be responsible for consolidating all baseline information required for the indicators identified in the Results Framework.

Progress Monitoring

- Quarterly Reports will be prepared by the PCT and verified by the PROFONANPE.
- An Annual Progress Report (APR) will be prepared by the Project Coordinator, and shared with all stakeholders. The APRs will include progress against set goals, objectives and targets, lessons learned, risk management and detailed financial disbursements. APRs will be prepared to monitor progress made since project start and in particular for the previous reporting period. The APRs will include, but are not limited to, the following:

    - ✓ Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative); information related to product indicators will be collected mainly through documentation and records within

institutional stakeholders, as well as through the review of meeting reports and agreements of the Steering Committee.

- ✓ Project outputs delivered per project Outcome (annual);
- ✓ Lessons learned/good practices;
- ✓ Annual expenditure reports;
- ✓ Risk management, and a critical assessment of project administration, coordination and execution
- ✓ Effectiveness of project and individual component design including progress in inter-institutional coordination and execution

- Government authorities, the PCT, and PROFONANPE staff will conduct regular field visits to project sites based on the agreed schedule in the project's Inception Report/Annual Operating Plan to assess first hand project progress.

Mid Term Evaluation

- The project will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation. The MTE will determine progress made toward the achievement of outcomes and will identify corrective actions if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated in a Mid-term Report.

- The Mid-term Evaluation, carried out when 40% of the AF resources are disbursed, or twenty-four months after the project contract goes into effect (whichever comes first), will determine progress towards results' achievement, the level of stakeholder participation, any positive changes in beneficiaries' practices due to the intervention, as well as identify necessary changes to be made.

Financial monitoring

- The PCT will provide PROFONANPE with certified periodic financial statements, and with an Annual Audit of the financial statements relating to the status of fund´s execution according to the established procedures set out in PROFONANPE´s Operations Manual. The Audit will be conducted in accordance with PROFONANPE Financial Regulations and Rules and applicable audit policies on PROFONANPE projects by a legally recognized auditor of the GoP, or by a commercial auditor engaged by the GoP.

Final evaluation

- A Final External Evaluation will be conducted three months before project closure (three months before the Project Steering Committee meets for the last time) and will focus on the same issues as the Mid-Term Evaluation. The Final Evaluation will also look at the impact and sustainability of project results.

  The budgeted M&E plan, which is included in the PEC costs, is presented in Table 14, and the break-down of how Implementing Entity's fees will be utilized in the supervision of the M&E function is included in Part III, Section G.

#	Type of M&E activity	Responsible party	Budget US$	Time frame
1	Inception workshop and report	• IMARPE • PROFONANPE • Steering committee	7,000 (PROFONANPE staff travel costs to be charged to IE fees)	Within first two months of project start up in one of the pilot areas Report within one month of the IW
2	Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	• Project Coordinator	None	Annually
3	Quarterly Reports	• Project Coordinator (EA) • PROFONANPE	None	Quarterly
4	Annual Progress Reports	• PCT (EA) • PROFONANPE	None	Within two months of the next year.
5	Meetings of the Project Steering Committee (PSC)	• Project Coordinator (EA) • PROFONANPE	None	
6	External Mid-term evaluation	• PCT • PROFONANPE External consultants	15,000	At the mid-point of project implementation
7	Late-term Workshop and report	• IMARPE • PROFONANPE • Project Steering Committee	10,000 (PROFONANPE staff travel costs to be charged to IE fees)	Nine months before the end of project implementation, in one of the pilot areas Report within one month of the workshop
8	External Final Evaluation	• Project Coordinator • Technical Secretary, • PROFONANPE, external consultants	30,000	Three months before the end project implementation
9	Final Report	• PCT • PROFONANPE	None	At least one month before the end of the project
10	Audits	• PCT • PROFONANPE	58,000	Annually - Following PROFONANPE procedures
11	Monitoring Visits to Field Sites	• PCT • PROFONANPE	10,000 (PROFONANPE staff travel costs to be charged to IE fees)	To be determined annually by PCT and PROFONANPE
	TOTAL			**US$ 130,000**

Table 14. M&E budget.

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

Results framework for the project proposal, including milestones, targets and indicators

Project Strategy		Objectively Verifiable Indicators				
Goal: Support the GoP in reducing the vulnerability of coastal communities to the impacts of climate change on the coastal marine ecosystems and fishery resources.		Indicator	Baseline	Target	Source of verification	Risks and assumptions
OBJECTIVE/COMPONENT 1: Implementation of interventions in pilot strategic areas to improve resilience of target coastal communities and key coastal marine ecosystems to climate change and variability-induced stress.		No. of artisanal fishers in PA adopting climate change adaptation measures that improve their livelihoods and the resilience of the ecosystem % of women adopting climate change adaptation measures	0 – artisanal fishers are adopting climate change measures at PA	700 artisanal fishers in PA adopted climate change measures 10% of women adopting climate change adaptation measures	Survey report	(See below)
OUTCOME 1.1. Increased resilience and reduced vulnerability of targeted coastal marine ecosystems to observed effects of climate change and variability-induced stress	OUTPUT 1.1.1.Adoption of sustainable fishing methods to tackle non-selective fishing gear based on EAF principles directed to target species vulnerable to climate change	% of non-selective fishing gears that are replaced by selective fishing gears by the fishing units in PAs. (from a total of 120 fishing boats in Máncora).	0% - Artisanal fisheries perceive that the resources are being depleted due to over extraction and other factors such as pollution and bad fishing practices (blast fishing, dinghy, buzzer)	At least 30% of non-selective offshore gillnets (used for fishing tuna) are replaced by long-line in Máncora cove, (tropical coastal PA).	Surveys report, site visits	Risk: Resistance by artisanal fishers to change traditional practices for sustainable practices. Assumption: Support to sustainable artisanal fishery and direct human consumption in the fishery policy.

	OUTPUT 1.1.2. Restoration and co-management of natural banks	# of natural banks restored	Historical records of natural bank of scallop in Don Martin island	1 natural bank of scallop restored in the Marine Protected Area	Survey report	Assumption: Normative framework promulgated for restoration and co-management of coastal marine area
		# of natural banks co-managed	Natural banks of razor clam in Punta Salinas	1 natural bank of razor clam under co-management principles	Survey report	Assumption: Climate conditions not exceeding predicted scenarios.
						Risk: Granting rights for other activities.
						Assumption: Strategy for the definition of priority areas by Ministry of Production.
						Assumption: Active participation of stakeholders and adequate monitoring from the authorities
OUTCOME 1.2. Improved adaptive capacity of local participating communities through the diversification	OUTPUT 1.2.1 Planning and development of sustainable aquaculture through small-scale concessions	# of artisanal fishers associations developing sustainable aquaculture	There are organizations interested in promoting the development of this activity; i.e. an association of artisanal fishers, aquaculture and related extractors "St. Martín de Porres" in Huacho	At least two artisanal fishers association developing scallops sustainable aquaculture	Progress reports (at local level); site visits	Assumption: It assumes a positive impact of sensitization and training activities according to the needs identified

and strengthening of their livelihoods and sources of income as they face climate change induced modifications of biomass and fish distribution		# of aquaculture concessions granted in Pilot Areas reporting profits	In Huacho, aquaculture was practiced for mullet and scallop. In 2009, fishermen (200 extractors) participated in a repopulation project for scallop in Don Martín Island. The project failed because of the low salinity and lack of technical assistance. SERNANP, who manages the island has expressed interest to make an agreement and develop a pilot plan.	At least 1 aquaculture concession granted in Huacho reporting profits		Assumption: Aquaculture activities defined with seasonal criteria and structured management plans with local communities
		# of projects with business plans	No antecedents of oyster aquaculture in Mancora.	1 business plan on aquaculture resource	Progress reports	
	OUTPUT 1.2.2. Creation of ecotourism enterprises	# of fishers associations participating in ecotourism ventures reporting complementary income	There is one company that employs artisanal fishers who now dedicate full time to ecotourism in Máncora In Máncora there is infrastructure for tourism development. In Huacho there are ongoing efforts from the local and regional governments to improve the ecotourism potential, but it's on initial stages planning	At least 2 fishers associations incorporating ecotourism as a complementary economic activity	Progress reports (at local level); site visits	Assumption: Positive impact of sensitization and training activities according to the needs identified Risk: Rejection of social organizations of artisanal fishers (SOAFs) to establish formal companies, resistance to paying taxes

	OUTPUT 1.2.3 Improvement of market power capacities for sustainable artisanal fisheries	% of fishers reporting increased income per fishing ton sold. (from a total of 300 fishers in Máncora).	Intermediaries capture a large percentage of the value of the production price and consumer price. The sale price received by fishers is significantly lower than the market price. High percentage of fishers below the poverty line.	20% of artisanal fishers increase their revenue per ton sold	Field (assessment) reports; progress reports; annual reports; surveys, site visits	Assumption: Positive impact of sensitization and training activities according to the needs identified
		# of trade agreements between SOAFs and middlemen / final consumer (i.e. restaurant, supermarket)	Existence of various intermediaries that reduce the purchase price of artisanal fisheries products. Low market power due to lack of transport and infrastructure for cooling.	At least one trade agreement in each PA managed in partnership with civil society organizations		
	OUTPUT 1.2.4. Start-up of certification process for local artisanal fisheries	# of SOAFs with ongoing certification processes started	The three performance conditions to start the certification process (sustainability of the stock, minimizing environmental impact and effective management) are not fully met in any of the pilot areas.	2 SOAFs have performed a pre-assessment for the fisheries certification	Progress reports	Assumption: Technical support and investment in the adoption of sustainable and environmental friendly fishing methods
	OUTPUT 1.2.5. Production of biofertilizers from fishery and aquaculture residues	# of artisanal fishers associations producing biofertilizers	National Agrarian University La Molina (UNALM) has developed the technology of homolactic fermentation to produce biofertilizers from fishery residues	At least two artisanal fishers associations producing biofertilizers from fishery and aquaculture residues	Progress reports	Assumption: Technical support from UNALM
OBJECTIVE/COMPONENT 2: Deployment of a modern and efficient environment surveillance and prediction system in the coastal marine ecosystems at regional and		No. of modern systems for environment surveillance and prediction	Partial and non-articulated studies, surveys and assessments have been carried out at PAs	One modern system for environment surveillance and prediction implemented	Technical reports	(See below)

local scales supporting fisheries adaptive management under the EAF principles		implemented				
OUTCOME 2.1.Increased response capacity of the government at a national and local level at PAs to address climate change induced physical and ecological stresses on the coastal marine environment, ecosystem services and resources availability	OUTPUT 2.1.1. Development of a climatic and an oceanographic surveillance system.	# of coastal meteorological stations operative and transmitting data	Information generated by the Don Martín station (outdated by disuse). There is an operational meteorological station in Cabo Blanco by a private company which has an agreement with IMARPE.	1 operational coastal meteorological station (in Don Martín island)	Field (assessment) reports; progress reports; environmental monitoring reports, annual reports, site visits, websites.	Assumption: Available sites for installing meteorological facilities with adequate protection
		# of marine autonomous gliders in operation	Do not exist (zero)	5 marine autonomous gliders		Assumption: Awareness of the local communities for the protection of facilities
		Interface for data sharing with other environmental or climate agencies	Do not exist (zero)	One interface implemented		Assumption: Mechanisms for co-funding the maintenance and operational costs (e.g. at institutional and regional governments level)
		# of satellite products incorporated in the surveillance system	There are ongoing projects between IRD and IMARPE to develop satellite oceanography, but are not operational yet	4 satellite products incorporated in the monitoring and surveillance system: winds, temperature, chlorophyll and altimetry.		
	OUTPUT 2.1.2. Establishment of marine environment surveillance programs in pilot areas in coordination with local stakeholders	Baseline assessments of environmental quality	Partial studies and baseline assessments of environmental quality and biodiversity, but are not integrated and do not include all elements required	1 baseline assessment achieved in each PA by the end of the first year	Field (assessment) reports; progress reports; environmental monitoring reports, annual reports, site visits, websites.	Assumption: Active participation of local stakeholders and other stakeholders in the monitoring programs and baseline studies
		Quality environmental and red tides monitoring program with local	Do not exist (zero)	3 sensors and data loggers for high-frequency observation of SST and		Assumption: Awareness and engagements of the local communities for

		stakeholders		conductivity		the protection of instruments and loggers
				1 operational monitoring program of environmental quality (DO, pH, harmful algal blooms) at selected points and on a seasonal basis		Assumption: Mechanisms for co-funding the maintenance and operational costs (e.g. at institutional and regional governments level)
		Ecosystem resilience monitoring program designed with other stakeholders and including fishermen as observers	Do not exist (zero)	1 proposal developed for an ecosystem resilience monitoring program		Assumption: Awareness and engagement of other stakeholders for participation in the ecosystem resilience monitoring program
	OUTPUT 2.1.3. Development of a modelling and prediction system at local scales	Oceanographic scenarios under optimistic and pessimistic IPCC greenhouse gas concentration trajectories (RCP 8.5 and RCP 3-PD)	Qualitative scenarios for climate change impacts developed at local scales	2 scenarios developed (optimistic and pessimistic)	Technical reports, publications.	Assumption: Adequate institutional mechanisms for recruitment of experts to carry out the tasks
		Catch potential scenarios of key resources under IPCC greenhouse gas concentration trajectories RCP 8.5 and RCP 3-PD	Qualitative scenarios for climate change impacts developed at local scales	2 scenarios developed (optimistic and pessimistic)		
	OUTPUT 2.1.4. Building capacity on monitoring and development of new science-based tools such as Ecological	# of trained scientists at IMARPE and academia and/or other centres	No training on ERA for climate change adaptation exists.	At least 15 trained scientists in IMARPE, and a similar number in academia and/or other centres.	Project reports; briefing materials; workshop reports, internet	Assumption: Labour stability of scientific staff

	Risk Assessments (ERA) for climate change directed to IMARPE, decision makers and academia.					
		# of workshops and seminars for decision-makers	There have been many technical training workshops, but have not been translated into public policy strategies aimed at decision makers	4 workshops / seminars directed to decision-makers within the framework of the project		Assumption: Ministry of Production promotes climate change adaptation strategy in the fishery sector
		# of undergraduate and graduate thesis developed related to project outcomes (baseline studies, aquaculture impact, ERAs, etc.),	No thesis developed on ERA in Peru.	At least 6 theses incorporating issues related to project		
OBJECTIVE/COMPONENT 3: Capacity building and knowledge management system for implementing the EBA and the EAF, and for the dissemination of project's lessons learned, targeting government officials, academia, local communities and other stakeholders		No. stakeholders with improved capacity in order to reduce vulnerability to climate change % of women with improved capacity	Do not exist (zero)	At least 10 fishery associations and 6 public institutions (PRODUCE, IMARPE, MINAM, SERNANP, local governments) with improved capacity 10 % of women with improved capacity	Project reports	(See below)
OUTCOME 3.1. Strengthened institutional capacity to assess the extension and magnitude of climate change impacts on	OUTPUT 3.1.1. Development and implementation of a Knowledge Management Strategy (KMS)	# of tools to support the processes of production, storage, update, circulation and knowledge (re)use	Do not exist (zero)	Formal communication, storage, classification and distribution systems of the information generated	Project reports; briefing materials; workshop reports, internet, website for dissemination of monitoring	Assumption: Coordination with ongoing activities and co-financing
		# of documented lessons by users type	Do not exist (zero)	As part of the learning process there are		Assumption: Joint assessments across

fisheries and effective actions to cope with these changes, providing limits on climate induced loss of income in local communities.		# of replication strategies for scale-up	Do not exist (zero)	identified at least 2 replication strategies for scale up (technical and management) by characterized user type (governmental, non-governmental, private, beneficiaries)	products	sectors, incorporating the assessment of beneficiaries
OUTCOME 3.2. Strengthened awareness and ownership of adaptation and climate risk reduction processes on impacted communities in the project target areas	OUTPUT 3.2.1. Training and sensitizing of beneficiaries on key topics such as good fishing practices, formalization, entrepreneurship and fishery surveillance and control.	# of artisanal fishers and other key agents trained in issues related to Component 1: fishing sustainable methods, self-organization, legal formalization, entrepreneurship, fisheries certification, marketing, aquaculture, ecotourism, fishery surveillance and control, etc.	Artisanal fishermen have received several sensitization workshops on various issues, but they are not continuous and do not target specific local problems in the PAs	30% of the target population trained	Workshop reports	Assumption: Incorporation of stakeholders in defining training needs and schedule.
		# of debate spaces for sharing successful experiences	Do not exist (zero)	3 network-wide debates for beneficiaries at each PA to generate synergies and share learning	Project reports; internet blogs	Assumption: Commitment and ownership of beneficiaries to create opportunities for joint learning and successful experiences with a proper technical support

	OUTPUT 3.2.2. Design and implementation of early warning systems through a participatory process at local and regional scales	# early warning systems associated to environmental variables	Do not exist (zero)	Two early warning systems developed with a set of reference levels and indicators associated to environmental variables to identify and timely evaluate the emergence of short-term deviations for taking appropriate action	A website created for dissemination of monitoring products of climatic and environmental events	
OBJECTIVE/COMPONENT 4: Management policies, regulations and measures promoting the resiliency of coastal ecosystems and local communities to climate change and variability-induced stress.		No. regulations or instruments proposals to promote resiliency of ecosystems and communities to climate change	Do not exist (zero)	At least 4 regulations or instruments proposals to promote resiliency of ecosystems and communities to climate change	Document proposals	(See below)
OUTCOME 4.1. Improved governance, policies and regulations at a national and local level to enhance the sustainable use and resilience of coastal marine	OUTPUT 4.1.1. Support of the cross-sector working group for the promotion of common actions addressing coastal ecosystems' resilience to climate change impacts	# of cross-sector management proposals addressing coastal marine issues related to climate change	Multisectoral Commission of Environmental Management of the Coastal Marine Medium (COMUMA), created in 2013 Regional Offices for Environmental issues and Natural Resources.	One cross-sector draft plan incorporating coastal and marine environments in climate change adaptation strategies and instruments for defining sector policies related to Integrated Management of Coastal Marine Areas	Project reports	Assumption: Financial and human resources to enable opportunities for coordination and cross-sector policy making.

resources		# of economic ecological zoning proposals in PA.	Zoning proposal at regional scale	1 zoning proposal have been developed in coordination with the MINAM (Territorial Ordination Office)		
	OUTPUT 4.1.2. Development of regulations and proposals for co-management in coastal marine areas	# of proposals for the update and/or development of the current fisheries normativity and regulations, with focus on co-management	Various co-management experiences promoted regionally, but not promoted at national level.	At least one normativity or guideline is incorporated for co-management at the sectorial and regional level	Project reports Technical documents	Assumption: Financial and human resources to enable opportunities for coordination and cross-sector policy making.
	OUTPUT 4.1.3. Development of regulation to implement incentives for the participation of artisanal fishermen, adopting sustainable practices, in the National Direct Human Consumption Program.	# of regulations and/or administrative procedures for the implementation of incentives approved	The use of non-selective gears and the low quality of fish products prevent the access of artisanal fishermen to the direct human consumption high-value markets.	1 regulation incorporated to promote artisanal fishing products for Direct Human Consumption, applying sustainable fishing methods, in the national and regional laws and regulations	Project reports, normative publications	Assumption: Leadership from PRODUCE

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

Alignment with Adaptation Fund Results Framework: The project's proposed results framework, presented in Part III E is aligned with the Adaptation Fund (AF) Results Framework[19] architecture and directly contributes to the overall objective "Reduce vulnerability and increase adaptive capacity to respond to the impacts of climate change, including variability at local and national levels".

There is perfect alignment between the stated objective of this proposal and the AF overall objective. Proposed project's objective (see Part I, Project Objectives) indicates that it supports the efforts of the GoP (a particularly vulnerable country to the adverse effects of climate change and party to the Kyoto Protocol) reducing the vulnerability of coastal communities to the impacts of climate change on their main source of income, wealth and wellbeing; the coastal marine ecosystems and fisheries resources in Peru. The project is limited to well-defined coastal marine areas to be co-managed with the community of users.

Alignment between the AF Results Framework and the project is also clear at the impact level. The project expected impact on the target population (selected pilot coastal fisheries communities) is to increase the resilience at the community level to climate variability and climate change.

In particular, the proposed project is aligned with the following outcomes and outputs of the AF (Table 15):

Project Objective(s)[20]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Objective 1. Implementation of interventions in pilot strategic areas to improve resilience of target coastal communities and key coastal marine ecosystems to climate change and variability-induced stress	No. of artisanal fishers in PA adopting climate change adaptation measures that improve their livelihoods and the resilience of the ecosystem	**Outcome 6.** Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.2. Percentage of targeted population with sustained climate-resilient livelihoods	3,124,800
Objective 2. Deployment of a modern and efficient environment surveillance and prediction system in the coastal marine ecosystems at regional and local scales supporting fisheries adaptive management under the EAF principles	No. of modern systems for environment surveillance and prediction implemented	**Outcome 1.** Reduced exposure at national level to climate-related hazards and threats	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	2,055,200

[19] Results Framework and baseline guidance, project level, Adaptation Fund, 2011
[20] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

Objective 3. Capacity building and knowledge management system for implementing the EBA and the EAF, and for the dissemination of project's lessons learned, targeting government officials, academia, local communities and other stakeholders	No. stakeholders with improved capacity in order to reduce vulnerability to climate change	**Outcome 2.** Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses **Outcome 3.** Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	2.1. No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks 3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	420,000
Objective 4. Management policies, regulations and measures promoting the resiliency of coastal ecosystems and local communities to climate change and variability-induced stress.	No. regulations or instruments proposals to promote the resiliency of ecosystems and communities to climate change	**Outcome 7.** Improved policies and regulations that promote and enforce resilience measures	7. Climate change priorities are integrated into national development strategy	250,000
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Outcome 1.1. Increased resilience and reduced vulnerability of targeted coastal marine ecosystems to observed effects of climate change and variability-induced stress.	% of non-selective fishing gears that are replaced by selective fishing gears by the fishing units in PAs. No. of natural banks restored No. of natural banks co-managed	**Output 5.** Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)	994,854
Outcome 1.2. Improved adaptive capacity of local participating communities through the diversification and	No. of artisanal fishers associations developing sustainable aquaculture, ecotourism and	**Output 6.** Targeted individual and community livelihood strategies	6.1.1.No. and type of adaptation assets (physical as well as knowledge) created in support of individual or	2,130,216

strengthening of their livelihoods and sources of income as they face climate change induced modifications of biomass and fish distribution	conversion of residues to bioproducts	strengthened in relation to climate change impacts, including variability	community-livelihood strategies 6.1.2. Type of income sources for households generated under climate change scenario	
Outcome 2.1. Increased response capacity of the government at a national and local level at PAs to address climate change induced physical and ecological stresses on the coastal marine environment, ecosystem services and resources availability.	No. of marine autonomous gliders in operation No. of trained scientists at IMARPE and academia and/or other centres	**Output 1.** Risk and vulnerability assessments conducted and updated at a national level	1.1. No. and type of projects that conduct and update risk and vulnerability assessments 2.1.1. No. of staff trained to respond to, and mitigate impacts of climate-related events	2,055,200
Outcome 3.1. Strengthened institutional capacity to assess the extension and magnitude of climate change impacts on fisheries and effective actions to cope with these changes, providing limits on climate induced loss of income in local communities.	No. tools to support the processes of production, storage, update, circulation and knowledge (re)use	**Output 2.1.** Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events	2.1.2. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	120,000
Outcome 3.2. Strengthened awareness and ownership of adaptation and climate risk reduction processes on impacted communities in the project target areas	No. artisanal fishers and other key agents trained in issues related to Component 1: fishing sustainable methods, self-organization, legal formalization, entrepreneurship, fisheries certification, marketing, aquaculture, ecotourism, etc.	**Output 2.2.** Targeted population groups covered by adequate risk reduction systems	2.1.2. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	300,000
		Output 1: Risk and vulnerability assessments conducted and updated at a national level	1.2. Development of early warning systems	
		Output 3.	3.1.1 No. and type	

	No. early warning systems associated to environmental variables No. of debate spaces for sharing successful experiences	Targeted population groups participating in adaptation and risk reduction awareness activities	of risk reduction actions or strategies introduced at local level	
Outcome 4.1. Improved governance, policies and regulations at a national and local level to enhance the sustainable use and resilience of coastal marine resources.	No. of regulations and/or administrative procedures for the implementation of incentives approved No. of proposals for the update and/or development of the current fisheries normativity and regulations, with focus on co-management	**Output 7.** Improved integration of climate-resilience strategies into country development plans	7.1. No., type, and sector of policies introduced or adjusted to address climate change risks	250,000

Table 15. Contribution of the project components to the AF Results Framework

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.

Detailed budget

Objectives/Outcomes/Outputs		Total	N°	Note
Objective 1: Implementation of interventions in pilot strategic areas to improve resilience of target coastal communities and key coastal marine ecosystems to climate change and variability-induced stress		**3,124,800**		
Outcome 1.1. Increased resilience and reduced vulnerability of targeted coastal marine ecosystems to observed effects of climate change and variability-induced stress.		**994,584**		
Output 1.1.1. Adoption of sustainable fishing methods to tackle non-selective fishing gear based on EAF principles directed to target species vulnerable to climate change	Consultants	130,483	1	Contracts for the Consultants carrying-on this activity
	Travel	38,621	2	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	105,517	3	Workshops and meetings to coordinate the development of the Output and provide technical assistance
	Contractors	19,473	4	Hiring of third-parties for field experiences and conditioning of boats
	Equipment	78,166	5	Fishing gear needed for the adoption of new fishing methods
	Sub total 1.1.1	372,259		
Output 1.1.2. Restoration and co-management of natural banks	Consultants	100,000	6	Contracts for the Consultants carrying-on this activity
	Travel	7,704	7	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	7,704	8	Workshops and meetings to develop the Output and provide technical assistance
	Contractors	461,695	9	Hiring of third-parties for the prospection and safekeeping of the restored banks
	Equipment	45,222	10	Fishing gear and boating equipment needed for the restoration process
	Sub total 1.1.2	622,325		
Outcome 1.2. Improved adaptive capacity of local participating communities through the diversification and strengthening of their livelihoods and sources of income as they face climate change induced modifications of biomass and fish distribution		**2,130,216**		

Output 1.2.1 Planning and development of sustainable aquaculture through smallscale concessions	Consultants	420,000	11	Contracts for the Consultants carrying-on this activity
	Travel	7,704	12	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	7,704	13	Workshops and meetings to develop the Output and provide technical assistance
	Contractors	35,556	14	Administrative and maintenance costs
	Equipment	654,273	15	Aquaculture and boating equipment needed to develop selected areas
	Sub total 1.2.1	1,125,236		
Output 1.2.2. Creation of ecotourism enterprises	Consultants	11,846	16	Contracts for the Consultants carrying-on this activity
	Travel	8,000	17	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	8,000	18	Workshops and meetings to develop the Output and provide technical assistance
	Contractors - Máncora	497,676	19	Development / improvement of dock and other tourism infrastructure
	Contractors - Huacho	66,119	20	Development of tourism infrastructure
	Equipment	70,769	21	Boating and security equipment needed for the development of ecotourism
	Sub total 1.2.2	662,410		
Output 1.2.3 Improvement of market power capacities for sustainable artisanal fisheries	Consultants	100,000	22	Contracts for the Consultants carrying-on this activity
	Travel	16,000	23	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	16,000	24	Workshops and meetings to develop the Output and provide technical assistance
	Sub total 1.2.3	132,000		
Output 1.2.4 Start-up of certification process for local artisanal fisheries	Consultants	63,570	25	Contracts for the Consultants carrying-on this activity
	Travel	16,000	26	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	16,000	27	Workshops and meetings to develop the Output and provide technical assistance
	Miscelaneous	5,000	28	Incidental expenses
	Sub total 1.2.3	100,570		
Output 1.2.5 Production of biofertilizers, biodiesel and food through bioconversion of solid and liquid fishery and aquaculture	Consultants	10,000	29	Contracts for the Consultants carrying-on this activity

residues.				
	Travel	5,000	30	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	10,000	31	Workshops and meetings to develop the Output and provide technical assistance
	Contractors	4,000	32	Habilitation of the plant
	Equipment	76,000	33	Equipment for biorremediation plant
	Miscelaneous	5,000	34	Incidental expenses
	Sub total 1.2.3	110,000		
Objective 2: Deployment of a modern and efficient environment surveillance and prediction system in the coastal marine ecosystems at regional and local scales supporting fisheries adaptive management under the EAF principles		**2,055,200**		
Outcome 2.1.Increased response capacity of the government at the national and local level at pilot areas (PAs), to address climate change induced physical and ecological stresses on the coastal marine environment, ecosystem services and resources availability		**2,055,200**		
Output 2.1.1. Development of a climatic and oceanographic surveillance system	Consultants	64,000	35	Contracts for the Consultants carrying-on this activity
	Travel	8,000	36	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	8,000	37	Workshops and meetings to develop the Output and provide technical assistance
	Contractors	192,000	38	Maintenance and management of scientific equipment
	IT Equipment	100,000	39	IT equipment to be used as part of the climatic and oceanographic surveillance system
	Equipment	910,000	40	Scientific equipment for climatic and oceanographic surveillance system
	Sub total 2.1.1	1,282,000		
Output 2.1.2. Establishment of marine environment surveillance programs in pilot areas in coordination with local stakeholders	Consultants	84,000	41	Contracts for the Consultants carrying-on this activity
	Travel	8,000	42	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	8,000	43	Workshops and meetings to develop the Output and provide technical assistance
	Contractors	95,000	44	Maintenance of scientific equipment
	Equipment	143,000	45	Scientific equipment for marine environment surveillance program
	Sub total 2.1.2	338,000		

Output 2.1.3. Development of a modeling and prediction system at local scales	Consultants	187,200	46	Contracts for the Consultants carrying-on this activity
	Travel	9,000	47	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	9,000	48	Workshops and meetings to develop the Output and provide technical assistance
	IT Equipment	50,000	49	IT equipment to be used for the modeling and prediction systems
	Sub total 2.1.3	255,200		
Output 2.1.4. Building capacity on monitoring and development of new science-based management tools and development of Ecological Risk Assessment (ERA) for climate change directed to IMARPE, decision makers and academia	Consultants	20,000	50	Contracts for the Consultants carrying-on this activity
	Travel	50,000	51	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	108,200	52	Workshops and meetings to develop the Output and provide technical assistance
	Miscelaneous	1,800	53	Incidental expenses
	Sub total 2.1.4	180,000		
Objective 3: Capacity building and knowledge management system for implementing the EBA and the EAF, and for the dissemination of project's lessons learned, targeting government officials, academia, stakeholders and local communities		**420,000**		
Outcome 3.1. Strengthened institutional capacity to assess the extension and magnitude of climate change impacts on fisheries and effective actions to cope with these changes, providing limits on climate induced loss of income in local communities.		**120,000**		
Output 3.1.1. Development and implementation of a Knowledge Management Strategy (KMS)	Consultants	48,000	54	Contracts for the Consultants carrying-on this activity
	Travel	6,000	55	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	6,000	56	Workshops and meetings to develop the Output and provide technical assistance
	IT Equipment	48,000	57	IT equipment (i.e. servers) to be used in the development and implementation of a KMS
	Communications	10,800	58	Development and implementation of communication strategy
	Miscelaneous	1,200	59	Incidental expenses
	Sub total 3.1.1	120,000		
Outcome 3.2. Strengthened awareness and ownership of adaptation and climate risk reduction processes on impacted communities in the project target areas		**300,000**		
Output 3.2.1. Training and sensitizing of beneficiaries on key topics such as good fishing	Consultants	100,000	60	Contracts for the Consultants carrying-on this activity
	Travel		61	Travel costs related to capacity building workshops and meetings

practices, formalization, entrepreneurship, fishery surveillance and control r		18,000		
	Workshops & Meetings	110,000	62	Capacity building workshops and meetings to develop the Output
	IT Equipment	4,000	63	IT equipment to support training and sensitizing of beneficiaries
	Miscelaneous	8,000	64	Incidental expenses
	Sub total 3.2.1	240,000		
Output 3.2.2. Design of an early warning system through a participatory process and implementation at local and regional scales	Consultants	40,000	65	Contracts for the Consultants carrying-on this activity
	Travel	8,000	66	Travel costs related to capacity building workshops and meetings
	Workshops & Meetings	8,000	67	Capacity building workshops and meetings to develop the Output
	IT Equipment	4,000	68	IT and communications equipment to support the early warning system
	Sub total 3.2.2	60,000		
Objective 4: Management policies, regulations and measures promoting the resiliency of coastal ecosystems and local communities to climate change and variability-induced stress.		**250,000**		
Outcome 4.1. Improved governance, policies and regulation at a national and local level to enhance the sustainable use and resilience of coastal marine resources		**250,000**		
Output 4.1.1. Support of the cross-sector working group for the promotion of common actions addressing coastal ecosystems' resilience to climate change impacts	Consultants	80,000	69	Contracts for the Consultants carrying-on this activity
	Travel	8,000	70	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	8,000	71	Workshops and meetings to develop the Output and provide technical assistance
	Miscelaneous	4,000	72	Incidental expenses
	Sub total 4.1.1	100,000		
Output 4.1.2. Development of regulations and proposals for co-management in coastal marine areas	Consultants	57,000	73	Contracts for the Consultants carrying-on this activity
	Travel	8,000	74	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	8,000	75	Workshops and meetings to develop the Output and provide technical assistance
	Miscelaneous	2,000	76	Incidental expenses
	Sub total 4.1.2	75,000		
Output 4.1.3. Definition of incentives for the participation of	Consultants	57,000	77	Contracts for the Consultants carrying-on this activity

artisanal fishers, adopting sustainable practices, in the National Direct Human Consumption Program	Travel	8,000	78	Travel costs for site visits, workshops and meetings
	Workshops & Meetings	8,000	79	Workshops and meetings to develop the Output and provide technical assistance
	Miscelaneous	2,000	80	Incidental expenses
	Sub total 4.1.3	75,000		
Total Project Cost (TPC)		5,850,000		
Total Project Execution Costs (PEC)		**555,750**	81	PEC costs managed by the Executing Agency. Refer to Part III, Section G: PEC Costs" for details
TPC + PEC		**6,405,750**		
Project Cycle Management Fee (PCMF)		**544,489**	82	PCMF managed by the Implementing Entity. Refer to Part III, Section G: PCMF costs" for details
Financing Requested		**6,950,239**		
Notes				
1. PEC: charged by the Executing Agency, up to 9.50% of TPC				
2. PCMF: charged by the Implementing Entity, up to 8.50% of TPC + PEC				

Project Cycle Management Fee (PCMF)

Description	Profonanpe services	Estimated Cost of Profonanpe Services (USD)	%
Development and Preparation	• Provide technical support for Project preparation. • Detailed screening against technical, financial, social and risk critera. • Assist in the determination of Implementation Arrangements and negociation with other sectors. • Assist in verifying complementarity with other projects • Verify quality of preparation. • Obtain clearances from Adaptation Fund • Respond to information requests, arrange revisions, etc.	27,224	5.0%
Implementation and Supervision	• Provide technical and operational support for Project team. • Technical support in preparing TORs and verifying expertise for technical positions. • Regular reporting. • Verify technical validity of all reports. • Support and follow-up to project procurements • Project financial follow-up • Carry-out supervision missions and field visits. • Mid Term Review. • Receipt, allocation and reporting to the AFB of financial respources. • Oversight and monitoring of AF funds. • Participate as necessary during Project activities.	408,367	75.0%
Final Evaluation and Closing	• Undertake technical analysis, validate results and compile lessons. • Disseminate technical findings. • Support and follow-up to project procurements. • Project financial follow-up. • Final evaluation and Implementation Completion and Results Report.	108,898	20.0%
Total		**544,489**	**100.0%**

Project Execution Costs (PEC)

(in US$)

Description	2016	2017	2018	2019	Total	%
Staff						
Project Coordinator	23,550	51,600	51,600	51,600	178,350	32.1%
Procurement specialist	10,800	21,600	21,600		54,000	9.7%
Administrative assistant	4,200	8,400	8,400	8,400	29,400	5.3%
Project Officer - Máncora	20,000	24,000	24,000	24,000	92,000	16.6%
Project Officer - Huacho		24,000	24,000	24,000	72,000	13.0%
Sub total Staff	58,550	129,600	129,600	108,000	425,750	76.6%
M&E	20,489	31,793	10,598	67,120	130,000	23.4%
Total	79,039	161,393	140,198	175,120	**555,750**	100.0%

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

A comprehensive disbursement schedule with time-bound milestones has been developed for the proposed project and presented down below.

Description	Amount					Percentage			
	2016	2017	2018	2019	Total	2016	2017	2018	2019
Objective 1	**690,376**	**1,246,137**	**751,025**	**437,263**	**3,124,800**	**22.1%**	**39.9%**	**24.0%**	**14.0%**
Outcome 1.1	**275,838**	**257,973**	**247,973**	**212,799**	**994,584**	**27.7%**	**25.9%**	**24.9%**	**21.4%**
Output 1.1.1	81,340	108,698	108,698	73,523	372,259	21.9%	29.2%	29.2%	19.8%
Output 1.1.2	194,498	149,276	139,276	139,276	622,325	31.3%	24.0%	22.4%	22.4%
Outcome 1.2	**414,538**	**988,163**	**503,051**	**224,464**	**2,130,216**	**19.5%**	**46.4%**	**23.6%**	**10.5%**
Output 1.2.1	217,936	453,650	366,569	87,081	1,125,236	19.4%	40.3%	32.6%	7.7%
Output 1.2.2	177,495	470,992	6,962	6,962	662,410	26.8%	71.1%	1.1%	1.1%
Output 1.2.3	-	-	66,000	66,000	132,000	0.0%	0.0%	50.0%	50.0%
Output 1.2.4	14,357	28,721	28,721	28,771	100,570	14.3%	28.6%	28.6%	28.6%
Output 1.2.5	4,750	34,800	34,800	35,650	110,000	4.3%	31.6%	31.6%	32.4%
Objective 2	**146,300**	**1,444,967**	**231,967**	**231,967**	**2,055,200**	**7.1%**	**70.3%**	**11.3%**	**11.3%**
Outcome 2.1	**146,300**	**1,444,967**	**231,967**	**231,967**	**2,055,200**	**7.1%**	**70.3%**	**11.3%**	**11.3%**
Output 2.1.1	20,000	1,094,000	84,000	84,000	1,282,000	1.6%	85.3%	6.6%	6.6%
Output 2.1.2	25,000	199,667	56,667	56,667	338,000	7.4%	59.1%	16.8%	16.8%
Output 2.1.3	51,300	101,300	51,300	51,300	255,200	20.1%	39.7%	20.1%	20.1%
Output 2.1.4	50,000	50,000	40,000	40,000	180,000	27.8%	27.8%	22.2%	22.2%
Objective 3	**105,000**	**129,000**	**93,000**	**93,000**	**420,000**	**25.0%**	**30.7%**	**22.1%**	**22.1%**
Outcome 3.1	-	**24,000**	**48,000**	**48,000**	**120,000**	**0.0%**	**20.0%**	**40.0%**	**40.0%**
Output 3.1.1	-	24,000	48,000	48,000	120,000	0.0%	20.0%	40.0%	40.0%
Outcome 3.2	**105,000**	**105,000**	**45,000**	**45,000**	**300,000**	**35.0%**	**35.0%**	**15.0%**	**15.0%**
Output 3.2.1	84,000	84,000	36,000	36,000	240,000	35.0%	35.0%	15.0%	15.0%
Output 3.2.2	21,000	21,000	9,000	9,000	60,000	35.0%	35.0%	15.0%	15.0%

Objective 4	**62,500**	**100,000**	**62,500**	**25,000**	**250,000**	**25.0%**	**40.0%**	**25.0%**	**10.0%**
Outcome 4.1	**62,500**	**100,000**	**62,500**	**25,000**	**250,000**	**25.0%**	**40.0%**	**25.0%**	**10.0%**
Output 4.1.1	25,000	40,000	25,000	10,000	100,000	25.0%	40.0%	25.0%	10.0%
Output 4.1.2	18,750	30,000	18,750	7,500	75,000	25.0%	40.0%	25.0%	10.0%
Output 4.1.3	18,750	30,000	18,750	7,500	75,000	25.0%	40.0%	25.0%	10.0%
Total Project Costs (TPC)	**991,484**	**2,963,165**	**1,154,553**	**740,799**	**5,850,000**	**16.9%**	**50.7%**	**19.7%**	**12.7%**
Project Execution Costs (PEC)	**105,605**	**144,509**	**124,914**	**180,723**	**555,750**	**19.0%**	**26.0%**	**22.5%**	**32.5%**
TPC + PEC	**1,097,088**	**3,107,674**	**1,279,466**	**921,522**	**6,405,750**	**17.1%**	**48.5%**	**20.0%**	**14.4%**
Project Cycle Mgt Fee (PCMF)	**136,122**	**136,122**	**136,122**	**136,122**	**544,489**	**25.0%**	**25.0%**	**25.0%**	**25.0%**
Financing Requested	**1,233,210**	**3,243,796**	**1,415,589**	**1,057,644**	**6,950,239**	**17.7%**	**46.7%**	**20.4%**	**15.2%**

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

A. Record of endorsement on behalf of the government[21]

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:

Viviana Grissel Zaldivar Chauca (Advisor); Asesora, Gabinete de asesores de la Alta Dirección, Ministry of Environment (MINAM)	Date*: January th, 2015*

B. Implementing Entity certification

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

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (National Strategy of Climate Change) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
Name & Signature Implementing Entity Coordinator	
Date: *(Month, Day, Year)*	Tel. and email:
Project Contact Person:	
Tel. And Email:	

[22.] 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 I Detailed description of pilot areas and planned intervention actions

Description of the pilot areas and proposed adaptation interventions per selected site

The Peruvian coast is affected by two main different climatic and oceanographic systems. The Northern coast is partly under the influence of warm tropical waters and high precipitations on land, whereas the rest of the coast is subject to the cold coastal upwelling waters and arid conditions on the continent (Figure A1). Nevertheless, the southernmost coastal marine area presents a very narrow shelf and is more exposed to the intrusion of oceanic waters with lower productivity. Current trends in coastal SST exhibit significant warming for the Northern coast (<06°S), contrasting with strong cooling from Callao (12°S) to the south (Gutiérrez et al., 2011) (Figure 8). This behavior is also associated with different trends in productivity and possibly subsurface water oxygenation (Demarcq, 2009; Quipúzcoa et al., accepted).

Taking into account these features, the different adaptation interventions proposed in the coastal zone focus on two representative areas: one at the Northern coast (Máncora, 04°06' – 04°15'S, Piura Region), and one at the Central coast (Huacho, 11°01 – 11°20'S, Lima Region is one of the main fishing harbors in the Lima Region, the second in terms of industrial fishery due to the exploitation of the Northern-Central stock of Peruvian anchovy (*Engraulis ringens*). Máncora is nowadays not a landing point for the industrial fishery, but lies within the main distribution area of hake (*Merluccius gayi peruanus*), which is the main demersal[22] resource off the Peruvian coast.

Adaptation measures to reduce the impact of climate change on natural resources should necessarily address the issue of overfishing in the face of climate change, which will involve measures to reduce current catches. In this context adaptation interventions for the selected sites will promote fishery resource conservation, sustainable fishery management programs and economic alternatives outside fishery harvest.

[22] Describing a fish that lives close to the floor of the sea or a lake (http://www.thefreedictionary.com/demersal)

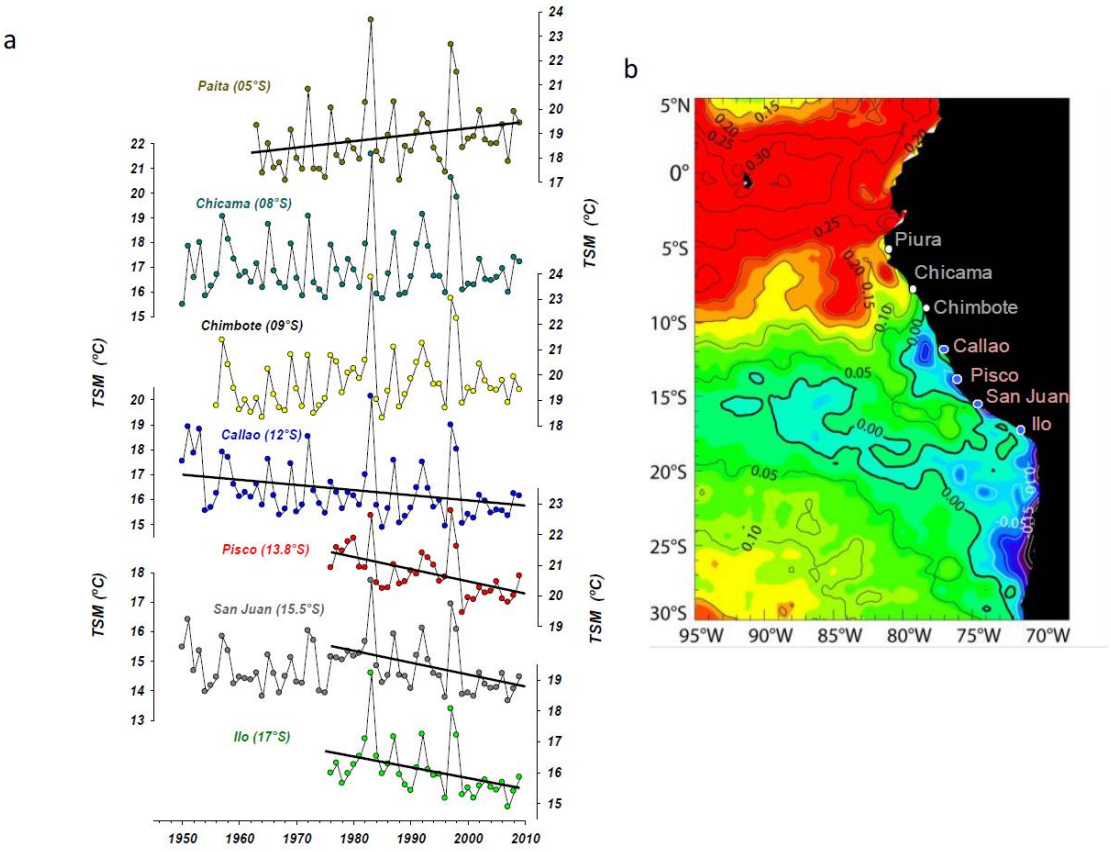


Figure A1. a) Trends in mean annual sea surface temperatures (SST), as measured in piers along the coast. Bold lines indicate statistical significance. For Paita, trend is +0.15±0.10°C, for Callao, -0.22±0.08°C decade^{-1}; p=0.01, for Pisco, -0.43±0.13°C decade^{-1}, p<0.01 (no data before 1976), for San Juan, -0.42±0.14°C decade^{-1}; p<0.01 (since 1976), for Ilo, -0.18±0.06°C decade^{-1}; p<0.01; **b) Trends in °C/decade for SST since 1984 to 2010 for the region, using the Reynolds database**. Modified from Gutiérrez et al. (in press).

In addition, participative workshops involving artisanal fishermen will be carried out in order to gather information about traditional fishery practices, and to involve local fishers in the decision-making process about the fishing gears selected at each pilot area. The sites are characterized in terms of proposed adaptation interventions, specific environmental, socio-economical and fisheries management issues as follows:

Approach for the interventions at pilot sites

The main objective of the interventions is to increase the communities' adaptive capacity at pilot areas based on a better understanding of their conditions and needs matched with a better understanding and monitoring of the ocean's productive capacity. They will be implemented in a highly interactive and participatory process with the coastal communities which apply artisanal fishing techniques. Through a mutual learning process, common ground is aimed to be found on activities which will not only ensure long-term sustainability of fish populations but also the social and economic needs of the communities. Adaptation actions to be implemented will be prioritized with respect to their specific cost/benefit ratio and their strategic contribution towards a long-term artisanal fisheries management system.

In order to improve the current adaptive capacity of these local coastal communities, the adaptation pilots are divided in immediate and second phase actions. At the start of the project, immediate actions, the activities include an intensive consultation and mutual learning process between the coastal communities and the project team, training for the local fishers and populations, strengthening of climatic and oceanographic monitoring, support of pilot projects on ecotourism and 'fishery-tourism', support of new or ongoing territorial planning projects or policies, and realization of local workshops to discuss the implementation of co-management. In the second phase, the activities comprise promoting the use of new technologies, eco-labeling and certification, development of aquaculture of native species, support improvement of aquaculture systems, and environmental education in local schools.

Table A1. Summary of vulnerability factors in the two pilot strategic areas.

Factor / Feature	Máncora	Huacho
Key physical forcing	Equatorial Front	Coastal winds
Shelf/upwelling	Narrow/episodic plumes	Wide/wide
Coastal marine habitat	Vulnerability to climatic extremes (floodings, El Niño). Untreatment of waste waters	Subjected to chemical pollution (fisheries, agriculture) and domestic sources. Vulnerability to climatic extremes (El Niño).
Coastal biodiversity	Panamanian province and ecotone to Peruvian province (south), migration route of cetaceans and turtles	Wetlands, islands and inlets; habitats for migratory birds, colonial guano birds and marine mammals
Main resources	Giant Squid, Yellowfin Tuna	Anchovy (Central –Northern stock)
Main artisanal fishery resources; landings rank	Giant Squid, Yellowfin Tuna; 5th	Anchovy, scombrids, coastal fishes; 19th.
Anthropogenic pressure on top predators	Gillnet fishing – cetaceans and turtles	Pressure on habitat areas of marine birds and mammals
Hazards or conflicts in marine coastal management	Territory use/planning and climatic vulnerability and coastal marine pollution	Territory use/planning and coastal marine pollution
Climatic projection hypothesis up to 2030	SST increase in +0.4°C, > probability of extreme precipitations	High degree of uncertainty (either cooling or warming).

Several potential types of concrete interventions have been defined during a joint workshop between IMARPE and members of the communities of both pilot areas. These include: (1) promote the use of environmental friendly fishing gears, ameliorating the status of the coastal marine resources; (2) reduce by-catch resulting in

unintentional mortalities of top-predators, as marine mammals, birds and turtles; reducing the stress of the ecosystem food-chains; (3) promote sustainable aquaculture activities and ecotourism, where they are environmentally, financially and socially suitable, providing alternate economic activities for artisanal fishermen, reducing their vulnerability to climate change effects on their ecosystem; (4) support territorial planning, coastal marine habitats conservation or rehabilitation in agreement with the Ecosystem based Adaptation (EbA) approach (CBD, 2009); (5) promote co-management of benthic resources as a way to apply the Ecosystem Approach of Fisheries (EAF) at micro-scale; and (6) increase awareness of the impacts of climate and extreme events and the need for integrated coastal zone management, for the population and local authorities. These interventions will be further discussed, refined and complemented during a continued consultation process with the communities and throughout the implementation of the project.

1) Máncora, Piura Region, Tropical Coastal Ecosystem

General environmental description

In oceanographic terms, Máncora is located in southern tip of the Tropical Eastern Pacific Coastal Ecosystem, facing the seasonal north-south displacement of the Equatorial Front (EF) (Figure A2), where the Surface Tropical Waters (with high temperatures and low salinities) mix with the waters of moderate temperatures and higher salinities that characterize the HCS. The position of the EF is highly dynamic, exhibiting also interannual shifts in its latitudinal position. In winter, the Máncora area is influenced by the advection of upwelling waters from the south, lowering sea surface temperature values around 19°C, while in summer it is exposed to the advection of the Tropical Surface Waters, reaching 27°C (source: IMARPE, unpub. data).

Máncora town is both a seaside resort and a fishing cove in Northern Peru. On land, the Máncora area is cut by several ravines, which are filled in wet periods. The air temperature varies from 17°C to 27°C in the annual cycle, but during El Niño, the air temperature can reach 40°C. According to pluviometric measurements in Talara and in Tumbes, about 60km south and north of Máncora, respectively, mean monthly precipitation values range from 0-7mm (dry season) to 70-470mm (wet season) in the annual cycle, but during the last two extreme El Niño events (1982-83 and 1997-98), precipitation increased in about one order of magnitude during the wet season (Pouyaud et al., 2001), leading to the overflowing of the ravines and to coastal flooding. It is remarkable that in the last extreme El Niño, the combination of delivery of high amounts of particle material to the ocean and wave-driven sediment transport led to a regression of the shoreline in Máncora (Figure A3). The coastline presents fine sand beaches and wetlands. The sub-tidal sediments are oxidized muddy fine sands with relatively low contents of organic matter (~3%) (Carbajal et al., 2010).

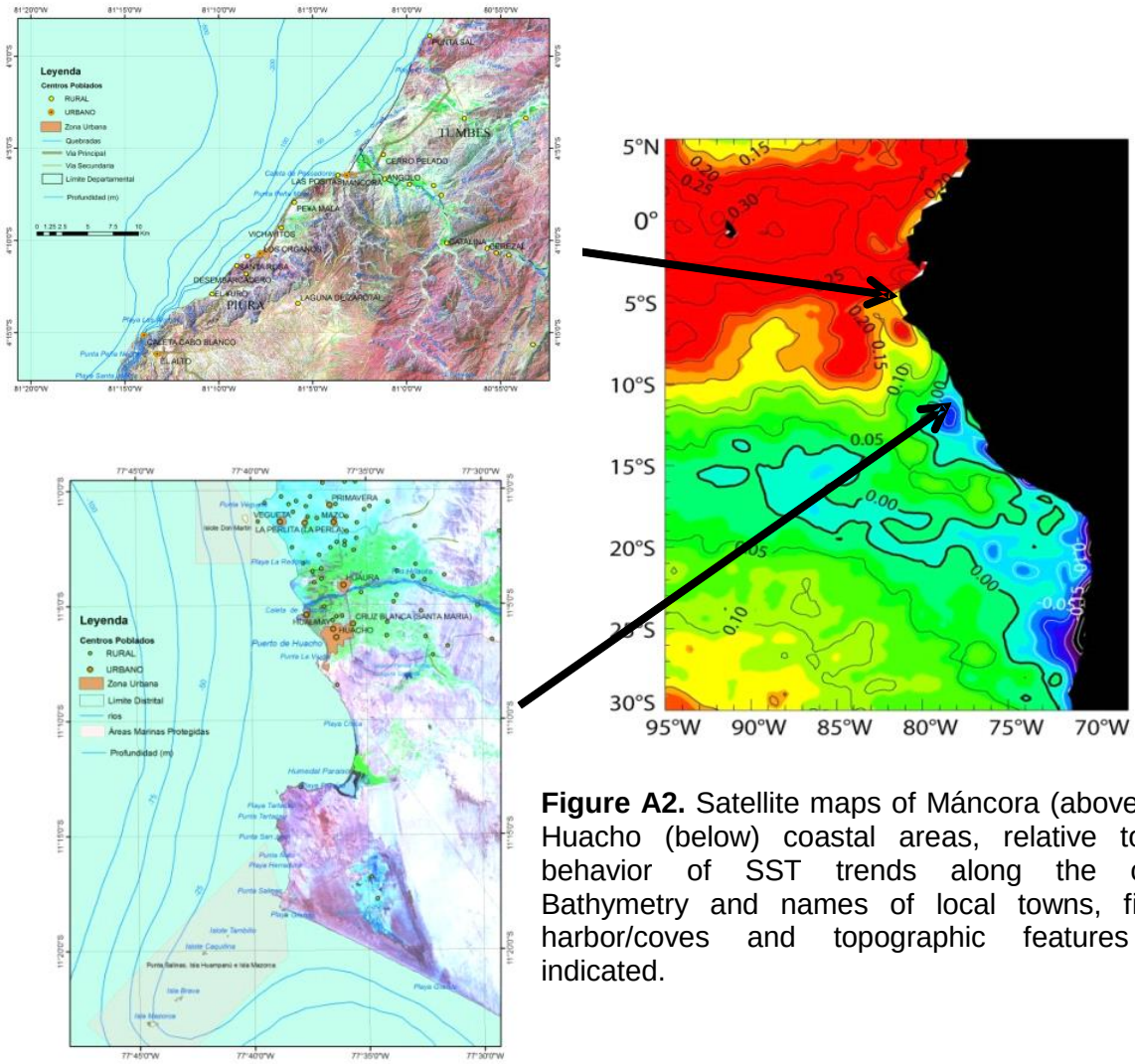


Figure A2. Satellite maps of Máncora (above) and Huacho (below) coastal areas, relative to the behavior of SST trends along the coast. Bathymetry and names of local towns, fishing harbor/coves and topographic features are indicated.

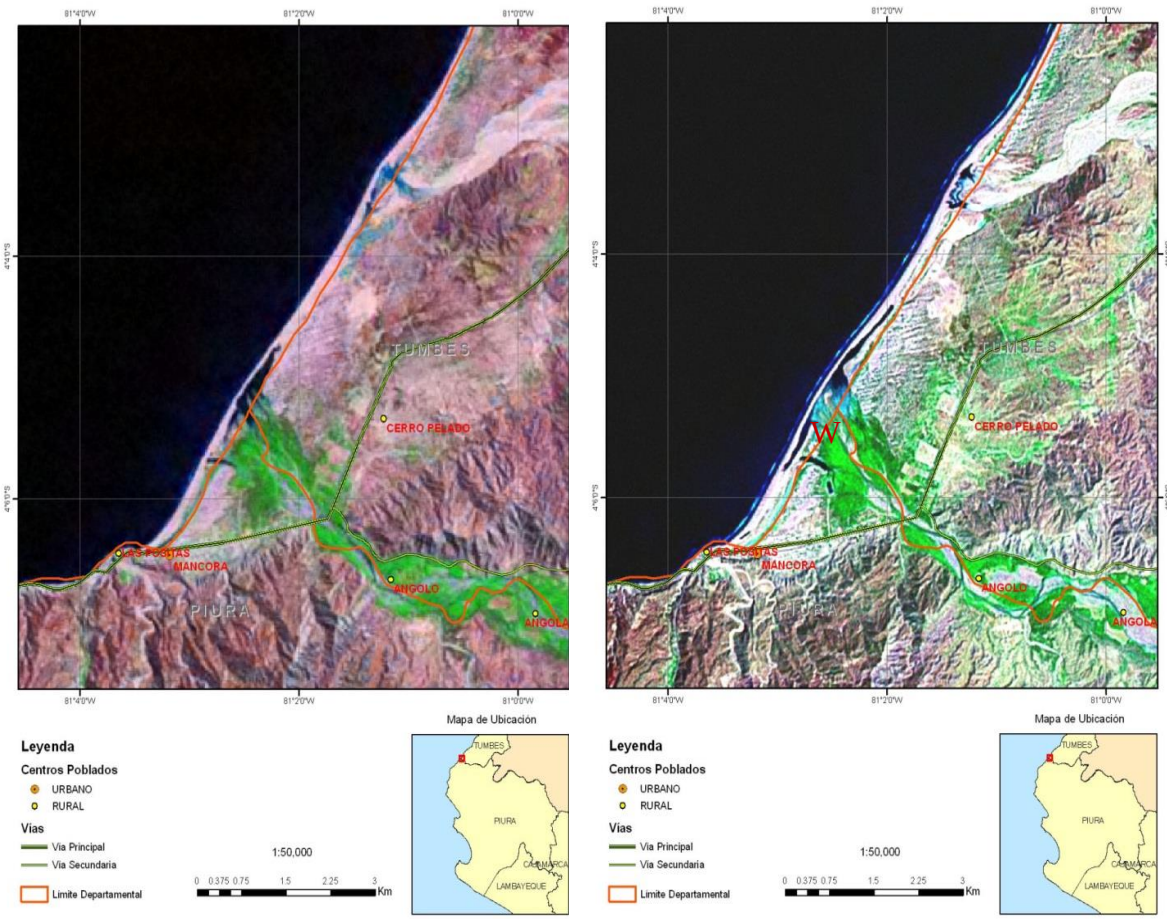


Figure A3. Change in the coastline induced by the 1997-98 El Niño around Máncora. Left: before the El Niño event; Right: after the El Niño event. Wetlands (W) associated to the ravine Quebrada Fernández are marked.

Economic activities and social conditions

According to the National Institute of Statistics (INEI), the population of Máncora is 10,547 people, and the working population is composed mainly by fishers (10.3%), car drivers (9.7%), shopkeepers and dealers (9.5%), followed by cooks, hotel personnel and bricklayers (about 5% each). Accordingly, the main economic activities of Máncora are: fishing, trade, hotels and restaurants, construction and transport. It is remarkable that in the recent years, Máncora has received an increasing number of national and foreign tourists, leading to a rapid building of hotels along its coastal line. One of the main social problems of Máncora is the housing sanitary conditions. 76.1% of the houses are connected to the public network of drinking water, and only 58.3% are connected to the public sewer system. On the other hand, 81.3% of the houses have access to electrical current.

Coastal marine zone management issues

A high coastal marine biodiversity characterizes Máncora due to its latitudinal position. The coastline presents wetlands, particularly associated to the mouth of the ravine Quebrada Fernandez (Figure 10), which are poorly studied in terms of their flora and fauna, and the ecological services they provide. The fine sand

beaches and the clear coastal waters attract tourism and recreation activities, including scuba diving and dive fishing. The biogeographic and oceanographic conditions sustain an active artisanal fishery oriented to oceanic, coastal and benthic resources[23]. An issue of concern is the impact of human populations and fishing activities on the habitat of large marine mammals and marine turtles.

Incidental fishing and stranding of whales, dolphins and turtles are frequent in the area, the latter due to injuries caused by gillnets deployed in the fishing areas. Therefore, an adequate management of the territory use, including the coastal marine zone, is still a pending task. Pollution and sanitary problems have not yet been solved for the whole area, though since 2010 the government is developing a project to improve the sewer system and to recover one of the wetlands located just next to Máncora town. Building hotels and resorts has been very rapid, increasing the pressure on the beaches and coastline, which are otherwise very sensitive to the El Niño-driven fluvial sediment transport and flooding.

Fishery and Landings

The following description is based on previous IMARPE surveys and fisheries database. Nearly all of the fishing activities in Máncora are performed by artisanal vessels, though they exhibit a high diversity of fishing gears and fishing targets, comprising large oceanic fishes, as tunas, sharks and scombrids, smaller pelagic[24] fishes, coastal demersal fishes, giant squid and benthic invertebrates. Figure A4a shows the relative contribution of the main nektonic resources to the landings in Máncora. It is remarkable the relatively large contribution of oceanic and coastal demersal fishes to overall landings, as well as the dominance of purse seines, gillnets and hooks (Figure A4b). Long-lines and surface-gillnets (which are included in the gillnet category) are oriented to oceanic fishing, as well as harpoons for sharks and marlins.

In general, the landings are characterized by a large variability in species composition and amount of landings (Figure A5). The top three resources in landing statistics for the past decade were Giant Squid (*Dosidicus gigas*), Pacific Harvestfish (*Peprilus medius*) and Yellowfin Tuna (*Thunnus albacores*), reaching annual catches of about 710 t, 610 t and 300 t, respectively. Landings of Yellowfin Tuna have shown a tendency to increase in the past decade (Figure A5b). Among the pelagic and coastal nekton, catches of Giant Squid and of Mackerel *Scomber japonicus* are episodic, while catches of Jack Mackerel *Trachurus murphyi* have almost disappeared since 2003 (Figure A5c). Among the coastal demersal nekton, catches of Hake (*Merluccius gayi peruanus*) are also episodic, while those of Common Snake Eel (*Ophichthus pacifici*) exhibit a declining trend.

Landings of Pacific Harvestfish are sustained, but with large fluctuations (Figure 12d). Finally, benthic invertebrates' landings are mainly composed by Oyster (*Ostrea iridescens*) and Brown Shrimp (*Farfantepenaeus californiensis*). In Peru, the last three El Niño appear to have negatively impacted landings of Brown Shrimp (Figure A5e).

[23] The collection of organisms living on or in sea or lake bottoms (http://www.thefreedictionary.com/benthic)
[24] Relating to or living in or on oceanic waters (http://www.thefreedictionary.com/pelagic)

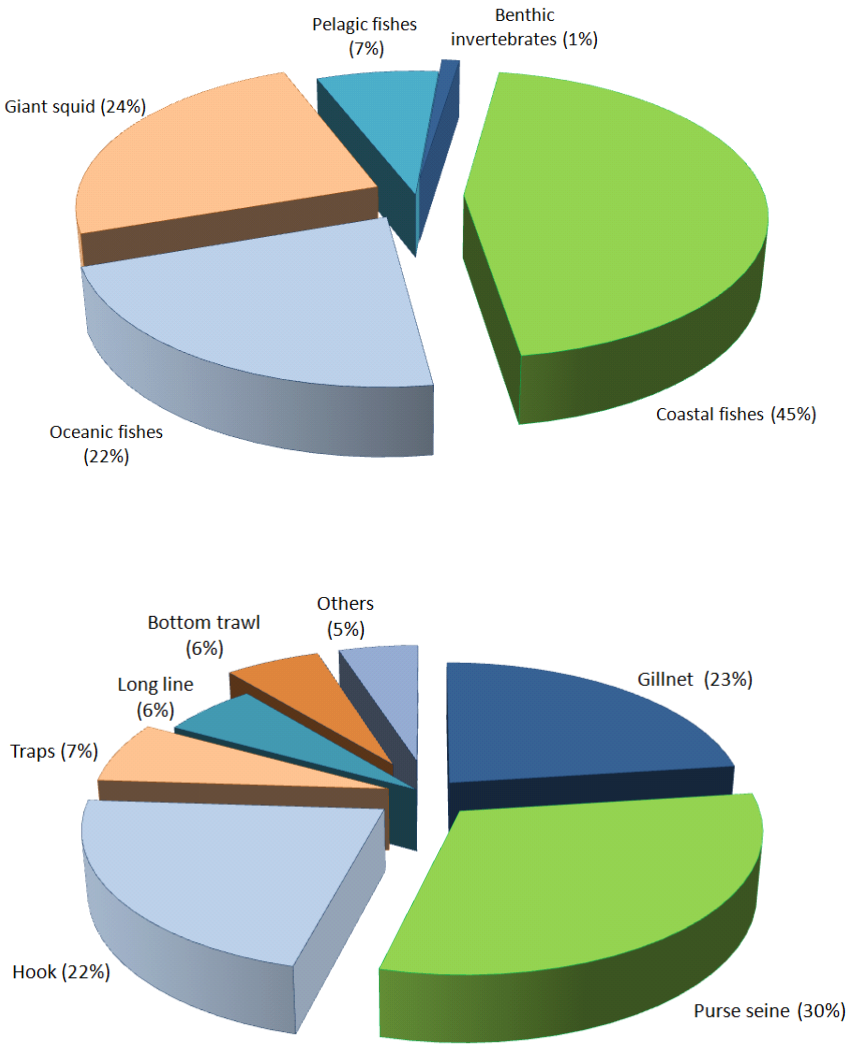


Figure A4. Summary of landing statistics from 2001 to 2010 in Máncora: a) Composition of landings by fishery resources; **b)** Composition of landings by fishing gears.

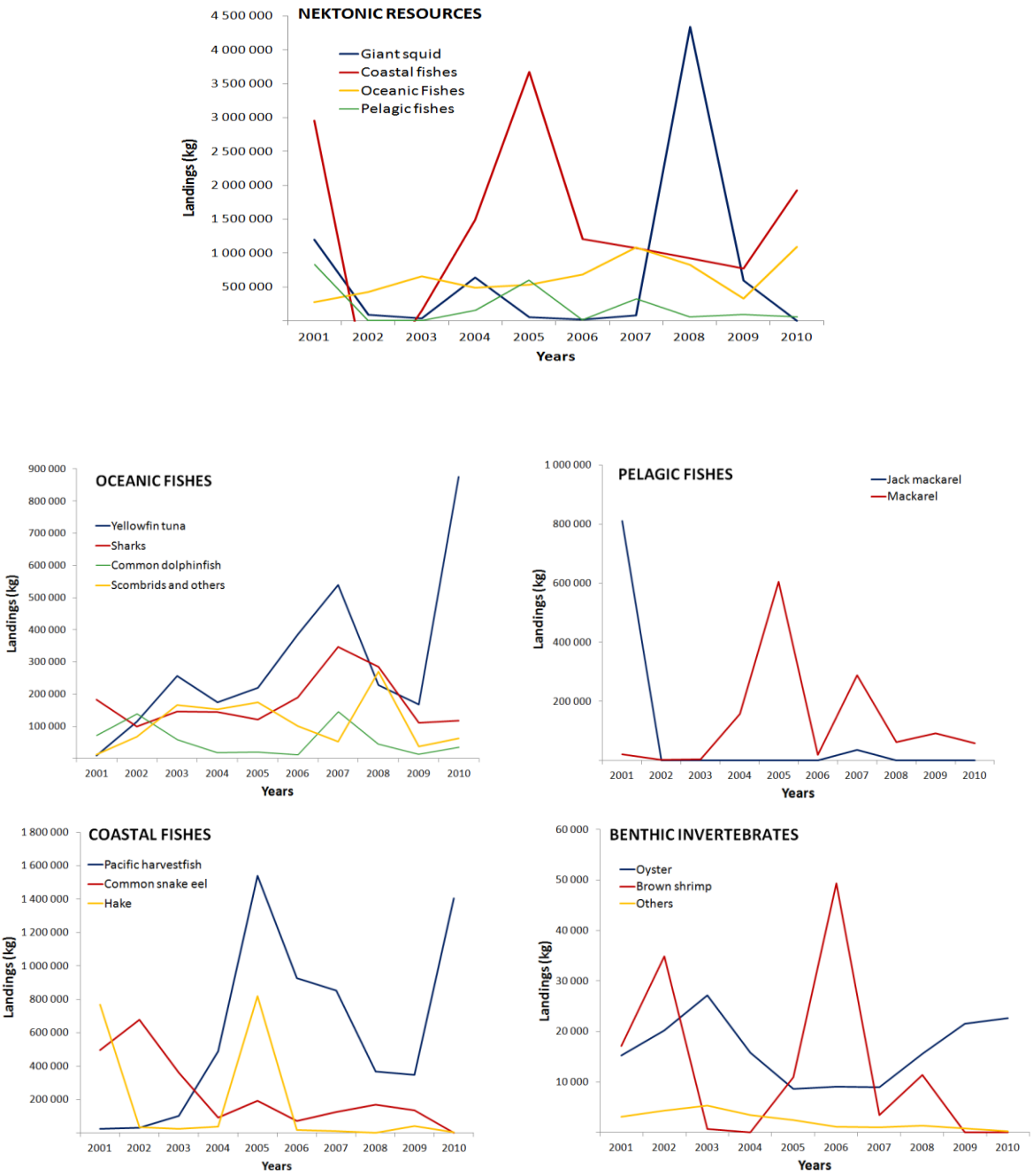


Figure A5. Time-series of landings (kg) by resource categories in Máncora and their main species: a) All nektonic resources; b) Oceanic fishes (tuna, sharks, common dolphin fish, scombrids and others); c) Pelagic fishes (jack mackerel and mackerel); d) Coastal fishes (Pacific harvestfish, common snake eel, hake); e) Benthic invertebrates (oyster and brown shrimp).

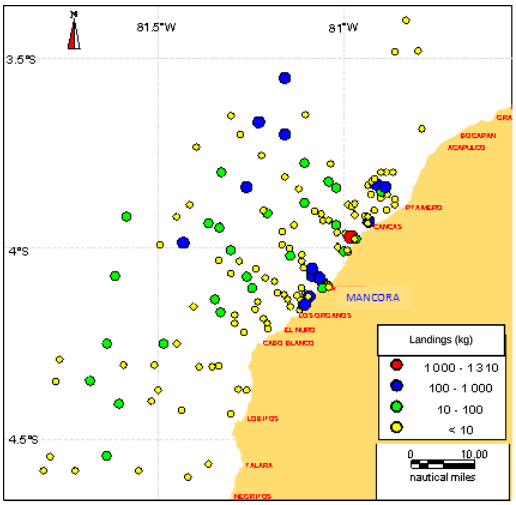
Banks and fishing grounds

Banks of several benthic resources are present off Máncora and nearby areas. The most important ones are those of the Pearl oyster (*Pteria sterna*), from Máncora to Los Órganos, Baby clams (*Donax* spp), mostly just south of Máncora, and Oyster (*Ostrea iridescens*), north of Máncora to Punta Sal (Carbajal et al., 2010; Ordinola et al., 2010). However the knowledge about biology and ecology of these resources is still limited. In terms of fishing grounds, a large portion of the fleet fishes off Máncora, Los Órganos and Punta Sal, within 30 miles off the coast. The fishing grounds of Yellowfin Tuna extend further, and the most important one is the so-called 'Banco de Máncora', a submarine elevation located about 30 miles north of the area. This elevation bears fossil reefs and a very high bathyal[25] benthic and nektonic biota, attracting large mammals and marine birds (Figure A6).

Proposed interventions

A map of the interventions in the Máncora pilot area is shown in Figure A7. As mentioned before, landings are characterized by a large variability in species composition and amount, according to the highly variable oceanic conditions. Among the top three resources in landing statistics for the past decade there is the Yellowfin Tuna. It is worth to mention that the fluctuations of the landings of Yellowfin Tuna, and of other tropical oceanic species are related to ENSO. For instance, higher catches in 2003, 2007 and 2010, followed the moderate El Niño events in the past decade. Therefore it is expected that the availability of this resource would increase with climate change, but sub-optimal fishing practices lead to poor values of fish products, while affecting other components of the ecosystem with by-catch. Also, given the uncertainty of the behavior of El Niño with climate change (e.g. increase in extreme events or just change in average conditions), it is necessary to apply a precautionary approach to safeguard the resilience of the resource and of the fishers. Therefore, promoting the replacement of current fishing gears by long-line represent a win-win condition, both for the ecosystem and the artisanal fishing community. Likewise, there is a traditional fishing on hake at El Ñuro, using hook instead of nets. This community is already close to attain MSC standards for achieving certification and thus, open alternatives for increasing the value of the products. The project will assist towards this goal. Hake is known to be sensitive to changes in subsurface dissolved oxygen, a parameter that varies at interannual and decadal scales (Bertrand et al., 2011) and possibly with ocean warming and increase stratification. Given that hake is an important human consumption resource in the North, the success of this process might lead to replicate it to other coves, reducing the vulnerability of this species to oceanographic changes.

[25] Related to the region of the ocean bottom between the sublittoral and abyssal zones, from depths of approximately 200 to 2,000 m (656 to 6,560 ft) (http://www.thefreedictionary.com/bathyal)



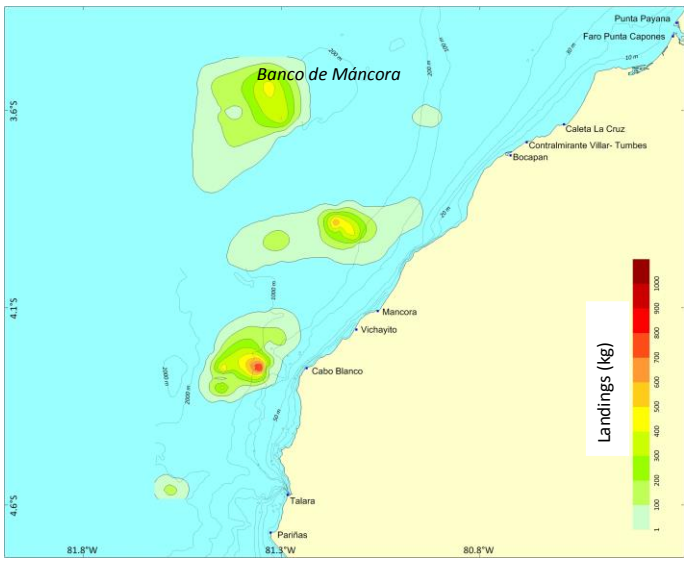


Figure A6. Location of fishing areas of the Máncora artisanal fleet: a) All fishing gears (2009 – 2010); b) Yellowfin tuna (gillnet; 2010).

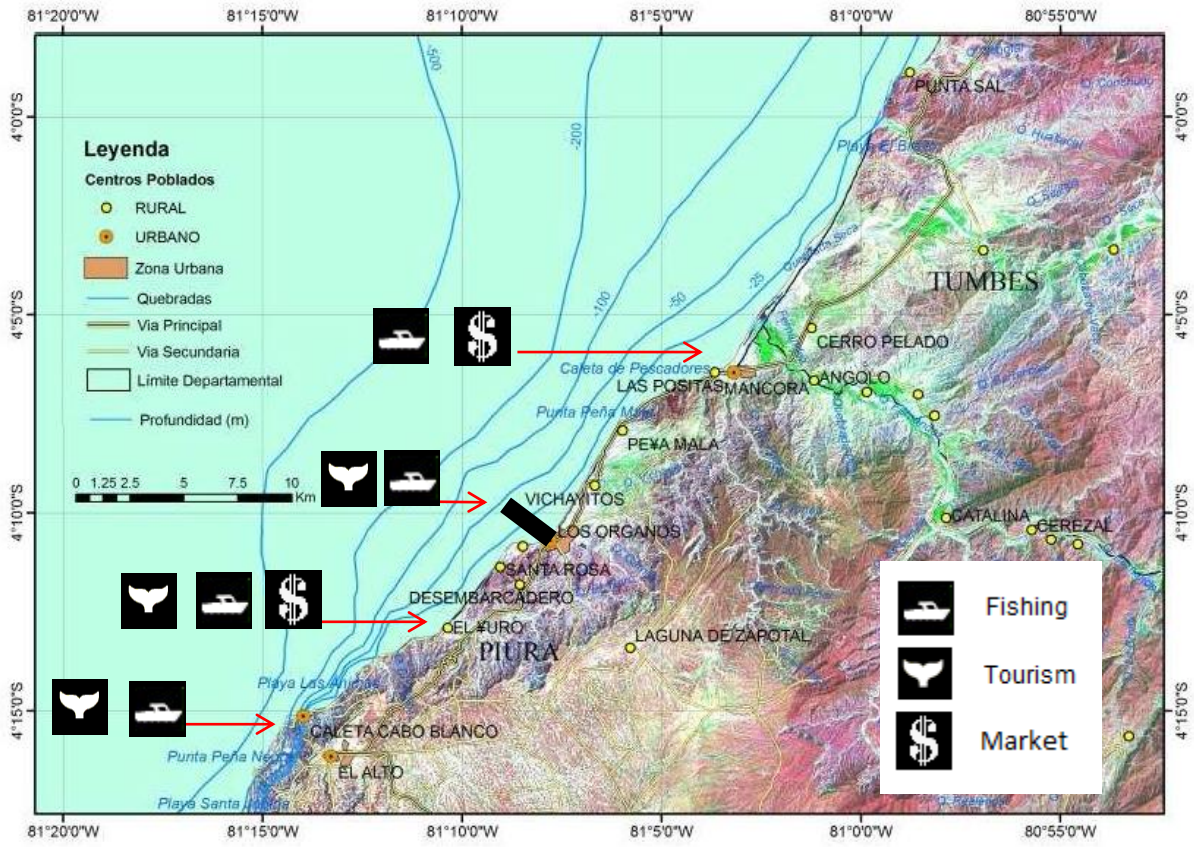


Figure A7. Map of potential interventions in Máncora area: Adaptation with environmental friendly gears imply 100% replacement of purse seines by long-lines (off Máncora, Órganos, Cabo Blanco and El Ñuro) and 100% replacement of gill-nets by long-lines for offshore fishing (off Máncora); improvement of market power capacities for hake fishery with hook in El Ñuro and of Yellowfin tuna in Máncora, including development of business plans; at least one small ecotourism enterprise (landscape watching, whales watching, etc.) in Órganos and the other in Cabo Blanco fishing coves.

2) Huacho area, Lima region, Peruvian coastal upwelling ecosystem

General environmental description

Huacho area is characterized by a complex topography with bays, capes and islands, as well as by the presence of wetlands. The cape Punta Salinas and the islands Don Martín, Huampanú and Mazorca belong to a national marine protected system of Islands, Islets and Capes. The total protected area is 3,312 ha for Don Martín Island, and 14,207 ha for Cape Punta Salinas, Huampanú and Mazorca (Figure A8). As other areas subjected to coastal upwelling, water is cold and very

productive, being the natural habitat of the Peruvian anchovy *Engraulis ringens*. The topography favors the existence of natural banks of benthic invertebrates, among which there are several subtidal mollusk species of high commercial value and demand (see below).

Administratively, this pilot area belongs to the Huaura province (197,384 inhabitants, with a surface of 4893 km^2, and a population density around 40 inhab/km^2), from which the main district, harbor and population center is Huacho (53,998 inhab). The two other districts with coastal populations and fishing coves are Carquín (6,091 inhabitants, with a surface of 2 km^2, and a population density of 2,986 inhab/km^2) and Végueta (18,265 inhabitants, with a surface of 254 km^2, and a population density around 72 inhab/km^2). The number of people working in artisanal fishery are 907, 250 and 160, respectively, so that families that depend directly from this economic activity are about 1300.

Huacho city (11º05'21"S; 77º37'36"W, 173.585 inhabitants, with a surface of 124 km^2, and a population density around 1405 inhab/km^2) is the capital of the Huaura province, Lima Department. Huacho harbor is located in the Huacho Bay, limited by La Viuda cape to the south and Carquín cape to the north (Figure A8). South of Huacho Bay is Hornillos beach and El Colorado. North of Huacho Bay is Carquín Bay, where the Huaura river discharges its waters.

Economic activities and social conditions

In Huacho, the main economic activity is small scale trade (9.2% of population), teaching (7.9%, mainly related to the Huacho University), restaurants (6.1%), construction (4.6%), transport (4.6%) and fishery (3.2%). In Carquín, economic activities comprise small scale trade (17.5%) and fishery (15.3%), with two fishmeal plants, and artisanal harvest for direct human consumption. Also, in Carquín other activities such as agriculture, cattle, poultry, bovine and pork industries are developed.

Coastal marine zone management issues

Huacho area contains a high diversity of species and natural banks of benthic invertebrates, due to the complex topography with large bays, capes and islands, as well as the presence of several rivers. Capes and islands belong to the recently created system of Marine Protected Areas. However, in this region there exists a chronic danger of pollution due to industrial activity, domestic sewage and runoff of pesticides from agriculture (Villegas, 2011).

Climate change will affect vulnerable areas such as the coastal zone of Huacho where temperature changes could shift the spatial distribution of species, and consequently fishing grounds and biodiversity. On the other hand, poor populations will be less prepared to adapt to climate change due to the lack of technology and infrastructure.

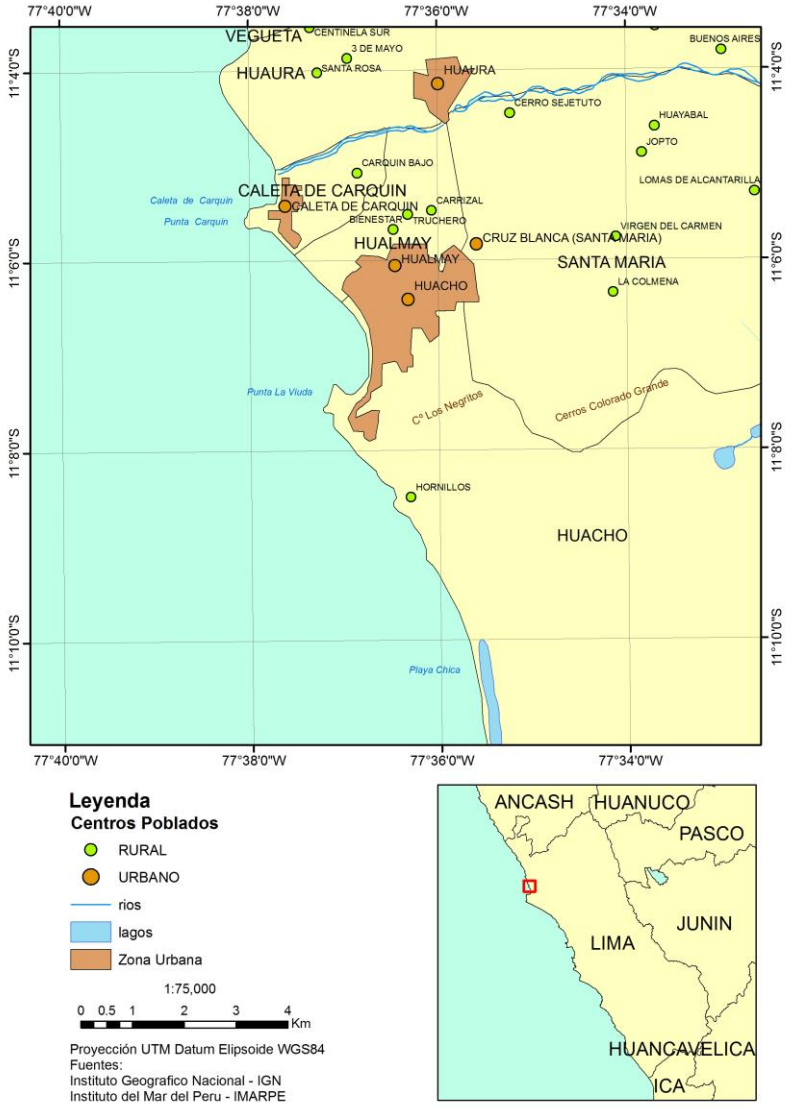


Figure A8. Geographic location of Huacho harbor.

Fishery issues - Landings

The Huacho harbor is considered an important center of industrial and artisanal fishery activity which generates positive impacts to the local and regional economy. The products of artisanal fishery are directed towards the fresh consumption for the local market and the capital (Lima) (Barreto 2005).

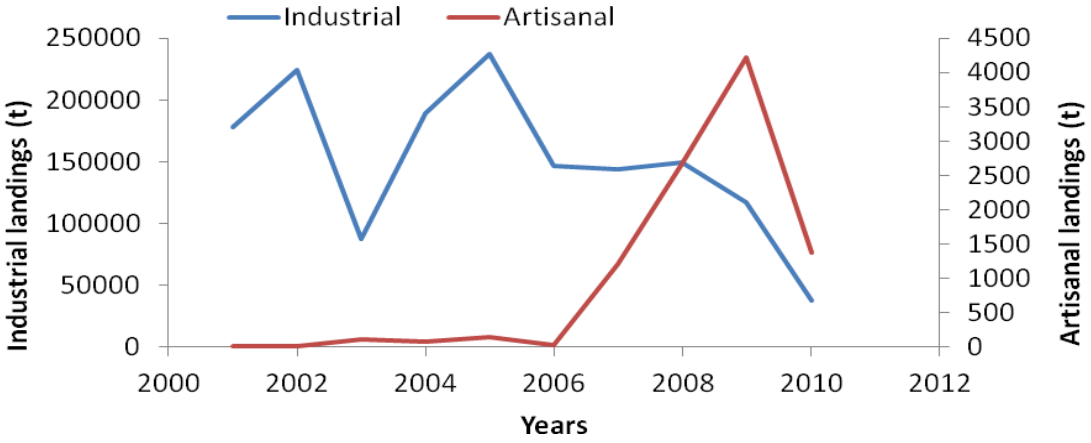


Figure A9. Total industrial and artisanal landings (t) in Huacho harbor, between 2001 – 2010.

The industrial fishery in Huacho during the period 2001- 2010 landed 1,512,652 t, which represented 2.3% of the national landings (65,461,835 t); landings were dominated by anchovy *Engraulis ringens* (97%) (IMARPE data). On the other hand, the artisanal fishery landed 9,797 t of anchovy, during the same period (Figure A9). These numbers show the different relevance of industrial versus artisanal fisheries of Huacho in relation to Máncora.

Artisanal fishing targets in Huacho comprise oceanic fishes (Pacific bonito, dolphinfish, sharks), pelagic fishes (anchovy, jack mackerel, Pacific menhaden and mackerel), coastal fishes (delicious drum, striped mullet, silverside and cabinza grunt) and several invertebrates (razor clam, black snail, squid and black sea cucumber) (Figure A10). Also, several fishing gears are used: purse seine, gillnet, autonomous diving, lung diving, long line, beach seine (chinchorro), among others (Figure A11).

Between 2001 and 2010, catches by the artisanal fleet grew reaching a peak of 4,218 t/year, composed mainly by anchovy, but also by delicious drum, silverside and razor clam (Figure A12). However, harvest under legal size limits could endanger the coastal resources (Gonzalez et al., 2010).

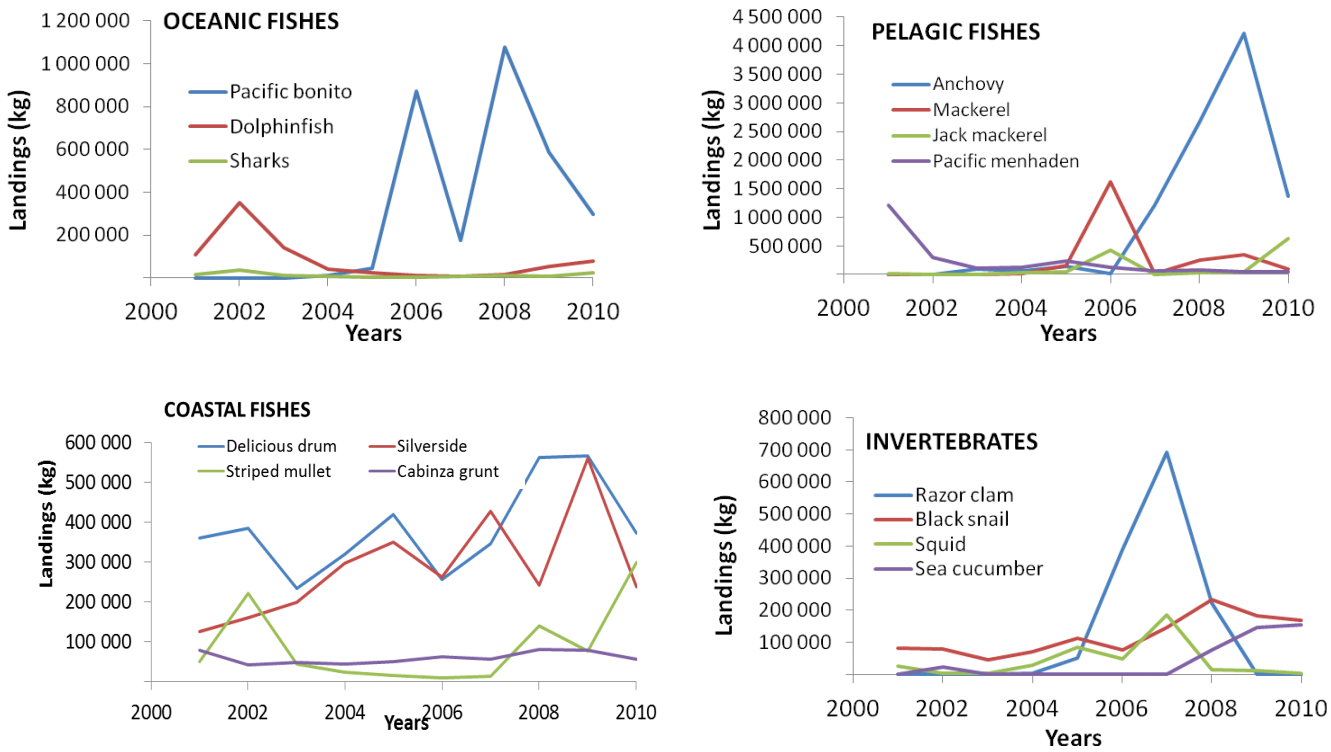


Figure A10. Time-series of landings (kg) by resource categories in Huacho and their main species: a) Oceanic fishes (Pacific bonito, dolphinfish and sharks); b) Pelagic fishes (anchovy, jack mackerel, Pacific menhaden and mackerel); c) Coastal fishes (Delicious drum, striped mullet, silverside and cabinza grunt); d) Invertebrates (razor clam, black snail, squid and black sea cucumber).

Between 2001 and 2010, landings of 33,873 t of hydrobiological resources comprised 75 species of fishes and 4 species of invertebrates. Species with largest landings were: *Engraulis ringens* (anchovy) with 9,796 t (28.9%), *Sciaena deliciosa* (delicious drum) with 3,826 t (11.3%), *Odontesthes regia regia* (silverside) with 2,868 t (8.5%), *Ensis macha* (razor clam) with 1,191 t (4.0%), *Ethmidium maculatum* (Pacific menhaden) with 2,368t (7.0%), Stramonita chocolata (black snail) with 3,826 t (3.5%), *Mugil cephalus* (striped mullet) with 1,355 t (4.0%), *Isacia conceptionis* (cabinza grunt) with 603 t (1.8%), *Loligo gahi* (Patagonian squid) with 406 t (1.2%) and *Patallus mollis* (black sea cucumber) with 363 t (1.1%) (IMARPE).

The artisanal fleet uses mainly purse seines oriented to catch anchovy, delicious drum, Pacific menhaden, cabinza grunt, striped mullet and Patagonian squid. The seashell fleet uses semiautonomous diving oriented to razor clam, black snail, black sea cucumber and crabs. Another fleet uses beach seine to catch delicious drum, Patagonian squid, striped mullet, Pacific menhaden, snakehead kingcroaker, Pacific guitarfish and flatfish. Finally, a small fleet uses hooks to catch delicious drum, Peruvian morwong, Peruvian grunt, cabinza grunt and Patagonian squid. The use of purse seines with a mesh size of only 38 mm, which is adequate for anchovy, has an impact on the higher prized species because it extracts mostly juveniles and creates conflicts with the gillnet fishers which target the same species.

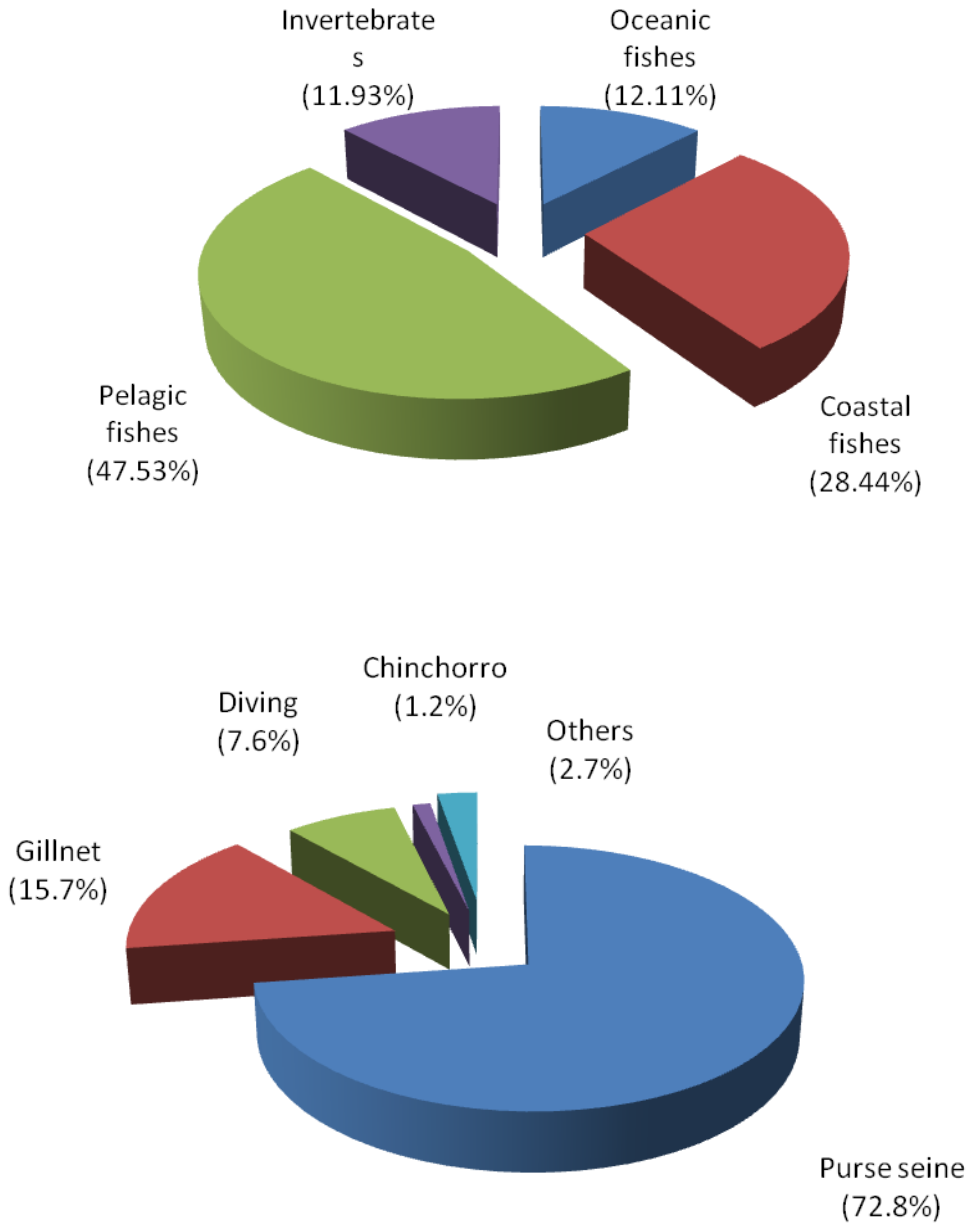


Figure A11. Summary of artisanal landing statistics from 2001 to 2010 in Huacho: a) Composition of landings by fishery resources; b) Composition of landings by fishing gears.

Banks and fishing grounds

The area between Carquín cape and Choza (Playa Grande) has 37 km of coastline, with large sandy beaches, rocky capes and small islands. The latter are spawning areas of silverside (*Odontesthes regia regia*), while small bays are spawning areas of Patagonian squid and habitat for mole crab (*Emerita analoga*) (Figure A13).

The main commercial invertebrate species are: *Cancer porteri* (lemon crab), *Cancer setosus* (hairy crab), *Platyxanthus orbignyi* (violet crab), *Aulacomya ater* (mussel), *Concholepas concholepas* (Chilean abalone), *Ensis macha* (razor clam), *Loligo gahi* (squid), *Sinum cymba* (Peruvian abalone), *Stramonita chocolata* (black snail), *Pattalus mollis* (black sea cucumber) and *Emerita analoga* (mole crab).

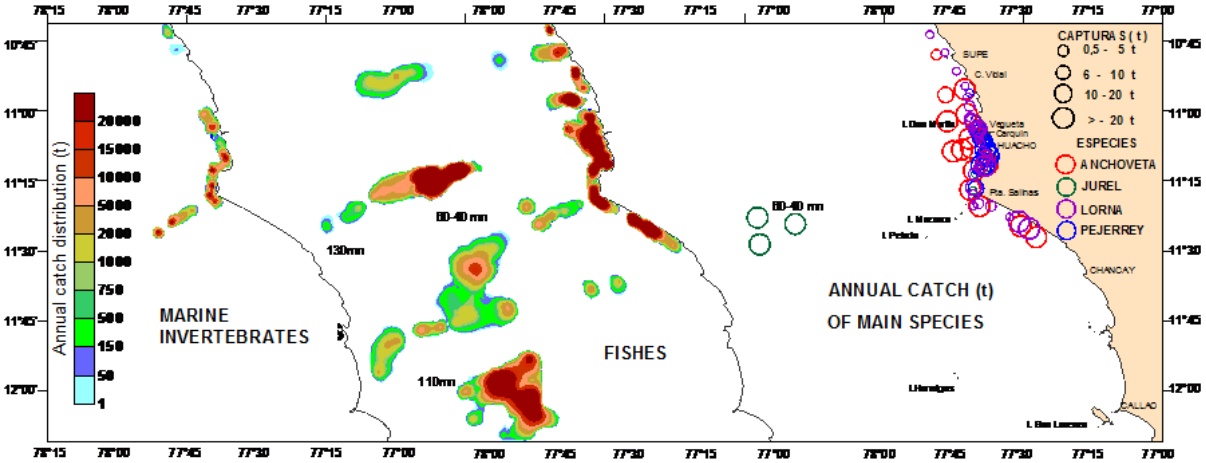


Figure A12. Location of fishing areas of the Huacho artisanal fleet: a) Invertebrates; b) Fishes; c) Annual catch of main species

Climate change impact on Peruvian anchovy population and artisanal fishing

The recent coastal cooling trend of Central and Southern Peru has not been translated in a positive trend of anchovy's biomass, which has exhibited interdecadal fluctuations following changes in upwelling and oxygenation (Bertrand et al., 2011). Since year 2000, the biomass is rather stable at about 10 to 12 million of tons (Fréon et al. 2008). Nevertheless acoustic biomass estimations suggest a northward shift in the gravity center of the population, from about 12 – 14°S in the 1970's to 6 – 8°S in the last decade (M. Gutiérrez et al., accepted). The large fishing capacity by the industrial fleet (Fréon et al., 2008) might have limited the biomass growth, but other ecological factors linked to the environmental change could also have limited the carrying capacity. For example, the cold-water squat lobster *Pleuroncodes monodon* has increased its distribution northward, and its ecological niche partially overlaps with anchovy's. Also, increased coastal wind intensity may induce stronger turbulence and larger mortality of eggs and larvae of the anchovies. The future evolution of the carrying capacity for anchovy is uncertain, because it also depends on predator-prey relationship changes and water column oxygenation, both of which are related with changes in water mass distribution and circulation processes that are still not well understood (Bertrand et al., 2011; Echevin et al., 2011; Gutiérrez et al., 2011).

Historically the Huacho harbor has been an important landing point for the industrial fishing of anchovy and several factories for fish meal and oil production have established. Since 2009, the artisanal fleet is fishing the anchovy, encouraged by the government policies to increase the direct human consumption, and now anchovy landings represent over 90% of the total artisanal fishery landings in the area.

Exploitation of natural banks of benthic invertebrates

An active diving extraction of benthic resources occurs along the area. However, pollution due to industrial activity, domestic sewage and runoff of pesticides from agriculture (Villegas 2011), compromises the ecological health of coastal environments located near towns, fishing coves and effluents. Some of the major banks are located onshore Don Martín Island, and in cape Punta Salinas, offering a chance for their sustainable management. Unfortunately the 'Master Plan' for the marine protected areas here is still to be formulated, and according to the normativity, it is the legal tool that would permit the marine spatial use planning for the reserve, involving activities as ecotourism, aquaculture and even recovery of natural banks (SERNANP, 2009). Two of the main benthic resources with high commercial value (for export and for national consumption) are the Peruvian scallop (*Argopecten purpuratus*) and the razor clam (*Ensis macha*).

Argopecten purpuratus is an edible marine filter-feeding bivalve, which inhabits sheltered sandy areas between 5 m and 40 m depth, from Panama through the coasts of Peru to Coquimbo in northern Chile. Gonadic maturity is accelerated during El Niño events off southern Peru and Chile due to high temperatures (Wolff, 1987), but sublethal temperature off Peru has been estimated in 29°C (Urban et al., 1994); consequently strong El Niño may have deadly effects on the banks located in the northernmost Peruvian coast. Scallops have a lifespan of up to five years, reaching almost commercial size (65 mm) in 180 days (Mendo et al., 2011). The species has a wide distribution along the Peruvian coast, being present in Don Martín Island. In the last decade, coinciding with the cooling trend and the absence of strong El Niño, the main productive area has changed from Independence Bay in the south (14°30'S) to Sechura (6°) in the north, though in the latter most of the production derives from extensive aquaculture which is connected to the management of the natural banks.

On the other hand, *Ensis macha* is a deposit feeding clam, which prefers silty sand and fine sand subtidal environments (5 to 20 m) for larval recruitment. Cannibalism for larvae is one of the characteristics of the species, limiting the recruitment area around the adult fields. Its main region of distribution is the Chilean coast, but the species has also expanded its latitudinal range northwards to even 06°S in the Peruvian coast in the last one to two decades (Espinoza et al., 2010). Off Peru its growth rate is more rapid than off Chile and it can attain the commercial size (125 mm) in about 2 years. The colonization of the Peruvian subtidal habitats triggered an uncontrolled extraction with hydraulic dredging, which damaged the population and the sedimentary properties, leading to the collapse of the banks in Independencia Bay in the mid 2000's (Espinoza et al., 2010). In the Huacho area, the main natural bank is in cape Punta Salinas, whereby hydraulic dredging has also been reported. Despite that this practice has been forbidden by law, it is still a threat over the population and its habitat due to the lack of effective control and attractive fishing gears for economic profit. In Punta Salinas, a ban established in 2008 has allowed the recovery of the adult population but the restoration of the silty sand bottoms are slow, putting in danger the renewal of the bank (IMARPE, 2011).

Integrality of the adaptation measures

The above mentioned coastal resource cases are examples of the threats and opportunities that climate change represents for a large portion of the Peruvian's coastal upwelling ecosystem and its stakeholders, particularly the artisanal fishery. The three resources are sensitive to climate-driven oceanographic changes and their distribution have responded to the recent environmental changes, but their future behavior is uncertain due to the non-linear character of the climate change impacts in the upwelling ecosystem (Echevin et al., 2011). Therefore adaptation measures need to be applied to maximize the opened opportunities and to minimize the vulnerabilities of the resources driven by the current fishing practices, limited information of the coastal ocean dynamics/ future regional climate change scenarios, and management limitations.

The proposed interventions will be mainly oriented to improve the resilience capacity of these three resources and of the local fishing communities; by means of: i) sustainable, fishing practices with profitable products (e.g. anchovy); ii) promotion of extensive aquaculture as an economic alternative (e.g. Peruvian scallop); and iii) stocking and re-stocking of natural banks of benthic invertebrates (e.g. razor clam).

Access to markets will accompany the whole process in order to give sustainability to the adaptation measure. Fishery certification will increase the product's value and demand, which in turn will also add sustainability to the process. Success of the intervention will imply significant potential benefits for the artisanal fishing of anchovy along the coast, and for the national goal of promoting direct human consumption over the fishmeal and fish oil uses. Better economic revenues will allow reducing the overall fishing pressure on the resource, also reducing its vulnerability to climate change manifestations. For extensive aquaculture as an economic alternative, the management of a concession area to culture *Argopecten purpuratus* will be carried out. The management will involve the participation, by agreement, of local shellfish fishers, and technical assistance will be provided for establishing a small enterprise formed by local fishers which will ensure management sustainability beyond the project. The intervention will involve: i) technical assistance for the formulation of the project dossier and the formal requests to obtain the approval of the concession project; ii) investment on the infrastructure, acquisition of the seeds and harvest; and iii) management of the concession area during the project. Operational costs, like the security surveillance of the area, maintenance and monitoring of the cultures will be shared with local shellfish fishers association. According to similar experiences that have taken place in other Peruvian sites, net profits are expected from the second year of the project. The intervention will comprise an area of 10 ha south of Huacho in front of Colorado and Hornillos beaches (Figure A13). Part of the scallops' yield will be used to stock a natural bank of this resource, onshore Don Martín Island and/or onshore Punta Salinas, according to the zoning established by the Master Plan of the Reserve of Islands, Islets and Capes (see below).

In addition, part of the profits will be re-invested for monitoring and aquaculture research in the area. In this way, at least one source of natural larvae production will be established in the marine protected system, which would supply larvae for other aquaculture concessions along the Huacho coast, providing a sustainable alternative economic activity for the fishing community.

For re-stocking and/or management of natural banks, the main intervention will be focused on the *Ensis macha* razor clam fishery. As exposed above, the lack of

effective management has put in danger the local banks of this resource, which otherwise had expanded its latitudinal range in accordance with coastal cooling. The intervention consists in two main actions. First, a technical assistance will be funded to identify an alternative extraction method with minimal impact on the substrate but attractive catch per unit of effort. Next, this extraction method will be promoted among the community by demonstrative training.

In parallel, based on the Master Plan of the protected area, the natural bank in the cape Punta Salinas will be spatially co-managed with the shellfish fishermen under the control of the national reserve. The management strategy will combine ”no-take” areas for the preservation of a spawning stock with areas under controlled extraction. The latter will reduce clam cannibalism and allow substrate availability for the settling larvae that will permit the renewal of the bank and a sustainable yield. The implementation of these practices fulfills the MSC principles for the fishery certification, so that a process towards this goal will be carried out. The certification will bring or ease the access to international markets with fair values of the product. In this way, the razor clam’s extractors will become allies and beneficiaries of a sustainable fishery, ending with a win-win resilience condition, both for the resource and for the fishing community.

The interventions will be complemented by specific long-term adaptation measures to improve governance and the response capacity of the government to address climate change effects on the coastal marine ecosystem and resources availability, as mentioned in Part II A of the proposal.

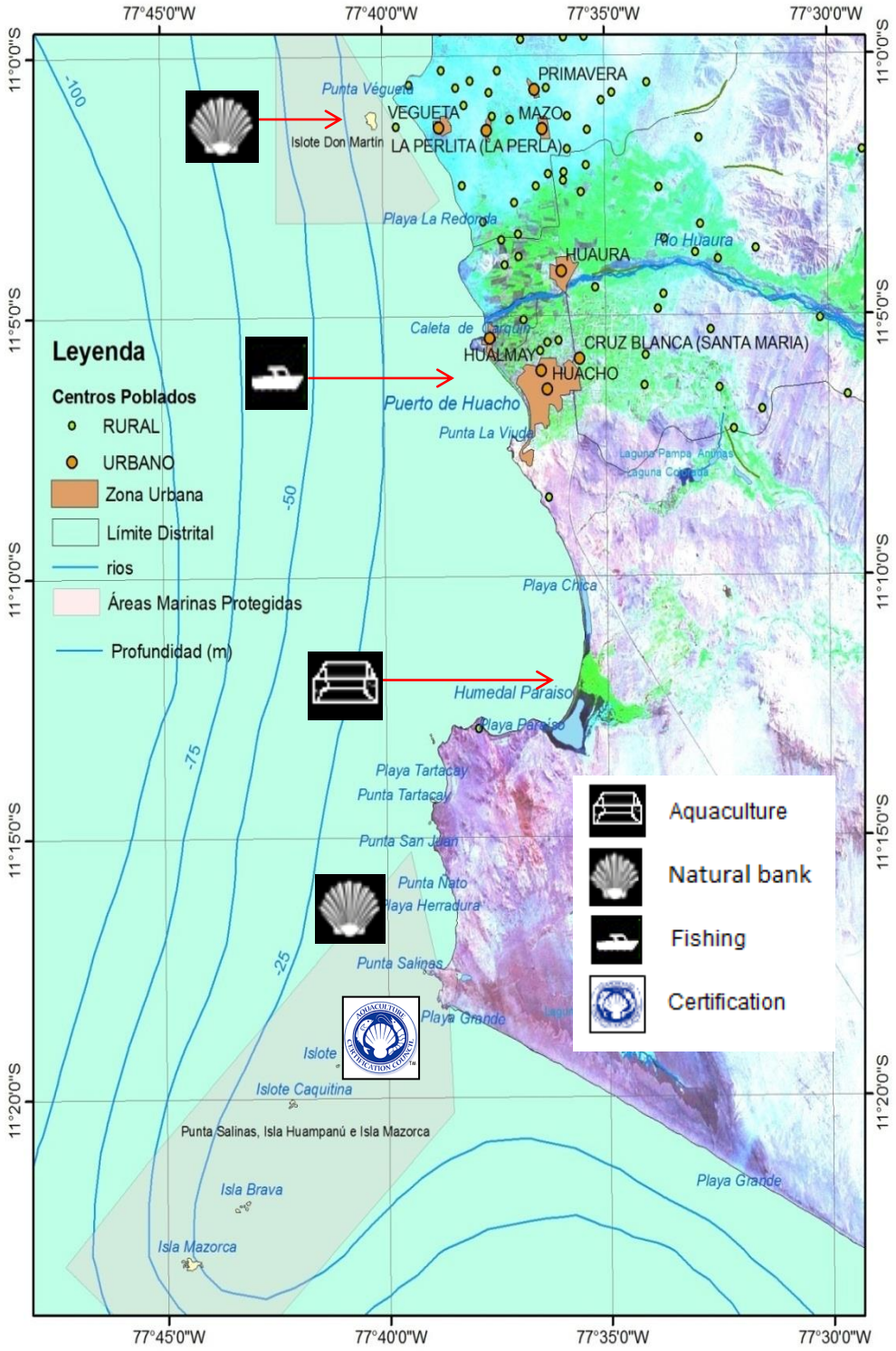


Figure A13. Map of potential interventions in the Huacho pilot area: The interventions might imply following-up of the use of environmentally friendly gears for artisanal fishing of anchovy in vessels under less than 20 tons of store capacity (Huacho harbor); start-up of certification of the razor clam extraction, following sustainable practices; a concession area for extensive and profitable aquaculture of the Peruvian scallop, linked to the restoration and co-management of natural banks in the marine protected areas.

ANNEX II - REFERENCES

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ANNEX III. GLOSSARY

AF, Adaptation Fund

AOP, Annual Operating Plan

Bathyal, relating to the region of the ocean bottom between the sublittoral and abyssal zones, from depths of approximately 200 to 2,000 m (656 to 6,560 ft).

Benthic, describing a fish that lives close to the floor of the sea or a lake.

DGEX, Dirección General de Extracción, General Direction of Harvest.

DGPA, Dirección General de Pesca Artesanal, General Direction of Artisanal Fishery.

DGA, Dirección General de Acuicultura, General Direction of Aquaculture.

DGAAP, Dirección General de Asuntos Ambientales de Pesquería, General Direction of Environmental Issues of Fisheries.

EA, Executing Agency

EAF, Ecosystem Approach to Fisheries, an extension of conventional fisheries management recognizing more explicitly the interdependence between human well-being and ecosystem health and the need to maintain ecosystems productivity for present and future generations, e.g. conserving critical habitats, reducing pollution and degradation, minimizing waste, protecting endangered species (Ward et al. 2002).

EBA, Ecosystem Based Adaptation, integrates the use of biodiversity and ecosystem services into an overall strategy to help people adapt to the adverse impacts of climate change (CBD, 2009).

EBM, Ecosystem Based Management, is a globally recognized approach for better understanding and managing the interactions between uses and the natural system, and integrating multi-sectorial interests into decision making for the whole marine ecosystem.

EF, Equatorial Front; latitudinal range off Northern Peru where surface tropical waters mix with colder waters with higher salinities from coastal upweling.

ENSO, El Niño Southern Oscillation.

ERA, Ecological Risk Assessment, is an effective and transparent methodological structure to assess potential risks to all essential components of a studied fishery, namely the ecological as well as the human well-being.

GEF, Global Environment Fund.

GoP, Government of Peru

IMARPE, Instituto del Mar del Perú (Peruvian Marine Research Institute)

M&E, Monitoring and Evaluation

MIE, Multilateral Implementing Entity

MTE, Mid-term Evaluation

NIE, National Implementing Entity

PA, Pilot Area

PC, Project Coordinator

PIP, Project Implementation Plan

PCT, Project Coordination Team

PIW, Project Inception Workshop

PRODUCE, Ministry of Production

PROFONANPE, Fondo de Promoción de las Areas Naturales Protegidas del Perú

PSC, Project Steering Committee

SENAMHI, Servicio Nacional de Meteorología e Hidrología

SERNANP, Servicio Nacional de Areas Naturales Protegidas

SOAF, Social Organizations of Artisanal Fishers

TS, Technical Secretary

UE-003. Unidad Ejecutora 003 “Fomento al consumo Humano Directo – A Comer Pescado” of PRODUCE

ANNEX IV. LIST OF STAKEHOLDERS AT PILOT AREAS WORKSHOPS

Participants of Workshop in Huacho

Date: September 10, 2012
Hour: 9 am – 1 pm
Place: House of Culture, Huacho.

N°	NAME	INSTITUTION	E-MAIL / PHONE
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Participants of Workshop in Máncora

Date: September 6, 2012
Hour: 9 am – 2 pm
Place: Association of Fishermen, Máncora

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16	Angelica Lucia Rumiche	Regional MDM	#956490440
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18	Javier Mogollon Delgado	Gremio Los Órganos	968997365

ANNEX V. ENVIRONMENTAL ASSESSMENT

Céspedes, C., N. Ortiz. 2015. Evaluación ambiental. Proyecto: Adaptación a los impactos del cambio climático en el ecosistema marino del Perú y sus pesquerías. PROFONANPE.

Evaluación ambiental

Proyecto:
Adaptación a los impactos del cambio climático en el ecosistema marino del Perú y sus pesquerías

MSc. Cynthia Céspedes M.
MSc. Natalia Ortiz E.
PROFONANPE. 2015

Contenido

1 Introducción

En el año 2012, el Fondo de Adaptación aprobó la nota conceptual del proyecto "Adaptación a los impactos del cambio climático en el ecosistema marino del Perú y sus pesquerías".

El siguiente paso es presentar el diseño detallado del proyecto, el cual debe de cumplir con las políticas ambientales del Fondo de Adaptación. De acuerdo a los requerimientos de este Fondo, las Entidades de Implementación deben de (i) tener un sistema de manejo ambiental y social que asegure que los riesgos ambientales y sociales sean identificados y evaluados al inicio del diseño del proyecto, (ii) adoptar medidas para evitar o mitigar los riesgos durante la implementación, y (iii) monitorear e informar el estatus de las medidas durante y al finalizar el proyecto.

En este sentido, en el presente documento, se realiza un análisis de los posibles impactos y riesgos ambientales que la ejecución del proyecto podría generar, y se desarrolla una propuesta de plan de manejo ambiental, el cual contiene las medidas específicas para evitar o mitigar los potenciales impactos y riesgos ambientales, así como un procedimiento para el monitoreo y evaluación del cumplimiento de las medidas ambientales (salvaguardas), el cual deberá ser realizado por Profonanpe, como Entidad Nacional de Implementación del Fondo de Adaptación para el presente proyecto.

2 Resumen del proyecto

El proyecto "Adaptación a los impactos del cambio climático en el ecosistema marino del Perú y sus pesquerías", tiene como objetivo general apoyar al Gobierno Peruano en reducir la vulnerabilidad de las comunidades costeras a los impactos del cambio climático en los ecosistemas marino costeros y sus recursos pesqueros.

Esto requerirá la implementación de los siguientes componentes del proyecto:

- **Componente 1.** Implementación de intervenciones en sitios piloto estratégicos para mejorar la resiliencia de comunidades costeras objetivo y ecosistemas marino costeros claves, frente al cambio climático y al estrés inducido por la variabilidad.

Las intervenciones estarán orientadas a desarrollar actividades como la adopción de métodos de pesca sostenible, acuicultura extensiva sostenible y ecoturismo en los dos sitios piloto identificados: Máncora y Huacho.

Este componente tiene 2 resultados:

Resultado 1.1. Resiliencia aumentada y vulnerabilidad reducida de ecosistemas marino costeros a efectos observados del cambio climático y el estrés inducido por la variabilidad

Resultado 1.2. Capacidad adaptativa mejorada de las comunidades locales participantes a través de la diversificación y el fortalecimiento de sus medios de sustento y fuentes de ingreso en vista a las modificaciones inducidas por el cambio climático en la biomasa y distribución de peces

- **Componente 2.** Implementación de un moderno y eficiente sistema de vigilancia y predicción ambiental de los ecosistemas marino costeros a escalas regionales y locales que apoye el manejo adaptativo de pesquerías bajo los principios de "Enfoque Ecosistémico a la Pesca" (Ecosystem Approach to Fisheries -EAF).

Como resultado de este componente se tiene:

Resultado 2.1. Capacidad de respuesta aumentada del gobierno a nivel nacional y local en áreas piloto para afrontar los estresores físicos y ecológicos inducidos por el cambio climático sobre el ambiente marino costero, los servicios ecosistémicos y la disponibilidad de recursos.

- **Componente 3.** Creación de capacidades y de un sistema de manejo de la información para la implementación de los principios de "Adaptación Basada en Ecosistemas" (Ecosystem-Based Adaptation - EBA) y "Enfoque Ecosistémico a la Pesca" (EAF), y para la diseminación de las lecciones aprendidas del proyecto, dirigida a autoridades del gobierno, científicos, comunidades locales y otros grupos de interés.

Los resultados de este componente son:

Resultado 3.1. Capacidad institucional fortalecida para evaluar la extensión y magnitud de los impactos del cambio climático en las pesquerías y acciones efectivas para afrontar estos cambios, dando límites a la pérdida de ingreso inducida por el clima en comunidades locales.

Resultado 3.2. Conciencia fortalecida y apropiación de procesos de adaptación y reducción de riesgo climático sobre comunidades impactadas en las áreas piloto del proyecto.

- **Componente 4.** Políticas de manejo, regulaciones y medidas que promuevan la resiliencia de ecosistemas costeros y comunidades locales al cambio climático y al estrés inducido por la variabilidad.

El resultado de este componente es:

Resultado 4.1. Gobernanza, políticas y reglamentos mejorados a nivel nacional y local para mejorar el uso sostenible y la resiliencia de recursos marino costeros.

3 Metodología

El análisis de impactos y riesgos ambientales se realizó en base a las actividades que se describen en los 4 componentes del proyecto.

3.1 Identificación y evaluación de impactos ambientales

Para la identificación de impactos potenciales del proyecto, se empleó la técnica de la lista de chequeo o método simple de control con el propósito de identificar las acciones del proyecto que puedan causar impactos sobre los distintos componentes o factores ambientales. Estos impactos pueden ser de carácter beneficioso (+) o perjudicial (-) sobre los factores considerados.

La valoración cualitativa se realizó a partir de la matriz de identificación de impactos, en la que cada casilla de cruce, proporciona una idea del efecto de las actividades del proyecto sobre cada factor ambiental afectado.

De acuerdo al análisis realizado, los impactos (positivos y negativos) se clasificaron según su nivel de magnitud como Leve, Moderado y Alto, considerando el grado de afectación o beneficio que genera la actividad sobre cada factor ambiental. Asimismo, los impactos se clasificaron según su condición de afectación (directa, indirecta y/o acumulativa) sobre el componente ambiental.

3.2 Identificación y evaluación de riesgos ambientales

Para la identificación y evaluación de los riesgos ambientales del proyecto, se utilizó como base la metodología propuesta por el MINAM (2009), que define el riesgo ambiental como la probabilidad de ocurrencia que un peligro afecte directa o indirectamente al ambiente y a su biodiversidad, en un lugar y tiempo determinado, el cual puede ser de origen natural o antropogénico.

El proceso de evaluación de los riesgos ambientales de acuerdo al MINAM (2009), tiene 3 etapas: análisis, evaluación y caracterización, como se muestra en el siguiente gráfico:

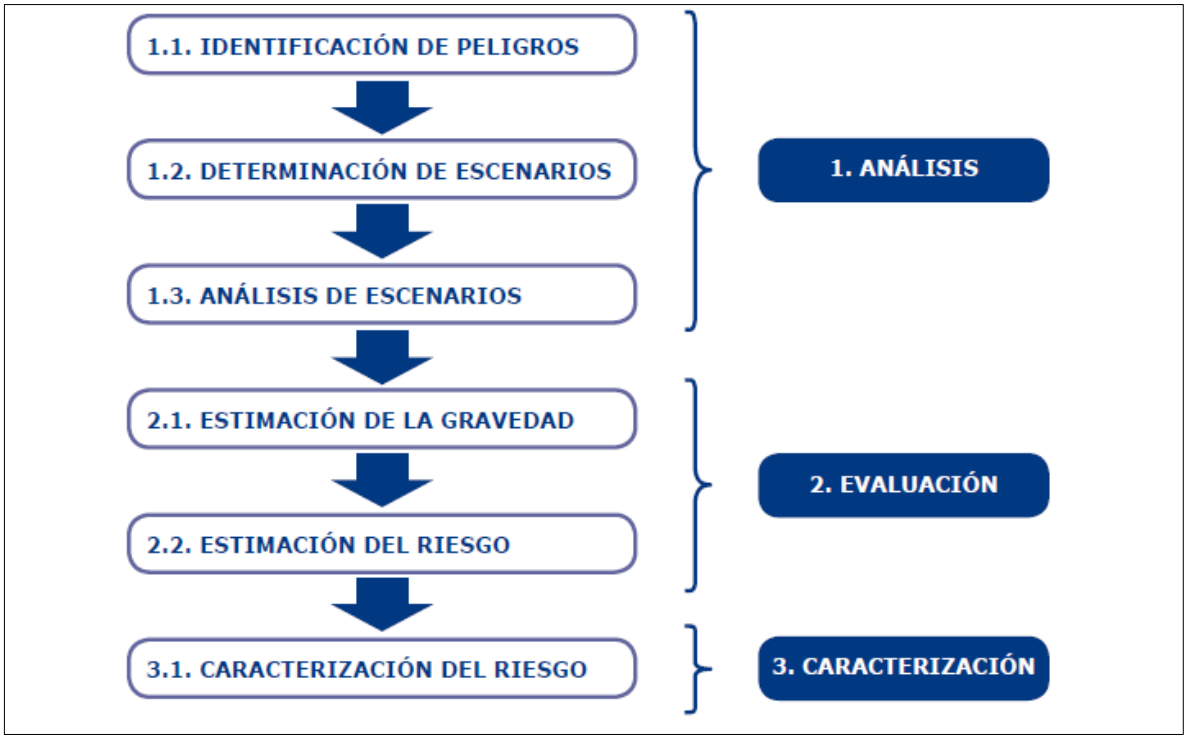

Gráfico 01. Criterios para la evaluación de riesgos ambientales. Fuente: MINAM (2009)

Para los fines de este documento, los riesgos del proyecto, se indujeron de los impactos ambientales negativos previamente identificados. Para estos riesgos potenciales se estimó la **probabilidad de ocurrencia** en función a la escala de la Tabla 01.

Tabla 01. Rangos de estimación probabilística de riesgos ambientales

Valor	Probabilidad
5	Muy probable
4	Altamente probable
3	Probable
2	Posible
1	Poco probable

Luego se estimó la **gravedad de las consecuencias** para el entorno natural, en base a los valores de las Tablas 02 y 03. Cabe señalar, que la metodología del MINAM analiza

también el entorno humano y socioeconómico, sin embargo, para los fines del presente análisis sólo se consideró el entorno natural.

Tabla 02. Fórmula para la estimación de la gravedad de las consecuencias

Gravedad	Límite del entorno	Vulnerabilidad
Entorno natural	= Cantidad + 2 Peligrosidad + Extensión	+ Calidad del medio

Tabla 03. Rangos de los límites del entorno natural

Entorno natural				
Valor	**Cantidad**	**Peligrosidad**	**Extensión**	**Calidad del medio**
4	Muy alta	Muy peligrosa	Muy extenso	Muy elevada
3	Alta	Peligrosa	Extenso	Elevada
2	Poca	Poco peligrosa	Poco extenso	Media
1	Muy poca	No peligrosa	Puntual	Baja

Definiciones

• **Cantidad:** Intensidad del agente estresor que puede ser químico (tóxicos o nutrientes), físico (represas, redes de pesca, sedimentos suspendidos) o biológico (especies exóticas, organismos genéticamente modificados). Este atributo mide el volumen o concentración de una sustancia química emitida al entorno, la magnitud o extensión de la interrupción física o la densidad o tamaño poblacional de un estresor biológico.

• **Peligrosidad:** Es la propiedad o aptitud intrínseca del agente estresor de causar daño (toxicidad, posibilidad de acumulación, bioacumulación, etc.);

• **Extensión:** Es el espacio de influencia del impacto en el entorno;

• **Calidad del medio:** Se considera el impacto y su posible reversibilidad;

Asimismo, se asignó una puntuación de 1 a 5 a la gravedad de las consecuencias en el entorno natural, según el resultado obtenido del cálculo previo y de acuerdo a los valores de la Tabla 04.

Tabla 04. Valoración de los escenarios de gravedad de las consecuencias identificados

Magnitud	Rango	Valor asignado
Crítico	20 – 18	5
Grave	17 – 15	4
Moderado	14 – 11	3
Leve	10 – 8	2
No relevante	7 – 5	1

Luego se calculó el riesgo ambiental, producto de la probabilidad y el valor asignado a la gravedad de las consecuencias:

Riesgo = Probabilidad x Gravedad de la consecuencia

Finalmente, se caracterizó la magnitud del riesgo ambiental, en base a los siguientes valores:

Tabla 05. Magnitud del riesgo ambiental

Magnitud	Valor
Riesgo significativo	16 - 25
Riesgo moderado	6 – 15
Riesgo leve	1 - 5

3.3 Plan de Manejo Ambiental

Se elaboró un plan de manejo ambiental con la finalidad de identificar todas las medidas específicas de control ambiental, para prevenir, corregir y/o mitigar los impactos y riesgos ambientales negativos identificados, que pudieran afectar o dañar los componentes o factores ambientales del medio físico y biológico. Asimismo, se desarrolló una propuesta para el monitoreo y evaluación de las medidas de mitigación, a través de protocolos y se estableció el procedimiento para su implementación por parte de Profonanpe.

4 Identificación y evaluación de impactos ambientales

4.1 Identificación

En la Tabla 06 se presenta la matriz de identificación de los impactos ambientales potenciales (positivos y negativos) por la intervención del proyecto.

4.2 Evaluación

En la Tabla 07 se presentan los resultados de la evaluación y valoración cualitativa de la magnitud (Alto, Moderado y Leve) de los impactos identificados. Asimismo, en la Tabla 08 se clasifican los impactos por su condición de afectación (directa, indirecta y acumulativa) a los componentes ambientales.

Tabla 06. Matriz de identificación de impactos ambientales

Actividades del proyecto	Detalle de actividades	Componentes ambientales							
		Suelo	Agua	Aire	Aves, mamíferos y reptiles	Peces	Plancton	Invertebrados	Algas
Componente 1: Implementación de intervenciones en sitios piloto estratégicos para mejorar la resiliencia de comunidades costeras objetivo y ecosistemas marino costeros claves, frente al cambio climático y al estrés inducido por la variabilidad.									
Adopción de métodos de pesca sostenibles para combatir aparejos de pesca no sostenibles basados en principios del EAF dirigidos a especies objetivo vulnerables al cambio climático.	Reemplazo por artes de pesca ambientalmente sostenibles (cortina por palangre en las embarcaciones de pesca de atún de aleta amarilla).				(+/-)	(+)			
Establecimiento de áreas de manejo pesquero en co-manejo con comunidades beneficiarias para facilitar la restauración de bancos naturales.	Establecimiento de áreas de manejo de pesca en co-manejo con comunidades beneficiarias.					(+)		(+)	
	Poblamiento de bancos naturales (conchas de abanico) en áreas protegidas para captación de larvas.							(+)	
	Repoblamiento de bancos naturales de invertebrados marinos (concha navaja) en áreas co-manejadas y en áreas protegidas para extracción controlada.							(+)	
Desarrollo de acuicultura sostenible a través de concesiones de pequeña escala.	Instalaciones acuícolas de pequeña escala en concesiones o áreas de manejo.	(-)	(-)					(-)	
	Evaluaciones de línea base y plan de manejo.							(+)	
	Observación de fauna marina en embarcaciones y pesca vivencial.	(-)	(-)		(+/-)	(+/-)			

Actividades del proyecto	Detalle de actividades	Componentes ambientales							
		Suelo	Agua	Aire	Aves, mamíferos y reptiles	Peces	Plancton	Invertebrados	Algas
Creación de empresas de ecoturismo.	Acondicionamiento de muelle para actividades ecoturísticas.[1]								
Mejora de las capacidades de comercialización de las pesquerías artesanales.	Mejora de las capacidades de comercialización.								
Inicio de procesos de certificación para pesquerías artesanales.	Inicio del proceso de certificación pesquera artesanal de concha navaja en Huacho.								
Conversión de residuos de pesca y acuicultura en biofertilizantes.	Conversión de residuos de pesca y acuicultura en biofertilizantes.	(+)	(+)						
Componente 2: Implementación de un moderno y eficiente sistema de vigilancia y predicción ambiental de los ecosistemas marino costeros a escalas regionales y locales que apoye el manejo adaptativo de pesquerías bajo los principios de "Enfoque Ecosistémico a la Pesca" (Ecosystem Approach to Fisheries -EAF).									
Desarrollo de un sistema de vigilancia climática y oceanográfica	Instalación de dispositivos autónomos (gliders) equipados con sensores de temperatura, salinidad, oxígeno, pH y clorofila-a.								
	Instalación de estaciones meteorológicas en puntas o islas guaneras.	(-)			(-)				
	Desarrollo de tesis de grado y postgrado.					(+)		(+)	
Establecimiento de programas de vigilancia ambiental en áreas piloto en	Supervisión y monitoreo ambiental de indicadores oceanográficos sensibles: oxígeno, acidez, mareas rojas, etc.	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)

[1] Los posibles impactos ambientales de esta actividad, deberán ser evaluados con el instrumento de gestión ambiental que requiera el sector competente.

Actividades del proyecto	Detalle de actividades	Componentes ambientales							
		Suelo	Agua	Aire	Aves, mamíferos y reptiles	Peces	Plancton	Invertebrados	Algas
coordinación con actores locales.									
Desarrollo de un sistema de modelado y predicción a escalas locales.	Producción de modelos físicos, químicos, biológicos y bio-económicos bajo un escenario de cambio climático.	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
Construcción de capacidades para monitoreo y desarrollo de nuevas herramientas científicamente basadas como Evaluación de riesgo ecológico (ERA) para cambio climático dirigido al IMARPE, tomadores de decisiones y academia.	Desarrollo de Evaluaciones de Riesgo Ecológico (ERA) relacionado a los impactos del cambio climático en biotopos, bancos naturales y especies clave seleccionadas.				(+)	(+)		(+)	
Componente 3. Creación de capacidades y de un sistema de manejo de la información para la implementación de los principios de "Adaptación Basada en Ecosistemas" (Ecosystem-Based Adaptation - EBA) y "Enfoque Ecosistémico a la Pesca" (EAF), y para la diseminación de las lecciones aprendidas del proyecto, dirigida a autoridades del gobierno, científicos, comunidades locales y otros grupos de interés.									
Desarrollo e implementación de un Sistema de Manejo del Conocimiento.	Desarrollo e implementación de un Sistema de Manejo del Conocimiento.	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
Entrenamiento y sensibilización de	Asistencia técnica a pescadores para fortalecimiento organizacional.								

Actividades del proyecto	Detalle de actividades	Componentes ambientales							
		Suelo	Agua	Aire	Aves, mamíferos y reptiles	Peces	Plancton	Invertebrados	Algas
beneficiarios en tópicos clave como formalización, emprendimiento empresarial, normativas y artes de pesca.	Capacitación y asistencia técnica a pescadores (en ecoturismo, acuicultura sostenible y comercialización).	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
	Capacitación en mejores prácticas pesqueras y proceso de certificación.		(+)		(+)	(+)		(+)	
	Capacitación y sensibilización de beneficiarios en formalización, iniciativa empresarial, normatividad y artes de pesca.	(+)	(+)		(+)	(+)		(+)	
	Educación y capacitación para el monitoreo ambiental básico y actividades de vigilancia y control.		(+)	(+)	(+)	(+)	(+)	(+)	
	Educación y capacitación en manejo sostenible de recursos costeros, tomando en cuenta el riesgo ecológico bajo el cambio climático.		(+)		(+)	(+)	(+)	(+)	
	Capacitación y fortalecimiento de instituciones gubernamentales para la sostenibilidad a largo plazo.								
	Capacitación de científicos locales y actores clave en el uso de información y herramientas basadas en ciencia.								
Diseño e implementación de sistemas de alerta temprana a través de un proceso participativo a escalas local y regional.	Diseño e implementación de sistemas de alerta temprana a través de un proceso participativo a escalas local y regional.	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)

Actividades del proyecto	Detalle de actividades	Componentes ambientales							
		Suelo	Agua	Aire	Aves, mamíferos y reptiles	Peces	Plancton	Invertebrados	Algas
Componente 4. Políticas de manejo, regulaciones y medidas que promuevan la resiliencia de ecosistemas costeros y comunidades locales al cambio climático y al estrés inducido por la variabilidad.									
Creación y operación de un grupo de trabajo para la promoción de acciones comunes para promover la resiliencia de ecosistemas costeros a los impactos del cambio climático.	Creación y operación de un grupo de trabajo								
Desarrollo de reglamentos y propuestas de co-manejo en áreas marinas costeras.	Apoyo a los organismos competentes en el desarrollo de planes de gestión y de manejo de áreas marinas protegidas.	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
	Apoyar la formulación e implementación del Plan Maestro de la Reserva Nacional Sistema de Islas, Islotes y Puntas Guaneras (RNSIIPG) en el área de Huacho.	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
	Apoyo a los organismos locales, regionales y nacionales para el manejo sostenible de áreas de pesca y de recursos pesqueros.	(+)	(+)			(+)		(+)	
	Apoyar a los gobiernos nacionales y regionales con la promulgación de reglamentos y ejecución de medidas para facilitar el EBA y aplicar el EA.	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
	Apoyar al gobierno en una estrategia de gobernanza.	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
Desarrollo de reglamentos para	Crear un marco jurídico y de organización necesario para el empoderamiento de las	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)

Actividades del proyecto	Detalle de actividades	Componentes ambientales							
		Suelo	Agua	Aire	Aves, mamíferos y reptiles	Peces	Plancton	Invertebrados	Algas
implementar incentivos para la participación de pescadores artesanales, que adoptan prácticas sostenibles, en el Programa Nacional de Consumo Humano Directo.	comunidades en su responsabilidad de manejar los recursos pesqueros.								

Tabla 07. Valoración cualitativa por la magnitud de los impactos ambientales

Detalle de actividades	Impacto ambiental	Componente ambiental afectado	Magnitud del impacto
Componente 1: Implementación de intervenciones en sitios piloto estratégicos para mejorar la resiliencia de comunidades costeras objetivo y ecosistemas marino costeros claves, frente al cambio climático y al estrés inducido por la variabilidad.			
Reemplazo por artes de pesca ambientalmente sostenibles (cortina por palangre en las embarcaciones de pesca de atún de aleta amarilla).	Reducción de la vulnerabilidad y la presión de pesca sobre el recurso objetivo y otras especies marinas	Peces e invertebrados	Impacto positivo alto
	Disminución de la mortalidad de vertebrados marinos por captura incidental	Mamíferos, aves y tortugas marinas	Impacto positivo moderado
	Captura incidental de vertebrados marinos	Mamíferos, aves y tortugas marinas	Impacto negativo leve
	Reducción de gases de efecto invernadero provenientes del ahorro en combustible por el cambio de artes de pesca	Aire	Impacto positivo leve
Establecimiento de áreas de manejo de pesca en co-manejo con comunidades beneficiarias.	Adopción de mejores medidas de manejo sostenible de los recursos pesqueros	Invertebrados	Impacto positivo alto
Poblamiento de bancos naturales (conchas de abanico) en áreas protegidas para captación de larvas.	Incremento de las poblaciones de invertebrados marinos	Invertebrados	Impacto positivo alto
	Mayor disponibilidad de alimento para peces y otras especies marinas del eslabón alimenticio	Peces, vertebrados marinos	Impacto positivo moderado
Repoblamiento de bancos naturales de invertebrados marinos (concha navaja) en áreas co-manejadas y en áreas protegidas para extracción controlada.	Incremento de las poblaciones de invertebrados marinos	Invertebrados	Impacto positivo alto
	Mayor disponibilidad de alimento para peces y otras especies marinas del eslabón alimenticio	Peces, vertebrados marinos	Impacto positivo moderado
Instalaciones acuícolas de pequeña escala en concesiones o áreas de manejo.	Generación de residuos sólidos y oleosos	Suelo y agua	Impacto negativo leve
	Modificación de la composición de especies bentónicas	Invertebrados	Impacto negativo leve
Evaluaciones de línea base y plan de manejo.	Adopción de mejores medidas de manejo sostenible de los recursos pesqueros	Peces e invertebrados marinos	Impacto positivo alto
Observación de fauna marina en embarcaciones y pesca vivencial.	Generación de residuos sólidos y oleosos	Suelo y agua	Impacto negativo leve
	Perturbación de fauna marina por ruido de motores y presencia humana	Mamíferos, aves y tortugas marinas	Impacto negativo leve

Detalle de actividades	Impacto ambiental	Componente ambiental afectado	Magnitud del impacto
	Incremento de la conciencia ambiental de actores sociales para la conservación de biodiversidad marina	Mamíferos, aves y tortugas marinas	Impacto positivo moderado
Conversión de residuos de la pesca y acuicultura en biofertilizantes	Disminución de la contaminación por generación de residuos sólidos	Suelo y agua	Impacto positivo alto
Componente 2: Implementación de un moderno y eficiente sistema de vigilancia y predicción ambiental de los ecosistemas marino costeros a escalas regionales y locales que apoye el manejo adaptativo de pesquerías bajo los principios de "Enfoque Ecosistémico a la Pesca" (Ecosystem Approach to Fisheries -EAF).			
Instalación de estaciones meteorológicas en puntas o islas guaneras.	Generación de residuos sólidos	Suelo y agua	Impacto negativo leve
	Perturbación de aves guaneras	Aves	Impacto negativo leve
Desarrollo de tesis de grado y postgrado.	Adopción de mejores decisiones y medidas de manejo de recursos marinos	Peces e invertebrados marinos	Impacto positivo moderado
Supervisión y monitoreo ambiental de indicadores oceanográficos sensibles: oxígeno, acidez, mareas rojas, etc.	Incremento del conocimiento sobre la dinámica de los ecosistemas marino costeros	Suelo, agua, aire, aves, mamíferos, reptiles, peces, invertebrados, plancton y algas	Impacto positivo moderado
Producción de modelos físicos, químicos, biológicos y bio-económicos bajo un escenario de cambio climático.	Incremento del conocimiento sobre la dinámica de los ecosistemas marino costeros	Suelo, agua, aire, aves, mamíferos, reptiles, peces, invertebrados, plancton y algas	Impacto positivo moderado
Desarrollo de ERA relacionadas a los impactos del cambio climático en biotopos, bancos naturales y especies clave seleccionadas.	Adopción de mejores decisiones y medidas de manejo de recursos marinos	Aves, mamíferos, reptiles, peces, invertebrados	Impacto positivo moderado
Componente 3. Creación de capacidades y de un sistema de manejo de la información para la implementación de los principios de "Adaptación Basada en Ecosistemas" (Ecosystem-Based Adaptation - EBA) y "Enfoque Ecosistémico a la Pesca" (EAF), y para la diseminación de las lecciones aprendidas del proyecto, dirigida a autoridades del gobierno, científicos, comunidades locales y otros grupos de interés.			
Desarrollo e implementación de una Estrategia de Manejo del Conocimiento.	Mejora de la gestión de ecosistemas marino costeros	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas	Impacto positivo moderado

Detalle de actividades	Impacto ambiental	Componente ambiental afectado	Magnitud del impacto
Capacitación y asistencia técnica a pescadores en ecoturismo, acuicultura sostenible y comercialización.	Incremento del conocimiento y la conciencia ambiental de pescadores para desarrollar actividades económicas alternativas de manera amigable con el medio ambiente y sostenibles en el tiempo	Suelo, agua, aire, aves, mamíferos, reptiles, peces, invertebrados, plancton y algas	Impacto positivo moderado
Capacitación a pescadores en mejores prácticas pesqueras y proceso de certificación.	Incremento del conocimiento y la conciencia ambiental de pescadores para desarrollar buenas prácticas pesqueras	Agua, aves, mamíferos, reptiles, peces e invertebrados	Impacto positivo moderado
Capacitación y sensibilización de beneficiarios en formalización, iniciativa empresarial, normatividad y artes de pesca.	Incremento del conocimiento y la conciencia ambiental de los beneficiarios en la conservación y manejo integral de los ecosistemas marino costeros	Suelo, agua, mamíferos, aves, reptiles, peces e invertebrados	Impacto positivo moderado
Educación y capacitación en monitoreo ambiental básico y actividades de vigilancia y control.	Incremento del conocimiento y la conciencia ambiental de pescadores para desarrollar buenas prácticas pesqueras	Agua, aire, mamíferos, aves, reptiles, peces e invertebrados marinos	Impacto positivo moderado
Educación y capacitación en manejo sostenible de recursos costeros, tomando en cuenta el riesgo ecológico bajo el cambio climático.	Incremento del conocimiento y la conciencia ambiental de pescadores para manejar sosteniblemente los recursos costeros	Agua, mamíferos, aves, reptiles, peces, plancton, invertebrados marinos y algas	Impacto positivo moderado
Diseño de un sistema de alerta temprana a través de un proceso participativo e implementación a escalas locales y regionales.	Incremento del conocimiento y la capacidad de respuesta del gobierno y de las comunidades para tomar adecuadas medidas de adaptación al cambio climático	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados marinos y algas	Impacto positivo moderado
Componente 4. Políticas de manejo, regulaciones y medidas que promuevan la resiliencia de ecosistemas costeros y comunidades locales al cambio climático y al estrés inducido por la variabilidad.			
Apoyo a los organismos competentes en el desarrollo de planes de gestión y de manejo de áreas marinas protegidas.	Mejora de la gestión de ecosistemas marino costeros	Agua, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas	Impacto positivo moderado
Apoyar la formulación e implementación del Plan Maestro de la RNSIIPG en el área de Huacho.	Mejora de la gestión de ecosistemas marino costeros	Agua, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas	Impacto positivo moderado

Detalle de actividades	Impacto ambiental	Componente ambiental afectado	Magnitud del impacto
Apoyo a los organismos locales, regionales y nacionales para el manejo sostenible de áreas de pesca y de recursos pesqueros.	Mejora de la gestión de ecosistemas marino costeros	Suelo, agua, peces e invertebrados	Impacto positivo moderado
Apoyar a los gobiernos nacionales y regionales con la promulgación de reglamentos y ejecución de medidas para facilitar el EBA y aplicar el EA.	Mejora de la gestión de ecosistemas marino costeros	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas	Impacto positivo moderado
Apoyar al gobierno en una estrategia de gobernanza.	Incremento del control, supervisión y fiscalización de las normas legales para la gestión de los ecosistemas marino costeros	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas	Impacto positivo moderado
Crear un marco jurídico y de organización para el empoderamiento de las comunidades en su responsabilidad de manejar los recursos pesqueros.	Incremento de la responsabilidad ambiental de los pescadores artesanales de manejar los recursos pesqueros	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas	Impacto positivo moderado

Leyenda	
	Impacto positivo alto
	Impacto positivo moderado
	Impacto positivo leve
	Impacto negativo alto
	Impacto negativo moderado
	Impacto negativo leve

Tabla 08. Clasificación del impacto por su condición de afectación directa, indirecta y acumulativa

Detalle de la actividad del proyecto	Impacto ambiental	Componente ambiental afectado	Condición del impacto		
			Directo	Indirecto	Acumulativo
Componente 1: Implementación de intervenciones en sitios piloto estratégicos para mejorar la resiliencia de comunidades costeras objetivo y ecosistemas marino costeros claves, frente al cambio climático y al estrés inducido por la variabilidad.					
Reemplazo por artes de pesca ambientalmente sostenibles (cortina por palangre en las embarcaciones de pesca de atún de aleta amarilla).	Reducción de la vulnerabilidad y la presión de pesca sobre el recurso objetivo y otras especies marinas	Peces e invertebrados	X		
	Disminución de la mortalidad de vertebrados marinos por captura incidental	Mamíferos, aves y tortugas marinas	X		
	Captura incidental de vertebrados marinos	Mamíferos, aves y tortugas marinas	X		X
	Reducción de gases de efecto invernadero provenientes del ahorro en combustible por el cambio de artes de pesca	Aire		X	
Establecimiento de áreas de manejo de pesca en co-manejo con comunidades beneficiarias para facilitar la recuperación de los bancos naturales	Adopción de mejores medidas de manejo sostenible de los recursos pesqueros	Invertebrados	X		
Poblamiento de bancos naturales (conchas de abanico) en áreas protegidas para captación de larvas	Incremento de las poblaciones de invertebrados marinos	Invertebrados	X		
	Mayor disponibilidad de alimento para peces y otras especies marinas del eslabón alimenticio	Peces, vertebrados marinos		X	
Repoblamiento de bancos naturales de invertebrados marinos (concha navaja) en áreas co-manejadas y en áreas protegidas para extracción controlada	Incremento de las poblaciones de invertebrados marinos	Invertebrados	X		
	Mayor disponibilidad de alimento para peces y otras especies	Peces, vertebrados marinos		X	

Detalle de la actividad del proyecto	Impacto ambiental	Componente ambiental afectado	Condición del impacto		
			Directo	Indirecto	Acumulativo
	marinas del eslabón alimenticio				
Instalaciones acuícolas de pequeña escala en concesiones o áreas de manejo	Generación de residuos sólidos y oleosos	Suelo y agua	X		
	Modificación de la composición de especies bentónicas	Invertebrados	X		
Evaluaciones de línea base y plan de manejo	Adopción de mejores medidas de manejo sostenible de los recursos pesqueros	Peces e invertebrados marinos		X	
Observación de fauna marina en embarcaciones y pesca vivencial	Generación de residuos sólidos y oleosos	Suelo y agua	X		X
	Perturbación de fauna marina por ruido de motores y presencia humana	Mamíferos, aves y tortugas marinas	X		X
	Incremento de la conciencia ambiental de actores sociales para la conservación de biodiversidad marina	Mamíferos, aves y tortugas marinas		X	X
Conversión de residuos de la pesca y acuicultura en biofertilizantes	Disminución de la contaminación por generación de residuos sólidos	Suelo y agua	X		
Componente 2: Implementación de un moderno y eficiente sistema de vigilancia y predicción ambiental de los ecosistemas marino costeros a escalas regionales y locales que apoye el manejo adaptativo de pesquerías bajo los principios de "Enfoque Ecosistémico a la Pesca" (Ecosystem Approach to Fisheries -EAF).					
Instalación de estaciones meteorológicas en puntas o islas guaneras.	Generación de residuos sólidos	Suelo y agua	X		
	Perturbación de aves guaneras	Aves marinas	X		
Desarrollo de tesis de grado y postgrado	Adopción de mejores decisiones y medidas de manejo de recursos marinos	Peces e invertebrados marinos		X	
Supervisión y monitoreo ambiental de indicadores oceanográficos sensibles: oxígeno, acidez, mareas rojas, etc.	Incremento del conocimiento sobre la dinámica de los ecosistemas marino costeros	Suelo, agua, aire, aves, mamíferos, reptiles, peces, invertebrados, plancton y algas		X	

Detalle de la actividad del proyecto	Impacto ambiental	Componente ambiental afectado	Condición del impacto		
			Directo	Indirecto	Acumulativo
Producción de modelos físicos, químicos, biológicos y bio-económicos bajo un escenario de cambio climático	Incremento del conocimiento sobre la dinámica de los ecosistemas marino costeros	Suelo, agua, aire, aves, mamíferos, reptiles, peces, invertebrados, plancton y algas		X	
Desarrollo de ERA relacionadas a los impactos del cambio climático en biotopos, bancos naturales y especies clave seleccionadas.	Adopción de mejores decisiones y medidas de manejo de recursos marinos	Aves, mamíferos, reptiles, peces, invertebrados		X	
Componente 3. Creación de capacidades y de un sistema de manejo de la información para la implementación de los principios de "Adaptación Basada en Ecosistemas" (Ecosystem-Based Adaptation - EBA) y "Enfoque Ecosistémico a la Pesca" (EAF), y para la diseminación de las lecciones aprendidas del proyecto, dirigida a autoridades del gobierno, científicos, comunidades locales y otros grupos de interés.					
Desarrollo e implementación de una Estrategia de Manejo del Conocimiento.	Mejora de la gestión de ecosistemas marino costeros.	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas		X	
Capacitación y asistencia técnica a pescadores en ecoturismo, acuicultura sostenible y comercialización.	Incremento del conocimiento y la conciencia ambiental de pescadores para desarrollar actividades económicas alternativas de manera amigable con el medio ambiente y sostenibles en el tiempo.	Suelo, agua, aire, aves, mamíferos, reptiles, peces, invertebrados, plancton y algas		X	
Capacitación a pescadores en mejores prácticas pesqueras y proceso de certificación.	Incremento del conocimiento y la conciencia ambiental de pescadores para desarrollar buenas prácticas pesqueras.	Agua, aves, mamíferos, reptiles, peces e invertebrados		X	
Capacitación y sensibilización de beneficiarios en	Incremento del conocimiento y la conciencia	Suelo, agua, mamíferos, aves, reptiles,		X	

Detalle de la actividad del proyecto	Impacto ambiental	Componente ambiental afectado	Condición del impacto		
			Directo	Indirecto	Acumulativo
formalización, iniciativa empresarial, normatividad y artes de pesca.	ambiental de los beneficiarios en la conservación y manejo integral de los ecosistemas marino costeros.	peces e invertebrados			
Educación y capacitación en monitoreo ambiental básico y actividades de vigilancia y control.	Incremento del conocimiento y la conciencia ambiental de pescadores para desarrollar buenas prácticas pesqueras.	Agua, aire, mamíferos, aves, reptiles, peces e invertebrados marinos		X	
Educación y capacitación en manejo sostenible de recursos costeros, tomando en cuenta el riesgo ecológico bajo el cambio climático.	Incremento del conocimiento y la conciencia ambiental de pescadores para manejar sosteniblemente los recursos costeros.	Agua, mamíferos, aves, reptiles, peces, plancton, invertebrados marinos y algas		X	
Diseño de un sistema de alerta temprana a través de un proceso participativo e implementación a escalas locales y regionales.	Incremento del conocimiento y la capacidad de respuesta del gobierno y de las comunidades para tomar adecuadas medidas de adaptación al cambio climático.	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados marinos y algas		X	
Componente 4. Políticas de manejo, regulaciones y medidas que promuevan la resiliencia de ecosistemas costeros y comunidades locales al cambio climático y al estrés inducido por la variabilidad.					
Apoyo a los organismos competentes en el desarrollo de planes de gestión y de manejo de áreas marinas protegidas.	Mejora de la gestión de ecosistemas marino costeros	Agua, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas		X	
Apoyar la formulación e implementación del Plan Maestro de la RNSIIPG en el área de Huacho.	Mejora de la gestión de ecosistemas marino costeros	Agua, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas		X	
Apoyo a los organismos locales, regionales y nacionales para el manejo	Mejora de la gestión de ecosistemas marino costeros	Suelo, agua, peces e invertebrados		X	

Detalle de la actividad del proyecto	Impacto ambiental	Componente ambiental afectado	Condición del impacto		
			Directo	Indirecto	Acumulativo
sostenible de áreas de pesca y de recursos pesqueros.					
Apoyar a los gobiernos nacionales y regionales con la promulgación de reglamentos y ejecución de medidas para facilitar el EBA y aplicar el EA.	Mejora de la gestión de ecosistemas marino costeros	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas		X	
Apoyar al gobierno en una estrategia de gobernanza.	Incremento del control, supervisión y fiscalización de las normas legales para la gestión de los ecosistemas marino costeros	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas		X	
Crear un marco jurídico y de organización para el empoderamiento de las comunidades en su responsabilidad de manejar los recursos pesqueros.	Incremento de la responsabilidad ambiental de los pescadores artesanales de manejar los recursos pesqueros	Suelo, agua, aire, mamíferos, aves, reptiles, peces, plancton, invertebrados y algas		X	

4.3 Descripción de los potenciales impactos ambientales identificados

A continuación se describen cada uno de los potenciales impactos ambientales identificados, según las actividades contempladas en los componentes del proyecto.

Componente 1: Implementación de intervenciones en sitios piloto estratégicos para mejorar la resiliencia de comunidades costeras objetivo y ecosistemas marino costeros claves, frente al cambio climático y al estrés inducido por la variabilidad.

- *Reemplazo por artes de pesca ambientalmente sostenibles (cortina por palangre en las embarcaciones de pesca de atún de aleta amarilla).*

El reemplazo por artes de pesca amigables con el ambiente afectará de manera positiva a los peces e invertebrados marinos, al reducir la vulnerabilidad y la presión de pesca sobre las especies objetivo. Al ser la pesca más selectiva, se reducirán las capturas

incidentales de otras especies hidrobiológicas, así como la captura de individuos juveniles. Por lo tanto, se contribuirá de manera directa a la recuperación de los stocks poblacionales de las especies sobreexplotadas y al incremento de la resiliencia del ecosistema marino. El impacto sobre estos componentes ambientales (peces e invertebrados marinos) será positivo y alto.

Por otro lado, la pesca artesanal genera captura incidental de mamíferos, aves y tortugas marinas, la cual ha sido evidenciada en diferentes estudios realizados a nivel nacional e internacional (Lewison *et al*. 2004). El reemplazo por artes de pesca más selectivos y amigables con el entorno, contribuirá de manera directa a reducir la mortalidad por captura incidental de estos vertebrados marinos (principalmente mamíferos marinos), produciéndose así un impacto positivo moderado sobre estas especies. Sin embargo, no se eliminarán por completo las capturas incidentales. Por ejemplo, para el caso de las tortugas marinas, se ha evidenciado que éstas caen accidentalmente tanto en las redes de cortina como en el palangre (Wallace *et al*. 2010; Alfaro-Shigeto *et al*. 2008), por lo que se producirá indefectiblemente un impacto directo negativo aunque de magnitud leve, dado que la incidencia de capturas en palangre es menor que en redes y se implementarán medidas de mitigación para evitar la mortalidad de las especies capturadas. Se ha considerado este último impacto como acumulativo, puesto que actualmente ocurre la captura incidental en las pesquerías que se realizan en los sitios piloto del proyecto.

Por otro lado, la actividad tendrá un efecto positivo e indirecto sobre la calidad del aire, ya que habrá una reducción en la emisión de gases de efecto invernadero debido al ahorro que se dará en el uso de combustible por el cambio de artes de pesca. Al cambiarse a redes más sostenibles, los pescadores capturarán peces más grandes y mejor conservados, con mayor valor de mercado, por lo que no será necesario capturar tanta biomasa y así se reduciría el tiempo de pesca. Si bien, el impacto es positivo, su magnitud en la calidad del aire será leve por el tamaño de la flota pesquera artesanal con la que se trabajará y el área de extensión donde intervendrá el proyecto.

- *Establecimiento de áreas de manejo de pesca en co-manejo con comunidades beneficiarias.*

En el proyecto se propone establecer áreas de manejo de pesca en co-manejo con comunidades beneficiarias para facilitar la recuperación de los bancos naturales. Esta actividad tendrá un impacto positivo directo sobre los invertebrados marinos, ya que al ser un área manejada, la extracción de los recursos hidrobiológicos será controlada bajo planes de manejo, evitando así la sobreexplotación del recurso.

- *Poblamiento de bancos naturales (conchas de abanico) en áreas protegidas para captación de larvas.*

El repoblamiento de los bancos naturales de concha de abanico al interior de áreas marinas protegidas favorecerá directamente la dispersión larval y por consiguiente el incremento poblacional de las especies. Por lo tanto, esta actividad tendrá un impacto de magnitud alta. Esto a su vez, beneficiará indirectamente a otras especies de la cadena alimenticia como peces y vertebrados marinos, ya que existirá una mayor disponibilidad de alimento, produciéndose así un impacto positivo moderado.

- *Repoblamiento de bancos naturales de invertebrados marinos (concha navaja) en áreas co-manejadas y en áreas protegidas para extracción controlada.*

El repoblamiento de bancos naturales de concha navaja favorecerá directamente al incremento poblacional de las especies. Por lo tanto, esta actividad tendrá un impacto de magnitud alta. Esto a su vez, beneficiará indirectamente a otras especies de la cadena alimenticia como peces y vertebrados marinos, ya que existirá una mayor disponibilidad de alimento, produciéndose así un impacto positivo moderado.

- *Instalaciones acuícolas de pequeña escala en concesiones o áreas de manejo.*

El tipo de acuicultura que se propone realizar con el proyecto es extensiva y de menor escala. De acuerdo al Reglamento de la Ley de Promoción y Desarrollo de la Acuicultura (Decreto Supremo N° 030-2001-PE), la acuicultura extensiva se define como la siembra o resiembra de especies hidrobiológicas en ambientes naturales o artificiales, cuya alimentación se sustenta en la productividad natural del ambiente, pudiendo existir algún tipo de acondicionamiento del medio. La producción a menor escala considera producciones mayores de 2 y hasta 50 TM brutas por año.

El desarrollo de la actividad acuícola requiere del uso de instalaciones mínimas como el uso de cercos y boyas para delimitar el espacio de cultivo, además del uso de embarcaciones pesqueras para la vigilancia y extracción del recurso. La instalación de cercos requiere que el fondo se limpie para evitar la competencia de la especie a cultivar con otras especies, lo que podría ocasionar la modificación de la composición de algunas especies bentónicas, generando un impacto negativo leve y directo sobre estas. Además, la presencia de pescadores en el área para acciones de vigilancia y extracción del recurso, generará residuos sólidos, sin embargo, el impacto será de magnitud leve, ya que la actividad será controlada bajo planes de manejo.

- *Evaluaciones de línea base y plan de manejo.*

Esta actividad contribuirá indirectamente a adoptar mejores medidas de manejo sostenible de los recursos pesqueros, por tanto tendrá un impacto positivo alto.

- *Observación de fauna marina en embarcaciones y pesca vivencial*

El proyecto contempla el desarrollo del ecoturismo a través de viajes a bordo de embarcaciones para la observación de fauna marina, así como para la pesca vivencial. Estas actividades generarán residuos sólidos y oleosos (por los motores) que podrían afectar el suelo y el agua, y en consecuencia el hábitat de las especies marinas, si no se disponen adecuadamente. Los residuos (como por ejemplo el plástico) también pueden causar la mortalidad de las especies de vertebrados marinos, ya que podrían consumir por ejemplo los plásticos y morir por asfixia. La presencia humana y la embarcación, así como el ruido del motor podrían generar perturbación de las especies observadas (mamíferos, aves y tortugas marinas) y en consecuencia producir alteraciones en su comportamiento, además se podrían dar casos de colisiones con las embarcaciones produciendo lesiones perjudiciales en los animales (Parsons 2012, Pilcher *et al*. 2014; Dias *et al*. 2014; Australian Government 2012). En este sentido, la actividad podría tener impactos directos y negativos, aunque se consideran que serían de magnitud leve, dado que el proyecto contempla regulaciones específicas para esta actividad.

Es importante mencionar, que esta actividad se viene desarrollando en la zona de Máncora, por lo que los impactos ambientales ya existen, en este sentido, serán acumulativos. No obstante, el proyecto promoverá medidas para regular estos impactos, por lo tanto, las medidas de mitigación que se plantean, también serán acumulativas.

Adicionalmente, se tendrá un impacto positivo moderado indirecto sobre todos los componentes del ecosistema, ya que este tipo de actividades contribuyen a incrementar y reforzar el nivel de conciencia ambiental de los actores sociales en la conservación de la biodiversidad.

- *Conversión de residuos de pesca y acuicultura en biofertilizantes*

Esta actividad contribuirá directamente a la disminución de la contaminación producida por la generación de los residuos sólidos de las actividades de pesca y acuicultura en los sitios piloto. Por lo tanto, el impacto ambiental será positivo y alto.

Componente 2. Implementación de un moderno y eficiente sistema de vigilancia y predicción ambiental de los ecosistemas marino costeros a escalas regionales y locales que apoye el manejo adaptativo de pesquerías bajo los principios de "Enfoque Ecosistémico a la Pesca" (Ecosystem Approach to Fisheries -EAF).

Este componente contempla las siguientes actividades (i) instalación de estaciones meteorológicas en islas y puntas guaneras, (ii) desarrollo de tesis de grado y postgrado, (iii) Supervisión y monitoreo ambiental de indicadores oceanográficos sensibles, (iv) producción de modelos físicos, químicos, biológicos y bio-climáticos, (v) desarrollo de ERA.

Sólo la implementación de estaciones meteorológicas producirá impactos directos y negativos debido a la generación de residuos sólidos durante la instalación de la estación y probable perturbación a las aves guaneras por la presencia humana. No obstante, estos impactos serán de leve magnitud, dado que su efecto será momentáneo, además que la actividad será coordinada con la autoridad competente (SERNANP).

En el caso de las demás acciones, los impactos que se generarán serán positivos y moderados, ya que contribuirán de manera indirecta a incrementar el conocimiento sobre la dinámica de los ecosistemas marino costeros, lo cual permitirá la adopción de mejores decisiones en el manejo de los recursos costeros, basadas en un enfoque de manejo adaptativo de pesquerías. Esto beneficiará a todos los componentes biológicos del ecosistema marino costero.

Componente 3. Creación de capacidades y de un sistema de manejo de la información para la implementación de los principios de "Adaptación Basada en Ecosistemas" (Ecosystem-Based Adaptation - EBA) y "Enfoque Ecosistémico a la Pesca" (EAF), y para la diseminación de las lecciones aprendidas del proyecto, dirigida a autoridades del gobierno, científicos, comunidades locales y otros grupos de interés.

En este componente el proyecto contempla acciones de educación y capacitación técnica dirigida a los beneficiarios del proyecto (pescadores artesanales principalmente) en los siguientes temas: ecoturismo, acuicultura sostenible, comercialización, mejores prácticas pesqueras, certificación, monitoreo ambiental básico, vigilancia y control y manejo sostenible de recursos costeros tomando en cuenta el riesgo ecológico.

Estas acciones en su conjunto generarán de manera indirecta un impacto positivo moderado en todos los componentes ambientales identificados, ya que contribuirán a incrementar el conocimiento y la conciencia ambiental de los pescadores artesanales para manejar sosteniblemente los recursos costeros y marinos.

Componente 4. Políticas de manejo, regulaciones y medidas que promuevan la resiliencia de ecosistemas costeros y comunidades locales al cambio climático y al estrés inducido por la variabilidad.

En este componente se proponen actividades orientadas a apoyar a las diferentes instancias del gobierno (nacional, regional y local) para desarrollar documentos de planificación para el manejo de áreas marinas protegidas y recursos marino costeros, elaborar propuestas de normas legales para facilitar la aplicación de los enfoques del proyecto en el manejo adaptativo de los ecosistemas (EBA y ERA) y empoderar a las comunidades beneficiarias en el manejo de los recursos pesqueros.

Estas acciones tendrán un impacto positivo moderado que redundarán de manera indirecta en beneficio de todos los componentes ambientales identificados, ya que contribuirán a mejorar la gestión de los ecosistemas marino costeros, incrementar el conocimiento y la capacidad de respuesta del gobierno y de las comunidades para tomar adecuadas medidas de adaptación al cambio climático e incrementar el control, supervisión y fiscalización de las normas legales para la gestión de los ecosistemas marino costeros.

5 Identificación y evaluación de riesgos ambientales

5.1 Identificación

De acuerdo al análisis realizado, se han identificado los siguientes riesgos ambientales potenciales (Tabla 09):

Tabla 09. Identificación de potenciales riesgos ambientales

Detalle de la actividad del proyecto	Riesgo ambiental
Reemplazo por artes de pesca ambientalmente sostenibles (cortina por palangre en las embarcaciones de pesca de atún de aleta amarilla).	R1. Mortalidad de vertebrados marinos (tortugas marinas) por captura incidental en aparejos de pesca.
Instalaciones acuícolas de pequeña escala en concesiones o áreas de manejo	R2. Contaminación del agua de mar por la generación de residuos sólidos y oleosos provenientes de la actividad acuícola desarrollada en los sitios piloto del proyecto.
	R.3. Disminución de la población de algunas especies bentónicas.
Observación de fauna marina en embarcaciones y pesca vivencial	R.4. Contaminación del agua de mar por la generación de residuos sólidos y oleosos provenientes de la actividad ecoturística

	desarrollada en los sitios piloto del proyecto.
	R.5. Desplazamiento o abandono de hábitat de vertebrados marinos (mamíferos, aves y tortugas) por efecto del ruido de las embarcaciones y presencia humana en los sitios donde se realizan los avistamientos.

Adicionalmente, se han identificado los siguientes riesgos ambientales externos al proyecto, pero que podrían generar alteraciones en los ecosistemas involucrados y por lo tanto repercutir sobre las actividades propuestas, principalmente para la acuicultura:

(i) R.6. Contaminación ambiental asociada a los desagües domésticos e industriales de las ciudades costeras adyacentes a los sitios piloto.
(ii) R. 7. Afectación de los hábitats de los sitios piloto por la ocurrencia de El Niño, otros eventos climáticos y mareas rojas.

5.2 Evaluación

A continuación en la Tabla 10, se presenta la estimación de los riesgos ambientales, de acuerdo a su probabilidad de ocurrencia y gravedad de las consecuencias.

Tabla 10. Evaluación y caracterización de los riesgos ambientales identificados

Riesgo	Cantidad	Peligrosidad	Extensión	Calidad del medio	Gravedad de la consecuencia	Probabilidad de ocurrencia	Valor del riesgo	Magnitud del riesgo
R.1	2	2	1	2	2	2	4	Leve
R.2	2	2	2	1	2	2	4	Leve
R.3	1	1	1	1	1	1	1	Leve
R.4	2	2	2	2	2	2	4	Leve
R.5	2	2	2	2	2	2	4	Leve
R.6	2	2	2	2	2	2	4	Leve
R.7	3	3	3	2	3	3	9	Moderado

6 Plan de Manejo Ambiental

El Plan de Manejo Ambiental comprende 2 programas: (i) Programa de prevención y mitigación ambiental, en el cual se establecen las medidas específicas para evitar la generación de impactos y riesgos ambientales o que los mismos sean controlados y

reducidos de manera que eviten daños, y (ii) Programa de monitoreo, evaluación y supervisión.

6.1 Programa de mitigación y prevención ambiental

Si bien la mayoría de los impactos y riesgos ambientales potenciales identificados no son significativos, se considera necesario implementar medidas específicas durante la ejecución del proyecto para prevenir, corregir y/o reducirlos. En la Tabla 11, se presentan las medidas de mitigación propuestas.

Tabla 11. Propuesta de medidas de mitigación de los potenciales impactos y riesgos ambientales negativos

Componente 1: Implementación de intervenciones en sitios piloto estratégicos para mejorar la resiliencia de comunidades costeras objetivo y ecosistemas marino costeros claves, frente al cambio climático y al estrés inducido por la variabilidad.			
Actividad del proyecto	**Impacto ambiental**	**Riesgo ambiental**	**Medidas de mitigación propuestas**
Reemplazo por artes de pesca ambientalmente sostenibles (cortina por palangre en las embarcaciones de pesca de atún de aleta amarilla).	Captura incidental de vertebrados marinos	Mortalidad de vertebrados marinos (tortugas marinas) por captura incidental en aparejos de pesca.	(i) Establecer un programa de monitoreo a bordo para el seguimiento de la captura incidental de vertebrados marinos (mamíferos, aves y tortugas marinas), el cual contribuirá a dar recomendaciones para mejorar la práctica pesquera y así reducir la captura incidental de las especies y la mortalidad asociada. (ii) Capacitar a los pescadores artesanales en técnicas de recuperación, rehabilitación y liberación de las especies capturadas incidentalmente.
Instalaciones acuícolas de pequeña escala en concesiones o áreas de manejo	Generación de residuos sólidos y oleosos	Contaminación del agua de mar por la generación de residuos sólidos y oleosos provenientes de la actividad acuícola desarrollada en los sitios piloto del proyecto.	(i) Elaborar la Declaración de Impacto Ambiental, solicitada por el sector competente (PRODUCE). (ii) Elaborar e implementar un plan de manejo de residuos sólidos y oleosos, el cual deberá formar parte del plan de manejo del área de pesca o concesión. (iii) Realizar revisiones periódicas de los motores de las embarcaciones para evitar derrames de aceites o lubricantes, medida que deberá estar incluida en el plan de manejo del área de pesca o concesión. (iv) Considerar dentro del componente del proyecto sobre la creación de capacidades, módulos de capacitación sobre manejo de residuos sólidos y buenas prácticas acuícolas.

			(v) Supervisar el adecuado desarrollo de la actividad acuícola.
	Modificación de la composición de especies bentónicas.	Disminución de la población de algunas especies bentónicas.	(i) Desarrollar investigaciones orientadas a generar información sobre el impacto real de la acuicultura en las especies bentónicas e implementar las recomendaciones derivadas.
Observación de fauna marina en embarcaciones y pesca vivencial	Generación de residuos sólidos y oleosos	Contaminación del agua de mar por la generación de residuos sólidos y oleosos provenientes de la actividad ecoturística desarrollada en los sitios piloto del proyecto.	(i) Elaborar e implementar un plan de manejo de residuos sólidos y oleosos provenientes de las actividades de ecoturismo. (ii) Realizar revisiones periódicas de los motores de las embarcaciones para evitar derrames de aceites o lubricantes. (iii) Desarrollar capacitaciones para los beneficiarios sobre manejo de residuos sólidos.
	Perturbación de fauna marina por ruido de motores y presencia humana.	Desplazamiento o abandono de hábitat de vertebrados marinos (mamíferos, aves y tortugas) por efecto del ruido de las embarcaciones y presencia humana en los sitios donde se realizan los avistamientos.	(i) Elaborar códigos de conducta de buenas prácticas para la observación de fauna marina, que deberá ser implementado por las empresas ecoturísticas conformadas. (ii) Suscribir acuerdos o compromisos con los beneficiarios para el cumplimiento de las buenas prácticas de observación. (iii) Desarrollar capacitaciones para los beneficiarios sobre buenas prácticas ecoturísticas. (iv) Asegurar el cumplimiento de normas legales relacionadas con la operación turística, como por ejemplo el Decreto Supremo N° 006-2011-MTC – Reglamento de Transporte Turístico Acuático. (v) Supervisar el adecuado desarrollo de la operación ecoturística de los beneficiarios.

Acondicionamiento de un muelle exclusivo para actividades ecoturísticas[2]			(i) Elaborar el instrumento de gestión ambiental requerido por la autoridad competente.
Componente 2. Implementación de un moderno y eficiente sistema de vigilancia y predicción ambiental de los ecosistemas marino costeros a escalas regionales y locales que apoye el manejo adaptativo de pesquerías bajo los principios de "Enfoque Ecosistémico a la Pesca" (Ecosystem Approach to Fisheries - EAF).			
Instalación de estaciones meteorológicas en puntas o islas guaneras.	Generación de residuos sólidos		(i) Evacuar todos los residuos sólidos generados fuera del área natural protegida (islote Don Martín).
	Perturbación de aves guaneras		(i) Coordinar con el personal de la RNSIIPG (SERNANP) la ubicación y la época de ingreso al islote Don Martín.

Adicionalmente, se proponen las siguientes medidas de mitigación, para los riesgos ambientales externos al proyecto:

Impacto ambiental	Riesgo ambiental	Medidas de mitigación propuestas
Desagües domésticos e industriales de las ciudades costeras adyacentes a los sitios piloto	Contaminación del agua de mar por desagües domésticos e industriales provenientes de ciudades costeras adyacentes a los sitios piloto.	(i) Evitar áreas contaminadas o con amenaza de ser contaminadas en el diseño de las potenciales áreas de manejo o concesiones de acuicultura.
Ocurrencia del ENSO, otros eventos climáticos y mareas rojas	Afectación de los hábitats de los sitios piloto por ocurrencia de eventos climáticos (El Niño, mareas rojas, entre otros).	(i) Asegurar que el diseño y la implementación del sistema de alerta temprana, así como las estrategias locales de difusión, sean parte de los objetivos del proyecto.

6.2 Programa de monitoreo, evaluación y supervisión

El monitoreo y evaluación de las acciones para la implementación de las medidas de mitigación anteriormente identificadas requerirá de una cuidadosa supervisión por parte del equipo de Profonanpe, como Entidad Nacional de Implementación del Fondo de Adaptación.

De acuerdo, a los arreglos institucionales establecidos en el proyecto, el Equipo de Implementación del Proyecto (PIT por sus siglas en inglés), deberá elaborar un Manual de Operaciones del Proyecto (MOP). Por lo tanto, en este documento se deberá incluir

[2] Se deberá elaborar el instrumento de gestión ambiental que requiera la actividad competente, una vez definidas las actividades que se realizarán para el acondicionamiento del muelle. En el instrumento de gestión ambiental, se establecerán las medidas de mitigación, correspondientes, las mismas que deberán ser monitoreadas por Profonanpe.

el protocolo y procedimiento para el monitoreo y evaluación de los impactos y riesgos ambientales identificados en el presente documento.

6.2.1 Protocolo para el monitoreo y evaluación de los posibles impactos y riesgos ambientales negativos

En la siguiente Tabla se propone un protocolo para el monitoreo y evaluación, a fin de que sea implementado por Profonanpe, en coordinación con el Equipo de Implementación del Proyecto.

Tabla 12. Protocolo para el monitoreo y evaluación de las medidas de mitigación de los impactos y riesgos ambientales

Medida de mitigación	Tipo de medida de mitigación	Indicador	Medio de verificación	Responsable
Establecer un programa de monitoreo a bordo para el seguimiento de la captura incidental de vertebrados marinos (mamíferos, aves y tortugas marinas).	Asistencia técnica	Número de embarcaciones con observadores a bordo instalados. Número de viajes de pesca por embarcación con observadores a bordo. Número de capturas incidentales registradas por embarcación con observadores a bordo. Número de individuos liberados (vivos) por especie.	Informes del programa de observación a bordo.	Equipo de Implementación del Proyecto PRODUCE IMARPE
Capacitar a los pescadores artesanales en técnicas de recuperación, rehabilitación y liberación de las especies capturadas incidentalmente.	Capacitación	Número de capacitaciones realizadas. Número de pescadores artesanales capacitados. % de incremento de la calificación obtenida de las evaluaciones realizadas antes y después de la capacitación.	Informes de capacitaciones realizadas Listas de asistencia a capacitaciones Fotografías Evaluaciones	Equipo de Implementación del Proyecto
Elaborar la Declaración de Impacto Ambiental, solicitada por el sector competente (PRODUCE).	Instrumento de gestión ambiental	DIA aprobado	Resolución Ministerial	Equipo de Implementación del Proyecto
Elaborar e implementar un plan de manejo de residuos sólidos y oleosos, el cual deberá formar parte del plan de manejo del área de pesca o concesión.	Plan de manejo	Número de planes de manejo de áreas de pesca o concesiones (que contienen un plan de manejo de residuos sólidos y oleosos), aprobados por las autoridades competentes (PRODUCE y SERNANP en caso la actividad se realice al interior de un ANP).	Convenios de Conservación, Inversión y Producción Acuícola suscritos entre PRODUCE y los beneficiarios. Planes de manejo de las áreas de pesca o concesiones aprobados. Informes de implementación de los planes de manejo.	Equipo de Implementación del Proyecto PRODUCE Beneficiarios del proyecto
Realizar revisiones periódicas de los motores de las embarcaciones para evitar derrames de aceites o lubricantes, medida que deberá estar incluida en el plan de manejo del área de pesca o concesión.	Plan de manejo			

Medida de mitigación	Tipo de medida de mitigación	Indicador	Medio de verificación	Responsable
Considerar dentro del componente del proyecto sobre la creación de capacidades, módulos de capacitación sobre manejo de residuos sólidos y buenas prácticas acuícolas.	Capacitación	Número de capacitaciones realizadas. Número de pescadores artesanales capacitados. % de incremento de la calificación obtenida de las evaluaciones realizadas antes y después de la capacitación.	Informes de capacitaciones realizadas Listas de asistencia a capacitaciones Fotografías Evaluaciones	Equipo de Implementación del Proyecto
Supervisar el adecuado desarrollo de la actividad acuícola.	Supervisión	Número de supervisiones realizadas	Informes de supervisión	Equipo de Implementación del Proyecto Profonanpe
Desarrollar investigaciones orientadas a generar información sobre el impacto real de la acuicultura en las especies bentónicas.	Asistencia técnica	Número de investigaciones realizadas	Informes de investigación	Equipo de Implementación del Proyecto IMARPE
Elaborar e implementar un plan de manejo de residuos sólidos y oleosos provenientes de las actividades de ecoturismo.	Plan de manejo Documento contractual	Número de planes de manejo elaborados e implementados por los beneficiarios	Planes de manejo Informes	Equipo de Implementación del Proyecto PRODUCE Beneficiarios del proyecto
Realizar revisiones periódicas de los motores de las embarcaciones para evitar derrames de aceites o lubricantes, medida que deberá formar parte del plan manejo de residuos oleosos.	Plan de manejo			
Desarrollar capacitaciones para los beneficiarios sobre manejo de residuos sólidos.	Capacitación	Número de capacitaciones realizadas. Número de pescadores artesanales capacitados. % de incremento de la calificación obtenida de las evaluaciones realizadas antes y después de la capacitación.	Informes de capacitaciones realizadas Listas de asistencia a capacitaciones Fotografías Evaluaciones	Equipo de Implementación del Proyecto
Suscribir acuerdos o compromisos con los beneficiarios para el	Documento contractual	Número de acuerdos	Acuerdos	Equipo de Implementación del Proyecto

Medida de mitigación	Tipo de medida de mitigación	Indicador	Medio de verificación	Responsable
cumplimiento de las buenas prácticas de observación de fauna.				
Elaborar un código de conducta de buenas prácticas que deberá ser implementado por las empresas conformadas para el desarrollo de la actividad.	Asistencia técnica	Código de conducta de buenas prácticas elaborado	Documento Material de difusión	Equipo de Implementación del Proyecto
Desarrollar capacitaciones para los beneficiarios sobre buenas prácticas ecoturísticas.	Capacitación	Número de capacitaciones realizadas. Número de personas capacitadas. % de incremento de la calificación obtenida de las evaluaciones realizadas antes y después de la capacitación.	Informes de capacitaciones realizadas Listas de asistencia a capacitaciones Fotografías Evaluaciones	Equipo de Implementación del Proyecto
Asegurar el cumplimiento de normas legales relacionadas con la operación turística, como por ejemplo el Decreto Supremo N° 006-2011-MTC – Reglamento de Transporte Turístico Acuático.	Supervisión	Número de supervisiones realizadas	Informes de supervisión	Equipo de Implementación del Proyecto Profonanpe
Supervisar el adecuado desarrollo de la operación ecoturística de los beneficiarios.	Supervisión	Número de supervisiones realizadas	Informes de supervisión	Equipo de Implementación del Proyecto Profonanpe
Acondicionamiento de un muelle exclusivo para actividades ecoturísticas	Instrumento de gestión ambiental	Instrumento de gestión ambiental aprobado	Certificación ambiental	Equipo de Implementación del Proyecto
Evacuar todos los residuos sólidos generados fuera del área natural protegida (islote Don Martin).	Acción específica	Cantidad de residuos sólidos generados y evacuados	Informe de instalación de estación meteorológica Autorización de ingreso al área natural protegida (Resolución de la Jefatura del ANP).	El Equipo de Implementación del Proyecto deberá coordinar con el SERNANP la autorización de ingreso al ANP (RNSIIPG) para la instalación de la estación meteorológica.
Coordinar con el personal de la RNSIIPG (SERNANP) la ubicación y la época de ingreso al islote Don Martín.	Acción específica	Coordinaciones realizadas		

6.3 Procedimiento para la implementación del plan de manejo ambiental

- ✓ Para el monitoreo y evaluación del estado de implementación de las medidas de mitigación propuestas, Profonanpe designará a un especialista ambiental, que tendrá a su cargo las funciones de seguimiento de las salvaguardas ambientales. Asimismo, el coordinador del Equipo de Implementación del Proyecto deberá designar a un responsable para las coordinaciones que se efectúen con Profonanpe.

- ✓ El Equipo de Implementación del Proyecto deberá informar a Profonanpe sobre el cumplimiento de las medidas de mitigación, incluyendo en los reportes los medios de verificación correspondientes. Los informes a Profonanpe se emitirán de manera semestral (cada 6 meses).

- ✓ El responsable del Equipo de Implementación del Proyecto encargado de la elaboración de los informes, deberá adjuntar a los informes la **Ficha de Control de Aplicación de Medidas de Mitigación** que se encuentra en el Anexo.

- ✓ El especialista responsable de Profonanpe, verificará los reportes enviados por el Equipo de Implementación del Proyecto y a su vez preparará los informes que se remitirán semestralmente a la fuente cooperante (Fondo de Adaptación) en idioma inglés.

- ✓ Profonanpe realizará anualmente como mínimo 02 supervisiones, 01 de campo y 01 a las oficinas del proyecto para verificar el cumplimiento de las medidas de mitigación. Durante las supervisiones se deberá utilizar la **Ficha de Control de Aplicación de Medidas de Mitigación** que se encuentra en el Anexo. Esta ficha deberá ser adjuntada a los informes de supervisión, conjuntamente con los medios de verificación correspondientes.

- ✓ Las fechas de las supervisiones que efectuará Profonanpe serán coordinadas previamente con el Equipo de Implementación del Proyecto, con la debida anticipación.

- ✓ Si durante la implementación del proyecto, se detectan impactos y riesgos ambientales no previstos, estos y sus medidas de mitigación, deberán incluirse en el Plan de Manejo Ambiental para seguimiento y evaluación.

7 Conclusiones

- ✓ El proyecto cumple con los principios ambientales del Fondo de Adaptación: (i) Protección a los hábitats naturales, (ii) Conservación de la diversidad biológica, (iii) Cambio climático, (iv) Prevención de la contaminación y eficiencia de los recursos, (v) Salud pública, (vi) Patrimonio físico y cultural, y (vii) Conservación de la tierra y el suelo. A continuación se presentan un análisis de la aplicación de cada uno de los principios:

  (i) **Protección a los hábitats naturales**: El proyecto contribuye a la protección de los hábitats naturales marino costeros, ya que promoverá la restauración de bancos naturales de especies de invertebrados marinos al interior de áreas marinas protegidas (islote Don Martín y Punta Salinas) y el co-manejo con las comunidades de pescadores artesanales y las autoridades para proteger esos bancos, promocionará la adopción de prácticas sostenibles para las pesquerías artesanales y apoyará la gobernanza de las áreas marinas protegidas. Asimismo, apoyará el establecimiento de áreas para acuicultura de menor escala fuera de las áreas marinas protegidas que serán co-manejadas con las comunidades de pescadores artesanales, lo que a su vez contribuirá al mantenimiento de los stocks al interior de las áreas marinas protegidas.

  (ii) **Conservación de la diversidad biológica:** El proyecto no generará una reducción o pérdida significativa de diversidad biológica y no generará introducción de especies exóticas. Por el contrario, las actividades contempladas contribuirán con la conservación de la biodiversidad marino costera, ya que se promoverá el desarrollo de actividades pesqueras, acuícolas y turísticas sostenibles, así como instrumentos normativos y de gestión para la conservación y manejo responsable de los ecosistemas marino costeros. No obstante, se han identificado algunos impactos y riesgos ambientales negativos (leves) asociados a las intervenciones del Componente 1 (acuicultura y ecoturismo) y Componente 2 (instalación de estaciones meteorológicas), para lo cual se han establecido medidas de mitigación para evitarlos o mitigarlos.

  (iii) **Cambio climático:** El proyecto no tendrá actividades que impliquen un aumento significativo en las emisiones de gases de efecto invernadero u otro estresor de cambio climático.

  (iv) **Prevención de la contaminación y eficiencia de los recursos:** Las actividades del proyecto contemplan el desarrollo de buenas prácticas en el

manejo de residuos sólidos y oleosos, por lo que se evitará en todo momento el riesgo de contaminación ambiental.

(v) **Salud pública:** Las actividades del proyecto no implican riesgo para la salud humana. Por el contrario, la promoción de producción de bio-fertilizantes, se hará bajo un uso eficiente de los residuos de pesquería y de acuicultura, los que significa en la práctica implementar acciones de reciclaje de residuos sólidos contaminantes y nocivos para la salud, convirtiéndolos en productos de valor comercial.

(vi) **Patrimonio físico y cultural:** En el área de intervención del proyecto no existen sitios de patrimonio cultural. Solo se intervendrá en el ámbito del área natural protegida Reserva Nacional Sistema de Islas, Islotes y Puntas Guaneras (sitio piloto Huacho), sin embargo, no habrá ninguna afectación a esta área.

(vii) **Conservación de la tierra y el suelo:** Las actividades del proyecto se llevarán a cabo principalmente en los ecosistemas marinos, por tanto no habrá degradación o conversión del suelo.

- ✓ La mayoría de los impactos ambientales identificados en la evaluación del proyecto, son positivos. Sólo se han identificado posibles impactos negativos y riesgos ambientales, en el Componente 1 del proyecto: *Implementación de intervenciones en sitios piloto estratégicos* y en el Componente 2: *Diseño e implementación de un sistema de vigilancia climática y oceanográfica y monitoreo bio-ambiental local*.

- ✓ Los impactos y riesgos ambientales identificados serán de **magnitud leve** y controlables/mitigables**,** por lo que no se generarán daños significativos al ambiente.

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ANEXO

FICHA DE CONTROL DE APLICACIÓN DE MEDIDAS DE MITIGACIÓN			
I. DATOS GENERALES			
Nombre del Proyecto:	Adaptación a los impactos del cambio climático en el ecosistema marino del Perú y sus pesquerías	**Supervisor:**	*(Nombre completo del supervisor)*
Componente:		**Institución y cargo:**	
Subcomponente:		**Fecha de control:**	*(Indicar la fecha en que se realiza la supervisión)*
Actividad:	*(Indicar el nombre de la actividad que se está supervisando)*	**Lugar de la supervisión:**	*(Indicar el lugar específico donde se realiza la supervisión)*

II. DESCRIPCIÓN DE LA ACTIVIDAD								
Situación:	*(Describir la situación en la que se encuentra la actividad)*							
Fecha de inicio:		**Fase de ejecución:** *(marcar con una X)*	Inicio		Medio término		Final	

III. CONTROL DE MEDIDAS DE MITIGACIÓN					
Posible impacto ambiental (*)	**Posible factor ambiental afectado (*)**	**Medida de mitigación propuesta (*)**	**Situación actual**		
			Pendiente	**En proceso**	**Efectuado**
Captura incidental de vertebrados marinos	Aves, mamíferos y tortugas marinas	Asistencia técnica / Capacitación			
Generación de residuos sólidos y oleosos por acuicultura	Suelo y agua	Plan de manejo / Capacitación / Supervisión			
Modificación de la composición de especies bentónicas	Invertebrados	Asistencia técnica			
Generación de residuos sólidos y oleosos por ecoturismo	Suelo y agua	Plan de manejo / Documento contractual / Capacitación			
Perturbación de fauna marina por ruido de motores y presencia humana	Aves, mamíferos y tortugas marinas	Asistencia técnica / Supervisión			
Generación de residuos sólidos por instalación de estación meteorológica	Suelo y agua	Acción específica			
Perturbación de aves guaneras	Aves	Acción específica			
Observaciones o recomendaciones:					

(*) Nota: El supervisor deberá especificar los impactos y medidas de mitigación, de acuerdo a la actividad que se supervisará. En este modelo se presentan todos los impactos y medidas identificadas durante la evaluación ambiental del proyecto.

ANNEX VI. SOCIAL ASSESSMENT

González, S. 2015. Aspectos sociales a tomar en cuenta en el desempeño del Proyecto "Adaptación a los impactos del cambio climático en los ecosistema marino costeros y la pesquería del Perú". PROFONANPE.

Aspectos sociales a tomar en cuenta en el desempeño del Proyecto "Adaptación a los impactos del cambio climático en los ecosistema marino costeros y la pesquería del Perú"

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Preparado para:

PROFONANPE

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CONTENIDO

INTRODUCCIÓN

Sabido es que durante los eventos de El Niño, las masas de agua cálida y pobre en nutrientes se extienden a lo largo de la costa y como resultado de ello, se evidencia una disminución general de la productividad costera.

El cambio climático está afectando al contenido de calor, la estratificación térmica, la acidez y el contenido de oxígeno en los océanos de manera que se convierte en un factor de estrés adicional para los ecosistemas marinos globales.

Tendencias oceanográficas de los últimos 30-40 años, indican un fortalecimiento del afloramiento costero y la productividad primaria cerca de la costa central hasta el sur de Perú, mientras que el calentamiento y el aumento de la estratificación térmica es una tendencia, frente al norte de Perú y en el resto de la costa (Gutiérrez et al., 2011) .

Estas tendencias deben dar lugar a cambios en la distribución, ciclo de vida y el potencial de captura de los recursos marinos. La anchoveta puede ser beneficiada por la expansión de su hábitat en un primer momento, aunque más tarde, al aumentar la turbulencia del viento, podría aumentar la mortalidad natural de las larvas de peces.

Por otra parte, las especies de aguas cálidas como el atún podrían ampliar su distribución hacia el sur, volviéndose más disponibles para la pesca. Sin embargo, el potencial global de peces en los ecosistemas costeros peruanos dependerá en última instancia del destino de la producción primaria (por ejemplo, la capacidad de carga). Dado que los modelos globales predicen un aumento de la estratificación térmica y el debilitamiento de los vientos alisios que controlan el potencial de productividad en el Pacífico Oriental (Vecchi y Soden, 2007; Echevin et al, 2011), **se espera una disminución en los rendimientos de la pesca en el Perú a largo plazo.**

La presencia de aguas cálidas, genera la migración de especies de peces tropicales a lo largo de la costa. Como contraparte del fenómeno de El Niño, se experimenta el fenómeno de La Niña, que se expresa a través de la presencia de corrientes frías.

Esta situación de variabilidad climática, tiene consecuencias socioeconómicas tanto para la industria de la pesca, así como para las comunidades de pescadores artesanales.

Los servicios ambientales que proveen en general los ecosistemas costeros, son la pesca y la acuicultura.

En la última década, la contribución de la pesca al PIB nacional ha aumentado de 1.5 mil millones de soles a 2,3 mil millones de soles (en moneda corriente del 1994), lo que indica una tendencia positiva.

El grueso del impacto económico del sector está relacionado con la pesca de anchoveta para la industria de harina y aceite de pescado. En el escenario mundial, el Perú contribuye con un considerable 35% en la oferta de estos productos. La pesca industrial de gran escala dedicada a la producción de exportaciones genera aproximadamente 30.000 empleados de acuerdo a IMARPE.

Por su parte la pesca artesanal, dobla esa cifra de empleo ya que son aproximadamente 65, 500 personas que dependen de esta actividad.

Complementariamente y de acuerdo a la información que maneja el Ministerio de la Producción, 19,200 empleos genera la elaboración de alimentos basados en la pesca para el consumo humano directo.

De ese modo, las pesquerías artesanales mantienen aproximadamente 10.000 buques y contribuyen en gran medida a la seguridad alimentaria del país, mediante la producción de entre 200.000 y 400.000 toneladas de capturas anuales[1].

De otra parte en la formulación del proyecto se señala, que a los impactos del cambio climático, se debe añadir factores no climáticos que podrían aumentar aún más el estrés sufrido por los ecosistemas costeros, tales como:

- La sobreexplotación y las técnicas de pesca inadecuadas, sobre todo en los recursos costeros, terrestres.
- La contaminación, principalmente asociada a la falta o al tratamiento inadecuado de las aguas residuales, desechos y residuos sólidos generados por las ciudades costeras y; a las actividades industriales transporte y almacenamiento, la minería,

[1] El resumen que se presenta en la introducción ha sido tomado del Proyecto "Adaptación a los impactos del cambio climático en los ecosistemas marino costeros y la pesquería del Perú". Año 2014.

la transformación del pescado y la acuicultura, la agricultura y otras actividades manufactureras que descargan en el mar

- El cambio de uso del suelo costero no planificado; y
- Actividades de exploración y producción de petróleo y gas, y la contaminación del mar relacionada con el transporte marítimo, así como la eliminación de residuos mediante unidades de pesca, etc.

Los factores climáticos y no climáticos señalados impactarán inequívocamente en la disminución de los rendimientos de la pesca en general del país.

En ese sentido, el principal desafío del proyecto consiste en contribuir con el aumento de la resiliencia de los ecosistemas marinos costeros y las comunidades costeras (en particular de las comunidades pesqueras artesanales) a efectos del cambio climático.

En esa medida, **los principales beneficiarios de esta propuesta son las comunidades de pescadores artesanales, cuyo sustento depende preponderantemente del estado de los ecosistemas marinos costeros,** que ya están sujetos a una serie de amenazas no climáticas, que pueden ser revertidas como parte del impacto de la intervención del proyecto. De allí que el sustento de proyecto se oriente a la implementación de medidas de adaptación para mejorar la resiliencia al cambio climático tanto de los ecosistemas y de las comunidades de pescadores artesanales.

La realidad ha develado que existe una fuerte presión sobre el recurso pesquero, tanto de parte de los productores industriales de harina de pescado, como de parte de los pescadores artesanales.

El sistema de cuotas como medida de mitigación, ha aliviado la presión de pesca sobre la población principal y una política de precaución para la cuota global ha permitido una lenta recuperación de las poblaciones de algunos depredadores superiores, como las aves guaneras y mamíferos marinos.

Ahora bien, introduciéndonos en el tema de la identificación de impactos sociales que generará el proyecto a través de la implementación de su propuesta programática, es de vital importancia desde el punto de vista metodológico, partir de una evaluación exhaustiva de sus Objetivos Estratégicos/Resultados Intermedios y de las actividades que se derivan de los mismos, con la finalidad de determinar si ellas generan impactos sociales

contraproducentes y/o impactos positivos sociales, de cara a la Política Ambiental y Social del Fondo de Adaptación.

CAPÍTULO 1

IDENTIFICACIÓN, ANÁLISIS Y EVALUACIÓN DE LOS IMPACTOS SOCIALES Y RIESGOS POTENCIALES POR LA IMPLEMENTACIÓN DEL PROYECTO.

1.1. ÁMBITOS DE INTERVENCIÓN

El planteamiento de la propuesta se orienta a implementar las medidas de adaptación en dos espacios diferenciados del ecosistema costero del país: un primer sitio ubicado en la parte norte de la costa, en el límite sur del Ecosistema Costero del Pacífico Tropical, que está sometido a la interacción entre las cálidas aguas tropicales y la intrusión hacia el norte de las aguas de surgencia, y que se encuentra en la actualidad dentro de una tendencia de calentamiento.

El segundo sitio es representativo de la surgencia costera de ecosistemas del Mar frio de la Corriente Peruana.

Zona Máncora

La zona piloto del norte comprende las siguientes ciudades y/o caletas de pesca: Máncora, Los Órganos, El Ñuro y Cabo Blanco (04 ° 05-04 ° 15'S), de todas ellas, Máncora es la más grande, por lo tanto a la zona norte se le denomina Máncora.

En términos oceanográficos, Máncora se enfrenta a la temporada de desplazamiento norte-sur del Frente Ecuatorial (EF), donde las aguas superficiales tropicales (con altas temperaturas, baja salinidad) se mezclan con las aguas más frías y mayor salinidad que caracterizan el afloramiento costero. La posición del EF es muy dinámica, mostrando también los cambios interanuales en su posición latitudinal.

Zona Huacho

La segunda zona piloto se distribuye desde el islote Don Martín hasta Punta Salinas (11 ° 01'S - 11 ° 19'S), e incluye las siguientes ciudades y/o caletas de pesca: Végueta, Huacho y Carquín, siendo Huacho la principal, por lo tanto, a esta área se le denomina Huacho.

Don Martín y Punta Salinas son parte de las islas guaneras de la Reserva Nacional Sistema de Islas, Islotes y Puntas Guaneras (RNSIIPG). La zona marino-costera de Huacho y Carquín, tiene aguas ricas en nutrientes con varias zonas de pesca importantes para los pescadores artesanales.

Esta área también tiene playas de arena que se utilizan en verano por la población local como lugares de recreo, zonas húmedas ricas en aves migratorias y las islas con abundantes bancos naturales de invertebrados marinos.

1.2. CARACTERÍSTICAS SOCIOECONÓMICAS GENERALES DE LOS ESPACIOS DE INTERVENCIÓN

Máncora

El Centro Poblado de Máncora tiene una extensión de 100.19 km2. Cuenta con una población de 10,547 habitantes; el 96% vive en el área urbana, 28% de su población se encuentra en el rango de 0-14 años. La población de sexo masculino es ligeramente superior a la población femenina, el 51.1% son hombres (5390) y 48.9% son mujeres (5157)[2]

El IDH es 0,629519, que resulta siendo superior al del departamento que es de 0.5979. Es importante mencionar que el IDH está compuesto por tres indicadores, los mismos que para el caso de Máncora son:
a) esperanza de vida (73.33 años), mayor que para el caso del departamento de Piura que llega a 71.74 años;
b) logro educativo (92.33) que resulta siendo mayor que el de Piura que sólo llega a 87.96;
c) ingreso familiar per cápita (364.88), significativamente mayor que el departamental que solo llega a 313.8. Sin embargo, el 69.9% de la población tiene necesidades básicas insatisfechas, lo que la califica como una población en estado de pobreza.

En lo que respecta a actividades económicas, el turismo, la pesca, el comercio y los servicios, son actividades que dinamizan la economía de esta localidad.

[2] Plan de Desarrollo Concertado del Distrito de Máncora. Fuente: INEI, Censo de Población y Vivienda 2007.

Cabo Blanco

Por su parte, Cabo Blanco, es una caleta de pescadores que forma parte del distrito de El Alto.

El Distrito de El Alto cuenta con una población de 7,137 habitantes.

"El Alto basa su economía en función de dos actividades principales: por un lado se encuentra la explotación de los hidrocarburos (petróleo y gas) y en forma menos intensa la explotación de los recursos hidrobiológicos que proporciona el mar, el cual es rico en especies marinas. La PEA del distrito El Alto, es de 2,607 habitantes. El 13.6% de la PEA, se dedica a la actividad extractiva hidrobiológica. La caleta de Cabo Blanco presentó el 2008 un desembarque de recursos marítimos para consumo humano directo de 3072 TMB (toneladas métrica bruta).El distrito de El Alto, está considerado como pobre con un índice de pobreza que se ubica en el quintil 2 (FONCODES), lo que significa que la mayor parte de los pobladores de El Alto, no tiene satisfactoriamente resueltas sus necesidades básicas de alimentación balanceada, vivienda con condiciones satisfactorias de habitabilidad, acceso a educación, salud, recreación, etc"[3].

Los Órganos y El Ñuro

El distrito Los Órganos, pertenece a la provincia de Talara del departamento de Piura, cuenta con una población de 9,612 habitantes según el Censo del año 2007 del INEI. Cuenta con una superficie de 165.01 km2. Las mujeres representan el 48.85% (4,695) y los varones representan el 51.15% (4,917), de la población total del distrito. En el mapa de la pobreza del INEI el distrito Los Órganos está considerado como uno de los menos pobres ya que sólo el 19.1% de sus habitantes estaría atravesando por esta condición. El Ñuro es una caleta que pertenece al distrito de Los Órganos, cuenta con una población de no más de 1,000 habitantes.

Huacho

Pertenece a la provincia de Huaura y cuenta con una población importante de 58,347 habitantes al año 2014 (Proyecciones INEI). El 51.3% de la población son mujeres (29,932) y el 48.7% son varones (28,415). Según el Mapa de Pobreza del año 2007 de FONCODES,

[3] Plan de Desarrollo Concertado, Distrito de El Alto 2011-2021.

el distrito de Huacho se ubica en el quintil 5. Lo que significa menos pobre[4]. La población total dependiente de la pesca artesanal marítima en Huacho es aproximadamente 4000 personas (Plan de Desarrollo de la Provincia de Huaura 2009-2021).

Caleta de Carquín

Es un distrito de la provincia de Huaura y cuenta con una población de 6,736 habitantes al año 2014 (Proyecciones INEI). El 55.85% son varones (3,762) y el 44.15% son mujeres (2,974). Según el Mapa de Pobreza del año 2007 de FONCODES, el distrito de Caleta de Carquín se ubica en el quintil 3. Lo que significa una pobreza media o regular. Aproximadamente 2500 personas se dedican en este distrito a las actividades de pesca artesanal (Plan de Desarrollo de la Provincia de Huaura 2009-2021). .

Vegueta

Es un distrito de la provincia de Huaura y cuenta con 21,604 habitantes al año 2014 (Proyecciones INEI). El 51.89% son varones (11,210) y el 48.11% son mujeres (10,394). Según el Mapa de Pobreza del año 2007 de FONCODES, el distrito de Vegueta se ubica en el quintil 2. Lo que significa que se trataría de un distrito pobre. Los pescadores artesanales en Vegueta llegan aproximadamente a 400 personas (Plan de Desarrollo de la Provincia de Huaura 2009-2021).

1.3. OBJETIVOS Y COMPONENTES DEL PROYECTO

Como producto de las últimas sesiones de trabajo interinstitucional entre PRODUCE; PROFONANPE e IMARPE, se ha logrado afinar el marco lógico del proyecto, lo que a su vez ha dado pie a un proceso de afinamiento, del producto1 de la presente consultoría.

Metodológicamente, se presenta la estructura programática del Proyecto, para tener una idea de los objetivos estratégicos y de las actividades que se han diseñado para la alcanzar

[4] En los mapas distritales de pobreza de FONCODES, lo quintiles se denominan de la siguiente manera: El primer quintil se llamará «Más pobre», el segundo quintil se le denomina «Pobre», el tercer quintil «Medio o Regular», el cuarto quintil se le denomina en la categoría de «Poco pobre» y el quinto quintil «Menos pobre».

los mismos y luego a través de una tabla de análisis se identifican los posibles impactos sociales que generará el proyecto con su intervención.

Objetivo General

Apoyar al Gobierno del Perú en reducir la vulnerabilidad de comunidades costeras a los impactos del cambio climático sobre los ecosistemas marinos y los recursos pesqueros.

Componentes Programáticos

COMPONENTE 1: Implementación de intervenciones en áreas piloto estratégicas para mejorar la resiliencia de comunidades costeras y ecosistemas marino costeros clave al cambio climático y el estrés inducido por la variabilidad.

COMPONENTE 2: Despliegue de un Sistema moderno y eficiente de vigilancia y predicción ambiental en ecosistemas marino costeros a escalas regional y local que apoya el manejo adaptativo pesquero bajo los principios del enfoque ecosistémico.

COMPONENTE 3: Construcción de capacidades y Sistema de manejo del conocimiento para implementar el EBA y EAF, y para diseminación de las lecciones aprendidas en el proyecto, orientado a oficiales del gobierno, academia, comunidades locales y otros actores

COMPONENTE 4: Políticas de manejo, reglamentos, y medidas que promueven la resiliencia de ecosistemas costeros y comunidades locales al cambio climático y el estrés inducido por la variabilidad.

1.4. EVALUACIÓN DE LOS IMPACTOS DE LA PROPUESTA PROGRAMÁTICA

COMPONENTE/RESULTADOS/PRODUCTOS	ANÁLISIS/IMPACTO SOCIAL/ MEDIDAS DE MITIGACIÓN
COMPONENTE 1: Implementación de intervenciones en áreas piloto estratégicas para mejorar la resiliencia de comunidades costeras y ecosistemas marino costeros clave al cambio climático y el estrés inducido por la variabilidad.	

Resultado 1.1. Resiliencia aumentada y vulnerabilidad reducida de ecosistemas marino costeros a efectos observados del cambio climático y el estrés inducido por la variabilidad	**Producto 1.1.1.** Adopción de métodos de pesca sostenibles para combatir aparejos de pesca no sostenibles basados en principios del EAF dirigidos a especies objetivo vulnerables al cambio climático	**Análisis** Si bien es cierto que la implementación de mejores prácticas de pesca como el reemplazo de redes de cortina por palangre/espinel por lo menos en 45 embarcaciones, es de suma importancia para mejorar la resiliencia y la reducción de la vulnerabilidad de los ecosistemas marinos; la adopción de la nueva práctica por parte de los pescadores artesanales, en primera instancia supone disponer de un fondo económico que les permita adquirir los nuevos equipos de acorde a la práctica de pesca que promocionará el Proyecto. En ese sentido, queda claro que el proyecto financiará la adquisición de estos equipos, Sin embargo, las capacitaciones y los aprendizajes no son inmediatos. De otro lado, se debe tener en cuenta que el giro de una técnica que ya manejaban por otra nueva, traerá un cierto nivel de resistencia y aversión al riesgo. Esta situación puede generar desconfianza en los pescadores artesanales frente al Proyecto y por tanto lentitud en la adopción de la nueva práctica. **Impacto Social** En ese sentido, el posible impacto social generado por la adopción de una nueva práctica de pesquería artesanal, traerá consigo de todas maneras un impacto de tipo socioeconómico que puede expresarse en lo inmediato en una disminución de ingresos familiares de los pescadores artesanales que adopten el cambio. **Medida de Mitigación** 1) Al financiar el proyecto la adquisición de los nuevos equipos, está asegurada una primera medida de mitigación, pues la adquisición de nuevos equipos no correrá a cuenta de los pescadores artesanales. 2) Implementar un proceso de capacitación y sensibilización para convencer a los pescadores artesanales que la adopción de nuevas prácticas de pesca son a

		mediano y largo plazo favorables para ellos mismos, puesto que asumirlas garantiza una pesca sostenible en el tiempo. 3) Promocionar fuentes alternas de diversificación de ingresos familiares con las esposas de los pescadores para reforzar la generación de ingresos monetarios familiares. Trabajar en una estrategia que permita reducir la intermediación comercial de productos marinos provenientes de la adopción de la nueva práctica de pesquería; a través de ferias semanales promocionadas por PRODUCE, las municipalidades y los gobierno regionales involucrados.
	Producto 1.1.2. Establecimiento de áreas de manejo pesquero en co-manejo con comunidades beneficiarias para facilitar la restauración de bancos naturales.	**<u>Análisis</u>** Bajo esta actividad lo que se busca en especial es promocionar la restauración a través del repoblamiento en un área de 10 hectáreas y conservación de bancos naturales de generación de larvas de concha de abanico, en áreas marino-costeras protegidas. La topografía favorece la existencia de bancos naturales de invertebrados bentónicos, con varias especies de moluscos submareales de alto valor comercial y de demanda. Algunos de los principales bancos se encuentran en el islote Don Martín y en Punta Salinas que forman parte de la RNSIIPG, condición que ofrece una oportunidad para su gestión sostenible. Dos de los principales recursos bentónicos de alto valor comercial (para la exportación y para el consumo nacional) son la concha de abanico (*Argopecten purpuratus*) y la concha navaja (*Ensis macha*). En la zona de Huacho, el principal banco natural de la navaja se encuentra en Punta Salinas. La actividad, supone la intervención organizada de por lo menos 100 pescadores artesanales pertenecientes a tres organizaciones y/o cooperativas, para que se dediquen a gestionar los bancos naturales

		seleccionados. Existen reportes de dragado hidráulico en estas zonas, que hacen peligrar la existencia natural de estos bancos, así como de otras actividades de pesca poco amigables y orientadas al lucro económico. De lo que se trata es que la zona se convierta en un banco natural de especies bentónicas que permita suministrar larvas de especies comerciales para la provisión de iniciativas productivas de acuicultura. De modo tal que la provisión suponga un negocio sostenible, rentable y que favorezca fundamentalmente a comunidades de pescadores artesanales de la zona. **Impacto Social** Impacto social altamente positivo y beneficioso en términos de generación de ingresos para las familias de pescadores provenientes del suministro de larvas de especies comerciales (concha de abanico y concha navaja). De otro lado, tiene un impacto positivo social, en tanto tiende a establecer un modelo de autogestión empresarial de las comunidades pesqueras. Sin embargo, al establecerse un área de 10 hectáreas en un área natural protegida que pertenece a la RNSIIPG, puede abrirse la posibilidad de conflictos sociales con aquellos pescadores que no son beneficiarios directos del proyecto, en tanto un área natural protegida de todas maneras genera restricciones de uso de recursos dentro del área delimitada. En esa medida, será importante proponer una medida de mitigación para los posibles afectados, por la restricción de uso de los bancos naturales. **Medida de Mitigación** 1) Desarrollar alternativas económicas de generación de ingresos con los afectados por la restricción de uso de recursos como producto de la instalación de los bancos naturales. 2) Implementar un plan de capacitación para la generación de capacidades de manejo de iniciativas de generación de ingresos; los procesos de capacitación no sólo deben estar orientados a los beneficiarios del proyecto, sino también a los afectados

		por restricción de uso de AMP (Bancos Naturales). **Análisis** El desarrollar repoblación de los bancos naturales de invertebrados bentónicos (por ejemplo, concha navaja) supone un nivel importante de participación de las comunidades de pescadores, puesto que se trata de construir un modelo de co-manejo entre el Proyecto y las comunidades de pescadores interesados en la repoblación de bancos naturales de concha navaja. En ese sentido, el componente social para la organización y gestión del modelo, requiere de una intervención sostenida en formación de capacidades y habilidades orientadas a la conservación y manejo adecuado de bancos naturales de invertebrados bentónicos, a través de procesos de capacitación que en definitiva, favorecerán a las organizaciones de pescadores, pero a su vez representarán una experiencia nueva y viable para que el Estado Peruano a través de la experiencia de este modelo, pueda replicar en otros espacios similares el modelo. **Impacto social** Impacto social altamente positivo y beneficioso en términos de generación de capacidades y habilidades para la sostenibilidad de un modelo de cogestión encaminado a repoblar bancos naturales, contribuyendo de ese modo a la conservación y aprovechamiento sostenible de recursos marinos de alto significado económico. **Medidas de mitigación** No se sugiere ninguna en especial, puesto que el desarrollo de la actividad no genera impactos sociales negativos, por el contrario los efectos de la intervención son positivos desde el punto de vista social. Se sugiere involucrar no sólo a pescadores en esta actividad, sino también a las esposas

		en la parte organizativa, de gestión y de administración.
Resultado 1.2. Capacidad adaptativa mejorada de las comunidades locales participantes a través de la diversificación y el fortalecimiento de sus medios de sustento y fuentes de ingreso en vista a las modificaciones inducidas por el cambio climático en la biomasa y distribución de peces	**Producto 1.2.1** Desarrollo de acuicultura sostenible a través de concesiones de pequeña escala	**<u>Análisis</u>** El desarrollo de esta actividad también forma parte de la estrategia de generación de ingresos complementarios como producto de la adopción de nuevas prácticas de captura de las pesquerías artesanales. En ese sentido, será importante que los beneficiarios de esta actividad sean los pescadores que han adoptado la nuevas prácticas, así como aquellos pescadores que sin ser parte del proyecto se han visto vinculados a él, por las restricciones de uso de bancos naturales de larvas de bentónicos comerciales, así como del establecimiento de áreas en co-manejo con comunidades beneficiarias para facilitar la restauración de bancos naturales. **<u>Impacto social</u>** Impacto social altamente positivo y beneficioso en términos de generación de ingresos complementarios de mitigación de los efectos de la adopción de la nuevas prácticas de captura de las pesquerías y como medida de mitigación para aquellos pescadores que sin ser parte del proyecto se han visto afectados por el mismo, debido a la restricción de usos de recursos de bancos naturales. **<u>Medidas de mitigación</u>** 1) Dar prioridad en el establecimiento de esta actividad a la participación de los pescadores que han adoptado nuevas prácticas de pesquería y a aquellos que sin ser parte del proyecto han sufrido los efectos que conlleva la restricción de uso de recursos de bancos naturales. 2) Tomar en cuenta la participación de las mujeres en el desarrollo e

	Producto 1.2.2. Creación de empresas de ecoturismo.	implementación de las actividades de acuicultura. 3) Desarrollar un programa de información sostenida al inicio del proyecto dirigida a las comunidades de pescadores vinculados al proyecto, sobre las bondades y los beneficios de la participación en la implementación de actividades de acuicultura. **<u>Análisis</u>** La implementación de esta actividad es estratégica en tanto la diversificación de fuentes de ingreso provenientes de la implementación de otras actividades distintas y/o asociadas a la pesca, se traduce en una buena alternativa que permite sustancialmente sostener la propuesta programática desde el punto de vista de los ingresos familiares. Como ya se había comentado líneas arriba, la adopción de prácticas nuevas en las actividades de pesquería tomará su tiempo y ello repercutirá en los ingresos del día a día. En ese contexto, la promoción de fuentes de ingreso provenientes del ecoturismo de avistamiento de fauna y pesca vivencial generarán ingresos complementarios a los provenientes de la pesca artesanal. Esta estrategia actuará, como medida de mitigación del impacto que generará al principio, la adopción de nuevas técnicas de pesca más amigables al medio ambiente. **<u>Impacto Social</u>** El impacto de la implementación de esta actividad, contribuirá a la generación complementaria de ingresos familiares, generación en la cual la participación de las mujeres es clave. La contribución de las mujeres al ingreso familiar, las alejará de algún modo de sus tareas habituales de cuidado del niño y de supervisión de aprendizajes de los niños en edad escolar, lo que puede resultar contraproducente para la

		familia, si no se toman medidas de mitigación y/o control del impacto social **<u>Medidas de Mitigación</u>** 1) El proyecto debe generar alianza de triangulación estratégica, con el Ministerio de Desarrollo e Inclusión Social y las municipalidades distritales de las zonas focalizadas para la intervención. La idea es que el Proyecto, facilite/ayude a los gobiernos locales para que éstos gestionen la implementación del Programa CUNA MAS y de ese modo, contribuir que las madres de niños menores de 3 años, garanticen el acceso a los beneficios del Programa social, y puedan de ese modo, comprometer su tiempo en el desarrollo y gestión de las iniciativas de complementariedad de ingresos familiares. 2) Respecto a los niños en edad escolar (época de vacaciones), se debe implementar convenios con las municipalidades distritales para que en los meses de vacaciones se implementes actividades lúdicas, deportivas y académicas de vacaciones útiles para favorecer a todos los niños, en especial a aquellos niños de los pescadores involucrados en el Proyecto.
	Producto 1.2.3 Mejora de las capacidades de comercialización de las pesquerías artesanales	**<u>Análisis</u>** De manera similar a lo que se implementará en Máncora, bajo esta actividad de lo que se trata es de promocionar un cambio de las prácticas tradicionales de pesquería en Huacho, hacia la adopción de técnicas que contemple el uso de artes de pesca sostenibles. Asimismo, la actividad se complementará a través de un proceso de capacitación cuyo resultado esperado es que los pescadores estén mejor preparados para lograr accesos ventajosos al mercado, que les permita generar mejores márgenes de ganancia. Ambientalmente la

		implementación de esta actividad traerá a mediano y largo plazo la mejora de la resiliencia y por ende la reducción de la vulnerabilidad de los ecosistemas marinos costeros frente al cambio climático; sin embargo, la adopción de prácticas nuevas y su internalización por parte de los pescadores artesanales, va a significar invertir en nuevos instrumentos y reemplazar de manera paulatina los usados hasta ahora. En ese sentido la inversión en estos equipos está contemplada como parte de los beneficios que el proyecto brindará. De otro lado, el impacto de capacitarlos para que estén mejor preparados para los procesos de comercialización de sus productos en el mercado local, no será inmediato, pues estos procesos sociales llevan consigo su tiempo de maduración, por ello mismo, los beneficios no son inmediatos, sobre todo si se considera de que la pesca artesanal es una actividad que genera ingresos del día a día. **Impacto Social** El posible impacto social generado por la adopción de una nueva práctica de pesquería artesanal, traerá consigo de todas maneras un impacto de tipo socioeconómico que puede expresarse en lo inmediato en una disminución de ingresos familiares de los pescadores. **Medida de Mitigación** 1) El proyecto financiará la adquisición de los nuevos equipos 2) Implementar un fuerte proceso de capacitación y sensibilización para convencer a los pescadores artesanales que la adopción de nuevas prácticas de pesca son a mediano y largo plazo favorables para ellos mismos, puesto que asumirlas garantiza una pesca sostenible en el tiempo.

		3) Promocionar fuentes alternas de diversificación de ingresos familiares con las esposas de los pescadores y con pescadores que quieran incursionar en actividades de acuicultura y otras como la producción de bio-fertilizantes.
	Producto 1.2.4. Inicio de procesos de certificación para pesquerías artesanales	**Análisis** La intervención de Proyecto bajo este producto se centrará en lo fundamental en realizar una pre-evaluación con miras futuras a certificación de la concha navaja en Huacho y el atún y merluza en Máncora y El Ñuro **Impacto Social** La actividad no generará un impacto social visible, ya que bajo esta actividad se trabajará simplemente en la exploración de la posibilidad de certificación de los productos mencionados a través de estudios. **Medidas de Mitigación** 1) Ninguna en especial.
COMPONENTE/RESULTADOS/PRODUCTOS		**ANÁLISIS/IMPACTO SOCIAL/ MEDIDAS DE MITIGACIÓN**
COMPONENTE 2: Despliegue de un Sistema moderno y eficiente de vigilancia y predicción ambiental en ecosistemas marino costeros a escalas regional y local que apoya el manejo adaptativo pesquero bajo los principios del enfoque ecosistémico.		
Resultado 2.1 Capacidad de respuesta	**Producto 2.1.1.** Desarrollo de un Sistema de vigilancia climático y oceanográfico	**Análisis** Bajo esta actividad de carácter científico, se instalarán dispositivos autónomos (gliders)

aumentada del gobierno a nivel nacional y local en áreas piloto para afrontar los estreses físicos y ecológicos inducidos por el cambio climático sobre el ambiente marino costero, los servicios ecosistémicos y la disponibilidad de recursos		equipados con sensores de temperatura, salinidad, oxígeno, pH y clorofila, así como estaciones meteorológicas, con tecnologías de punta que faciliten el monitoreo marino con información oceanográfica satelital, que posibilitará realizar un modelado de las zonas costeras de los ámbitos de intervención. Desde el punto de vista social, la implementación de estas actividades favorecerán a los beneficiarios del proyecto, en tanto les permitirá contar con información científica del comportamiento climático y sus variabilidades, lo que permitirá alcanzar un mejor performance en el desarrollo de sus actividades. **Impactos sociales**: El desarrollo de esta actividad no generará impactos sociales negativos por el contrario propone mejorar el manejo de la información oceanográfica por parte de los beneficiarios del proyecto **Medidas de Mitigación** Ninguna al no existir impactos negativos.
	Producto 2.1.2 Establecimiento de programas de vigilancia ambiental en áreas piloto en coordinación con actores locales	**Análisis** Bajo esta actividad se implementarán acciones de supervisión y monitoreo ambiental de indicadores oceanográficos sensibles: oxígeno, acidez, mareas rojas, etc. Para efectivizar estas acciones se recomienda incluir en los proceso de monitoreo ambiental a pescadores organizados, para que acompañen el proceso de recopilación de información científica en zonas clave, ya que al ser lugareños conocen muy bien los espacios adecuados para desarrollar este tipo de muestreo y supervisión ambiental, pudiendo servir de guías locales. **Impactos sociales** Esta actividad generará impactos positivos, puesto que si se realiza de manera participativa, se puede ir generando capacidades y conocimientos en pescadores artesanales que se interesen por el monitoreo

		comunitario de indicadores oceanográficos clave, que les permitirá manejar información adecuada para el desarrollo de sus actividades **Medidas de Mitigación** Ninguna al no existir impactos sociales negativos.
	Producto 2.1.3. Desarrollo de un Sistema de modelado y predicción a escalas locales.	**Análisis** El desarrollo de esta actividad requiere del concurso de expertos. **Impactos sociales** Esta actividad no genera impactos sociales negativos, por el contrario, será de utilidad contar con la información que genere el sistema, lo que favorecerá el desarrollo de las actividades marino costeras. **Medidas de Mitigación** Ninguna al no existir impactos sociales negativos.
	Producto 2.1.4. Construcción de capacidades para monitoreo y desarrollo de nuevas herramientas científicamente basadas como Evaluación de riesgo ecológico (ERA) para cambio climático dirigido al IMARPE, tomadores de decisiones y academia.	**Análisis** El desarrollo de esta actividad requiere del concurso de expertos. **Impactos sociales** Esta actividad no genera impactos sociales negativos, por el contrario, será de utilidad contar con profesionales expertos capacitados en el uso de herramientas científicas de evaluación de riesgo ecológico para el cambio climático. **Medidas de Mitigación** Ninguna al no existir impactos sociales negativos.

COMPONENTE/RESULTADOS/PRODUCTOS		ANÁLISIS/IMPACTO SOCIAL/ MEDIDAS DE MITIGACIÓN
COMPONENTE 3: Construcción de capacidades y Sistema de manejo del conocimiento para implementar el EBA y EAF, y para diseminación de las lecciones aprendidas en el proyecto, orientado a oficiales del gobierno, academia, comunidades locales y otros actores		
Resultado 3.1 Capacidad institucional fortalecida para evaluar la extensión y magnitud de los impactos del cambio climático en las pesquerías y acciones efectivas para afrontar estos cambios, dando límites a la pérdida de ingreso inducida por el clima en comunidades locales.	**Producto 3.1.1.** Desarrollo e implementación de un Sistema de Manejo del Conocimiento (KMS)	**Análisis** El desarrollo del conjunto de actividades del componente 3, se sustentan en la implementación y fortalecimiento de conocimientos científicos y técnicos encaminados a lograr una mejor gestión en la identificación de información valiosa vinculada al cambio climático. Socialmente la aplicación de estas medidas, es altamente positiva para las instituciones estatales responsables en el rubro, así como para el personal técnico y científico de las estaciones de vigilancia climática dedicadas a observar la evolución de comportamiento de los indicadores y variables oceanográficas. **Impactos Sociales** Esta actividad genera impacto positivo en las variables sociales en tanto genera conocimientos científicos y técnicos de los cuales se beneficiarán los involucrados nacionales y locales del Proyecto. **Medidas de Mitigación** Ninguna en particular al evidenciar que no existen impactos negativos desde el punto de vista social.
Resultado 3.2. Conciencia fortalecida y apropiación de procesos de adaptación y reducción de riesgo climático sobre comunidades impactadas en las	**Producto 3.2.1.** Entrenamiento y sensibilización de beneficiarios en tópicos clave como formalización, emprendedurismo, normativas y artes de pesca	**Análisis** Esta actividad sostiene desde el punto de vista de la generación de capacidades y habilidades locales, todas las actividades que se implementarán bajo el Componente 1. Sin el desarrollo de procesos de capacitación, la sostenibilidad económica, social y organizativa del Proyecto sería inviable. Esta actividad tienen un enorme

áreas piloto del proyecto		impacto en el ámbito social, toda vez que es fuente generadora de capacidades y conocimientos técnicos vinculados a actividades de pesquería artesanal, así como a actividades de organización para los emprendimientos, formalización de empresas locales, diversificación productiva y por ende de generación de ingresos familiares, ordenamiento ambiental y pesquero, etc. Generar conocimientos a través de proceso de capacitación garantiza el éxito de la propuesta programática. Por tanto, socialmente genera impactos positivos. **Impactos Sociales** Genera enormes impactos positivos en la población beneficiaria, pues se orienta a fortalecer capacidades locales para el desarrollo de las iniciativas diversas que programáticamente propone el presente proyecto. **Medidas de Mitigación** Ninguna en tanto no se generan impactos sociales negativos con la implementación de esta actividad.
	Producto 3.2.2. Diseño e implementación de sistemas de alerta temprana a través de un proceso participativo a escalas local y regional	**Análisis** Esta actividad es de tipo participativo, pues se orienta a que el sistema de monitoreo de vigilancia oceanográfica sea enfrentado de manera participativa, de allí el empeño en lograr el concurso de monitores para la vigilancia oceanográfica local a través de procesos de capacitación que incidan en el tema de la supervisión y fiscalización ambiental costero marina. Monitores locales capacitados en supervisión y fiscalización ambiental, se encuentran preparados para formar los sistemas de alerta temprana a nivel local y nacional. Bajo estas actividades de capacitación y generación de capacidades el Proyecto generará impactos positivos sociales en la población, puesto que al capacitar a un grupo de pescadores, estudiantes hombres y/o mujeres locales, también está generando habilidades locales

		para la vigilancia y el monitoreo oceanográfico. **<u>Impactos Sociales</u>** Esta actividad generara impactos sociales positivos pues contribuye al fortalecimiento de capacidades locales para la supervisión y fiscalización ambiental oceanográfica. **<u>Medidas de Mitigación</u>** Ninguna en particular, debido a que la activad no genera impactos sociales negativos.

COMPONENTE/RESULTADOS/PRODUCTOS		**ANÁLISIS/IMPACTO SOCIAL/ MEDIDAS DE MITIGACIÓN**
COMPONENTE 4: Políticas de manejo, reglamentos, y medidas que promueven la resiliencia de ecosistemas costeros y comunidades locales al cambio climático y el estrés inducido por la variabilidad.		
Resultado 4.1. Gobernanza, políticas y reglamentos mejorados a nivel nacional y local para mejorar el uso sostenible y la resiliencia de recursos marino costeros	**Producto 4.1.1.** Creación y operación de un grupo de trabajo para la promoción de acciones comunes para promover la resiliencia de ecosistemas costeros a los impactos del cambio climático	**<u>Análisis</u>** Bajo estas actividades en general, lo que el proyecto se propone, es generar incidencia política en las esferas gubernamentales decisorias. La búsqueda de un marco normativo, adecuado que permita abrir espacio a los pescadores artesanales es una medida de justo valor, pues contribuye a fortalecer la política de seguridad alimentaria del país, toda vez que la masa más importante del consumo humano de especies de mar proviene de actividades de pesquería artesanal, así como garantizar niveles de ingreso importantes para los pescadores artesanales. En esa medida es de vital importancia también colocar a este actor social, justamente en un contexto de variabilidad climática, buscando que las comunidades de pescadores a través de la gestión de AMPs, del desarrollo de iniciativas sostenibles como la acuicultura y las prácticas de pesca amigables con los ecosistemas marinos, así como la cogestión
	Producto 4.1.2. Desarrollo de reglamentos y propuestas de co-manejo en áreas marinas costeras	
	Producto 4.1.3. Desarrollo de reglamentos para implementar incentivos para la participación de Pescadores artesanales, que adoptan prácticas sostenibles, en el	

	Programa Nacional de Consumo Humano Directo.	de bancos naturales de invertebrados bentónicos de preciado valor comercial, se inserten en un patrón de mercado que les permita salir de la línea de pobreza en la que se encuentran. Esta posibilidad de empoderamiento de los pescadores y sus organizaciones, es desde ya un impacto social de trascendental importancia que generaría el proyecto con su intervención. **Impacto Social** Impacto altamente positivo pues lograría niveles de incidencia política con el Estado, para que los actores menos favorecidos cumplan un rol importante en el suministro de productos marinos para la seguridad alimentaria, lo que permitiría que los mismos salgan de las posiciones de desventaja en las que actualmente se encuentran. **Medidas de Mitigación** Ninguna en especial pues el desarrollo de estas tres actividades no genera impactos sociales negativos.

1.5. POLÍTICA SOCIAL DEL FONDO DE ADAPTACIÓN

Las políticas sociales y ambientales del Fondo de Adaptación, actúan como políticas operacionales de salvaguardas ambientales y sociales, en todos aquellos proyectos que financia.

> "Las políticas ambientales y sociales son fundamentales para asegurar que el Fondo no apoye proyectos/programas que innecesariamente dañan el medio ambiente, la salud pública o las comunidades vulnerables. Como parte de las responsabilidades de las entidades de desarrollo para el proyecto / programa, todas las entidades de ejecución deben (i) tener un sistema de gestión ambiental y social que asegure que los riesgos ambientales y sociales se identifiquen y evalúen a la mayor brevedad posible, en la etapa de diseño del proyecto / programa, (ii) adoptar medidas para evitar o impedir un impacto o mitigar esos riesgos durante la ejecución, y (iii) supervisar e informar sobre el estado de esas medidas durante y al final de la

ejecución. Habrá oportunidades adecuadas para la participación informada de todas las partes interesadas en la formulación y ejecución de los proyectos / programas apoyados por el Fondo"[5].

En ese sentido, en esta parte del informe se hace un análisis de las acciones que el proyecto se propone impulsar, contrastándolas con la política del Fondo de Adaptación.

Principios ambientales y sociales del Fondo de Adaptación	**Análisis**
Cumplimiento de la Ley:	El diseño y formulación del Proyecto **"Adaptación a los impactos del cambio climático en los ecosistema marino costeros y la pesquería del Perú "**ha tomado como referencia la base normativa vigente actual del Perú: o Decreto Ley N° 25977, Ley General de Pesca del año 1992 o Estrategia Nacional de Cambio Climático del año 2003 o Política Nacional del Medio Ambiente 2009 o Programa de Investigación Científica para el cambio Climático año 2009. o Plan Nacional de Ambiental del año 2010 o Plan de Acción para la Adaptación y Mitigación del cambio Climático del año 2010. o Decreto Supremo DS. 02-2008-MINAM, acerca de los estándares de calidad del agua en las zonas marinas. En ese sentido, se cumple con la primera salvaguarda social y ambiental del Fondo de Adaptación
Acceso y equidad	En lo fundamental la propuesta programática se orienta a mejorar la resiliencia de las comunidades costeras de destino y

[5]Environmental Social Policy (Approved In November 2013). AdaptationFundBoard

	de los ecosistemas marinos costeros claves para el cambio climático y el estrés inducido por la variabilidad. Pero esa mejora no es un asunto meramente técnico, ni de vigilancia climática oceanográfica. Por el contrario para que ello suceda, se asume como actores clave a los pescadores, siendo la participación de éstos, de suma importancia para el éxito del proyecto. En ese sentido, los pescadores artesanales son los principales beneficiarios del proyecto ya que acceden con equidad a los beneficios del mismo: o Participan en el cambio de prácticas no adecuadas a prácticas de pesquería amigables con la fragilidad de los ecosistemas marítimos y el cambio climático. o Participan en el repoblamiento de bancos naturales de especies de alto valor comercial para la generación de iniciativas productivas acuícolas. o Participan en la cogestión de áreas identificadas como bancos naturales de especies en áreas del estado, conservando y asumiendo usos sostenibles de los recursos marinos. o Participan en actividades alternas de generación de ingresos a la pesca (ecoturismo, **producción de bio-fertilizantes con residuos provenientes de la acuicultura y de la pesca**, etc.) o Participan en un procesos de desarrollo de capacidades para la supervisión y fiscalización ambiental, para la generación de iniciativas alternas a la pesca y para la constitución y formalización de empresas de ecoturismo, acuicultura, y para el fortalecimiento mismo de los gremios de pescadores. o Acceden a los beneficios de la información climática oceanográfica que se generará gracias a la implementación programática del componente 2.

	○ Se promociona con el proyecto la participación de los pescadores artesanales en la supervisión y fiscalización ambiental vía procesos de capacitación encaminados a mejorar sus capacidades técnicas y sus conocimientos ambientales en el contexto del cambio climático. ○ Se busca equidad social al promover un proceso de incidencia política para mejorar la gobernanza incluyendo la participación de los pescadores artesanales en el sector.
Grupos marginados y vulnerables	○ Al ser los pescadores artesanales el grupo mayoritario que accede a los beneficios propiciados por el proyecto, se está cumpliendo a través del proyecto con el cumplimiento de esta política del Fondo de Adaptación. ○ El proyecto busca mejorar los niveles de ingreso fomentando la certificación de las pesquerías artesanales para productos de alto valor comercial destinado al mercado internacional, con ello se espera mejorar sustancialmente los ingresos de los pescadores artesanales. ○ Al tener un enfoque de género, se promueve la participación de la mujer que es considerado tradicionalmente como grupo marginado y vulnerable.
Derechos Humanos	○ El proyecto toma como referencia los derechos humanos en su diseño y formulación. ○ Busca contribuir en la utilización sostenible de los recursos pesqueros como acción que garantiza la provisión de productos orientados a la seguridad alimentaria, puesto que los pescadores direccionan su producción para el consumo humano directo.
Equidad de Género y Empoderamiento de la Mujer	○ El proyecto se orienta a generar la participación de la mujer en aquellas actividades de ecoturismo que promociona como parte de la estrategia de diversificación de ingresos.

	○ El proyecto impulsa el desarrollo de proyectos acuícolas y producción de bio-fertilizantes, bajo modalidad empresarial y/o asociativa en los que mujeres organizadas pueden ser beneficiarias del mismo. ○ Promueve la capacitación de mujeres y hombres por igual, para que asuman la gestión, organización y sostenibilidad social en las iniciativas de diversificación de ingresos familiares.
Derechos Fundamentales del Trabajo	○ El proyecto no está diseñado para promocionar empleo en los ámbitos de intervención, sin embargo al promover iniciativas de ecoturismo, de producción acuícola, de manejo de repoblamiento de bancos naturales marinos, de producción de bio-fertilizantes, definitivamente generará puestos de trabajo para las familias de pescadores artesanales.
Pueblos Indígenas	○ En ambas zonas de intervención, no existe presencia de población indígena por tanto las salvaguardas de pueblos indígenas no se activan para el caso del presente proyecto.
Reasentamiento involuntario	○ La implementación y desarrollo de los componentes y de las actividades programáticas, no se realizarán sobre terrenos, ni poblados, sino básicamente son actividades costeras marinas, por tanto esta política de salvaguardas de reasentamiento involuntario no se activa para el presente proyecto. Sin embargo, se ha considerado la posible restricción del uso de recursos pesqueros debido a la protección estricta que se dará de los bancos naturales de especies bentónicas y al establecimiento de concesiones para acuicultura. Por lo mismo se han propuesto un conjunto de medidas que mitigarán estos efectos.

Protección de los hábitats naturales	○ El proyecto con su intervención justamente está salvaguardando y protegiendo los hábitats naturales costero marinos, pues promueve por ejemplo; el repoblamiento de bancos naturales de especies marinas, promociona la adopción de prácticas sostenibles para las pesquerías artesanales, apoya la protección de los hábitats naturales por el establecimiento de áreas de manejo conjunto y el apoyo de la gobernanza de las áreas naturales protegidas.
Conservación de la Diversidad Biológica	○ La pesca sostenible, la creación de áreas de manejo conjunto y el apoyo a las áreas naturales protegidas en conjunto son acciones que contribuyen en el fomento de la conservación de la diversidad biológica marina y costera.
Cambio Climático	○ El proyecto no tendrá actividades que implican un aumento significativo en las emisiones de gases de efecto invernadero.
Prevención de la contaminación y la eficiencia de los recursos	○ Las actividades del proyecto no implicará en absoluto la emisión de contaminantes al medio marino. Las actividades de acuicultura seguirá la normatividad relativa a las normas de calidad del agua en las zonas marinas.
Salud Pública	○ Las actividades del proyecto no implican ningún riesgo significativo para la salud humana. Por el contrario, la promoción de producción de **bio-fertilizantes,** se hará bajo un uso eficiente de los residuos de pesquería y de acuicultura, ya que implica de alguna manera el reciclaje de residuos sólidos contaminantes y nocivos para la salud, convirtiéndolos en productos de valor comercial.
Patrimonio físico y cultural	○ El proyecto no afectará los sitios con los valores del patrimonio físico y cultural. De hecho, el proyecto beneficiará a la gobernanza de las áreas naturales protegidas.

Tierras y Conservación de Suelos	○ Las actividades del proyecto se llevarán a cabo en las áreas marinas, que no afecta a las tierras o suelos.

1.6. RECOMENDACIONES

- La adopción de nuevas prácticas de pesca, en el corto plazo generaría un posible impacto negativo en los ingresos de los pescadores artesanales, puesto que asumir una nueva práctica de pesca artesanal, provocará una disminución en los volúmenes de pesca y como corolario en los niveles de ingresos familiares. Ante ello, la promoción de actividades de diversificación de ingresos como el ecoturismo de avistamiento de fauna, la pesca vivencial, las alternativas de promoción de iniciativas asociativas de producción acuícola, etc., deben ser impulsadas como parte del enfoque de aplicación de salvaguardas sociales.
- Las actividades de capacitación orientadas a generar capacidades locales para la comercialización, así como la promoción de ferias para la venta directa de productos hidrobiológicos con participación de las mujeres, deben ser acciones que desde la partida del proyecto se implementen para reforzar la sostenibilidad social del proyecto y evitar la resistencia y desánimo que puede generar la adopción de nuevas prácticas de pesca artesanal.

- El financiamiento por parte del proyecto para la adquisición de equipos de pesca artesanal acorde a la práctica promocionada por el mismo, es imprescindible para generar confianza entre los pescadores que se involucren con el proyecto.

- Los procesos de capacitación sobre medidas ambientales para enfrentar el cambio climático, para el emprendimiento de nuevas alternativas económicas como el ecoturismo, la acuicultura, **la producción de bio-fertilizantes**, la implementación de actividades de repoblamiento de bancos naturales y la implementación de manejo de áreas naturales en co-gestión; son sustanciales para la sostenibilidad social del Proyecto, en la medida que a mediano plazo se constituyen en fuentes seguras de complementariedad de ingresos familiares que puede permitir a largo

plazo superar la valla de la pobreza. En ese sentido; los procesos de capacitación deben ser continuos, bajo objetivos precisos y con definición clara sobre el grupo al que van dirigidos.

- Incorporar a las mujeres en este proceso es ineludible para cumplir con el enfoque de género que se propone de manera conceptual el Proyecto. Sin embargo, la dedicación de las mujeres a estas actividades de capacitación y de gestión si es que se incorporan en la implementación de las iniciativas, puede alejarlas de sus tareas tradicionales de cuidado de los niños y de supervisión y vigilancia de los niños en edad escolar. En ese sentido, se sugiere que a través de convenios con el Ministerio de Desarrollo e Inclusión Social, se propicie la presencia activa del Programa Cuna Mas, para mitigar de alguna manera el impacto que pueda provocar el desarrollo de las iniciativas de complementariedad y diversificación de ingresos familiares. Asimismo, los municipios locales pueden implementar cursos de vacaciones útiles para que tengan ocupados a los niños de edad escolar en la época de descanso escolar.

- Una medida importante de mitigación de impactos sociales, debe orientarse a promocionar la venta de sus productos marinos tradicionales a través de ferias locales promovidas por el Ministerio de la Producción en convenio con las municipalidades locales, como manera de asegurar la venta rápida de sus productos a precios favorables, ya que irían del pescador al consumidor directamente, evitando de ese modo la asimetría en los términos de intercambio, que genera la intermediación comercial.

- Promocionar a partir de la implementación del componente 4 vinculado a la generación de una gobernanza adecuada, para que los pescadores artesanales tradicionalmente marginados de la cadena de valor del sector, asuman protagonismo social, de modo tal que las políticas del sector favorezcan también los intereses de los pescadores artesanales cuya vulnerabilidad social es un factor presente en sus vidas. El impacto social de esta intervención sería altamente positivo pues permitiría a los pescadores asumir un rol protagónico en el aseguramiento de la seguridad alimentaria con una provisión proveniente de

prácticas sostenibles de pesca orientada en lo fundamental al consumo humano directo. Los pescadores por su lado, como producto de su participación en las ventas lograrían mejorar sus condiciones de vida.

- Desde el punto de vista social, promocionar actividades que se orienten a reforzar las capacidades locales para la autogestión y co-manejo en áreas marinas a través de la implementación de actividades de protección y conservación de hábitats de recursos hidrobiológicos con el propósito de recuperarlos; es un reto social y de gestión importante. El éxito del modelo, dependerá de un acompañamiento a nivel de la capacidad de incidencia que el proyecto se propone alcanzar en el PRODUCTO 4.1.2. "Desarrollo de reglamentos y propuestas de co-manejo en áreas marinas costeras". Al respecto, se recomienda que se evalúe que implicancias sociales, traería el establecimiento de "un área de manejo piloto" y de acuerdo a la dinámica que se desarrolle ir proponiendo, reglamentos, normativas, que validen la propuesta de co-manejo de éstas áreas.

CAPITULO 2
PLAN DE MANEJO DE IMPACTOS Y RIESGOS SOCIALES IDENTIFICADOS

El Plan de Manejo de Impactos y Riesgos Sociales del Proyecto "Adaptación a los impactos del Cambio Climático en los Ecosistemas Marino Costero y la Pesquería del Perú" tiene por finalidad establecer las medidas y/o acciones que permitirán manejar adecuadamente los posibles impactos sociales y riesgos (identificados en el capítulo anterior del presente documento), que podría ocasionar la implementación del proyecto.

El Plan, ha sido elaborado respetando la estructura programática propuesta en el proyecto en mención, de modo tal que su estructura organizativa facilite su ejecución por los operadores del proyecto y por los encargados del monitoreo y supervisión de su ejecución.

2.1. Objetivos

- Implementar de manera programática las medidas de mitigación de los impactos y riesgos sociales que se han identificado en el proyecto “Adaptación a los impactos del cambio climático en los ecosistemas marino costero y la pesquería del Perú”.

- Evitar la ocurrencia de impactos sociales negativos en el área de influencia del Proyecto. En el caso de no poder evitarlos, reducir los impactos negativos que se presenten, a niveles aceptables.

- Establecer consideraciones sociales para la realización de las diversas actividades y trabajos que se desarrollarán durante la implementación del proyecto.

- Evitar en la medida de lo posible el surgimiento de conflictividad social entre los beneficiarios del proyecto y aquella población del entorno que siendo también pescadores, no forman parte del proyecto y podría verse afectada por la protección estricta derivada de la propuesta de implementar concesiones para acuicultura y la restricción de acceso a los bancos naturales de especies bentónicas como la concha de abanico y la concha navaja (10 Has cada una).

2.2. ALCANCE

Este Plan se aplicará en todas las actividades en las que se han identificado algún nivel de impacto y riesgo social, debiendo ser aplicado durante todo el proceso de implementación y cierre del proyecto; vale decir desde la primera etapa que debe iniciarse con procesos de información y comunicación en los espacios de intervención, acerca de los objetivos y actividades del proyecto y su duración (cronograma de ejecución, horizonte programático del proyecto, objetivos del proyecto, beneficios visibles, etc); así como en la etapa misma de arranque e implementación de las actividades y desarrollo del proyecto, hasta su culminación y cierre.

2.3 MEDIDAS A IMPLEMENTARSE POR PRODUCTO PROGRAMÁTICO

Componente 1.- Implementación de intervenciones en áreas piloto estratégicas para mejorar la resiliencia de comunidades costeras y ecosistemas marino costeros clave al cambio climático y el estrés inducido por la variabilidad.

Resultado 1.1. Resiliencia aumentada y vulnerabilidad reducida de ecosistemas marino costeros a efectos observados del cambio climático y el estrés inducido por la variabilidad.

Producto 1.1.1. Adopción de métodos de pesca sostenibles para combatir aparejos de pesca no sostenibles basados en principios del EAF dirigidos a especies objetivo vulnerables al cambio climático

Identificación de Impactos Sociales

Es altamente probable que la adopción de una nueva práctica de pesquería artesanal, en 45 embarcaciones, traerá consigo un impacto de tipo socioeconómico que puede expresarse en lo inmediato en una disminución de ingresos familiares de los pescadores artesanales que adopten el cambio, debido básicamente a una posible disminución de los volúmenes de pesca, como producto de la migración de una práctica tradicional a otra más amigable con el medio ambiente, pero que no tendrá sus frutos inmediatamente, hasta que los pescadores artesanales alcancen un nivel de manejo adecuado.

Medida de Mitigación

Actividad 1.1.1.1. Proceso de sensibilización a pescadores artesanales.- se debe trabajar a través de talleres dinámicos y sencillos sobre las ventajas que traerá a mediano y largo plazo la adopción de las nuevas prácticas (asumirlas garantiza una pesca sostenible, sin agotamiento del recurso), pero al mismo tiempo informar que; hasta que se logre un entrenamiento aceptable y capacidades de manejo de la nueva práctica, podría darse el hecho de una disminución de los volúmenes de captura respecto a los volúmenes de captura que realizaban con la práctica tradicional. Bajo ese probable hecho, informarles de manera transparente que el proyecto implementará un conjunto de medidas que mitiguen esa probable merma económica.

Actividad 1.1.1.2. Financiamiento de la adquisición de los nuevos equipos.- El proyecto tiene previsto asumir como parte de su intervención la adquisición de los equipos de pesca, lo que será importante informar a los pescadores artesanales para convencerlos de que el costo del cambio tecnológico no correrá por su cuenta.

Actividad 1.1.1.3. Apoyo a la comercialización de productos de pesquería.- Bajo esta actividad el proyecto debe trabajar con las esposas de los pescadores actividades de selección, manejo y preparación de productos provenientes de la pesca artesanal, con la finalidad de canalizarlos al mercado de consumo directo a través de ferias semanales y/o diarias de productos ictiológicos, promocionadas por PRODUCE, los gobiernos locales y regionales involucrados, como una estrategia encaminada a ganar mercados seguros y lograr mejores márgenes de ganancia, debido a una comercialización directa, sin intermediarios. Ello significa trabajar, previamente acciones de coordinación y establecimiento de convenios de cooperación institucional entre los actores involucrados: pescadores artesanales, PRODUCE, gobiernos locales y regionales.

Producto 1.1.2. Establecimiento de áreas de manejo pesquero en co-manejo con comunidades beneficiarias para facilitar la restauración de bancos naturales.

Identificación de Impactos Sociales

Impacto social altamente positivo y beneficioso en términos de generación de ingresos para las familias de pescadores provenientes del suministro de larvas de especies comerciales (concha de abanico y concha navaja). De otro lado, tiene un impacto positivo social, en tanto tiende a establecer un modelo de autogestión empresarial de las comunidades pesqueras. ***Sin embargo, al establecerse un área de 10 hectáreas en un área marina protegida que pertenece a la RNSIIPG, puede abrirse la posibilidad de conflictos sociales con aquellos pescadores que no son beneficiarios directos del proyecto, en tanto un área marina protegida (AMP) de todas maneras genera restricciones de uso de recursos dentro del área delimitada***. En ese sentido, será importante proponer algunas medidas de mitigación para los posibles afectados, por la restricción de uso de los bancos naturales. De otro lado, la implementación de acciones para la restauración de bancos naturales de suministro de larvas de especies comerciales, supone un nivel importante de participación de las comunidades de pescadores (La actividad, supone la intervención organizada de por lo menos 100 pescadores artesanales pertenecientes a tres organizaciones y/o cooperativas, para que se dediquen a gestionar los bancos naturales seleccionados), puesto que se trata de construir un modelo de co-manejo entre el Proyecto y las comunidades de pescadores interesados en la repoblación de bancos naturales de concha navaja y concha de abanico. En ese sentido, el componente social para la organización y gestión del modelo, requiere de una intervención sostenida en formación de capacidades y habilidades orientadas a la conservación y manejo adecuado de bancos

naturales de invertebrados bentónicos, a través de procesos de capacitación que en definitiva, favorecerán a las organizaciones de pescadores, pero a su vez representarán una experiencia nueva y viable para que el Estado Peruano a través de la experiencia de este modelo, pueda replicar en otros espacios similares el modelo.

Medida de Mitigación

Actividad 1.1.2.1. Desarrollar alternativas económicas de generación de ingresos.- Con los afectados por la restricción de uso de recursos como producto de la restauración y co-manejo de los bancos naturales, se deben implementar prioritariamente medidas que compensen la restricción de uso, tales como: (i) empadronamiento de afectados para determinar cuántos son, (ii) Desarrollar iniciativas de generación de ingresos con los empadronados, como producción de bio-fertilizantes, actividades de ecoturismo, desarrollo de acuicultura de pequeña escala, etc. (iii) implementar procesos de capacitación para el mejoramiento de capacidades de gestión de las iniciativas de generación de ingresos.

Actividad 1.1.2.2. Implementar un plan de capacitación para la generación de capacidades de manejo de iniciativas de generación de ingresos.- Los procesos de capacitación no sólo se deben orientar a los beneficiarios del proyecto, sino también a los afectados por restricción de uso de AMP (Bancos Naturales), en tanto se debe incorporar a los mismos dentro de los beneficios del proyecto a modo de compensación. Por ello, es indispensable que el proyecto, los tenga como aliados orientando las estrategias de generación de ingresos también a ellos.

Para cumplir en ambas actividades de mitigación con el enfoque de género, será imprescindible no sólo trabajar con los pescadores, sino también con las esposas de ellos, ya que la conducción de las estrategias de diversificación de ingresos tiene que ser compartida con otros miembros de la familia y que mejor que en ello se involucre a las esposas de los pescadores.

Resultado 1.2. Capacidad adaptativa mejorada de las comunidades locales participantes a través de la diversificación y el fortalecimiento de sus medios de sustento y fuentes de ingreso en vista a las modificaciones inducidas por el cambio climático en la biomasa y distribución de peces

Producto 1.2.1 Desarrollo de acuicultura sostenible a través de concesiones de pequeña escala

Identificación de impactos sociales

El desarrollo de esta actividad también forma parte de la estrategia de generación de ingresos complementarios como producto de la adopción de nuevas prácticas de captura de las pesquerías artesanales. En ese sentido, será importante que los beneficiarios de esta actividad sean los pescadores que han adoptado las nuevas prácticas, así como aquellos pescadores que sin ser parte del proyecto se han visto vinculados a él, por las restricciones de uso que genera el establecimiento de áreas en co-manejo con comunidades beneficiarias para facilitar la restauración de bancos naturales. El impacto social que se genera con la implementación de este producto es altamente positivo y beneficioso en términos de generación de ingresos complementarios de mitigación de los efectos de la adopción de la nuevas prácticas de captura de las pesquerías y como medida de mitigación para aquellos pescadores que sin ser parte del proyecto se han visto afectados por el mismo, debido a la restricción de usos de recursos marinos.

Medidas de mitigación

Actividad 1.2.1.1. Priorización de beneficiarios para iniciativas de acuicultura.- Dar prioridad en el establecimiento de esta actividad a la participación de los pescadores que han adoptado nuevas prácticas de pesquería y a aquellos que sin ser parte del proyecto han sufrido los efectos que conlleva el establecimiento de concesiones de acuicultura, en tanto requieren mitigar los efectos de la disminución de ingresos por la adopción de nuevas prácticas de pesquería y de otro, compensar los posibles efectos adversos de aquellos pescadores que han visto restringido el uso de recursos.

Actividad 1.2.1.2. Implementar conversión de residuos de pesca y acuicultura en bio-fertilizantes.- Esta actividad está programada dentro las actividades estratégicas de generación de ingresos complementarios para las familias de pescadores que participarán en el proyecto, y se debe implementar tanto en la zona de Huacho como en Máncora. Esta actividad adicionalmente a la generación de ingresos complementarios familiares tiene un impacto positivo en el medio ambiente de las caletas pesqueras puesto que mejorará la disposición de residuos sólidos, descontaminando las mismas y dándoles valor comercial a

través de la transformación de estos residuos contaminantes de la calidad de aire en bio-fertilizantes. Se sugiere que en todas estas actividades de complementariedad de ingresos económicos familiares participen las mujeres

Actividad 1.2.1.3. Promocionar la participación de las mujeres en actividades de acuicultura.- Tomar en cuenta la participación de las mujeres en el desarrollo e implementación de las actividades de acuicultura. Sobre todo en el modelo de manejo en cogestión.

Actividad 1.2.1.4. Implementar procesos de información previos al inicio del proyecto.- Desarrollar un programa de información sostenida al inicio del proyecto dirigida a las comunidades de pescadores vinculados al proyecto, sobre las bondades y los beneficios de la participación en la implementación de actividades de acuicultura.

Producto 1.2.2. Creación de empresas de ecoturismo.

Identificación de impactos sociales

Es importante que el proyecto proponga a través de este producto, la promoción de fuentes de ingreso provenientes del ecoturismo. En ese sentido, cobra relevancia implementar actividades de: (i) paseos marítimos con avistamiento de fauna, y (ii) pesca vivencial. Estas actividades generarán ingresos complementarios a los provenientes de la pesca artesanal, que deberán ser sostenidas en términos de gestión no sólo por los pescadores, sino por las esposas de los mismos. En ese sentido, la participación de las mujeres en la generación de ingresos complementarios familiares se presenta como una alternativa viable. Es importante recordar que la adopción de prácticas nuevas en las actividades de pesquería toma su tiempo y por lo mismo repercute en los ingresos del día a día. En ese contexto, la estrategia de creación de empresas de ecoturismo actúa, como medida de mitigación del impacto que generará al principio, la adopción de nuevas técnicas de pesca más amigables al medio ambiente. La contribución de las mujeres al ingreso familiar, a través de estas actividades, las alejará de algún modo de sus tareas habituales de cuidado del niño y de supervisión de aprendizajes de los niños en edad escolar, lo que puede resultar contraproducente para la familia, si no se toman medidas de mitigación y/o control del impacto social

Medidas de Mitigación

Actividad 1.2.2.1. Gestionar la implementación del programa CUNA MAS.- El proyecto debe generar alianza de triangulación estratégica, con el Ministerio de Desarrollo e Inclusión Social y las municipalidades distritales de las zonas focalizadas para la implementación de esta actividad. La idea es que el Proyecto, facilite/ayude a los gobiernos locales para que éstos gestionen la implementación del Programa CUNA MAS y de ese modo, contribuir que las madres de niños menores de 3 años, garanticen el acceso a los beneficios del Programa social, y gracias a ello comprometer su tiempo en el desarrollo y gestión de las iniciativas de ecoturismo y otras que se propongan con la finalidad de implementar estrategias de complementariedad de ingresos familiares.

Actividad 1.2.2.2. Vacaciones útiles con la intervención de gobiernos locales.- Respecto a los niños en edad escolar (época de vacaciones), se debe implementar convenios con las municipalidades distritales para que en los meses de vacaciones se implementes actividades lúdicas, deportivas y académicas de vacaciones útiles para favorecer a todos los niños, en especial a aquellos niños de los pescadores involucrados en el Proyecto y a aquellos niños de los pescadores afectados por la restricción de usos que provoque el establecimiento de áreas para acuicultura y restauración de bancos naturales.

Producto 1.2.3 Mejora de las capacidades de comercialización de las pesquerías artesanales

Identificación de impactos sociales

Bajo el desarrollo de esta actividad se propone mitigar el impacto de la adopción de nuevas prácticas de pesquería tanto en la zona de Máncora como en la Zona de Huacho. En ese sentido, la actividad se centra en generar capacidades de comercialización a través de un proceso de capacitación cuyo resultado esperado es que los pescadores estén mejor preparados para lograr accesos ventajosos al mercado, que les permita generar mejores márgenes de ganancia. De otro lado, el impacto de capacitarlos para que estén mejor preparados para los procesos de comercialización de sus productos en el mercado local, no será inmediato, pues estos procesos sociales llevan consigo su tiempo de maduración, por ello mismo, los beneficios no son inmediatos, sobre todo si se considera de que la pesca

artesanal es una actividad que genera ingresos del día a día. El impacto social que traerá la implementación de este producto, es que mientras los beneficiarios del proyecto se capaciten sus niveles de ingreso sufrirán una posible reducción.

Medida de Mitigación

Actividad 1.2.3.1. Apoyo a la comercialización de productos de pesquería.- Bajo esta actividad el proyecto debe trabajar con las esposas de los pescadores actividades de selección, manejo y preparación de productos provenientes de la pesca artesanal, con la finalidad de canalizarlos al mercado de consumo directo a través de ferias semanales y/o diarias de productos ictiológicos, promocionadas por PRODUCE, los gobiernos locales y regionales involucrados, como una estrategia encaminada a ganar mercados seguros y lograr mejores márgenes de ganancia, debido a una comercialización directa, sin intermediarios. Ello significa trabajar, previamente acciones de coordinación y establecimiento de convenios de cooperación institucional entre los actores involucrados: pescadores artesanales, PRODUCE, gobiernos locales y regionales.

COMPONENTE 2: Despliegue de un Sistema moderno y eficiente de vigilancia y predicción ambiental en ecosistemas marino costeros a escalas regional y local que apoya el manejo adaptativo pesquero bajo los principios del enfoque ecosistémico.

Resultado 2.1. Capacidad de respuesta aumentada del gobierno a nivel nacional y local en áreas piloto para afrontar los estreses físicos y ecológicos inducidos por el cambio climático sobre el ambiente marino costero, los servicios ecosistémicos y la disponibilidad de recursos

Producto 2.1.2 Establecimiento de programas de vigilancia ambiental en áreas piloto en coordinación con actores locales

Identificación de impactos sociales

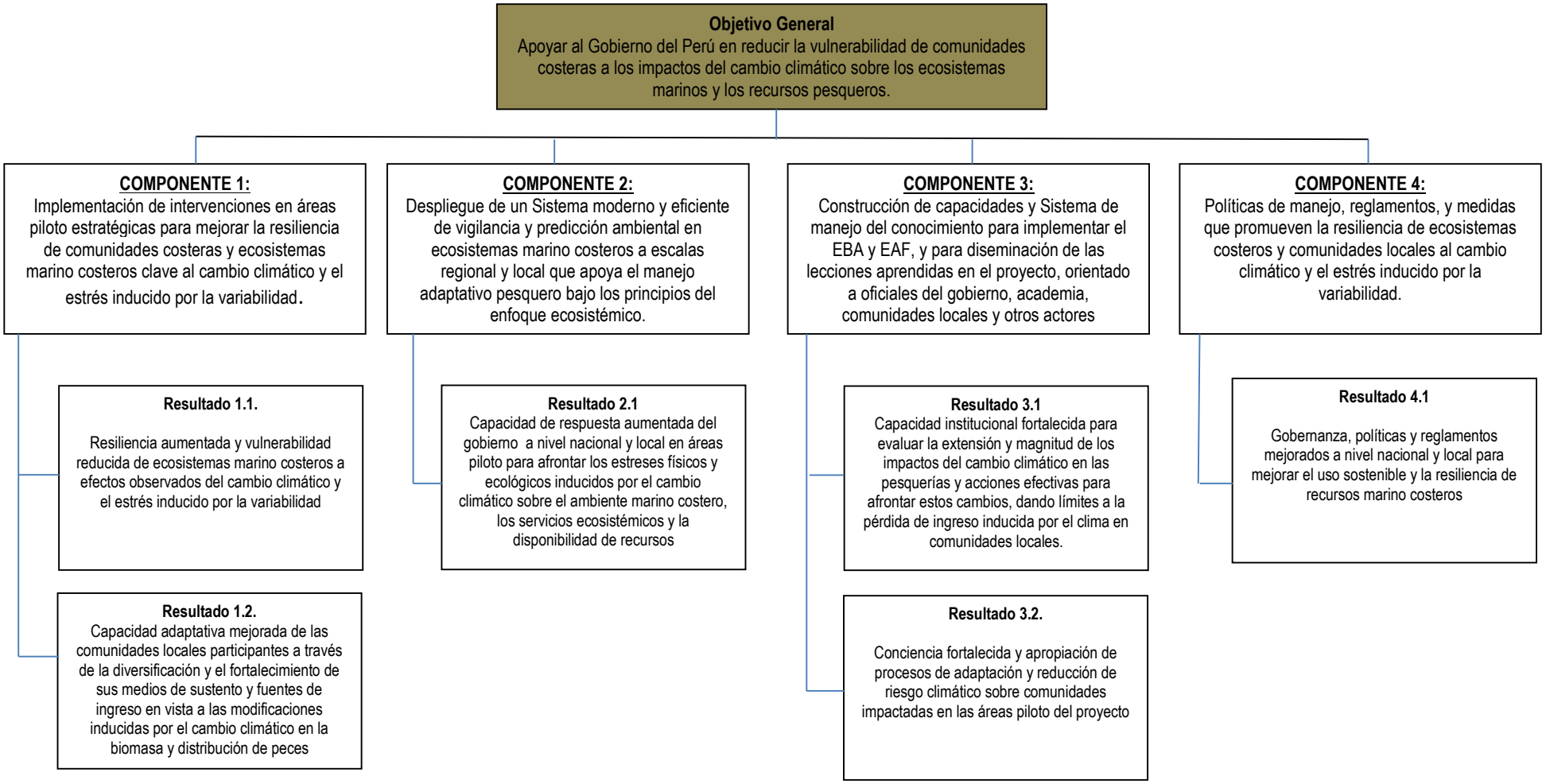
Bajo esta actividad se implementarán acciones de supervisión y monitoreo ambiental de indicadores oceanográficos sensibles: oxígeno, acidez, mareas rojas, etc. Para efectivizar estas acciones se recomienda incluir en los proceso de monitoreo ambiental a pescadores organizados, para que acompañen el proceso de recopilación de información científica en zonas clave, ya que al ser lugareños conocen muy bien los espacios adecuados para

desarrollar este tipo de muestreo y supervisión ambiental, pudiendo servir de guías locales. Esta actividad generará impactos positivos, puesto que si se realiza de manera participativa, se puede ir generando capacidades y conocimientos en pescadores artesanales que se interesen por el monitoreo comunitario de indicadores oceanográficos clave, que les permitirá manejar información adecuada para el desarrollo de sus actividades.

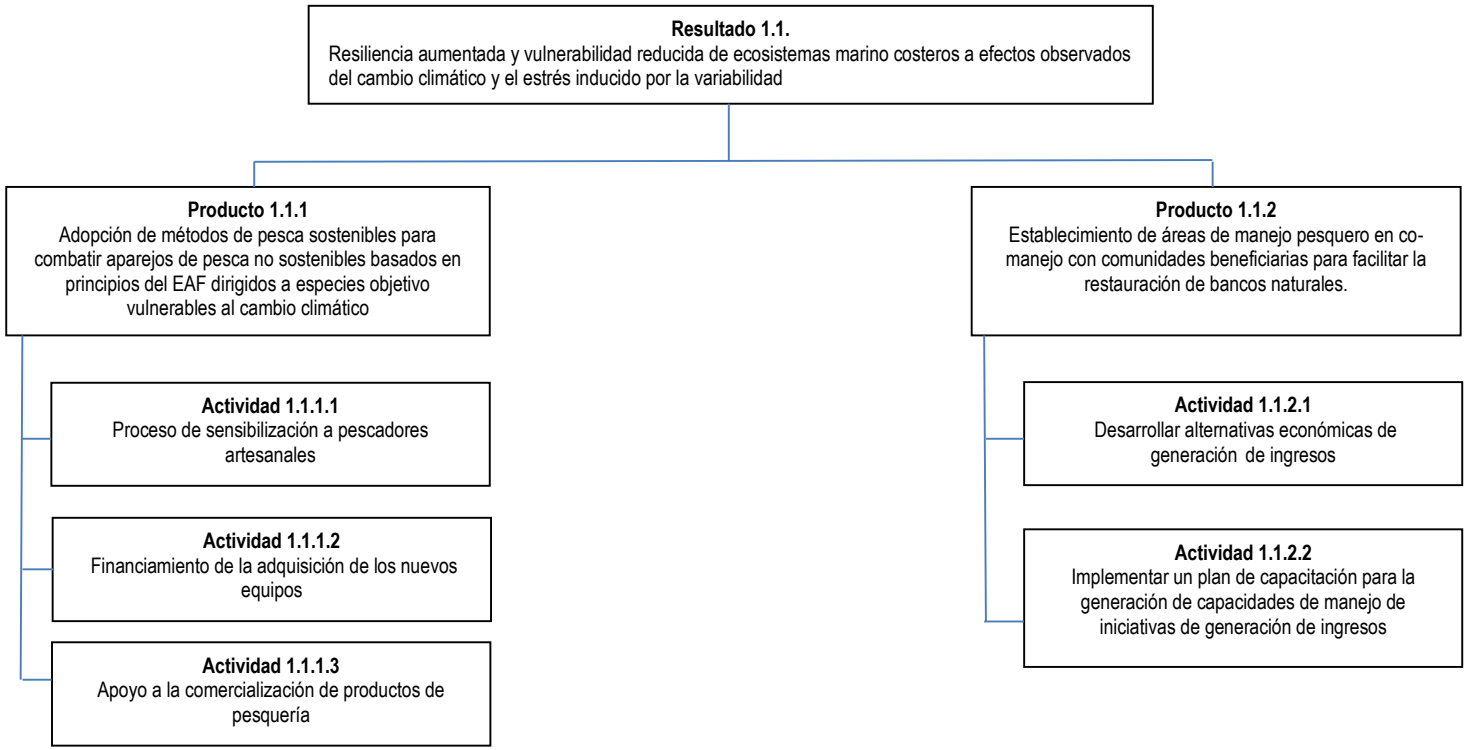
Medidas de Mitigación

Actividad 2.1.2.1. Implementar un sistema de monitoreo participativo.- Para reforzar la capacidad participativa de las comunidades de pescadores, será vital hacer una selección de personas de manera participativa designados por las propias organizaciones de pescadores y/o por las comunidades de pescadores para que personas del lugar conformen equipos de monitoreo participativo oceanográfico. Ello implica desarrollar procesos de capacitación para que monitoreen variables oceanográficas sencillas y clave para la pesca artesanal. De ese modo se van generando capacidades locales para la vigilancia ambiental oceanográfica.

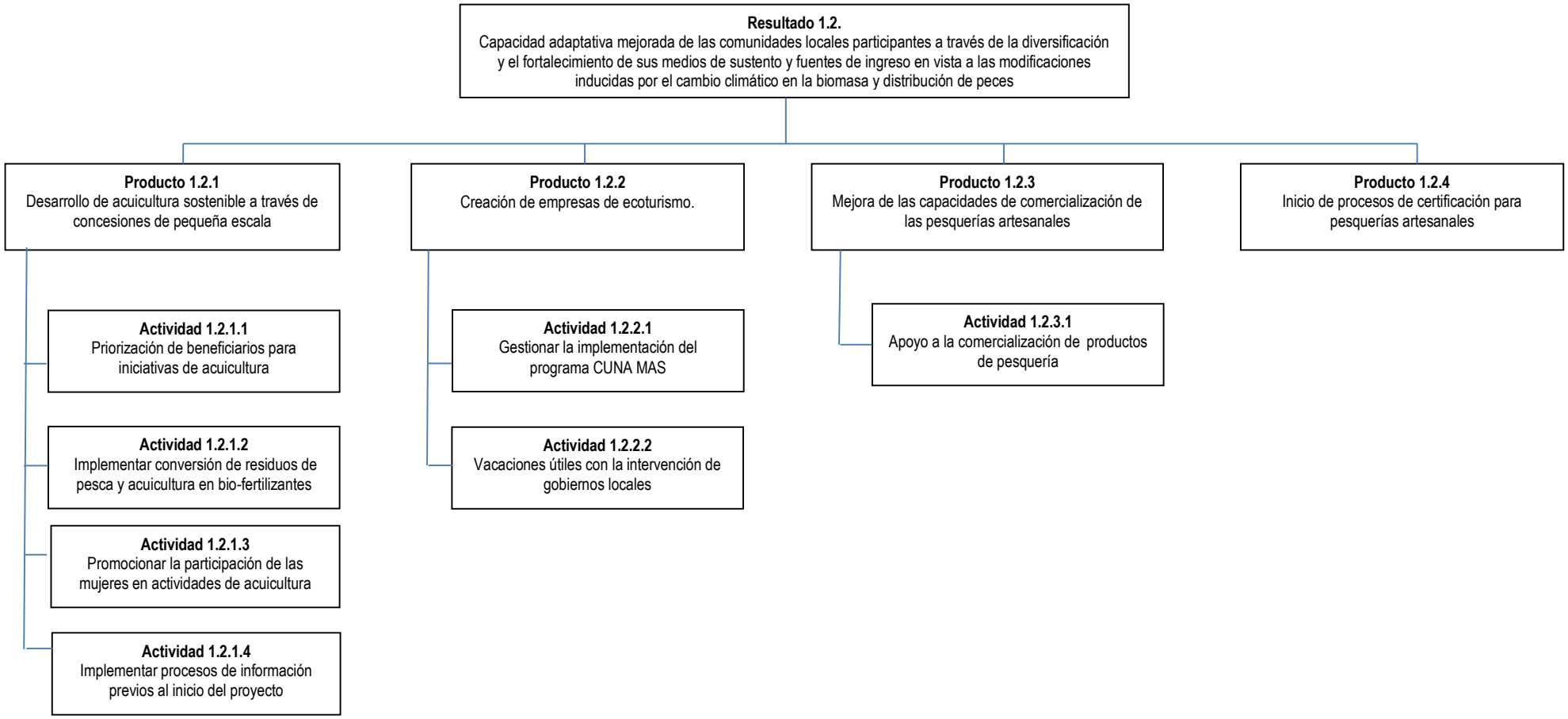
JERARQUÍA DE OBJETIVOS DEL PROYECTO



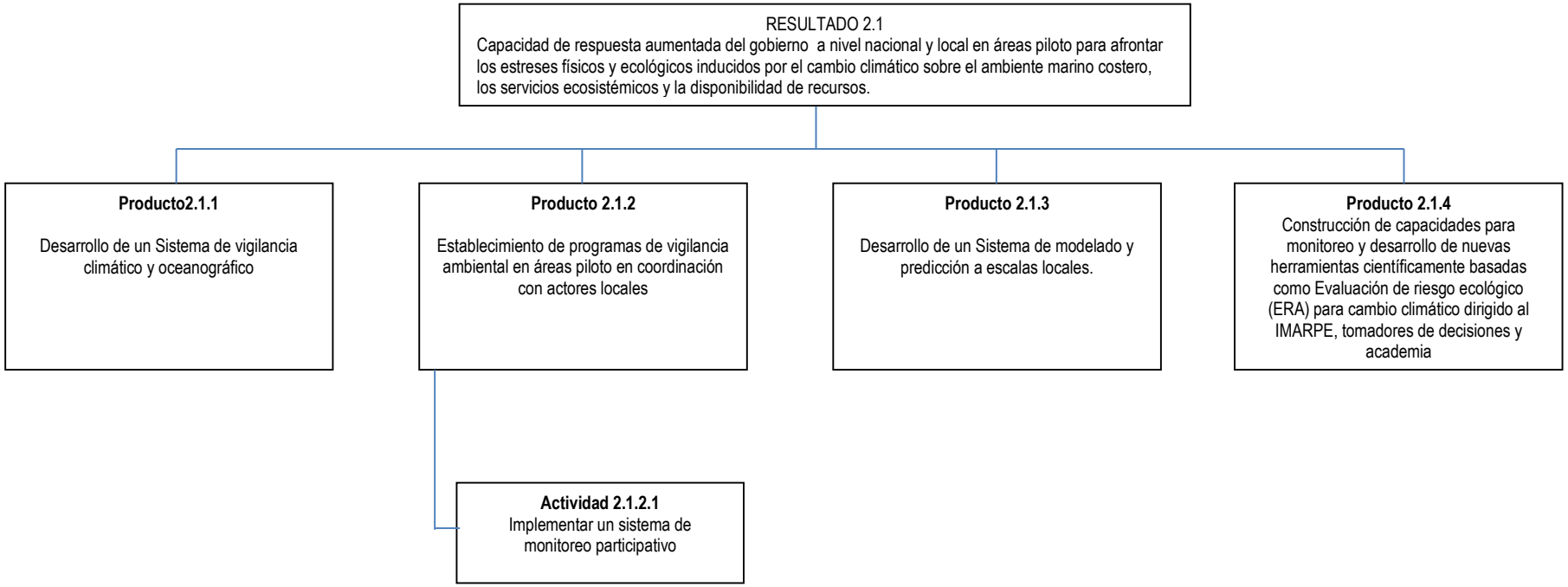
MEDIDAS DE MITIGACIÓN POR RESULTADOS Y PRODUCTOS



MEDIDAS DE MITIGACIÓN POR RESULTADOS Y PRODUCTOS



MEDIDAS DE MITIGACIÓN POR RESULTADOS Y PRODUCTOS



CAPÍTULO 3

GUÍA DE PROCEDIMIENTO PARA EL MONITOREO Y EVALUACIÓN DEL CUMPLIMIENTO DE LAS SALVAGUARDAS SOCIALES PARA SER APLICADAS DURANTE LA EJECUCIÓN DEL PROYECTO.

3.1. CONSIDERACIONES PROGRAMÁTICAS

Siguiendo lo establecido en el Plan de Manejo de Impactos y Riesgo Sociales, del Proyecto "Adaptación a los impactos del cambio climático en los ecosistemas marino costero y la pesquería del Perú", se ha podido constatar que muy pocas actividades del proyecto generan impactos sociales negativos leves y temporales, básicamente sobre los niveles de ingresos de las familias de pescadores.

Estos impactos están asociados mayoritariamente a las actividades del componente 1. Es importante resaltar que solo se ha propuesto una medida de mitigación en lo que respecta a la ejecución programática del componente 2.

En resumen, se han propuesto un conjunto de medidas de mitigación por producto (ver capítulo anterior), cuyo eje de orientación se sustenta en una estrategia de generación de ingresos complementarios que ya estaba contemplado de alguna manera en las actividades programáticas del mismo proyecto. Sin embargo, para que se tome especial atención en ellas se ha propuesto trabajarlas como parte de las medidas de mitigación de los impactos sociales que genera el proyecto en sí. A continuación presentamos un listado de las mismas de acuerdo a su correlación programática con los productos que se ha propuesto alcanzar con su intervención el proyecto "Adaptación a los impactos del cambio climático en los ecosistemas marino costero y la pesquería del Perú",

COMPONENTE 1

Producto 1.1.1: tres actividades de mitigación

Actividad 1.1.1.1: Proceso de sensibilización a pescadores artesanales
Actividad 1.1.1.2: Financiamiento de la adquisición de los nuevos equipos
Actividad 1.1.1.3: Apoyo a la comercialización de productos de pesquería

Producto 1.1.2: dos actividades de mitigación

Actividad 1.1.2.1: Desarrollar alternativas económicas de generación de ingresos
Actividad 1.1.2.2: Implementar un plan de capacitación para la generación de capacidades de manejo de iniciativas de generación de ingresos

Producto 1.2.1: cuatro actividades de mitigación

Actividad 1.2.1.1: Priorización de beneficiarios para iniciativas de acuicultura
Actividad 1.2.1.2: Implementar conversión de residuos de pesca y acuicultura en bio-fertilizantes
Actividad 1.2.1.3: Promocionar la participación de las mujeres en actividades de acuicultura
Actividad 1.2.1.4: Implementar procesos de información previos al inicio del proyecto

Producto 1.2.2: dos actividades de mitigación

Actividad 1.2.2.1: Gestionar la implementación del programa CUNA MAS
Actividad 1.2.2.2: Vacaciones útiles con la intervención de gobiernos locales

Producto 1.2.3: una actividad de mitigación

Actividad 1.2.3.1: Apoyo a la comercialización de productos de pesquería

COMPONENTE 2

Producto 2.1.2: 1 actividad de mitigación

Actividad 2.1.2.1: Implementar un sistema de monitoreo participativo

Sobre la base de la implementación de las medidas de mitigación presentadas líneas arriba, se propone en este capítulo, un conjunto de procedimientos mínimos que consideramos garantizarán que las medidas planteadas se cumplan en la práctica y resuelvan en la medida de lo posible los impactos sobre los ingresos familiares de las familias de

pescadores involucrado en el proyecto y de aquello que sin formar parte del mismo, serán posiblemente afectados por la restricción de uso de recursos que generará el establecimiento de áreas para co-manejo de recursos bentónicos.

3.2. ESTRATEGIA DE INTERVENCIÓN SOCIAL

Las estrategias de intervención social deben estar orientadas a garantizar la viabilidad del proyecto a través del compromiso de las poblaciones locales con los objetivos programáticos del mismo. En esa medida será vital para el desempeño justo del proyecto, lograr que los pescadores involucrados y afectados, encuentren alternativas económicas sostenibles y productivas, con la facilitación y acompañamiento del equipo técnico del proyecto.

Para asegurar ello, será necesario lograr un consenso mayoritario a favor del proyecto. Esto es, que los actores institucionales y sociales muestren una adhesión real y participativa en el proyecto. En ese sentido, la palabra clave es la participación y no sólo de los pescadores, sino sobre todo de las esposas de éstos, en tanto serán ellas las que actúen protagónicamente en la implementación de las estrategias de complementariedad de ingresos familiares.

Visto de ese modo, se propone desarrollar la intervención a partir de la implementación de cuatro etapas procedimentales.

3.2.1. PRIMERA ETAPA DE INTERVENCIÓN SOCIAL

En primer lugar, será importante validar la información social (línea de base social del proyecto) con que cuenta el proyecto respecto a los beneficiarios y a los posibles afectados en ambas zonas de intervención, dado que la maduración del mismo se ha dado en varios años, lo que significa que la dinámica social debe haber variado en ambas zonas, durante ese tiempo; motivo por el cual será necesario actualizarla y/o validarla.

En ese sentido, a continuación se presentan las variables que requieren desde nuestro punto de vista ser validadas:

- N° de pescadores y embarcaciones que intervendrán en el proyecto asumiendo nuevas prácticas de captura en ambas zonas (Máncora y Huacho).

- N° de pescadores que se sumarán al co-manejo de bancos naturales de especies bentónicas para restauración y cuántos bancos se restaurarán. Lo que significa definir el lugar donde se establecerán definitivamente.

- N° de pescadores que serán posiblemente afectados por la restricción de uso de recursos debido al establecimiento de áreas en co-manejo para la restauración de los bancos naturales de especies bentónicas (en la zona de Huacho).

- N° de familias de pescadores en la zona de Máncora que asumirán iniciativas de ecoturismo, diferenciándolas entre aquellas que asumirán la alternativa de “paseos con avistamientos de fauna marina” y las otras que se inclinarán por la “pesca vivencial”.

- N° de familias que recibirán capacitaciones para fortalecer capacidades de manejo de post pesca, presentación y comercialización de productos de pesquería artesanal. En esta actividad será de crucial importancia saber cuántas mujeres participarán en la misma (en ambas zonas).

- N° de pescadores y/o esposas de pescadores que asumirán la transformación de restos de pesquería y acuicultura en el proyecto de producción de bio-fertilizantes (en ambas zonas).

- N° de pescadores y/o esposas de pescadores que asumirán la conducción de procesos productivos de acuicultura en ambas zonas (en ambas zonas).

- N° de organizaciones de pescadores existentes en cada zona y determinar y/o definir quienes formarán parte del proyecto.

Este proceso de validación debe hacerse a través de trabajo de campo y a través de talleres de recojo de información sobre el proyecto. Para cada actividad del proyecto que al mismo tiempo resultan siendo las medidas de mitigación; se deben trabajar padrones, sin levantar expectativas incumplibles. Los padrones determinarán en su justa medida la población objetivo con la que se trabajará cada una de las actividades propuestas.

Con la información validada se debe formular una estrategia de comunicación que considere como mínimo lo siguiente:

- La propuesta programática (objetivos resultados, productos, actividades y metas),
- Zonas de trabajo y los involucrados en cada actividad (población objetivo),
- Los cronogramas de ejecución,
- Los impactos positivos y negativos ambientales y sociales,
- Las medidas correctivas de los impactos identificados y
- El horizonte programático de ejecución

3.2.2. SEGUNDA ETAPA DE INTERVENCIÓN SOCIAL

Esta etapa se caracteriza por la implementación del proceso informativo en sí. Las herramientas que se utilizarán para efectivizar esta etapa serán las reuniones informativas y/o los talleres informativos. En esos eventos la tarea se centrará en socializar con la población objetivo y con los actores locales, los puntos centrales de la estrategia comunicacional.

En ese sentido, vale recordar que la estrategia comunicacional se debe efectivizar a través de procesos informativos previos a la ejecución del proyecto. Mejor dicho no se puede iniciar el proceso de ejecución del proyecto si previamente no se informa de que trata el mismo en su integralidad.

Estas reuniones informativas deben dar como resultado un amplio apoyo y adhesión al proyecto. Es decir, en esta etapa se debe lograr la licencia social.

El objetivo de la estrategia comunicacional y de los procesos de información es posicionar y garantizar la sostenibilidad social del proyecto en cada zona de intervención y se debe destacar para el logro de esa adhesión los beneficios que traerá ´su intervención en las zonas focalizadas.

Éstas reuniones también se deben realizar con los aliados estratégicos locales, vale decir; las organizaciones y gremios de los pescadores artesanales, los funcionarios de los gobiernos regionales y locales involucrados, el sector pesquero local, las organizaciones de las mujeres vinculadas a las actividades de pesquería artesanal.

El temario será el propuesto en el ítem anterior, poniendo especial énfasis en los impactos ambientales y sociales positivos y negativos que pueda generar el proyecto, así como las medidas de mitigación y/o corrección de tales impactos.

En ese sentido, cobra vital importancia socializar en esta etapa informativa la estrategia de complementariedad de ingresos familiares, a través del desarrollo de proyectos de ecoturismo, acuicultura, promoción y capacitación para la comercialización a través de ferias locales semanales y/o diarias, la restauración de bancos naturales de especies bentónicas, la implementación de un proyecto por zona de producción de bio-fertilizantes, a través de la transformación de desechos de pesquería y de acuicultura y su impacto positivo en el medio ambiente de las caletas de pescadores.

3.2.3. TERCERA ETAPA DE INTERVENCIÓN SOCIAL

Esta etapa se refiere al arranque y ejecución del proyecto. Durante esta etapa se prestará especial atención al cumplimiento estricto de las medidas de mitigación que se han propuesto, las mismas que deben establecerse por los operadores del proyecto de manera particular en un plan operativo ad hoc, con cronograma de ejecución.

El PROFONANPE, deberá ejercer un proceso de monitoreo y evaluación periódico de la ejecución del Plan de Manejo de Impactos y Riesgo Sociales, del Proyecto “Adaptación a los impactos del cambio climático en los ecosistemas marino costero y la pesquería del Perú”.

El equipo de especialistas del PROFONANPE, a través de la revisión de los reportes semestrales de ejecución del proyecto, debe ejercer el monitoreo y la supervisión del cumplimiento de las acciones de mitigación de impactos sociales propuestos en el Plan.

Ello significa, que los reportes semestrales de desempeño del proyecto, deben incluir una sección en la que se informe y/o reporte el avance en la ejecución de las actividades de mitigación social propuestas.

Si el equipo de monitoreo de PROFONANPE, lo determina oportuno y necesario, se realizarán visitas de campo para verificar in situ el desempeño del cumplimiento de las metas y/o indicadores por cada actividad propuesta.

Es importante recordar que el cumplimiento de las acciones de mitigación a parte de la descripción de la ejecución de las actividades, así como de la medición de los avances cuantitativos de los indicadores propuestos por cada actividad, debe contener elementos objetivos de verificación de que las actividades se cumplieron de acuerdo a la programación.

Si el equipo de monitoreo de PROFONANPE, determinara como parte de su trabajo, algún cuello de botella y/o problema en la ejecución de las acciones de mitigación propuesta en el Plan, procederá a sostener reuniones de trabajo evaluativas con los operadores del proyecto con la finalidad de re-direccionar, corregir, afinar, etc; la estrategia de intervención social en función de los hallazgos que determine el proceso de monitoreo y evaluación realizado.

Este proceso de retroalimentación operativa, será fundamental para validar la estrategia de intervención social y/o re-direccionarla o corregirla.

En buena cuenta, la evaluación de la estrategia de intervención social no es otra cosa que determinar si la estrategia de complementariedad de ingresos económicos implementada a través de las acciones de mitigación de impactos sociales está cumpliendo o no con su cometido de mitigar los efectos adversos en la merma momentánea de los ingresos familiares de los participantes del proyecto, así como de los afectados por restricción de uso de recursos por el establecimiento de áreas co-manejadas.

3.2.4 CUARTA ETAPA DE INTERVENCIÓN SOCIAL

La cuarta etapa corresponde al cierre del proyecto. En lo que respecta al desempeño de las medidas de mitigación de impactos sociales identificados en el proyecto; en esta etapa se debe elaborar un informe final de cierre de aplicación de las medidas de salvaguardas sociales provenientes de los reportes semestrales de ejecución de las acciones de mitigación propuestas en el Plan.

El contenido mínimo de este informe de cierre de aplicación de salvaguardas sociales debe ser el siguiente:

- Introducción
- Marco de referencia
- Evaluación del cumplimiento de las acciones de mitigación
- Problemas encontrados
- Aprendizajes provenientes de la experiencia
- Conclusiones

Este informe si fuera el caso debe presentarse a la fuente cooperante, con la finalidad de que se corrobore que el proyecto se ejecutó cumpliendo en lo posible las directrices operacionales ambientales y sociales exigibles.

3.3. TABLA DE INDICADORES Y DE DOCUMENTOS OBJETIVAMENTE VERIFICABLES

Para facilitar las acciones de monitoreo y evaluación del equipo técnico de PROFONANPE, a continuación se presenta una tabla de indicadores y de documentos objetivamente verificables indispensables de ser presentados en los reportes semestrales y en el informe final de cierre de aplicación de salvaguardas sociales del proyecto.

TABLA DE INDICADORES DE MEDIDAS SOCIALES DE MITIGACIÓN

MEDIDA	INDICADORES	DOCUMENTOS VERIFICABLES
Producto 1.1.1: **Adopción de métodos de pesca sostenibles para combatir aparejos de pesca no sostenibles basados en principios del EAF dirigidos a especies objetivo vulnerables al cambio climático**		
Actividad 1.1.1.1: Proceso de sensibilización a pescadores artesanales	N° de talleres de sensibilización N° de participantes N° de mujeres participantes	Lista de participantes PPT sobre el tema Fotos, videos o grabaciones magnetofónicas

Actividad 1.1.1.2: Financiamiento de la adquisición de los nuevos equipos	N° de pescadores con equipos nuevos N° de embarcaciones que adoptan la nueva práctica	Presupuestos del proyecto Gasto de inversión en equipos de pesca
Actividad 1.1.1.3: Apoyo a la comercialización de productos de pesquería	N° de pescadores capacitados y comercializando N° de mujeres capacitadas y comercializando N° de ferias realizadas Volúmenes de venta realizados Márgenes de utilidad respeto a la línea base. N° de gobiernos locales involucrados	Informes semestrales Paneles de publicidad Vídeos y fotografías
Producto 1.1.2: Establecimiento de áreas de manejo pesquero en co-manejo con comunidades beneficiarias para facilitar la restauración de bancos naturales.		
Actividad 1.1.2.1: Desarrollar alternativas económicas de generación de ingresos	N° de pescadores afectados por restricción de uso de recursos. N° de pescadores afectados implementando alguna iniciativa de generación de ingresos. N° de mujeres participando en las iniciativas de generación de ingresos	Padrones Listas de participantes en actividades de generación de ingresos Lista de participantes en los talleres de capacitación. PPT de capacitación Vídeos, fotos, grabaciones magnetofónicas.
Actividad 1.1.2.2: Implementar un plan de capacitación para la generación de capacidades de manejo de iniciativas de generación de ingresos	N° de planes de capacitación N° de pescadores afectados capacitados en gestión de iniciativas de generación de ingresos. N° de mujeres participando en las capacitaciones	Documento PPT Lista de participantes en los talleres de capacitación. Vídeos, fotos, grabaciones magnetofónicas.
Producto 1.2.1: Desarrollo de acuicultura sostenible a través de concesiones de pequeña escala		
Actividad 1.2.1.1: Priorización de beneficiarios para iniciativas de acuicultura	N° de pescadores que han adoptado nuevas prácticas participando en acuicultura. N° de pescadores afectados por restricción de uso de recursos participando en acuicultura.	Padrones de participantes Padrones de afectados por restricción de uso Verificación en campo Vídeos, fotografías, testimonios, etc.
Actividad 1.2.1.2: Implementar conversión de residuos de pesca y acuicultura en bio-fertilizantes	N° de pescadores que han adoptado nuevas prácticas participando en bio-fertilizantes. N° de pescadores afectados por restricción de uso de recursos participando en bio-fertilizantes. N° de mujeres participando en bio-fertilizantes	Padrones de participantes Padrones de afectados por restricción de uso Verificación en campo Vídeos, fotografías, testimonios, etc
Actividad 1.2.1.3: Promocionar la participación de las mujeres en actividades de acuicultura	N° de mujeres participando en acuicultura	Padrones de participantes
Actividad 1.2.1.4: Implementar procesos de información previos al inicio del proyecto	N° de talleres informativos previos N° de participantes hombres y mujeres N° de organizaciones de pescadores participantes.	Documento PPT Lista de participantes en los talleres de capacitación.

	N° de funcionarios de gobiernos locales participando	Vídeos, fotos, grabaciones magnetofónicas
Producto 1.2.2: Creación de empresas de ecoturismo.		
Actividad 1.2.2.1: Gestionar la implementación del programa CUNA MAS	N° de mujeres participando en ecoturismo N° de pescadores participando en ecoturismo. N° de niños de familias de pescadores beneficiarios en programa CUNA MAS.	Fotos del local en funcionamiento Fotos de niños de pescadores Videos, etc. Informes institucionales del programa CUNA MAS. Informes del proyecto
Actividad 1.2.2.2: Vacaciones útiles con la intervención de gobiernos locales	N° de niños de familias de pescadores beneficiarios asistiendo a cursos de vacaciones útiles	Fotos del local en funcionamiento Fotos de niños de pescadores Videos, etc. Informes de gobiernos locales Informes del proyecto
Producto 1.2.3: Mejora de las capacidades de comercialización de las pesquerías artesanales		
Actividad 1.2.3.1: Apoyo a la comercialización de productos de pesquería	N° de pescadores capacitados y comercializando N° de mujeres capacitadas y comercializando N° de ferias realizadas Volúmenes de venta realizados Márgenes de utilidad respeto a la línea base. N° de gobiernos locales involucrados	Informes semestrales Paneles de publicidad Vídeos y fotografías
Producto 2.1.2: Establecimiento de programas de vigilancia ambiental en áreas piloto en coordinación con actores locales		
Actividad 2.1.2.1: Implementar un sistema de monitoreo participativo	N° de pescadores locales participando en sistema de monitoreo participativo N° de mujeres participando en sistema de monitoreo participativo N° de pescadores locales capacitados participando en sistema de monitoreo participativo N° de mujeres capacitadas participando en sistema de monitoreo participativo	Padrón de participantes Informes de monitoreo participativo Listas de participantes en los talleres de capacitación Videos, fotografías, grabaciones magnetofónicas, etc.

3.4. ENFOQUES DE LAS ESTRATEGIAS DE INTERVENCIÓN SOCIAL

Las estrategias de intervención social se sustentan en los siguientes enfoques:

Enfoque de Equidad de género, se debe promocionar la participación de mujeres y hombres en igualdad de oportunidades, es fundamental para lograr mejores niveles en la gestión del proyecto, incorporar en las actividades a las mujeres, en especial en las actividades de generación de ingresos complementarios familiares como ecoturismo, acuicultura, producción de bio-fertilizantes, etc.

Enfoque de interculturalidad, debido a que en las zonas focalizadas para la intervención existe una población heterogénea, por tanto será imprescindible para el proyecto recoger sus percepciones, opiniones y prácticas culturales en el uso de recursos marinos.

Enfoque de Participación Ciudadana, el objetivo es promover la participación de la ciudadanía que vive en el área de influencia del proyecto, en los procesos de toma de decisiones. Se trata de incorporar canales adecuados que aseguren una participación informada activa y consciente de los distintos grupos de interés. La participación informada de la ciudadanía contribuirá a fortalecer mecanismos de control social y corresponsabilidad frente al proyecto.

3.5. CRITERIOS DE ELEGIBILIDAD DE LAS PERSONAS AFECTADAS POR LA INSTALACIÓN DE BANCOS NATURALES

Los criterios de elegibilidad que se propone en esta sección, se refiere a los pescadores que no son beneficiarios del proyecto pero que por el establecimiento de áreas de con-manejo para acuicultura y restauración de bancos naturales, pueden verse afectadas en la restricción de uso de recursos naturales.

Son elegibles las personas cuya forma de vida depende del uso de recursos naturales marinos, cuyo uso se verá afectado por el establecimiento de bancos naturales de especies bentónicas.

La afectación del uso de los recursos no es impuesta por el Estado, sino que es el resultado de una negociación con las personas que viven y/o hacen uso tradicional de las zonas marinas en las que se establecerán las áreas en co-manejo para restauración de los bancos naturales y acuicultura. La población debe dar su consentimiento formal a las actividades del proyecto, conociendo que habrá restricciones de uso de recursos en los bancos naturales. Asimismo, deben ser informadas de que por esa afectación, tienen la posibilidad de participar en las iniciativas económicas que promociona el proyecto como parte de su estrategia de generación de ingresos complementarios a modo de mecanismo de compensación.

3.6. MECANISMO PARA QUEJAS

Para un desempeño social pertinente, será importante que se implementen mecanismos de atención de posibles quejas que las comunidades locales puedan presentar, así como diseñar mecanismos adecuados para la resolución de conflictos que puedan generarse por las diferentes percepciones en relación al tipo de impacto ambiental o social y a la modalidad de mitigación a efectuarse.

Para ello es importante generar espacios para desarrollar formas consensuadas de negociación donde se procesen las quejas y las demandas locales, por ejemplo la conformación de mesas de diálogo, rondas de negociaciones, y los comités de gestión y otros que cuenten con la representación autorizada de los organismos competentes y de las propias organizaciones locales.

PERÚ | Ministerio del Ambiente

MINISTERIO DEL AMBIENTE
DVMDERN
FOLIO: 2

"Decenio de las Personas con Discapacidad en el Perú"
"Año de la Diversificación Productiva y del Fortalecimiento de la Educación"

Lima, 28 ENE. 2015

Letter N°001 -2015- MINAM/DM/VZCH

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

Subject: Endorsement for "Adaptation to the impacts of Climate Change on Peru's Coastal Marine Ecosystem and Fisheries"

In my capacity as designated authority for the Adaptation Fund in Peru, I confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Peru.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by our National Implementation Entity – PROFONANPE and executed by the Ministry of Production.

Sincerely,

Viviana Zaldívar
Adviser Ministry of the Environment
Designated Authority

/LA

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