ADAPTATION FUND

AFB/PPRC.14/9
7 March 2014

Adaptation Fund Board
Project and Programme Review Committee
Fourteenth meeting
Bonn, Germany, 18-19 March 2014

Agenda Item 6 f)

PROPOSAL FOR INDIA (4)

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 44 that small-size adaptation project and programme proposals, i.e. those that request funding not exceeding US$ 1 million, would undergo an expedited one-step approval process. In this process, the proponent would directly submit a fully-developed project proposal which would undergo technical review by the secretariat, be reviewed by the PPRC, and ultimately require the Board's approval.

2. The Templates approved by the Board (OPG, Annex 4) provide a project and programme proposal template. For the review of a fully-developed proposal, the following five criteria are applied when reviewing the project:

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

3. 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.

4. 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.

5. 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 8 April 2010.

6. 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.

7. The following fully-developed project titled "Conservation and Management of Coastal Resources as a Potential Adaptation Strategy for Sea Level Rise" was submitted by the National Bank for Agriculture and Rural Development (NABARD), which is the National Implementing Entity of the Adaptation Fund for India. This is the first submission of the proposal, using the one-step approval process. The submission was received by the secretariat in time to be considered in the twenty-third Board meeting.

8. The secretariat carried out a technical review of the project proposal, assigned it the diary number IND/NIE/Coastal/2014/1, and completed a review sheet. In accordance with a request to the secretariat made by the Board in its tenth meeting, the secretariat shared this review sheet with NABARD, and offered it the opportunity of providing responses before the review sheet was sent to the PPRC.

9. 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

India – Conservation and Management of Coastal Resources as a Potential Adaptation Strategy for Sea Level Rise
Implementing Entity: *NABARD*
Project/Programme Execution Cost: USD 52,450
Total Project/Programme Cost: USD 544,333
Implementing Fee: USD 46,268
Financing Requested: USD 590,602

Programme Background and Context:

The proposed project is planned to take place in Krishna mangrove wetlands area of Andra Pradesh, India. The overall objective of the proposed project is to enhance adaptive capacities of the local community and other stakeholders by strengthening their institutional mechanism, restoration and management of coastal resources and building livelihood assets. The project is planning to assess the baseline situation and monitor the vulnerability due to predicted impact of climate change on natural and social systems and build on the current coping mechanisms and adaptive strategies. It would also train and build the adaptive capacities and climate resilient livelihood options for the stakeholders. It would restore 200 ha of degraded mangroves along the Krishna estuary, and develop 50 ha of Integrated Mangrove Fishery Farming System (IMFFS) in the Nali Krishna district. The project is proposed to be executed by M. S. Swaminathan Research Foundation (MSSRF), supported by Praja Pragathi Seva Sangam (PPSS). MSSRF has worked in the region for several years and restored more than 450 ha of degraded mangroves. PPSS is a local non-governmental organization which has collaborated with MSSRF on coastal area natural resources management since 2007.

Component 1: Stakeholder mobilization and organization (USD 3,333)

Village level institution is the local institution that is established at the village / hamlet level to plan, implement and monitor project activities. This component would conduct orientation meetings on project to leaders, women, men and youth in three project villages (Sorlagondi, Nali and Basavanipalem) and sensitize them on gender and different approaches to women development and empowerment. It would also organize exposure visits to the community to successful participatory resources management projects, conduct participatory rural appraisal (PRA) to understand village situation and major concerns, establish village level institutions, conduct stakeholder analysis, collect and analyse secondary data relating to sea level rise, and conduct a vulnerability assessment.

Component 2: PRA and entry point activities (USD 10,000)

This component would identify some of the major concerns of the villagers through PRA, prioritize them by women and men, and provide technical, institutional and partial financial support to solve one or two such concerns to build rapport and trust. Through this exercise, the capacity, network and interest of the community in developmental activities would be assessed. Finally, the community would be mobilized to contribute in cash and to kind to solve prioritized concerns.

Component 3: Training and capacity building for men and women of local community and other stakeholders on mangrove restoration techniques and management of coastal resources to enhance their adaptive capacities (USD 15,000)

In this component, the community would be trained on mangrove silviculture and IMFFS farming practices. This would be done by organizing orientation workshops to women groups, youth from fishing community, traditional and panchayat leaders and to managerial and field staff of the Forest Fisheries, Rural Development and Revenue Departments and grassroots NGOs. The workshops would focus on climate change and sea level rise and their impacts, role of mangroves and integrated mangrove-fishery farming system in increasing adaptive capacity to sea level rise. The component would also organize hands-on training on mangrove restoration techniques like mangrove nursery, planting and management and on mariculture practices.

Component 4: Restoration of degraded mangroves in 200 ha along the Krishna estuary (USD 106,950)

Restoration of degraded mangroves would be done through canal method, in which nursery raised saplings would be planted in the restoration site, using multiple species available in the area. The component would first assess the suitability of sites for mangrove restoration, then prepare a mangrove nursery with different mangrove species, dig canals for tidal flow, plant mangrove saplings in the restored area, replace saplings as necessary, and de-silt canals for free flow of water.

Component 5: Identification of areas and develop and demonstrate replicable models of IMFFS in 50 ha in Nali Krishna district (USD 303,267)

Integrated Mangrove Fishery Farming System (IMFFS) is a system which combines mangrove and aquaculture. Implementing such a system is predicted to increase income of artisanal fishermen and provide opportunities to diversify livelihood activities. Bunds and mangroves planted in the bunds would act as barriers against storm surges. This component would assess the suitability of sites for developing IMFFS through biophysical investigation, prepare designs and construct farms, plant mangrove and halophytes, and monitor their performance. The aquaculture activities in this component would include participatory selection of species for culturing, purchasing fish seed /prawn from hatcheries or collecting them from wild, acclimatizing fish/prawn seeds in the farm happa, releasing acclimatized fish seeds into the farm, monitoring water quality and survival and growth performance of fish, and harvesting fish and conducting a cost benefit analysis.

Component 6: Knowledge Management (USD 53,333)

Knowledge products such as brochures, pamphlets on best practices for climate change adaptation would be developed for dissemination. Resource materials would be developed in the local language to increase awareness about climate change, sea level rise and role of mangroves and IMFFS in increasing community adaptive capacity. The component would also include participatory monitoring of project activities, involving the community, and document best practices of adaptation as well as the process. A national seminar and workshops would be arranged.

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: SMALL SIZE PROJECT

Country/Region: **India**
Project Title: **Conservation and Management of Coastal Resources as a Potential Adaptation Strategy for Sea Level Rise**
AF Project ID: **IND/NIE/Coastal/2014/1**
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): **530,182**
Reviewer and contact person: **Mikko Ollikainen**
Co-reviewer(s): **Christian Severin**
IE Contact Person: **Shri. Sanjay Kumar Dora**

Review Criteria	Questions	Comments on 3 February 2014	Comments on 20 February 2014
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. However, the endorsement letter does not follow the template (http://www.adaptation-fund.org/page/proposal-submission-materials) as it does not identify the executing entities for the proposed project. **CAR1:** Please provide an updated endorsement letter identifying the executing entity or entities for the project.	**CAR1:** Addressed. A revised endorsement letter has been provided.

	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?	Requires clarification. An overall comment: The information on the project components in the section II A that should describe them is scarce and much relevant information has been included in other sections such as II I instead. **CR1:** Please provide the logical structure of the proposed project, and technical contents of each component and activity in section II A. The proposal mostly only mentions sea level rise as a climate change consequence that would have relevance to coastal protection, while the impacts of climate change on extreme weather events such as cyclones and storm surges have not been discussed in detail. **CR2:** Please analyse and explain in detail, based on climate scenarios, the expected changes to extreme weather events in the project area, and reflect that in the design of the project. Please analyse and present the protective measures such as rehabilitated mangrove and aquaculture systems with a view of how they can effectively withstand and protect against future weather events, and thus be a viable solution.	**CR1:** Mostly addressed. However, the arrangement of components in the text does not correspond to the components and financing table. **CR2:** Not adequately addressed. The document continues to refer to past and current situation with regard to the extreme weather events, and does not quantify expected future changes. The short statement on expected increase in severity of cyclone and storm surge (p. 5) is not backed up by a reference to any specific climate scenario.

		The proposal refers indirectly to the deteriorated status quo of some of the coastal features, and effects such as soil salinity but does not provide the reasons that have led to those changes, e.g. whether unsustainable agricultural practices and poor management have contributed to the situation. **CR3:** Please provide an analysis of the processes that have led to the deteriorated status of the mangrove and aquaculture systems and explain how the project would halt those processes in a sustainable way. **CR4:** Please explain what led to the "enormously impactful" decline in prawn farming and how the project would address those reasons, as relevant. **CR5:** Please explain clearly and in more detail what the land tenure of the mangrove to be rehabilitated is.	**CR3:** The proposal explains how its activities would aim to halt the consequences of past mangrove degradation by actively reforesting. The proposal also mentions that the plan is that the target area would be granted Coastal Regulation Zone status. However, it does not explain how it would prevent such degradation from continuing in the future. **CR4:** Partial explanation has been given in the response sheet but not in the main proposal. Further, the issue of collapse of the market for shrimp has not been addressed. **CR5:** Partial explanation has been given in the response sheet but not in the main proposal. Further, it is unclear what the land tenure security beyond the initial four years is, and what kind of assurances for longer tenure can be secured.

	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?	The proposed project has the potential of providing such benefits. **CR6:** Please provide more information on the target community, including total number of people, people specifically targeted by this project, the existing livelihoods, and any vulnerable groups within the community. Please also include a map identifying the target villages. The proposal mentions (p. 28) that individual farmers would provide their land for the integrated mangrove fishery farming system. **CR7:** Please explain, whether the farmers have already expressed willingness to provide their land to the mangrove fishery farming system, how their user rights would be safeguarded during the project, and if necessary how they would be compensated.	**CR6:** Addressed. **CR7:** Addressed but not included in the proposal itself: the aquaculture farmers in the Nali village have expressed willingness, and their user rights will be safeguarded.
	4. Is the project / programme cost effective?	Overall, the proposed project seems cost effective. However, there is barely any comparison to alternative options. **CR8:** Please provide a tabular comparison of the chosen option and the alternative options, with respect to the coastal protection function and other benefits.	**CR8:** Mostly addressed. However, in addition to the values of benefits, the costs of the different options should be estimated.

	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?	**CR9:** In section II C, please explain how the proposed project would be consistent with the State Action Plan on Climate Change for Andra Pradesh, and with the five-year plan.	**CR9:** Addressed.
	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund??	Requires clarification. The introductory text of the relevant section of the project proposal refers to the Coastal Regulation Zone (CRZ) rules. However, the table that follows does not refer to any specific regulations or rules. **CR10:** Please elaborate how the project would meet the applicable requirements of the CRZ and in particular, which type of environmental permit or plan would be necessary.	**CR10:** Addressed.

	7. Is there duplication of project / programme with other funding sources?	The proposal refers to pilot scale programme implemented with support from GIZ. **CR11:** Please explain what the main outcomes of the GIZ funded programme have been and how the proposed project would be able to utilize and build on those benefits. Apart from the GIZ funded pilot programme, the proposal has not included information on other recent or on-going adaptation projects in Andra Pradesh which include, for example, the AdaptCap project financed by the European Commission and also dealing with disaster risk reduction, the ClimaAdapt programme supported by Norway, and the Case study on the impacts of climate change on shrimp farming in Andra Pradesh produced by Network of Aquaculture Centres in Asia-Pacific. **CR12:** Please outline other climate change adaptation interventions in Andra Pradesh, and explain whether there are possibilities for synergies and drawing on their lessons (both positive and negative).	**CR11:** Partly addressed. The proposal refers to some immaterial lessons learned from the GIZ project. However, it does not explain how that project has achieved its stated objectives a) to build the technical and participatory management capacity of the community and local self-government to ensure sustainable coastal livelihood in the mangrove areas, and b) to establish access to mangrove and related fishery resources and fishery based livelihood increased, which seem to be highly relevant for the proposed project, and whether there are development outcomes from these objectives that the proposed project could make use of. **CR12:** Partly addressed. However, the proposal should explain also how it would plan to coordinate with the other initiatives during project implementation.
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Yes. However, the proposal does not explain whether and how it would use information generated by earlier work in the area. **CR13:** Please explain whether the project is able to draw on knowledge generated by earlier projects and studies.	**CR13:** Addressed.

	9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations?	Yes, and it has involved women among other stakeholders. It is unclear whether there are vulnerable sub-groups and how they have been involved (cf. CR below). **CR14:** Please explain how the community members will be consulted or will be able to participate in project decision-making during project implementation.	**CR14:** Addressed.
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	As noted above, it is not possible to assess the justification of the proposed activities and their funding as the climate change reasoning based on future trends and their impacts on the coastal sector have not been comprehensively explained.	
	11. Is the project / program aligned with AF's results framework?	Broadly, yes. However, the alignment table is not filled in correctly (cf. CR below).	
	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Requires clarification. The proposal states that the project would provide fish and other inputs only for the first year, and that for subsequent years, the farmers will be encouraged to contribute but information is scarce. **CR15:** Please explain whether the beneficiaries have expressed commitment to contribute during later project years, whether there is experience of such model working from the state, and which kinds of mechanisms to engage the villagers would be put in place to support commitment. The strategy towards replication and	**CR15:** Not addressed. The proposal still does not explain whether there is any guarantee that the beneficiaries would be willing to contribute as proposed.

		scaling up has not been well elaborated: it is not clear how the project would include active measures to do so. **CR16:** Please explain in more detail, which kind of active steps the project would have to promote replication and scaling up of its activities at larger scale.	**CR16:** Partly addressed. However, in addition to the written materials, the proposal should consider arranging additional exposure visits for additional communities to learn from the results of this project.
	13. Does the project / programme provide an overview of environmental and social impacts / risks identified?	Requires clarification. The project refers to fair and equitable access but does not elaborate on how this is achieved. Also, it does not explain how the investment in terms of provision of land by farmers is fair and equitable. **CR17:** Please elaborate how investments made by beneficiaries, and benefits, are expected to be fair and equitable. It is understood that the whole target community is marginalized but it is unclear whether there are certain more vulnerable sub-groups within the community. **CR18:** Please clarify whether the proposal has assessed the risk of potential impacts on marginalized and vulnerable groups (and/or indigenous peoples if relevant) and how it plans to mitigate and manage such risks. **CR19:** Please clarify whether the project would relocate people's livelihoods and if so, whether those people have consented to it and how they would be compensated.	**CR17:** Partly addressed. It remains partly unclear whether the proposed measures to ensure equitable distribution of benefits can be achieved, including to the landless community members. **CR18:** Addressed. **CR19:** Addressed.

Resource Availability	1. Is the requested project / programme funding within the cap of the country?	Yes.	
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	No: the fee is currently at ca. 9.3%. **CAR2:** Please decrease the IE Management fee to remain at maximum 8.5% of the project budget (excluding the fee itself).	**CAR2:** Addressed.
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes.	**CAR3:** With the revisions, the execution cost in the revised budget is at 9.64% and would need to be reduced to be below the cap.
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?	No. The proposal seems to confuse implementation and execution roles. As NABARD is the accredited implementing entity for this project, its roles in implementation should be described. The other entities would be executing entities operating under the supervision of NABARD. All executing entities should be mentioned on the title page, and should be introduced in detail in the management section. **CR20:** Please describe the roles and responsibilities of NABARD as the Implementing Entity and those of all the executing entities (such as MSSRF and PPSS). The implementation and execution arrangements could be made clearer by providing a detailed organization chart and more information on each entity such as whether it is governmental or non-governmental in nature and whether there are any existing institutional relationships between entities.	**CR20:** Addressed.

	2. Are there measures for financial and project/programme risk management?	For risk management, the proposal should consider a wider array of potential risks, related not only to the technical aspects but also e.g. to institutional arrangements, capacities, attitudes, etc. **CR21:** Please provide a tabular presentation of identified risks, the perceived level of those risks, and the planned mitigation measures. **CR22:** Please describe the role of NABARD in risk management in the project.	**CR21:** Addressed. **CR22:** Addressed.

	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? Does the proposal describe how the Implementing Entity will ensure that executing entities are fully aware of their responsibilities with regards to the provisions of the Environmental and Social Policy of the Adaptation Fund, including the promotion of human rights, where applicable, and how the executing entities and direct beneficiaries are made aware of the grievance mechanism available in the country and of the complaint handling mechanism of the Fund, in case of non-compliance?	Requires clarification. As noted above, some potential environmental and social risks need to be further clarified. Even if there would be no identified environmental and social risks, there should be mechanisms to deal with such should they emerge. **CR23:** Please explain how environmental and social risks would be managed, in line with the Environmental and Social Policy of the Fund. **CR24:** Please clarify how NABARD would ensure that executing entities are fully aware of their responsibilities with regards to the provisions of the Environmental and Social Policy of the Adaptation Fund, including the promotion of human rights, where applicable, and how the executing entities and direct beneficiaries would be made aware of the grievance mechanism available in the country and of the complaint handling mechanism of the Fund, in case of non-compliance.	**CR23:** Addressed. **CR24:** Addressed.
	4. Is a budget on the Implementing Entity Management Fee use included?	No. **CR25:** Please provide a budget (breakdown) on the Implementing Entity Fee use.	**CR25:** Addressed.

	5. Is an explanation and a breakdown of the execution costs included?	No. **CR26:** Please provide a breakdown of execution costs.	**CR26:** Addressed.
	6. Is a detailed budget including budget notes included?	Yes. However, it should be arranged according to the components and outputs of the project. **CR27:** Please revise the budget so that it conforms to the arrangement of components and outputs of the project.	**CR27:** Addressed.
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators?	There is basic information on monitoring and evaluation but it is not sufficient. **CR28:** Please explain clearly which reports would be produced during the project and by whom, in accordance with Adaptation Fund policies (please refer to the document "Instructions for Preparing a Request for Project or Programme Funding" and references therein. **CR29:** Please provide a budget for the M&E plan.	**CR28:** Addressed. **CR29:** Addressed.
	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. **CR30:** When providing a breakdown of the IE Fee use, please include supervision of the M&E function.	**CR30:** Addressed.

	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	No: the alignment table has been filled in incorrectly. **CR31:** Please fill the alignment table in accordance with the document "Instructions for Preparing a Request for Project or Programme Funding" and references therein. **CR32:** In the results framework, please include baselines, and wherever possible, absolute rather than relative targets.	**CR31:** Not addressed. The alignment table is still incorrectly filled in and does not provide the necessary alignment information. **CR32:** Not addressed. The results framework does not include the necessary information.
	10. Is a disbursement schedule with time-bound milestones included?	Yes.	

Technical Summary	The overall goal of the proposed project is to enhance adaptive capacities of the local community and other stakeholders by strengthening their institutional mechanism, restoration and management of coastal resources and building livelihood assets. To do this the project would (1) assess the baseline situation and monitor the vulnerability due to predicted impact of climate change on natural and social systems and build on the current coping mechanisms and adaptive strategies; (2) train and build the adaptive capacities and climate resilient livelihood options for the stakeholders; (3) establish mangrove bio-shields for ecological and livelihood security of the coastal community; and (4) develop and demonstrate replicable models of seawater based agro-aqua farming system as a potential means to adapt to coastal inundation due to sea level rise triggered by climate change. The initial technical found that the endorsement letter provided by the Designated Authority did not follow the template available at (http://www.adaptation-fund.org/page/proposal-submission-materials) as it did not identify the executing entities for the project. In addition, the requested Implementing Entity Management Fee was found to be above the 8.5% limit. Therefore, the following two Corrective Action Requests were made. **CAR1:** Please provide an updated endorsement letter identifying the executing entity or entities for the project. **CAR2:** Please decrease the IE Management fee to remain at maximum 8.5% of the project budget (excluding the fee itself). In addition, the initial review makes the following clarification requests: **CR1:** Please provide the logical structure of the proposed project, and technical contents of each component and activity in section II A. **CR2:** Please analyse and explain in detail, based on climate scenarios, the expected changes to extreme

	weather events in the project area, and reflect that in the design of the project. Please analyse and present the protective measures such as rehabilitated mangrove and aquaculture systems with a view of how they can effectively withstand and protect against future weather events, and thus be a viable solution. **CR3:** Please provide an analysis of the processes that have led to the deteriorated status of the mangrove and aquaculture systems and explain how the project would halt those processes in a sustainable way. **CR4:** Please explain what led to the "enormously impactful" decline in prawn farming and how the project would address those reasons, as relevant. **CR5:** Please explain clearly and in more detail what the land tenure of the mangrove to be rehabilitated is. **CR6:** Please provide more information on the target community, including total number of people, people specifically targeted by this project, the existing livelihoods, and any vulnerable groups within the community. Please also include a map identifying the target villages. **CR7:** Please explain, whether the farmers have already expressed willingness to provide their land to the mangrove fishery farming system, how their user rights would be safeguarded during the project, and if necessary how they would be compensated. **CR8:** Please provide a tabular comparison of the chosen option and the alternative options, with respect to the coastal protection function and other benefits. **CR9:** In section II C, please explain how the proposed project would be consistent with the State Action Plan on Climate Change for Andra Pradesh, and with the five-year plan. **CR10:** Please elaborate how the project would meet the applicable requirements of the CRZ and in particular, which type of environmental permit or plan would be necessary. **CR11:** Please explain what the main outcomes of the GIZ funded programme have been and how the proposed project would be able to utilize and build on those benefits. **CR12:** Please outline other climate change adaptation interventions in Andra Pradesh, and explain whether there are possibilities for synergies and drawing on their lessons (both positive and negative). **CR13:** Please explain whether the project is able to draw on knowledge generated by earlier projects and studies. **CR14:** Please explain how the community members will be consulted or will be able to participate in project decision-making during project implementation. **CR15:** Please explain whether the beneficiaries have expressed commitment to contribute during later project years, whether there is experience of such model working from the state, and which kinds of mechanisms to engage the villagers would be put in place to support commitment. **CR16:** Please explain in more detail, which kind of active steps the project would have to promote replication and scaling up of its activities at larger scale. **CR17:** Please elaborate how investments made by beneficiaries, and benefits, are expected to be fair and equitable. **CR18:** Please clarify whether the proposal has assessed the risk of potential impacts on marginalized and

	vulnerable groups (and/or indigenous peoples if relevant) and how it plans to mitigate and manage such risks. **CR19:** Please clarify whether the project would relocate people's livelihoods and if so, whether those people have consented to it and how they would be compensated. **CR20:** Please describe the roles and responsibilities of NABARD as the Implementing Entity, and those of all the executing entities (such as MSSRF and PPSS). This could be made clearer by providing an organization chart. **CR21:** Please provide a tabular presentation of identified risks, the perceived level of those risks, and the planned mitigation measures. **CR22:** Please describe the role of NABARD in risk management in the project. **CR23:** Please explain how environmental and social risks would be managed, in line with the Environmental and Social Policy of the Fund. **CR24:** Please clarify how NABARD would ensure that executing entities are fully aware of their responsibilities with regards to the provisions of the Environmental and Social Policy of the Adaptation Fund, including the promotion of human rights, where applicable, and how the executing entities and direct beneficiaries would be made aware of the grievance mechanism available in the country and of the complaint handling mechanism of the Fund, in case of non-compliance. **CR25:** Please provide a budget (breakdown) on the Implementing Entity Fee use. **CR26:** Please provide a breakdown of execution costs. **CR27:** Please revise the budget so that it conforms to the arrangement of components and outputs of the project. **CR28:** Please explain clearly which reports would be produced during the project and by whom, in accordance with Adaptation Fund policies (please refer to the document "Instructions for Preparing a Request for Project or Programme Funding" and references therein. **CR29:** Please provide a budget for the M&E plan. **CR30:** When providing a breakdown of the IE Fee use, please include supervision of the M&E function. **CR31:** Please fill the alignment table in accordance with the document "Instructions for Preparing a Request for Project or Programme Funding" and references therein. **CR32:** In the results framework, please include baselines, and wherever possible, absolute rather than relative targets. The proponent submitted a revised version of the proposal. The final technical review found that the proponent had addressed the two CARs and most of the CRs. However, the budget revision had led to increase of the execution cost, bringing it above the maximum limit of 9.5%. In addition, a number of CRs still require revision or additional information. These include: - The proposal should explicitly relate the proposed activities to specific scenarios of future climate in the target region, preferably using downscaled general circulation models. - The proposal should explain how it would prevent mangrove degradation from continuing in the future, and it should include in the comparison of alternative options also comparison of their associated costs - The proposal should explain more clearly how the project would ensure equitable distribution of benefits

	and commitment of beneficiaries to voluntarily contribute to the project. - The proposal should further elaborate on how it would avoid duplication and build upon an earlier GIZ funded project which has worked in the same state and very similar themes. Also coordination arrangements between the proposed project and other mentioned projects would need to be elaborated. - The proposal should include a complete results framework and an alignment framework. - The proposal should also include in the proposal information on land tenure, willingness of villagers to make their land available for the project, and the issue of collapse in shrimp production: partial information on these areas had been provided informally in an accompanying response sheet but not in the proposal itself.
Date:	20 February 2014

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:	SMALL - SIZED PROJECT
Country/ies:	INDIA
Title of Project/Programme:	CONSERVATION AND MANAGEMENT OF COASTAL RESOURCES AS A POTENTIAL ADAPTATION STRATEGY FOR SEA LEVEL RISE
Type of Implementing Entity:	NIE
Implementing Entity:	NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT (NABARD)
Executing Entity/ies:	M. S. SWAMINATHAN RESEARCH FOUNDATION (MSSRF)
Amount of Financing Requested:	US $ 590602 (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.

Background

Climate change has become a serious issue that had undermined the drive for sustainable development. Since the industrial revolution, the mean surface temperature of Earth has increased an average of 1° Celsius per century due to accumulation of greenhouse gases in the atmosphere. Furthermore, most of this change has occurred in the past 30 to 40 years, and the rate of increase is accelerating, with significant impacts both at a global as well as regional and local levels. While it remains important to reduce greenhouse gas emissions and reverse climate change in the long-run, many of the impacts of climate change are already in evidence. As a result, governments, communities and civil society are increasingly concerned with anticipating the future effects of climate change while searching for strategies to mitigate, and adapt to, it's current effects. A large portion of the population along the coastline is dependent on climate-dependent activities such as marine fisheries and agriculture. Sea level changes and occurrence of extreme events such as cyclones and storm surges are of considerable significance for India as these adversely impact human populations living in coastal regions and on islands as well as the sensitive ecosystems such

as the mangroves *(*INCCA, 2010[1]*)*. The coastal areas become highly vulnerable to the climate change for which this programme is designed to link ecological rehabilitation of degraded mangroves, utilization of saline lands for livelihood development, and preparing the communities for facing the climate change challenges through adaptation measures.

The mean sea-level rise along the Indian coasts is estimated to be about 1.3 mm/year on an average *(*INCCA, 2010[1]*)*. The livelihood security of the coastal communities and ecological security of the coastal zones of India are under stress due to high population density, urbanization, industrial development, high rate of coastal environmental degradation and frequent occurrence of cyclones and storms. This made more than 100 million people, who directly or indirectly depend on coastal natural resources for their livelihood. The problem will be further aggravated by increase in sea level rise due to climate change. It has been projected that along the Indian coast, sea level would rise by 15 to 38 cm by 2050 and 46 to 59 cm by 2100 due to climate change (NATCOM - India's 2nd National Communication to UNFCCC). The cyclonic disturbances are 5 to 6 times more frequent over the Bay of Bengal than over the Arabian Sea. An analysis of the cyclone data for the last 118-year period (1891-2008) by Niyas et al (2009)[2] shows that out of the total 618 cyclones, 485 (i.e. 78%) formed over the Bay of Bengal, while 133 (i.e. 22%) formed over the Arabian Sea (INCCA, 2010[1]). The most vulnerable areas along the Indian coastline are Kutch region of Gujarat, deltaic regions of Ganges in West Bengal, Cauvery in Tamil Nadu, Krishna and Godavari in Andhra Pradesh, coastal area of Mumbai, southern Kerala and Lakshadweep islands. It is also indicated that the predicated sea level rise would lead to inundation of sea water in about 5700 km^2 of land along the coastal states of India and nearly 7 million coastal families could be directly affected due to such inundation. Farming families, fishermen, aqua farmers and coastal inhabitants will bear the full force of these impacts through less stable livelihoods, changes in the availability and quality of fish, and rising risks to their health, safety and homes. Many fisheries-dependent communities already live a precarious and vulnerable existence because of poverty, lack of social services and essential infrastructure. The fragility of these communities is further undermined by overexploited fishery resources and degraded ecosystems.

[1] Indian Network for Climate Change Assessment (INCCA) 2010 Climate change and India: a 4x4 assessment - A sectoral and regional analysis for 2030s Published by Ministry of Environment & Forests, Government of India pp – 160.

[2] Niyas N T, Srivastava A K and Hatwar H R 2009 Variability and trend in the cyclonic storms over north Indian Ocean; *Met. Monograph* **3** 35

Vulnerability of Andhra Pradesh coast to climate change

The east coast of India is more vulnerable than the west coast, because the former is low-lying and more prone to the occurrence of cyclones than the latter (Shetye et al., 1990[3]; INCCA 2010[4]). The coast of Andhra Pradesh is known for its frequent tropical cyclones and associated floods and tidal surges causing loss of life and property in the region. In the last decade alone, the state experienced 18 devastating storms causing enormous loss of life and property. The atmospheric temperature is also increasing. The year 2007 was the fourth warmest year in Andhra Pradesh on record since 1901 after, 2002, 2006 and 2003. During 2009, heat wave conditions also prevailed over parts of coastal Andhra Pradesh during the second fortnight of May. Even in October 2009, temperatures were soaring when there should be a chill in the air. The increase in average earth temperature and corresponding increase in sea surface temperature resulting in volumetric expansion of sea surface leading to build up of more frequent and intensified cyclonic activity and associated storm surges in the coastal zone leading to salinization of the area affecting land and water productivity.

Climate change and associated sea level rise is yet another major environmental concern of today. The Sea Level Rise is likely to further intensify storm surges, besides accelerating shoreline erosion and other problems like seawater intrusion and damage to coastal infrastructure, thereby making the coast of Andhra Pradesh much more vulnerable in the future. About 43% of the Andhra Pradesh coast is considered at very high risk. It is predicted that if the sea level rises by ~0.6 m, it will displace more than 1.29 million people living within 2 m elevation in 282 villages[5]. The inhabitants of these villages are mainly hut-dwelling fishing communities who are highly vulnerable in socio-economic terms as well. Further, there is every possibility of increased storm surges that would reach much further inland than at present with a rise in sea level. Any increase in the intensity and/or frequency of extreme climatic events can hamper the coastal community.

As indicated in the State Action Plan on Climate Change of Andhra Pradesh, coast between Ongole and Machilipatnam is recognized as vulnerable to high storm surges. The severity of cyclone and storm surge is expected to increase as a consequence of climate change.

---

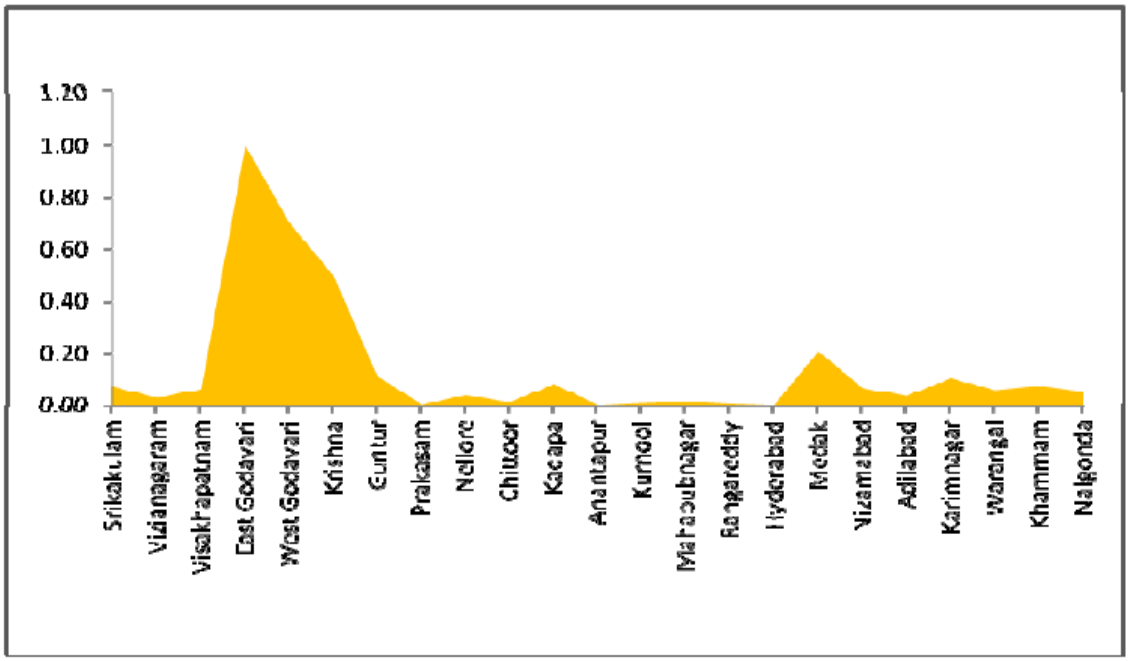
[3]Shetye S R, Gouveia A, Shenoi S S C, Michael G S, Almeida A and Santanam K 1990 Hydrography and circulation off the west coast of India during the southwest monsoon 1987; *Deep-Sea Res.* 48 359 -378

[4] Indian Network for Climate Change Assessment (INCCA) 2010 Climate change and India: a 4x4 assessment - A sectoral and regional analysis for 2030s Published by Ministry of Environment & Forests, Government of India pp – 160.

[5] Nageswara Rao, K., Subraelu, P., Venkateswara Rao, T., Hema Malini, B., Ratheesh, R., Bhattacharya, S., and Rajawat, A. S.: Sea-level rise and coastal vulnerability: an assessment 15 of Andhra Pradesh coast, India through remote sensing and GIS, J. Coast Conserv., 12, 195–207

As per the state Environment report, Andhra Pradesh (2009)[6] eight severe cyclones and 15 medium – normal cyclones have hit the Krishna District between 1891 and 2009. An analysis of the frequencies of cyclones on the East of India during 1891- 1990 shows that nine coastal districts of Andhra Pradesh are severely vulnerable to cyclonic storms and damages resulting due to cyclones, agricultural crop losses could be devastating (Figs 1 – 3).

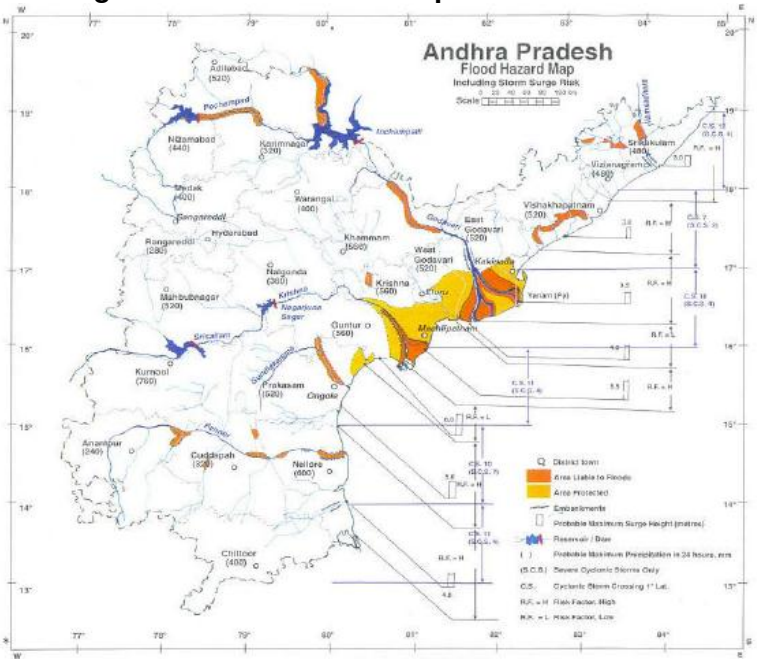
Figure 1: Districts with high exposure to coastal disasters like floods and cyclones



The project area district is also prone to annual floods and associated damage to agriculture and rural livelihoods.

[6] State of Environment Report, Andhra Pradesh (2009) EPTRI pp 318.

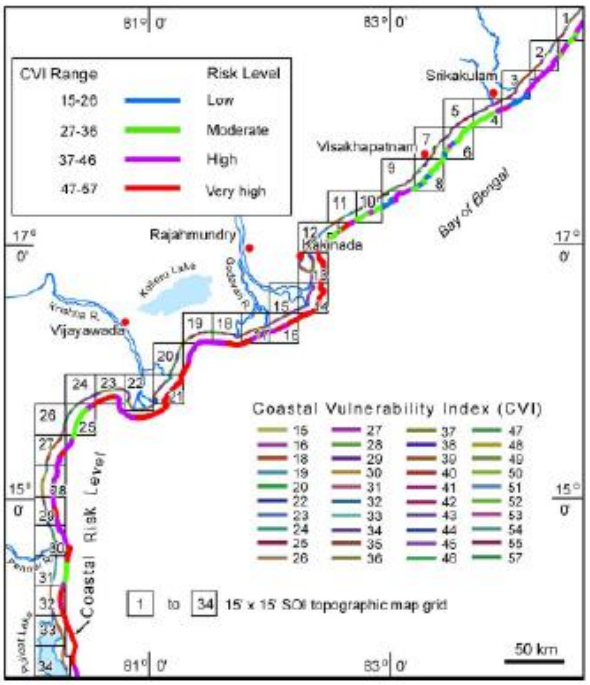
Figure 2: Flood Hazard Map Andhra Pradesh



(Source: State Action Plan on Climate Change for Andhra Pradesh, 2011)

As identified under State Action Plan on Climate Change restoration and plantation of new mangrove belts across the coast is one of the identified strategies for climate change adaptation for coastal areas.

Figure 3: Coastal Vulnerability Index and risk levels of different segments of AP coast



Coastal Vulnerability Index indicates that project area is highly vulnerable to sea level rise and associated damages to agriculture and coastal livelihood sectors[7].

[7] Nageswara Rao, K., Subraelu, P., Venkateswara Rao, T., Hema Malini, B., Ratheesh, R., Bhattacharya, S., and Rajawat, A. S.: Sea-level rise and coastal vulnerability: an assessment 15 of Andhra Pradesh coast, India through remote sensing and GIS, J. Coast Conserv., 12, 195–207

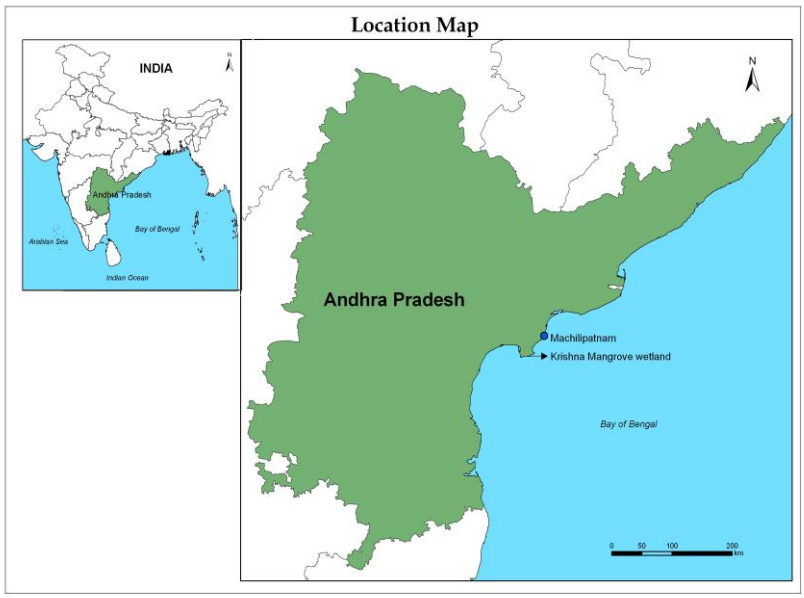
Context/Purpose of the Programme

This aim of the programme is to overcome the consequences of salinization of the coastal area due to sea level rise through appropriate adaptation strategies such as i) restoration of degraded mangroves and ii) demonstration of Integrated Mangrove Fishery farming System (IMFFS). The first activity of restoration of degraded mangroves with native multiple mangrove species will improve the health of the mangrove forest which will avoid ingression of seawater into main land. It is also proven that increase in the height of mangrove substratum is almost equal to predicted annual increase in sea level. The mangrove ecosystem helps to build the land through sedimentation of suspended solids in the root zone preventing exposure of land, water, other coastal resources and livelihood assets to saline water inundation. The second important activity, the integrated mangrove fishery farming system increases the opportunity to integrate both physical security against sea level rise and livelihood security of the coastal community. The raised bunds of this farming system can act as embankment protecting coastal villages from salt water intrusion during storm surges and at the same time community can generate income by culturing fish in the system.

Study area

The programme will be implemented near the Krishna mangrove wetlands in Andhra Pradesh (Fig. 4). The target community of the present programme area is fishing and farming families living in three villages close to sea. The expected impact of sea level rise in

Figure 4. Location of the programme area



these villages are as follows: i) permanent submergence of areas located in the intertidal zone, ii) inundation of mudflats, which are already saline, iii) inundation of non-saline areas, iv) salinization of ground water etc. These lead to total or partial loss of livelihood, reduction in income, health related problems, migration which will have huge socio-economic implications. Programme hamlets are identified from the study locations with the following criteria: i) land availability ii) vulnerability context iii) socio-economic status, iv) dependency on coastal resources and v) willing to take active participation in the programme.

Project / Programme Objectives:

List the main objectives of the project/programme.

- The overall goal is to enhance adaptive capacities of the local community and other stakeholders by strengthening their institutional mechanism, restoration and management of coastal resources and building livelihood assets.

Objectives

- To assess the baseline situation and monitor the vulnerability due to predicted impact of climate change on natural and social systems and build on the current coping mechanisms and adaptive strategies.
- To train and build the adaptive capacities and climate resilient livelihood options for the stakeholders.
- To establish mangrove bio-shields for ecological and livelihood security of the coastal community.
- To develop and demonstrate replicable models of seawater based agro-aqua farming system as a potential means to adapt to coastal inundation due to sea level rise triggered by climate change.

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$)
1. Stakeholder mobilization and organization Constituting Gender balanced village level institutions for participatory planning, implementation and monitoring	• Gender balanced Village Level Institutions (VLIs) established and capacitated on programme components and processes	Village level institutions actively perform towards sustaining the programme activities and decision making role of women enhanced	3333
2. PRA and entry point activities Mobilising the community and conducting surveys using participatory techniques and Remote Sensing (RS) and GIS tools for creating baseline	• Baseline database available for Krishna mangrove wetland on vulnerabilities and exisiting capacities • Digital elevation models available to predict sea level rise.	Plan documents incorporating appropriate interventions prepared.	10000

PROJECT /PROGRAMME COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US$)
3. Training and capacity building for men and women of local community and other stakeholders on mangrove restoration techniques and management of coastal resources to enhance their adaptive capacities	• 100 men and 100 women trained on restoration and Integrated Mangrove Fisheries Farming System (IMFFS) techniques including management skills and strengthening of livelihoods	Cadre of skilled men and women continue to sustain the interventions for long term benefits	15000
4. Restoration of degraded mangroves in 200 ha along the Krishna estuary.	• Mangroves in 200 ha of degraded area restored	Increase in fishery nursing ground to enhance the fishery resources to combat the fish catch reduction due to climate change	106950
5. Identification of areas and develop and demonstrate replicable models of IMFFS in 50 ha in Nali Krishna district.	• IMFFS established in 50 ha with community participation	Enhanced additional income with equitable sharing	303267
6. Knowledge Management	Process and progress reports Best practices documented and disseminated	Up-scaling and replication of models developed by different stakeholders	53333
7. Project/Programme Execution cost			52450
8. **Total Project/Programme Cost**			**544333**
9. Project/programme Cycle Management Fee charged by the Implementing Entity (if applicable)			46268
Amount of Financing Requested			**590602**

❑ Projected Calendar:

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

MILESTONES	EXPECTED DATES
Start of Project/Programme Implementation	May 2014
Mid-term Review (if planned)	June 2016
Project/Programme Closing	January 2018
Terminal Evaluation	March 2018

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.*

The problem of salinization of land due to sea level rise and there by losing the livelihood of the coastal community can be avoided if adaptive capacity of the community is enhanced for which the following activities are planned as adaptation strategy.

Mangrove Bioshield

The adaptability responses to sea level rise conceptualized by the Coastal Zone Management Subgroup of the IPCC divided adaptability responses into three categories namely, i) retreat, ii) accommodation and iii) protection. *Retreat* involves no protection of coastal land and structures in areas vulnerable to sea level rise are abandoned and these areas will be allowed for retreat of coastal wetlands (including mangroves). *Accommodation* category of adaptive response implies that people continue to use the lands that are at risk due to sea level rise but modify land use pattern and subsystems to ensure that changes take care of new threats such as salinization and flooding. Conversion of saline affected areas into sustainable aquaculture systems and cultivation of saline tolerant crops are commonly predicated changes in the land use pattern. Conservation of natural resources such as mangroves and coral reefs is another important option suggested in accommodation category of adaptation. *Protection* category of adaptive response involves protecting coasts from rising sea level by means of a) “hard” engineering measures such as construction of seawalls, dykes, and flood defense systems and b) “soft” measures such as restoration and conservation of existing protective coastal ecosystem such as mangroves and coral reefs.

The mean sea-level rise along the Indian coasts is estimated to be about 1.3 mm/year on an average (INCCA 2010[8]). Mangroves play an important role both in the accommodation and protection categories of adaptive responses to sea level rise.

[8] Indian Network for Climate Change Assessment (INCCA) 2010 Climate change and India: a 4x4 assessment - A sectoral and regional analysis for 2030s Published by Ministry of Environment & Forests, Government of India pp – 160.

There is an increase in average earth temperature and corresponding increased sea surface temperature, resulting in further volumetric expansion of sea surface leading to build up of more frequent and intensified cyclonic activity and associated storm surges in the coastal zone. Along Andhra Pradesh coast, the section between Nizampatnam and Machilipatnam is most prone to storm surges. Andhra Pradesh coast between Ongole and Machilipatnam is recognized as vulnerable to high surges among the segments of the east coast. The maximum height of storm surges experienced in Krishna district is 5.5 m. The severity of the cyclone and storm surge is expected to increase as a consequence of climate change.

An analysis of the frequencies of cyclones on the East coast of India during 1891- 1990 shows that nearly 262 cyclones occurred (92 severe) in a 50 km wide strip. The recorded frequency of cyclones per year along the Bay of Bengal is four and inevitably one of the four transforms into a severe cyclone causing human and property losses. Severe cyclones have become common events occurring every two to three years. Out of 31.57 million people living in the coastal districts of Andhra Pradesh, approximately 2.9 million are vulnerable to cyclones. Loss of lives and livestock is compounded by the loss of agricultural crops. While the nine coastal districts of Andhra Pradesh are severely vulnerable to cyclonic storms and damages resulting due to cyclones, agricultural crop losses could be devastating.
Mangroves reduce waves by as much as 66 percent over 100 meters of forest width providing a vital buffer against the impacts of storms, tsunamis, and hurricanes. The mangroves will be planted over 500 m width which will protect the villages from the natural disasters like cyclones and tsunami. Mangroves are the best and cheapest way to protect coastal areas from waves (Nyoman Suryadiputra). Mangroves are effective in carbon assimilation and are considered as a very good sink for carbon. Mangroves contribute 25% of carbon burial in the global coastal zone. Mangrove has the ability to mitigate the sea level rise by trapping sediments there by increasing the ground level corresponding to the sea level rise. The planting of mangroves in 200 ha will provide the livelihood security to the coastal community as well as the ecological security to the coastal area.

A recent research indicates that platform of coastal wetlands such as mangroves, salt marshes and tidal channels that are associated with these wetlands rises gradually in

concurrence to the rate of sea level rise (McIvor et al., 2013[9]). As a result, entry of seawater inland is prevented by these wetlands and this clearly indicates that mangroves and other coastal wetlands act as first line defense against sea level rise. The study also indicates that it is possible only if the plant communities of these wetlands are well conserved and continuous supply of sediment is ensured (McIvor et al., 2013[9]). Many of the mangroves are managed for the purpose of coastal protection, mostly at forestry point of view. However, it is well established that mangrove wetland is rich in bio resources such as fish, prawn and crabs and provide livelihood security to millions of poor and asset less fishers. The values of the mangroves in small scale fisheries and their role as nursery ground for fish, prawn and crabs are largely ignored. Thus, there is an urgent need for augmentation of fishery resources potential of mangroves to enhance livelihood security of coastal fishing families. Thus, restoring and sustaining mangrove wetland – which is the most dominant wetland in tropical coastlines – and also creating it in areas where biophysical and social conditions are suitable and augmenting its fishery resources, could be an important strategy to both mitigate the impact of sea level rise as well as enhance adaptive capacity of local community. Therefore about 200 ha of suitable land have been identified in Krishna wetland in Andhra Pradesh to develop mangroves. The land belongs to the revenue department for which the permission has been taken by the partner NGO Praja Pragathi Seva Sangham.

Change in Land use (Integrated Mangrove Fishery Farming System - IMFFS)

The fishermen are depending on the coastal resources particularly the water bodies for fishing. The increase in sea surface temperature due to climate change will lead to reduction in fish catch.

As indicated in the Accommodation category of adaptive responses, capacity of local community can be enhanced by changing the land use pattern in *saline* areas by introducing new sustainable production systems. One such system is Integrate Mangrove Fishery Farming System, wherein rising of mangrove trees is integrated with fish culture. It is a new kind of farming system wherein conventional earthen aquaculture ponds are modified in such a way to provide about 40% of the area for raising mangrove plantation and 60% water spread area for fish cultivation. Space for growing mangroves and other vegetation is created by constructing linear bunds or mounds inside the pond (Figs. 5 and 6). These farms can be designed in such a way to be tidally fed (water exchanged during high tide and low tide), which makes them more environment friendly and economically profitable. Above all,

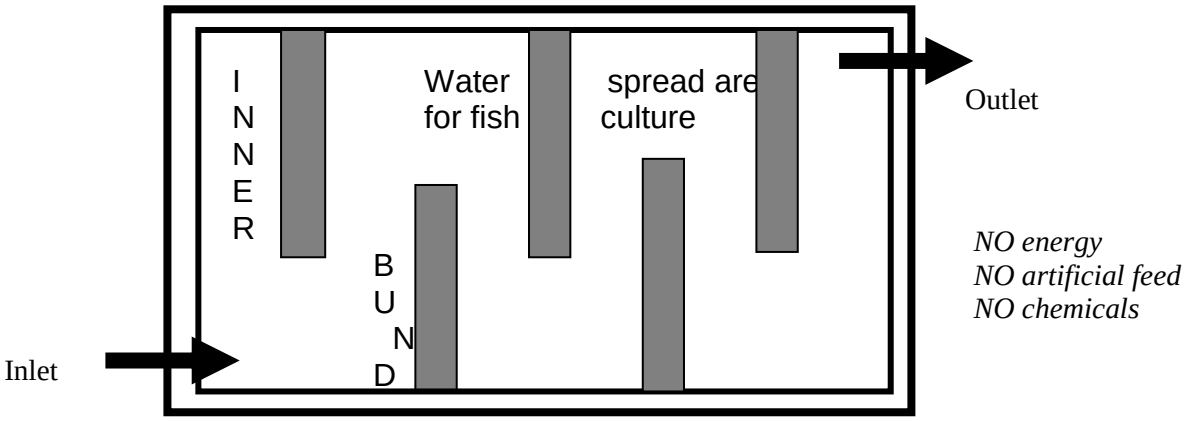
[9] McIvor, A.L., Spencer, T., Möller, I. and Spalding. M. (2013) The response of mangrove soil surface elevation to sea level rise. Natural Coastal Protection Series: Report 3. Cambridge Coastal Research Unit Working Paper 42. Published by The Nature Conservancy and Wetlands International. 59 pages. ISSN 2050-7941.

presence of dense mangrove trees would mitigate the impact of sea lever rise whereas sustained harvest of fish would take care of adaptive capacity of coastal community. About 50 ha of abandoned shrimp farms in Nali Village, Nagayalanka Mandal of Krishna wetland has been identified for this purpose. These farms lands are belonging to the fishermen living in the village.

The operational cost of the system is low. Water exchange is taking place daily through tides and there is no need to pump water in and out of the ponds to maintain water quality. There is also no need of using aerator to increase the oxygen content of the water as the water exchange help to get sufficient oxygen for the fishes growing in the farm. The stocking is also low when compared to the commercial farm which requires less food and oxygen. Daily exchange of water brings in lot of fresh food in the form of planktons avoid using artificial feed. Zero use of energy and artificial feed greatly reduces input cost and also avoid environmental pollution. Above all, presence of dense mangrove trees in the IMFFS would mitigate the impact of climate change especially sea lever rise whereas sustained harvest of fish would take care of adaptive capacity of coastal community.

Thus, the restoration of degraded mangroves, creation of mangroves in suitable areas and introduction of integrated mangrove fishery farming system in saline areas will enhance adaptive capacity of coastal community to sea level rise.

Fig 5. Design of Integrated Mangrove Fishery farming system



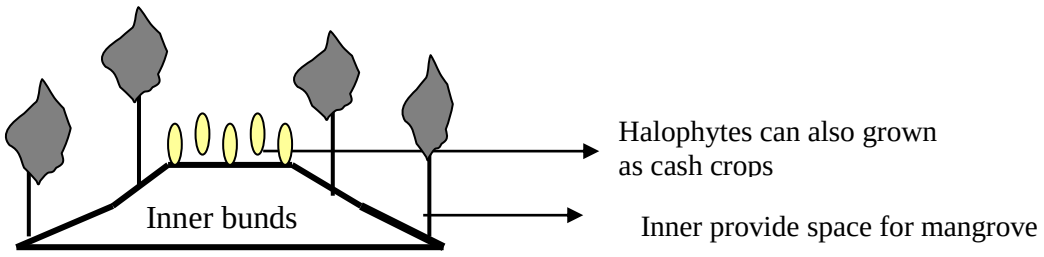
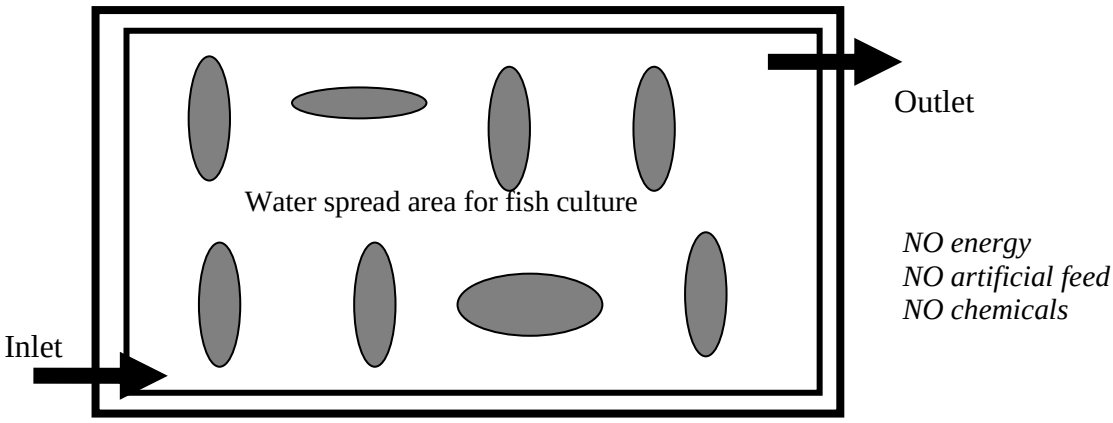
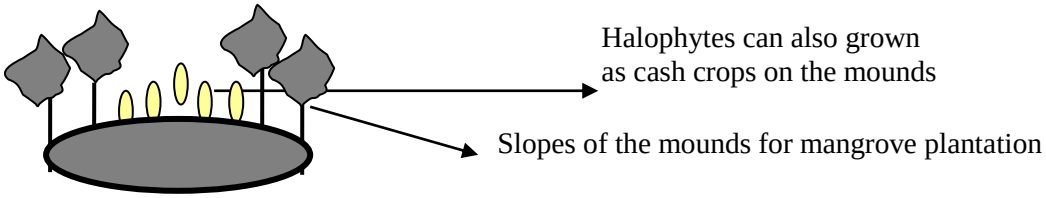


Fig 6: Another design of the seawater based integrated agro-aqua farm





The logical structure of the proposed project is as given below:

Situation Analysis in Andhra Pradesh for climate change vulnerability

↓

Orientation programme on the activities in three project villages

↓

Participatory Rural Appraisal

↓

Vulnerability assessment

↓

Exposure visit to Mangrove restored area and IMFFS

↓

Formation of Village level institutions

↓

Identification area for Mangroves and IMFFS

↓

Preparation of Joint Micro plan

↓

Joint monitoring and evaluation

Component-wise technical details:

Component 1: Community mobilization and organization

Village level institution is the local institution that is established in village / hamlet level to plan, implement and monitor project activities. It brings together men and women of different socio economic categories based on the common objectives and governed by collectively evolved norms. This would provide scope for accommodating the process and help to include socially and economically marginalized groups.

Activities:

i. Conducting orientation meetings on project to leaders, women, men and youth in three project villages (Sorlagondi, Nali and Basavanipalem)
ii. Sensitizing village leaders, men, women and youth on gender and different approaches to women development and empowerment
iii. Organizing exposure visits to the community (men, women and youth) to successful participatory mangrove, IMFFS and coastal resources management projects
iv. Conducting PRA to understand village situation and major concerns of the people relating to saline water intrusion due to sea level rise, mangrove conservation and development, livelihood and other developmental concerns
v. Establishing village level institution with 50% gender representation in General Body and Executive Committee
vi. Conducting stakeholder analysis in the project areas to identify their interest and influence in coastal resources management
vii. Collection and analysis of secondary data relating to sea level rise and participatory assessment of its impact in the proposed study area (vulnerability assessment)

Sub-Component 1.1: Identifying and implementing entry point activities

Activities:

i. Identifying some of the major concerns of the villagers through PRA
ii. Prioritizing them by women and men
iii. Providing technical, institutional and partial financial support to solve one or two such concerns to build rapport and trust and also to assess capacity, network and interest of the community in developmental activities
iv. Mobilizing community to contribute in cash and to kind to solve prioritized concerns

Component 2: Capacity building and training programmes

The community will be trained on mangrove sylviculture and IMFFS farming practices

Activities:

i. Organizing orientation workshop including field visit to women groups, youth from fishing community, traditional and panchayat leaders on climate change and sea level rise and their impacts, role of mangroves and integrated mangrove-fishery farming system in increasing adaptive capacity to sea level rise
ii. Organizing orientation workshop to managerial and field staff of the Forest Fisheries, Rural Development and Revenue Departments and grassroots NGOs climate change and sea level rise and their impacts, role of mangroves and integrated mangrove-fishery farming system in increasing adaptive capacity to sea level rise
iii. Hands on training on mangrove restoration techniques like mangrove nursery, planting and management
iv. Hands on training on mariculture practices for shrimps, fishes, crabs and mussel etc.

Component 3: Restoration of degraded mangroves

Restoration of degraded mangroves will be done through canal method. Nursery raised saplings will be planted in the restoration site. The multiple species available in the area will be planted.

Activities:

i. Assessing suitability of the sites for mangrove restoration (soil, water and topography studies)
ii. Preparation of mangrove nursery with different mangrove species
iii. Canal digging for tidal flow
iv. Planting of mangroves saplings in the restored area
v. Causality replacement of mangrove saplings
vi. Desilting of canals for free flow of water

Component 4: Demonstration of IMFFS

IMFFS is a framing system which integrates mangrove and aquaculture. This would increase income of artisanal fishermen and also would provide opportunities to diversify livelihood activities. Bunds and the mangroves planted in the bunds act as barriers for the storm surges.

Activities:

i. Assessing suitability of the sites for developing Integrated mangrove fishery farming system by conducting biophysical investigation
ii. Preparation of designs of the farms with the help of resource persons
iii. Construction of farms as per the design
iv. Planting of mangrove trees and halophytes
v. Monitoring performance of mangroves and halophytes planted

Sub-Component 4.1: Fish culture in the IMFFS farm

Activities:

i. Selection of species of fish for culturing with the participation of the community

ii. Purchasing fish seed /prawn from hatcheries or collecting them from wild
iii. Acclimatizing fish/prawn seeds in the farm in *happa*
iv. Releasing acclimatized fish seeds into the farm
v. Monitoring water quality
vi. Monitoring survivals and growth performance of fish
vii. Harvesting of fish and analysis of cost benefit

Component 5: Knowledge management and Monitoring and Evaluation

Knowledge products such as brochures, pamphlets on best practices for climate change adaptation will be developed for dissemination to the needed people.

i. Preparation of resource materials in local language to increase awareness about climate change, sea level rise and role of mangroves and integrated mangrove-fishery in increasing adaptive capacity of community to sea level rise
ii. Participatory Monitoring of the project activities along with the community
iii. Documenting best practices of adaptation to climate changes for dissemination
iv. Process documentation – field implementation book, field guide
v. National Seminar and Workshops
vi. Brochure and phamphlets

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.*

It is predicted by the Coastal Zone Management sub-group of the Intergovernmental Panel on Climate Change that in many coastal areas people would modify land-use pattern and sub-systems to ensure that such changes take care of new threats such as **salinization and flooding due to climate change**. One of the major land-use changes predicted is conversion of saline affected agriculture lands into aqua-culture farms. However, the current situation of aquaculture in India warrants a more responsible and sustainable aquaculture systems and practices. Development and demonstration of new approaches such as seawater or brackish water based integrated agro-aqua-farming system would not only ensure livelihood security of the poor coastal families and ecological security of the coastal areas but also enhance the adaptive capacity of coastal communities to sea level rise and climate change.

The social impact of decline in prawn farming is enormous. Many of the farmers, who converted their agriculture land into aquaculture farms, are now getting no income either from agriculture or from aquaculture; many of these families now migrate either temporarily or permanently in search of employment and livelihood leaving behind the women members in the village. In this situation, the projected Integrated Mangrove Fishery Farming System, wherein cultivation of mangroves, halophytes (salt-loving plants) and culture of fish, crab and prawn are integrated, provides some tangible solutions to make coastal aquaculture sustainable and also strengthen resilience of coastal communities against sea level rise. This also provides opportunity to integrate livelihood and mangrove bioshield. Thus the implementation of the project would offer better livelihood option for the families including women members. It is pertinent to mention here that 50% of the project beneficiaries would be women and provision has been made for capacity building and training on restoration and IMFFS techniques including management skills and strengthening of livelihood. Implementation of the project is expected to reduce the saline water intrusion to the ground water and thereby reducing the drudgery of women in the project area in bringing drinking water from far off places.

The details on target villages and there **socio-economic status** is indicated below:

(1) Sorlagondi village

Sorlagondi village is located in Nagayalanka Mandal, Krishna district, Andhra Pradesh. It is a delta village with flat topography which evidences multiple natural hazards especially the cyclone and flood. The 1977 *Divisema* cyclone devastated 714 lives and the livelihood assets of the village since then it had become a yearly phenomenon. There are about 434 households comprising of 512 families. The total population is 2,052 of which 972 and 1080 are men and women respectively. About 92 families mainly the landless are solely dependent on capture fishing for their livelihood are vulnerable to climate change.

The mangrove restoration involves mangrove seed collection, mangrove nursery raising, planting, causality replacement and desilting works. These works provide wage opportunity to the community and preference will be given to the 92 land less people depending on fishing. PRA will be carried out to find the lean season so that they will be utilised during that period.

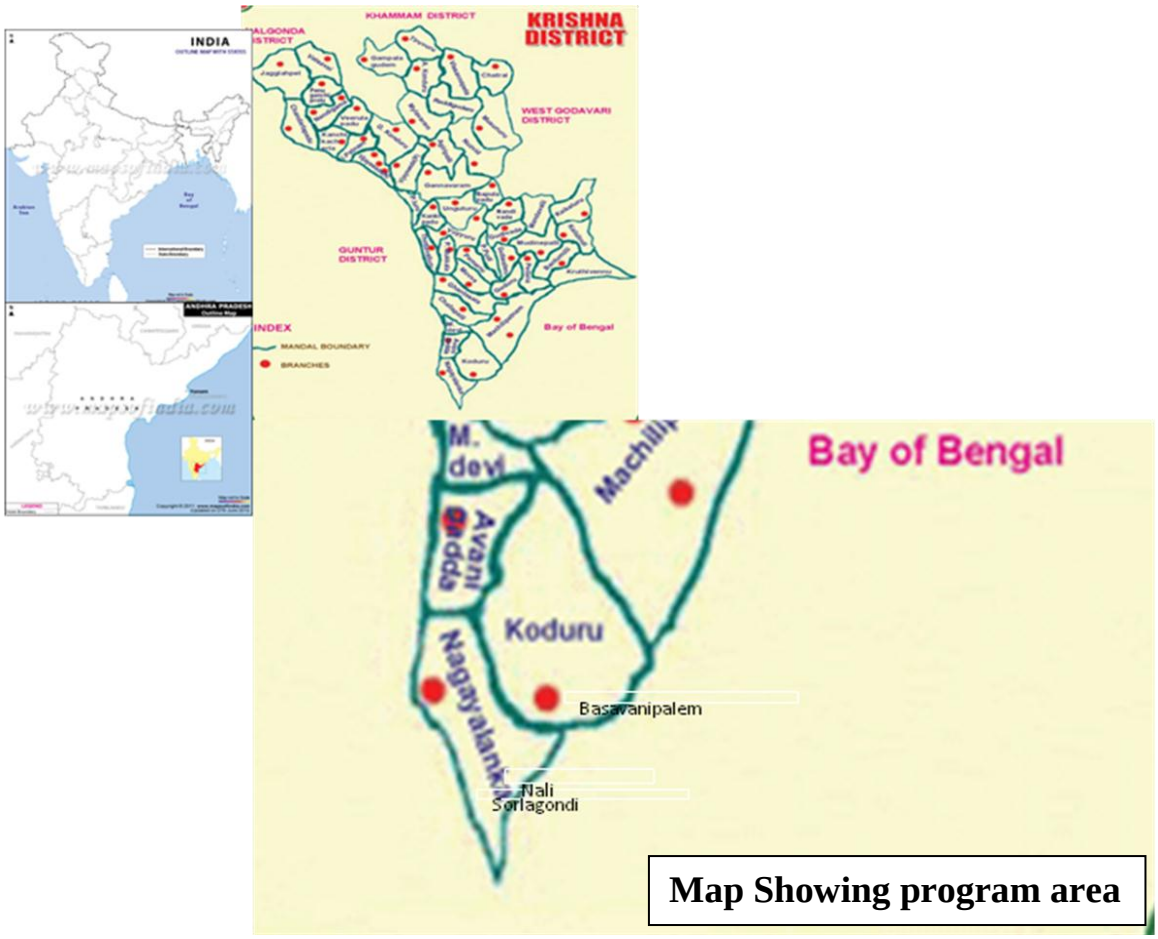
(2)Nali village

Nali village belongs to Nali Panchayat in Nagayalanka Mandal, Krishna District. This village has 361 households belonging to backward caste. Total population of the village is about 1209 including children. This village is a homogenous village; only fishermen are living in this village.

The shrimp farmers who abandoned the farms are the target group. Fifty hectares of land suitable for IMFFS will be selected and the owners of the land are the target group for the activity.

(3) Basavanipalem village

Basavanipalem hamlet belongs to Ramakrishnapuram Panchayat in Koduru Mandal, Krishna District. This hamlet has 55 households belonging to fishing community. Total population of the village is about 245. Many of them are agriculture labours and only 8 families have agriculture lands. They are also marginal farmers with 2 – 5 acres of land. The entire community will be involved in the mangrove restoration works and they will be engaged in the lean agriculture season.



Map Showing program area

The economic benefits from the mangroves are mostly the fishery resources collected from the wetlands. The restoration of mangroves will help to improve the fish catch there by enhancing the economic resources. The other indirect benefits are protection from the natural hazards, carbon sinks and preventing soil erosion.

The project will help the individual farmers to convert their abandoned shrimp farms into Integrated Fishery farming System (IMFFS). The project will help the conversion of ponds

and culture the fishes/prawns in the initial two years. The benefits from the system are summarized below:

Criteria	Key Benefits	Baseline Scenario
Social	• Protecting lives and livelihood assets of the households including women in the villages in the long run • Ensure sustainable income through IMFFS farming • Enhanced capacity on technical know-how and do-how • Reduction in migration • Coverage of 50% of women in skill development for restoration and IMFFS	• Availability of large extent of abandoned shrimp farms and degraded mangroves • Lack of technical knowledge on mangrove restoration and IMFFS • Lack of resource for converting the abandoned shrimp farms • Prevalent of out migration
Economic	• Increased access to fishery resources in the restored area • Increased income from IMFFS • Employment opportunity in execution of IMFFS and mangrove restoration works	• Fallow and unproductive land
Environment	• Improved water and land productivity • Eco-friendly techniques in IMFFS • Mitigating effects of seawater flooding on inland • Preventing soil erosion • Mangrove substratum increase in concurrence rising sea level which mitigates seawater ingression	• Agriculture and other lands inundated due to flooding of seawater • Soil erosion along the creeks
Institutional	• Enhanced networking and linkages • Collectiveness strengthened	*Adhoc* institutions

As may be seen from above, implementation of the project will not cause any negative social and environmental impacts. Local communities have been consulted in design of the project and components proposed are in line with the prevalent regulations, policies and standards of National and Sub-national Governments. Components proposed under the project have been designed with consideration towards the Social and Environmental Policy of Adaptation Fund.

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

The important criterion that favours mangroves as a first line defense against sea level rise is the economic benefits of mangroves like availability of commercially important wood and non-wood products and aquatic products such as fish, prawn, crab, mussel and oysters. The annual economic values of mangroves, estimated by the cost of the products and services they provide, have been estimated to be Rs.10, 00,000 to 450,00,000/- (USD 2,00,000-

9,00,000) per ha[10]. An estimate indicates that the value of Malaysian mangroves with respect to storm protection and flood control alone would be around Rs.15, 00,000/- (USD 3, 00,000) per km, which is based on the cost of replacing the mangroves with rock walls. It has been estimated that a hectare of mangroves is worth US$9,900 per year not just in fish production but also nutrient recycling, as carbon sink, coastal protection etc[11]. An assessment of the Rekawa mangrove-lagoon ecosystem, Sri Lanka in 2005 indicates the value of mangroves in terms of erosion control and buffer against storm damages is around Rs.15,000 per ha per year. Another study indicates that restoration of one ha of mangrove forest would result in increase in fish catch worth of Rs.5,85,000/- (USD 13,000) per year. However, the programme is spending USD 533 per ha for restoring the mangroves and the long term benefits are very high.

The cost benefit of the Integrated Mangrove Fishery Farming System is that only very limited energy is required for operation. Since water is exchanged daily by tides through gravitation pumping of water in and out of the ponds to maintain water quality is not required. Also there is no need to use aerator for increasing oxygen content of the water. Secondly, daily exchange of water brings in lot of fresh food in the form of planktons (microscopic plants and animals that float and drift in large numbers in sea and brackish water) to the pond. This avoids using artificial feed. Zero use of energy and artificial feed greatly reduces input cost and also avoid environmental pollution. The input cost for pumping the water into the aquaculture system is not required which reduces the input cost to a great extent.

The economic benefit in the Integrated Mangrove Fishery Farming System is the input cost which is always low. Only the fingerlings will be procured from the certified hatcheries. These fingerlings are able to grow in the system without any external inputs like feed and other chemicals. The natural system will be providing the necessary feed in the form of planktons to the fishes growing in the system.

Convergence with the government schemes will be made during the programme implementation for up scaling. As large extent of saline affected aquaculture lands are available, the community will be linked with the government schemes like MGNREGA for preparing the lands for Integrated Mangrove Fishery Farming system for coverage of more

[10] Gilman, E., Van Lavieren, H., Ellison, J., Jungblut, V., Wilson, L., Areki, F., Brighouse, G., Bungitak, J., Dus, E., Henry, M., Sauni, I. Jr., Kilman, M., Matthews, E., Teariki-Ruatu, N., Tukia, S. and K. Yuknavage. 2006a. Pacific Island Mangroves in a Changing Climate and Rising Sea. UNEP Regional Seas Reports and Studies No. 179. United Nations Environment Programme, Regional Seas Programme, Nairobi, KENYA.

[11] Costanza R., (1997). The value of the world's ecosystem services and natural capital. In *Nature* Vol 381 pp253 260.

areas. Technical inputs will be provided through this programme for the necessary farmers. The farmers will also get all the training and capacity for their skill up gradation related to farming. Similarly, the MGNREGA funds will be utilized for desilting the canals in the mangrove restored area.

The losses for the community without the implementation of the programme are as follows.

- Out migration of vulnerable community will persist resulting in family disintegration, drudgery for women and school drop outs
- Lack of collectiveness and capability to address the emerging socio-economic and environmental threats
- Land and water resource remain unproductive
- Productive lands and fresh water resources both surface as well as ground water will become saline and degraded
- Increase in fishery production will not happen
- Natural and social systems exposed to vulnerabilities

The comparison of the chosen option vis-a-vis alternative options is given below:

Activity proposed	Alternatives	Benefits
Mangrove restoration	Construction of wall / embankment	Mangroves restoration is less expensive Requires less maintenance Enhances livelihood through increase in fisheries Carbon sinks Removal of pollutants Enhances the aesthetic value
IMFFS	Conventional shrimp farming – high cost and environmentally unsustainable. Reclamation of saline lands	IMFFS is eco-friendly Less input cost and less risk for the community

Alternative options are either very expensive or socially acceptable to the community. The major advantage of the proposed project as against alternative options is in its ability to provide sustainable livelihood through IMFFS to vulnerable fisheries community living in the project area. As such the proposed project is environmentally sound and socially acceptable and enables the community to address core issue of sea level rise and salinization.

To sum up the following key characteristics of the project would considerably enhance its cost effectiveness:

1. The major project components viz. mangrove restoration and IMFFS are highly replicable under similar conditions in the coastal region of the country.
2. The project provides the most suitable livelihood option to the project beneficiaries thereby ensuring a sustainable livelihood.
3. Locally available mangrove and fisheries species which are adaptable to the local conditions are being promoted.
4. Participation of NGO and community right from inception of the project makes it community driven with high level of ownership by them.
5. Being cost effective, government departments would evince interest in up-scaling of the project through various programmes.
6. The implementation mechanism by involving NGO who has local presence and long standing work relationship with the community is highly cost effective.

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.*

India is a large developing country with diverse climatic zones. The livelihood of vast population depends on climate-sensitive economic sectors like agriculture, forestry and fisheries. The climate change vulnerability and impact studies in India assume high degree of uncertainty in the assessment due to limited understanding of many critical processes in the climate system, existence of multiple climatic and non-climatic stresses, regional-scale variations and nonlinearity. The costs of not addressing climate change or to adapt to it are very uncertain, but their consequences are enormous. Early actions on adaptation therefore are prudent and consistent from the viewpoint of precautionary principle.

In India about 700 million living in rural areas directly depend on climate-sensitive sectors like agriculture, forests and fisheries and natural resources such as water, biodiversity, mangroves, coastal zones, and grasslands. Furthermore, the adaptive capacity of dry land farmers, forest dwellers, fisher folk and nomadic shepherds is very low. Climate change is likely to impact all natural ecosystems as well as socio-economic systems in India. In addition, poverty is a critical factor that limits the adaptive capacity of rural people in India (Government of India 2008).

The restoration of mangroves will be carried out in revenue land and IMFFS will be done either in private land or in revenue land. These activities will not come under Forest Conservation Act, 1980, as the activities are planned outside the forest area.

The Environment (Protection) Act, 1986 has had a crucial role in the conservation and management of mangrove ecosystems. It declares a Coastal Regulation Zone in which industrial and other activities such as discharge of untreated water and effluents, dumping of waste, land reclamation and bunding are restricted in order to protect the coastal environment. Coastal stretches are classified into four categories, and mangroves are included in the most ecologically sensitive category.

National policy	Programme elements related to the policy
The National Policy 2006 indicates that Mangroves and coastal reefs are important coastal environmental resources which provide habitats for marine species, protection from extreme weather events and a resource base for sustainable tourism. In the case of mangroves the objectives of the scheme is to help the coastal state governments/ union territories in rehabilitation of degraded mangrove areas and enhance mangrove cover by replantation in the open mud flats. The scheme on conservation and Management of Mangroves and Coral Reefs was initiated in 1986 for - Conservation and protection of the mangrove ecosystems from further degradation, afforestation of degraded mangrove areas, maintenance of genetic diversity, especially of the threatened and endemic species, and creation of awareness among the people on importance of mangrove ecosystem and the need for conservation.	Restoration of mangroves in 200 ha in Krishna wetlands in Andhra Pradesh is aiming to fulfill the objective of replanting of mangroves in the mudflats as per the National Policy on mangroves and coral reefs.
Rising sea levels will cause displacement along one of the most densely populated coastlines in the world, also threatening freshwater sources and mangrove ecosystems as the impacts of climate change identified by the NATCOM report 2004.	The restored area as well as IMFFS mitigate the impact of the sea level rise
National Action Plan on Climate Change (NAPCC) identifies eight national missions to provide multi-pronged and integrated framework for addressing climate change, focusing on adaptation/mitigation, energy efficiency and natural resource conservation and	The proposed programme addresses most of the elements of NAPCC and NMSA

capacity building/stakeholder involvement on climate change issues. Under National Mission on Sustainable Agriculture (NMSA), developing mangrove and non-mangrove bio-shields to minimize the impact of coastal storms and sea water inundation is one of the mission interventions suggested.	
State Action Plan on Climate Change (SAPCC) – Andhra Pradesh	The state action plan for climate change has identified the loss of wetlands and degradation of forests and deforestation as major issues of climate change. The project is aligned to the following interventions proposed under State Action Plan for addressing the above issues: i. Restoration and plantation of new mangrove belts across the coast. ii. Revitalize community based initiatives like Joint Forest Management to check forest degradation and loss of biodiversity iii. Promote shelter belt plantations in coastal areas to reduce damage from cyclones etc.
12th Five Year Plan	As per 12th Five Year Plan under National Mission for a Green India eco- restoration of mangroves and wetlands is an important component. It is further indicated in Plan Document that "sensitive ecosystems such as the mangroves are also threatened by climate change. Identification of coastal vulnerability and assessment of the consequence of coastal inundation should, therefore, receive high priority during Twelfth Five Year Plan"

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.*

The technical standard provided here is based on the experience gained in the restoration of mangroves over two decades. Similarly the Good management Practices adapted in aquaculture practices like shrimp seeds from certified hatcheries will be used. However water crab and juvenile crabs of *Scylla serrata* and other fishes collected from the wild will be used for farming.

Activity	Technical Standard	Application to the programme	Monitoring
Restoring degraded mangroves in 200 ha	Canal dug for tidal flushing as per the topography of the area	Topographic study will be carried out	Contour Map - topographic study available
	Selection of species for planting as per the mangrove zonation	Biophysical survey will be carried out to study the biodiversity of mangrove plants	Inventory report
	Mangrove nursery for multiple species	Mangrove nursery established with multiple species	Survival report Field visit and Photos
	Planting of mangrove saplings in the restored area	Plantation established in 200 ha with multiple species	Survival report Field visit and Photos
Integrated Mangrove Fishery Farming System	The ponds will be registered with Coastal Aquaculture Authority. Ponds established for growing fishes in 60% of the area and 40% of the area to grow mangroves in an integrated manner	50 ha of IMFFS ponds established	Field visit and Photos
Release of Juveniles	Hatchery reared seeds of will be used for culture	*Penaeus monodon* available in the private hatcheries	Receipts from the hatcheries
Planting of mangroves in the bunds	*Avicennia* and *Rhizophora* plants planted at 1 m interval in the intertidal zone	Mangroves planted in the mounds of 50 ha	Field visit and Photos Survival report
Releasing of fishes for the livelihood security of the vulnerable coastal community	Brackish water fishes harvested with less inputs	Tidal fed ponds in operation	Field visit and Photos Survival report

- The project components proposed are aligned with the provisions of Environment (Protection) Act, 1986 and Forest Conservation Act, 1980. Once the area is fully developed, the same would fall under CRZ I and therefore cannot be utilised for any other purpose.
- The project activities involves **labour payments** for various works and these labour payments will as per the approved Standard Schedule of Rates (SSR) of Government of Andhra Pradesh which ensures wage payments as per the Minimum payment norms prescribed by National / Subnational Governments. This takes care of social security issues of labourers involved in execution of the project works.

- **CRZ Regulations:** As per the new Coastal Regulation Zone (CRZ) rules of the Ministry of Environment and Forests dated January 7, 2011, the ecologically sensitive areas like mangroves and mudflats form CRZ I. The CRZ notification of 2011 brought the participation of local communities in coastal management plans, a feature absent in the earlier notification of 1991. Thus, the communities living along the country's 7,500 km coastline will have a say in developing coastal regions in which development has been allowed. The CRZ 2011 rules extend the CRZ zone up to 12 nautical miles (about 22 km) into the sea and the entire water area of tidal bodies such as rivers, creeks and estuaries -- without any restrictions on fishing activities. The proposed activities are permissible under the CRZ notification. Further, as per the prevailing regulations traditional and improved traditional shrimp farming can be undertaken within the CRZ with a production range of 1 to 1.5 tonnes/ha/crop with stocking density of 40,000 to 60,000/ha/crop. This integrated Mangrove Fishery Farming system is traditional farming system where tidal water is used for farming and the stocking density is low (less than 30,000/ ha). In view of this, the project would meet the applicable requirements under CRZ and environmental permissions would not be required.

As such the project complies with the Environmental and Social Policy of the Adaptation Fund.

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

A pilot scale programme is being implemented in Pichavaram mangrove area in Tamil Nadu with the support of GiZ, New Delhi where only IMFFS was taken as climate change adaptation in 6 ha. Similar study has been expanded to other areas in Tamil Nadu and Andhra Pradesh to integrate both mangrove restoration and IMFFS to strengthen the resilience of the coastal community to climate change vulnerability.

Project	Objectives	Component	Geographical coverage
Integrated mangrove fishery farming system to enhance adaptive capacity of coastal Community to sea level rise supported by *Gesellschaft für*	To build the technical and participatory management capacity of the community and local self-government to ensure sustainable coastal livelihood in the mangrove areas To establish access to mangrove and related fishery resources and	Integrated Mangrove Fishery Farming System in 6 ha	Mudasaloadi village in Pichavaram, Tamil Nadu

Internationale Zusammenarbeit (GIZ), New Delhi	fishery based livelihood increased		
Augmenting water resources: Role of seawater	• To develop and demonstrate different science based biosaline agriculture methods and techniques for cultivation of selected commercially important halophytes • To develop and demonstrate replicable models of seawater based agro-aqua farming system that integrates livelihood security of the coastal communities and ecological security of the coastal areas	Integrated Mangrove Fishery Farming System in 5 ha Cultivation of halophytes in 5 ha	3 villages in Vedaranyam block, Nagapattinam district, Tamil Nadu
Seawater farming as adaptive capacity to the coastal community	• To develop and demonstrate the efficiency of halophytes in reducing the soil salinity • To develop and demonstrate science based bio-saline agriculture methods and techniques for cultivation of selected fodder halophyte species and their yield trials • To develop and demonstrate replicable models of seawater based agro-aqua farming system that integrates livelihood security of the coastal communities and ecological security of the coastal areas	Integrated Mangrove Fishery Farming System in 4 ha Cultivation of fodder grass in 1 ha	2 villages in East Godavari district in Andhra Pradesh

The following outcomes of the GiZ funded project will be utilized for design and implementation of the proposed project:

1. Integrated mangrove fishery farming helps to make coastal communities less vulnerable to the impacts of climate change by promoting fish farming as an alternative source of income. Mangroves protect the coastline from storm surges and cyclones.
2. **Short duration culture :** The culture period for crabs and shrimps are about 4 months when compared to fishes like sea bass which takes nearly eight months. The market demand for crabs and shrimps are very high and there is tie-up sale mechanism for these two species. In addition to these two species other species like mussel culture and clam culture can also provide additional income.

3. The IMFFS is most suitable for crab fattening and crab culture.
4. **Management :** In terms of management, individual farm management is successful and more sustainable than collective farming.

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

The programme will conduct situation analysis in the programme villages to identify and capture the vulnerabilities and adaptive capacities including best practices to learn and plan the interventions. Programme will blend the traditional knowledge and practice with frontier technologies to enhance adaptive capacities. Similarly the Monitoring and Evaluation systems will enable documenting the programme process and progress. This will be captured using printed and multimedia tools and shared with various stakeholders for replication. Community being the primary stakeholders' lesson drawn from the programme will be documented in local language and shared. Also lessons from the programme will be brought to the attention of State or national level climate change and disaster risk reduction departments. Specific targeting of programme analysis and policy information will be derived from early assessments of existing gaps or weaknesses in policy matters. In addition, opportunities for dissemination through regional and international conferences, publications in journals and books, or web-based content will be explored by the implementing agency. The brochures in regional language will be brought out for disseminating the information about climate change vulnerability and the impact of programme interventions. Baseline information on the availability of the saline land suitable for mangroves in Krishna estuary will be carried out through field survey along with the community. The remote sensing maps will be used to demarcate different land uses and the thematic map will be prepared for the area suitable for mangroves.

Some of the adaptation project under implementation in Andhra Pradesh are given below:

1.Irrigation Tank Renovation and Rainwater Catchment at Motumala, Prakasam District, Andhra Pradesh - AdaptCap adaptation pilot project: Climate change-related phenomena such as heavier rains in shorter, unseasonable times of the year are putting agricultural resources under pressure. Accordingly, irrigation tank renovation and rainwater catchment are proposed as interventions for sustaining and climate-proofing the agricultural livelihoods.

2. Cyclone Resistant Causeway over the Buckingham Canal and Fishing Equipment Shed at Ramudupalli Palem and Sri Ramapuram, Nellore District, Andhra Pradesh : AdaptCap

adaptation pilot project: During the rainy season and storms, the Buckingham Canal that separates aquaculture jobs and fish ready for market from the villagers is dangerous to cross, putting safety and income of fishermen and women at risk. The construction of a sturdy bridge as well as new storm-proof shed to store fishing equipments will improve people's livelihoods and safety and contribute to a climate-proof development.

3. Capacity building strategy plan under ClimaAdapt for Andhra Pradesh: ClimaAdapt has adopted an approach where the project will be implemented through Farmers Organizations (WUAs) to achieve the major objective of improved capacity of the Agriculture and Water Sector to climate change adaptation. The capacity building strategy is planned based on the implementation approach and stakeholder involvement. The activities include interaction meeting with stakeholders (for their sensitization and participation in the project), Exposure visits, specialized Training programs on new initiatives, demonstration of new methods/systems, Field days for celebration of successful activities.

4.Case study on the impacts of climate change on shrimp farming in Andhra Pradesh, India by Network of Aquaculture Centres in Asia-Pacific: the study highlighted that Shrimp aquaculture is threatened by changes in temperature, precipitation, drought and extreme climatic events (cyclones, storms, floods) that affect infrastructure and livelihoods which can impact aquaculture both negatively and positively. Ecological changes, inundation of low-lying lands and saline intrusions into freshwater regions are likely to cause substantial dislocation of communities and disruption of farming systems. As per the study report, the study area, Krishna delta coast with mudflats, mangrove swamps, and lagoons/backwaters is much more vulnerable to sea level rise in the future and is at very high-risk. The most important adaptation measures suggested in the report are water exchange, feeding practice, lime application, adjusted harvest and delayed stocking for irregular season, high temperature and uneven rainfall distribution. Among all the adaptive measures water exchange was highly correlated with level of success. The experience gained on culture practices in IMFFS will be used in this project. The systematization study (critical reflections of the implementation team) carried out in the GiZ will be useful in evolving guiding principles for this project. This case study gives critical insights on adaptive measures and their effectiveness for management of climate change impacts in coastal area. The proposed project would draw on the knowledge generation under the study.

The learnings from the above programmes / project would be effectively used for proposed project.

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.*

Consultation meetings with various stakeholders

The stakeholders of the programme include local community, community based organizations such as traditional Panchayat, elected Panchayat (local government), grass roots NGOs and government agencies such as Forest, Revenue, Fisheries and Agriculture Departments.

Meeting with the Community

The community is unaware of the social vulnerability due to climate change and sea level rise along the coastal areas of Andhra Pradesh. The interactions carried out in three villages during June 2013 with community revealed those different social groups such as landless labourers, small and marginal farmers and fishing families are living in the coastal area. They are being suffered by various climatic and non-climatic stresses such as

- Salinization of land and groundwater, which is the primary source of vulnerability in a large portion of the Krishna delta.
- Reduction in agricultural yield due to the impact of cyclones, sea water and fresh water floods, and groundwater/ land salinity
- Lack of access to credit for vulnerable fishing and farming community during times of distress (following storms or droughts)
- Lack of climate resilient agriculture crops and fishes for farming

The current adaptation strategies followed by the local community include a) migration to other villages or town for farm and non-farm work, b) working in shrimp farms, c) growing alternative crops, d) borrowing from money lenders. Fishing community demanded development of mangrove bio-shield as one of the major options to reduce their vulnerability to cyclones and sea level rise. They also expressed the need for reduction input cost, particularly cost of the fuel, more technology for harvesting deep sea fishery resources and diversification of income sources as measures to increase their adaptive capacity.

Women in the coastal villages expressed that the salinization of the ground water has increased the drudgery for them. They are fetching drinking water from far off places especially during summer. The mangrove plantation in the degraded area might reduce the saline water intrusion and the salinization process.

Meeting with the Government agencies and Academicia

Discussions were held with the fisheries department officials of Andhra Pradesh with the Deputy Director of Fisheries about the climate change adaptations and the Integrated Mangrove Fishery Farming System in June 2013. They informed that the IMFFS is similar to traditional farming where the input for the fish culture like feed and chemicals will be very less and there would not be any pollution problem. They are confident that the system is eco-friendly and suitable for saline soils which is not fit for agriculture. They also informed that the restoration of mangroves will not only improve the feeding and nursery ground for the fishery but also enhance the coastal protection from the natural disasters like cyclones. Similar views were expressed by the academicians of Center for Advanced in Marine Biology, Annamalai University for IMFFS and mangrove restoration.

The project implementation emphasizes on people-centric and bottom-up approach to have people's participation in all aspects of the project cycle to enhance the sense of ownership among the community for the project interventions. Greater community participation particularly the poorest of the poor and women is of paramount importance as part of project design.

Organizing the villagers into Village Level Institutions (VLIs) is process intensive and systematic processes are followed. The objectives of VLIs are a) to provide a platform for the people to participate in the project planning, implementation and monitoring, b) to provide opportunity for women and marginalized community in decision making and c) to create ownership of all project activities implemented in the village. Each VLI is a three tier structure. The General Body (GB) is constituted with adult male and female representatives of each household and acts as the decision making body. The next tier of the structure is Executive Committee (EC) consisting of selected representatives from the GB for implementing the activities and the Office Bearers are the leaders of the VLIs.

The above process of decision-making during implementation would ensure participation of community members. Since, the stakeholders have been consulted right from the planning stage of the project and the project components are designed taking into account inputs from the stakeholders during such consultations, besides technical investigations. The AFB's Environmental and Social Policy (approved in November 2013) will be made available to project stakeholders and promoted through training and dialogue with implementing agencies to build a common understanding of the principles and practices that have been adopted to enhance development benefits and avoid unnecessary harm to the environment and affected communities. Any potential impacts on marginalized and vulnerable groups

will be properly screened and considered by the implementing agencies.As such the project does not have any potential environmental and social risks.

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

It is the need of the hour to enhance the adaptive capacities with futuristic approaches where in restoration of mangroves and demonstration of IMFFS plays a vital role by satisfying the accommodation and protection contexts enabling both productive as well as protective functions. A science based and participatory processes are to be adopted to accomplish the selected adaptive strategies. Long term sustainability of interventions also requires financial capital. If the programme is not executed as mentioned earlier the socio-economic losses and environmental degradation would be much higher than the present state. The component-wise comparison of baseline situation with project scenario is presented below:

1) ***Component 1: Stake-holder mobilization, PRA and Entry Point Activities:***

   In the baseline scenario projects / programme are taken-up without much stakeholder consultations especially during the planning stage. Stakeholders especially the vulnerable communities who are the direct beneficiaries of any project are not taken on board while designing various components as also at other stages of implementation. Hence mobilization of the stakeholders, constitution of village level institutions PRA, etc. are not given required focus.

   Adaptation Alternative: In the project scenario a systematic efforts in mobilizing the stakeholders so that a gender balanced village level institution (VLIs) will be established for performing various roles during project implementation and sustaining the programme activities thereafter. The activities involved are initial and periodic meetings with villagers which would help to mobilize the villagers and organize them as groups for undertaking the intended activities.

   Participatory Rural Appraisal will be based on the secondary information about the villages already available with the revenue and village authorities supplemented by remote sensing and GIS data. As a part of PRA, vulnerability assessment will also be carried out by the agency.

   In order to generate interest amongst the community about the project and to bring them to the fold of the project, it is proposed to take-up certain entry point activities which are of high priority for the community. These interventions will help to gain

confidence of the villagers and help the agency to take them along without much hassle.

2) ***Component 2: Training and Capacity Building:***

In the baseline scenario the community is not having proper capacity to regenerate mangroves and take-up livelihood activities like IMFFS. Mostly these communities are resource poor having less access to institutions providing and capacity building. Presently there are no exclusive activities from the part of extension machinery of the Government in building capacity of the community.

Adaptation Alternative: In the project scenario provision has been made to develop the skills of 200 villagers (100 male and 100 female) in mangrove nursery rearing, mangrove plantation & rearing, silviculture and also group dynamics so that the villagers are able to continue the activities even after withdrawal from the project by the agencies. 50 farmers will be trained in IMFFS and will be taken for exposure visits to locations where similar activities are successfully undertaken. This will ensure the community to have requisite capacity in not only undertaking the activity but sustaining it on a long term.

3) ***Component 3: Restoration of Degraded Mangroves:***

In the baseline scenario, generally coastal area and communities are prone to multiple hazards such as cyclones, floods, storm surges and tsunami. Addition on to these is the predicted sea level rise due to climate change and the vulnerability is three fold; i) permanent submergence of some of the coastal areas, which leads to permanent loss of coastal habitats, human settlements and shoreline infrastructure ii) impact due to changed high tide line due to sea level rise, which results in periodical inundation of sea water into non-saline lands including agriculture areas and coastal aquifers and iii) exposure to increased intensity of cyclones and associated storm surges.

Adaptation Alternative: The mangroves play an important role towards adaptive responses to sea level rise and salinity ingress from sea water. The roots of the mangrove physically buffer shorelines from the erosive impacts of ocean waves and storms and will provide a bio shield to the coastal villages to combat climatic changes in terms of salinity incursion and the consequent loss of livelihood and dwelling. Additionally, mangroves protect riparian zones by absorbing floodwaters and slowing down the flow of sediment-loaded river water. This allows sediments to drop to the bottom where they are held in place, thus containing potentially toxic waste products and improving the quality of water and sanitation in coastal communities. Creation of

mangroves will prevent soil erosion from the coast and will also improve the biodiversity in the coastal mud flats /swamps thereby improving the natural productivity of the coastal waters which is the natural habitat of many varieties of fishes, crustaceans and mollusks. The project will restore the degraded mangroves, create mangroves in suitable mud flats near the coast which will help to conserve the shelter of many commercially important animals/ organisms including fishes and crustaceans which will increase the income levels of the community. Therefore about 200 ha of suitable land have been identified in Krishna wetland in Andhra Pradesh for regeneration under the project.

4) ***Component 4: Demonstration of IMFFS:***

In the baseline scenario, in the absence of proper livelihood for the community out migration persist in the area resulting in family disintegration, drudgery for women and school drop-outs. The excess salinity in the soil makes it difficult to undertake cropping. Impacts of frequent cyclone and flooding cause heavy damage to livelihoods including farming and fisheries. Salinization of the ground water makes the life of the community miserable. The current adaptation strategies in the absence of alternative livelihood include migration to other villages or towns, working as a labour in shrimp farms, sheep rearing, etc., which does not provide adequate income for sustenance. There is an urgent need for augmentation of fishery resources potential of mangroves to enhance livelihood security of coastal fishing families. Thus, restoring and sustaining mangrove wetland – which is the most dominant wetland in tropical coastlines – and also creating it in areas where biophysical and social conditions are suitable and augmenting its fishery resources, could be an important strategy to both mitigate the impact of sea level rise as well as enhance adaptive capacity of local community.

Adaptation Alternative: One such system is Integrate Mangrove Fishery Farming System, wherein rising of mangrove trees is integrated with fish culture. It is a new kind of farming system wherein conventional earthen aquaculture ponds are modified in such a way to provide about 40% of the area for raising mangrove plantation and 60% water spread area for fish cultivation. Space for growing mangroves and other vegetation is created by constructing linear bunds or mounds inside the pond. The IMFFS activities will improve the adaptive responses and resilience of the otherwise marginalized coastal fishermen who are most vulnerable to the vagaries of nature due to climatic imbalances. These interventions demand huge physical activities that encompass technical designing and execution of canal systems for mangrove restoration and pond preparation for IMFFS which requires qualified and skilled

human resources as well as financial resources. Thus, the restoration of degraded mangroves, creation of mangroves in suitable areas and introduction of integrated mangrove fishery farming system in saline areas will enhance adaptive capacity of coastal community to sea level rise.

5) Component 5: Knowledge Management:

At present one of the weakest links in implementation of many of the flagship projects is in its inability to capture processes and factors making the project a success. Thereby, it becomes quite often difficult to replicate and upscale many of the pilot projects implemented in the country. Documentation of the project during as well as after implementation is a grossly neglected area whereby limiting the scope for dissemination of information.

Adaptation Alternative: Under the project a systematic monitoring and evaluation system is proposed to be developed and practiced to ensure effectiveness and efficiency of the programme. It is also proposed to document and disseminate the process, progress and best practices for wide range of stakeholders for various uses. Thus, programme activities will enhance capacity of the community to make sure that coastal lands are used productively as adaptive strategy to sea level rise and enhance their livelihoods.

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

Sustainability is a major challenge for all developmental interventions. Given a very dynamic and unpredictable scenarios sustaining the adaptive capacity strategies should be looked in different dimensions. Hence the programme is attempting to sustain the physical, human, financial, and institutional and livelihoods components.

- In addition to creating the physical capital such as canals for mangroves and IMFFS ponds it is important to maintain them for its effective functioning. This requires periodical maintenance such as desilting of canals and ponds including sluice and supply channels, causality replacement of mangrove and fishes. To ensure the physical sustainability skilled communities are required and the project process will ensure building their capacities in this regard. Despite having skilled persons a collective approach with good leadership and social inclusiveness is a prerequisite. Therefore the gender balanced village level institutions are to be established in the programme villages. A management plan

involving multiple stakeholders is to be developed and executed by the village level institutions for protecting the resources and benefit sharing.

- The institutions to protect and continue to culture fishes in IMFFS require financial resources. The programme will provide fish and other inputs for the first year and the subsequent years the individual farmers will be encouraged to continue the farming system. The technical support will be provided to sustain the activity beyond the project period. Ultimately both the mangrove restoration and the IMFFS not only enhance the adaptive strategies but also help to earn additional income. The project will ensure that increase in fishery resources and other biodiversity takes place in the intervention area without having negative implications on the environment.
- The individual farmers will be providing their land for integrated mangrove fishery farming system and the project will help them to convert the land into IMFFS by suitably modifying them in such a way that the water is exchanged through tidal flow. The farmers providing the abandoned shrimp farms are small and marginal shrimp farmers. Some of the farmers already registered their farms with the Coastal Aqua Culture Authority (CAA) and the remaining farms will be registered with it. Similarly the farmers also have the certificates from MPEDA to sell the produces. Since, the input cost is less the community will manage the programme successfully after withdrawal of the programme.
- The village level institutions and the resident NGO PPSS ensure in sustaining the programme even after the project period. The activities of MSSRF in the programme locations in Andhra Pradesh will be continuing which will be useful in extending the technical guidance whenever required.
- In order to sustain programme activities strong linkages will be established with the existing programmes and schemes of the community based organizations, grass root NGOs, local self-government such as Panchayat as well as with other government agencies. Management of disasters has become a mandate of the local self-government. Since the proposed activities will play a role in reducing the impact of natural disasters and predicated climate change the local government will take keen interest in sustaining these activities.
- Replication/ Upscaling:
    - The proposed activities such as the Integrated Fishery farming system and the restoring mangrove vegetation can be linked to the PRI and the Forest and Fishery Departments of the state government. This will ensure replication of the models demonstrated in the programme.

- Similarly, the international and national NGOs working in the programme area will be interested to replicate the programme activities like mangrove restoration and development of Integrated Mangrove Fishery Farming system to reclaim the abandoned aquaculture farms.
- Individual farmers will also take up the IMFFS farming system in the saline lands as an adaptive capacity to SLR and salinization of the soil due to available model for demonstration and exposure.

The following specific measures are proposed under project intervention to replication and scaling-up of the activities on large scale:

1. Community being the primary stakeholders' lesson drawn from the programme will be documented in local language and shared.
2. Lessons from the programme will be brought to the attention of State or national level climate change and disaster risk reduction departments.
3. Specific targeting of programme analysis and policy information will be derived from early assessments of existing gaps or weaknesses in policy matters.
4. Opportunities for dissemination through regional and international conferences, publications in journals and books, or web-based content will be explored by the implementing agency.
5. The brochures in regional language will be brought out for disseminating the information about climate change vulnerability and the impact of programme interventions

Possible areas for replication and up-scaling of proposed activities:
Mangroves: The state forest department Government of Andhra Pradesh has restored more than 3000 ha of degraded mangroves in Krishna wetland and M S Swaminathan Research Foundation has restored more than 450 ha of degraded mangroves. Still more than 3,000 ha of degraded mangroves areas are available for mangrove restoration in Krishna mangrove wetland. Successful demonstration of mangrove restoration would help in replication of the similar efforts in other areas. It is estimated that more than 3000 ha available in Krishna mangrove wetlands.
IMFFS: The estimated brackish water area suitable for undertaking shrimp cultivation in India is around 11.91 lakhs ha spread over in 10 coastal states and union territories. In the total area only 10% area (around 1.2 lakhs ha) is under shrimp farming leaving a large scope for expanding the small scale shrimp farming in India. In Andhra Pradesh large areas of saline affected lands are available for replicating Integrated Mangrove

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	The project complies with Environment (Protection) Act, 1986 and Forest Conservation Act, 1980.	None

Access and Equity	The project provides fair and equitable access to the project beneficiaries and will not be impeding access to any of the other requirements like health clean water, sanitation, energy, education, housing, safe and decent working conditions and land rights.	None
Marginalized and Vulnerable Groups	The project is basically aimed at providing livelihood and income to marginalised community living in the project area and as such will not have any adverse impact on other marginalised and vulnerable groups	None
Human Rights	The project does not foresee any violation of human rights	None
Gender Equity and Women's Empowerment	The project covers 50% women beneficiaries and provision has been made for capacity building and training on restoration and IMFFS techniques including management skills and strengthening of livelihood. This will ensure participation by women fully and equitably, receive comparable socio-economic benefits and that they do not suffer adverse effect.	None
Core Labour Rights	Payments to labour under the project will be made as per Government approved norms duly following minimum wage rate and hence ensuring core labour rights.	None
Indigenous Peoples	Not applicable to this project	None
Involuntary Resettlement	The project does not displace any community and hence issue of resettlement does not arise	None
Protection of Natural Habitats	The mangrove restoration will be taken up in 200 ha of revenue land for which necessary permission have been taken from revenue department and as such does not affect any of the natural habitats	None
Conservation of Biological Diversity	The project promotes biological diversity through regeneration of various species of mangrove and rearing of fishes. IMFFS conserves both plant as well as aquatic bio-diversity. Mangroves are of high value for bio-diversity conservation and are an important resource for coastal communities. They provide the habitats for diverse marine and terrestrial flora and fauna.	None
Climate Change	The project is basically for enhancing the adaptive capacity of the fisherman community against adverse impact of climate change and is not expected to contribute to GHG emissions	None
Pollution Prevention and Resource Efficiency	IMFFS is designed in such a manner that that only very limited energy is required for operation since water is exchanged by tides through gravitation in and out ponds, more	None

	over no chemicals are used and hence does not create pollution related issues	
Public Health	No adverse impact on public health related issues is envisaged.	None
Physical and Cultural Heritage	No adverse impact on cultural heritage related issues is identified.	None
Lands and Soil Conservation	Restoration of mangroves is envisaged to help in land and soil conservation and will not create any damage to land & soil resources.	None

Addressing issues related to equitable access:

- The vulnerable community will be given preference and the village level institution plays major role in selecting the target group. VLCs will ensure inclusion of the poor and vulnerable sections of the community.
- The training and capacity building will be provided for all the interested community for sylviculture practices for mangrove restoration and IMFFS farming practices
- Under the project innervation support for IMFFS will be provided for first crop only. Subsequently the farmers will sustain the project activities

Proposed interventions are not envisaged to pose any risk or any other potential impacts on marginalized and vulnerable groups. The area is located in the highly vulnerable area for cyclones and more than 10,000 people were killed in the 1977 cyclone. The mangroves restored will enhance the coastal area protection. The poor vulnerable groups will get priority in the project activities like mangrove restoration work. Project would help in building climate resilience of these groups. Further, there will not be any relocation of the people's livelihood. The Mangroves will be restored in the degraded area which will provide livelihood in the form of labour initially and later through fishes. Similarly the abandoned shrimp ponds at present do not support any livelihood. The IMFFS provide sustainable shrimp farming with less input cost.

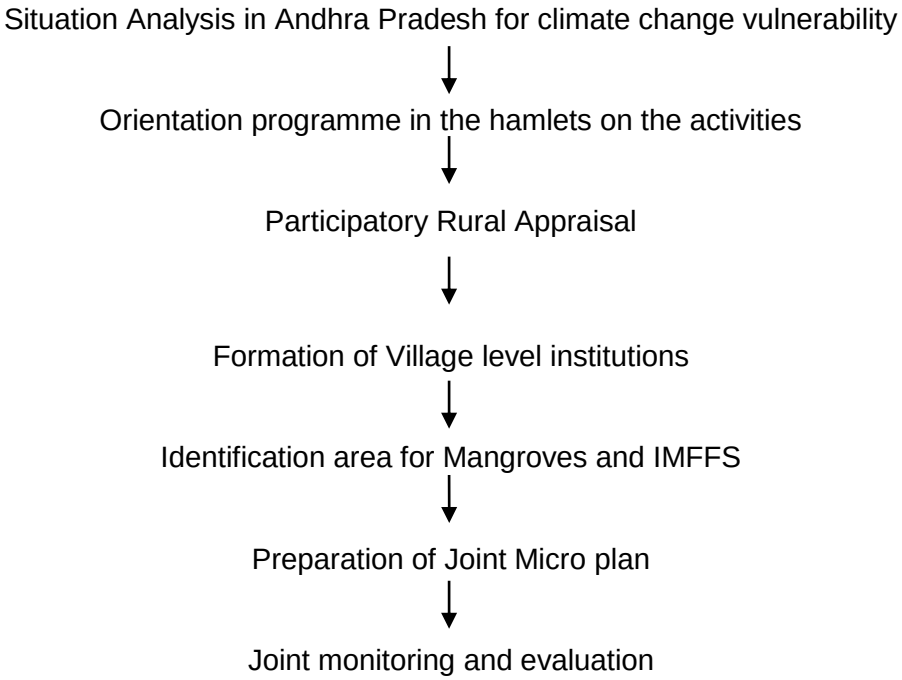
In view of the above the project is categorized as **"Category C"** with no adverse Environmental or Social Impacts.

PART III: IMPLEMENTATION ARRANGEMENTS

A. *Describe the arrangements for project / programme implementation.*

The overall strategy of the programme is science-based, people-centered, process-oriented and stakeholder based. The term science-based means all activities relating to enhancing capacity of local community to sea level rise will be taken up on sound understanding of ecological processes that operates in the programme area. The term people-centered means the local people or communities are the key players and they are the decision makers rather than government agencies or facilitating agency (such as MSSRF). The term process-oriented indicates that this approach should consists of series of steps, which accommodate changes in perception, socio-economic situation and problems, and the priorities of stakeholders. The programme will be implemented with community, Panchayat Raj Institutions and the government departments like fisheries and forest department in Andhra Pradesh. The following is the process to be followed in programme planning and implementation.

Fig 7. Steps of a participatory science-based, people centered and process oriented approach



Role of NABARD as NIE:

NABARD would be involved in periodic monitoring (on-site and off-site) of the project. Periodicity and structure of monitoring is given below:

1. On-site detailed monitoring would be done on six monthly basis jointly by NABARD Regional Office (Andhra Pradesh) and Head Office. The frequency of monitoring would be increased if considered necessary.
2. District Development Manager I.e NABARD officer stationed at the district would be a part of the monitoring committee for implementation of the project at local level.
3. NABARD would be part of steering committee which would be meeting every six months. The committee would deliberate and review the progress of implementation.
4. Quarterly report submission formats would be designed for submission by executing entities for desk appraisal of progress. This will be structured as a pat of the off-site monitoring surveillance system and would be designed to generate warning signals , if any.
5. Progress reporting would be done to AFB on periodic basis (half yearly or more frequently as per requirement of AFB).
6. NABARD would create platform for sharing and dissemination of knowledge at regional and national level.

Praja Pragathi Seva Sangham (PPSS) was registered in 1993 under societies Act of 1860 with Registration No.298/93, with its headquarters at Machilipatnam (Andhra Pradesh). The socio- economic development and environmental initiatives are implemented in Krishna district. PPSS is working with MSSRF in implementing the projects from 2007 onwards.

Agreements between MSSRF and PPSS

Memorandum of Understanding will be made between MSSRF and Praja Pragathi Seva Sangam (PPSS), to implement the project in the Krishna District in Andhra Pradesh. PPSS has been working with MSSRF from 2007 and has experience in natural resource management of the coastal area.

Both MSSRF and PPSS will work for the benefit of the communities in the coastal areas which are prone to natural disasters like tsunami, cyclones, storm surges and also to the sea

level rise due to climate change. MSSRF and PPSS to collaborate in the implementation of the project on Conservation and management of coastal resources as a potential adaptation strategy for sea level rise.

MSSRF will be releasing the money to PPSS as per the work plan prepared jointly by MSSRF and PPSS. PPSS implement the project activities as per the work plan which will be monitored at regular intervals by MSSRF, PPSS and the local community.

Roles and responsibilities of MSSRF and PPSS

MSSRF	PPSS
Community mobilization and organization	
• Constituting a gender balanced village level institution (VLI) in each project	
• Organizing exposure visits to restored mangroves and IMFFS areas for the community	
Understanding adaptive strategies and creating baseline	
i. Analyzing the current status of the coastal resources, environment and their management	
ii. Conducting Vulnerability and Capacity Assessment through Participatory Rural Appraisal	
ii. Predicting Sea Level Rise using Digital Elevation Model (DEM)	
A. Identifying concerns to enhance coping mechanism and adaptive strategies of the community	
iv. Documenting existing best practices relating to coping mechanism and adaptive strategies	
Restoration of degraded mangrove wetlands	
• Analyzing current status of mangroves and assessing the cause of degradation	• Raising mangrove nursery
• Land suitability and topography survey of the degraded area	• Digging canals / desilting of canals
• Analyzing issues relating to management of mangroves with different stakeholders using participatory tools and preparing a long term plan	• Planting of mangroves/ casualty replacement / watch and ward
B. Monitoring the growth of mangroves	
Integrated Mangrove Fishery Farming System	
• Layout and design preparation for IMFFS	• Pond preparation
	• Planting of mangroves
	• Releasing of fish juveniles
C. Monitoring of mangroves and fishes for their growth	
D. Harvesting and documenting	

Awareness, training and capacity building	
L. Awareness on predicted sea level rise due to climate change and its implications on coastal resources and livelihoods	
M. Training needs assessment and identifying target groups	
3.Training programmes towards livelihood strengthening activities and adaptive capacities	
• Organizing exposure visits for the community to identified best practice areas	
i. Organizing gender sensitization programme to the community	
Monitoring and Evaluation	
1. Indicators for Monitoring	
2. Periodic participatory monitoring	
3. Data collection based on indicators	
B. Data analysis and reporting the progress and best practices	

Activities to achieve outputs

Component 1: Community mobilization and organization

Major Activities:

1. Conducting orientation meetings in the project villages about the project, objectives and process
2. Constituting a gender balanced village level institution (VLI) in each of the project villages and involving it in project planning, monitoring and evaluation
3. Organizing exposure visits to VLI leaders and members to best practices relating to coping mechanism, adaptive strategies and coastal resources management

Component 2: Understanding adaptive strategies and creating baseline

Major activities

1. Analyzing perspectives of the community on the current status of the coastal resources, environment and their management
2. Conducting Vulnerability and Capacity Assessment using Participatory Rural Appraisal
3. Predicting Sea Level Rise using Digital Elevation Model (DEM)
4. Identifying concerns to enhance coping mechanism and adaptive strategies of the community of the programme villages
5. Preparing and disseminating a compendium of existing best practices relating to coping mechanism and adaptive strategies

Component 3: Restoration of degraded mangrove wetlands

Scientific and technical aspects like edaphic and hydrological factors responsible for the degradation of mangrove will be identified before initiating the mangrove restoration. In the stakeholders meeting the community members informed that some of the mangroves were cleared for shrimp farming.

The local community will be involved in the mangrove restoration works such raising mangrove nursery, planting mangrove saplings, watch and ward desilting of canals and casualty replacement. The canal digging will be carried out using earth movers. Community members will be given orientation on the need for mangrove restoration from the ecological point of view. Community will be trained in raising mangrove nursery and restoration of mangroves with techniques. As the mangrove restoration activity is labour intensive the local community derive more work through this programme.

Avicennia marina and *Avicennia officinalis* will be planted more in the restored area as the two species are more suitable than others. The availability of seeds for these two species is also high. They are able to tolerate wide range of salinity and could able to grow well in the restored area. As indicated above the multiple species provide better protection than the monoculture of mangrove species, other species like *Avicennia alba*, *Rhizophora apiculata, Rhizophora mucronata, Bruguiera gymnorrhiza, Excoecaria agallocha* and *Ceriops tagal* will be planted.

The mangroves in the degraded area will be restored through fish bone canals dug for tidal flushing. The main canals will be dug at an angle of 45^0 to the natural creek and the side canals will be dug at an angle of 30^0 to the main canal. Canals will be designed like fishbone in order to facilitate easy inflow and outflow of tidal water. The canal dimensions will be determined as per the contour levels and the tidal amplitude of the degraded area chosen for restoration. The canals will be dug in a trapezoidal shape in order to plant the saplings at the mid-level of the canal. This is to ensure that the plants receive tidal water, but at the same time they are not submerged. Based on the contour survey and hydrology study, the canal depths and dimensions will be fixed, corresponding to the topography and tidal amplitude of the selected restoration site.

Nursery raised Mangrove saplings or propagules collected from the mangrove forests will be planted along the canals. In addition to the nursery raised mangrove saplings direct planting of mangrove seeds/propagules will be carried out in between the canals and in the areas where ever possible. This type of plantations is being carried out in the elevated areas where

the tidal water flow is limited. All the maritime states are following this model for restoring mangroves in the degraded areas.

Major activities

1. Analyzing current status of mangroves and assessing the causes for degradation
2. Raising mangrove plantation using fish bone method to stabilize the coast to prevent saline water intrusion in extreme events and also to provide opportunities for income generation
3. Analyzing issues relating to management of mangroves with different stakeholders using participatory tools and preparing a long term plan

Component 4: Integrated Mangrove Fishery Farming System

Major activities

1. Analyzing current livelihood strategies in the project villages and issues relating to them
2. Demonstrating integration of mangroves and fisheries through integrated mangrove fishery farming system as an alternative source of income
    - Layout and design preparation
    - Pond preparation
    - Planting of mangroves
    - Releasing of fish juveniles
    - Monitoring of mangroves and fishes for their growth

Component 5: Awareness, training and capacity building

Major activities

1. Creating awareness on predicted sea level rise due climate change and its implications on coastal resources and livelihoods
2. Conducting training needs assessment and identifying target groups
3. Conducting training programmes to enhance knowledge, skill and attitude towards livelihood strengthening activities and adaptive capacities
4. Organizing exposure visits for leaders and members of grass roots NGOs and government agencies to identified best practice areas
5. Organizing gender sensitization programme to leaders and members, women, men and youth of the community, leaders and members of community based organizations and elected Panchayat leaders

Component 6: Monitoring and Evaluation

1. Setting up Monitoring and Evaluation system
2. Conducting participatory monitoring
3. Colleting process and progress data based on indicators
4. Analyzing the data and reporting the progress and best practices

Programme Management

Programme Advisory Committee

The members of Programme Advisory Committee will be

- Representative of Forest Department
- Representatives of Fisheries Department
- One mangrove expert
- One fishery expert
- Three representatives of the Voluntary / NGO sector

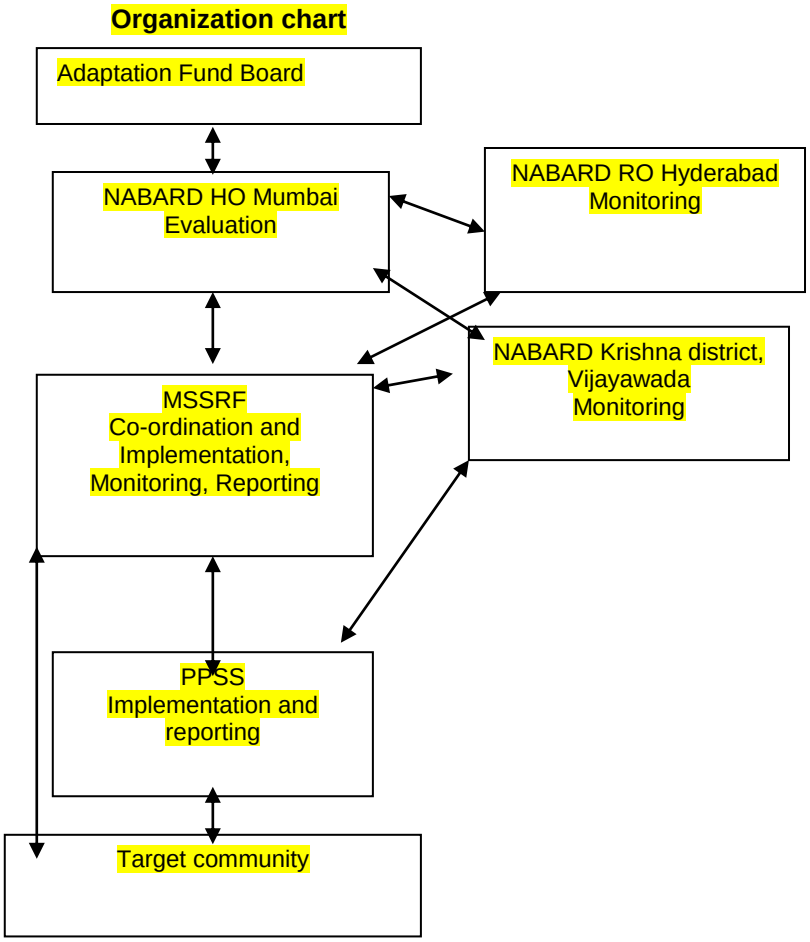
The Programme Director will be Member – Secretary of the Committee. The committee will meet at least twice in a year. The committee will provide policy guidance and advice to Programme Director in all activities related to the smooth implementation of the programme.

Programme Implementation structure

At the site a programme implementation team will be formed consisting of a Site Co-coordinator, mangrove / fishery experts and a social worker. Site Coordinator is responsible for smooth implementation of the programme at the site level and she/he will also function. The coordinator will be coordinating the project activities with the Praja Pragathi Seva Sangham for which MoU will be signed before initiating the project activities.

Programme reporting

Site Coordinator will send monthly progress report to Programme Director. Programme Director will send both technical and financial report as per schedule to the funding agency.



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

The grant will be deposited in a separate bank account and MSSRF will keep a separate ledger account. This ledger will be structured in line with the approved budget heads. Income and expenditure will be shown separately. The accounts will be maintained in such a manner that the auditor can ascertain that the funds received for the programme have been utilized for approved work plan. MSSRF will establish an internal system of financial monitoring to examine proper use of the fund and MSSRF will appoint an external auditor every year for auditing the accounts and audited report will be sent to the donor.

Experiences indicate that two major risks are expected: i) natural disasters such as cyclone and ii) flooding in the coastal areas, which will affect mangrove plantation; desilting of canals dug for free tidal flow in the mangrove plantation sites and replacing mangrove seedlings died are two management activities taken up to manage this risk. Permission for suitable land for restoring mangroves has been taken from the Revenue Department for two years. As per the practice in vogue, extension for two more years is routinely given by Revenue

Department provided the agency does good work in the area allotted, benefitting the community. In view of this, project with four years phasing could be considered.

Details on identified risks, the perceived level of those risks, and the planned mitigation measures are presented below:

Identified risk	**Perceived level of those risks**	**Planned mitigation measure**
Failure in Community Mobilisation to undertake the activities of mangrove-fishery - inertia against change	Low	• Exposure visit to successful interventions on same lines. • Entry point activities to gain confidence of the community. • Promotion of Community Ownership through village committees
Not all necessary stakeholders may take part in the process with the capacity and commitment required. Afterwards, there can be resistance from some stakeholders in adopting the proposed measures.	Low	The participatory meetings have been used to mitigate these risks. A training programme for community members, community leaders, and civil authorities will raise awareness about locally important issues related to climate change and adaptation would be conducted.
Financial mis-management	Low	• Periodic Monitoring – on-site and off-site for verification of expenditures • Social audit through transparency and display of project information on sanction and progress at public places. • Annual project auditing
Slow progress of the work due to climatic unfavourable factors	Low	• Work-plan based on the suitability of season for certain works like plantation, earthwork, fingerling rearing would prepared and monitored by
Extreme weather events during the project lifetime undermine confidence of local communities in adaptation measures promoted by the project	Medium	The project implementation team at grass root level and the Village Level Committees (VLCs) will be sensitized on disaster risk and early warning communication based on the existing early warning system in the project area operated by Government Agencies. This will enable basic preparedness planning. Primary target groups for these efforts are IMFFS fishers and community-based institutions.
Limited capacity of partner organisations to	Low	The project has a strong capacity building and training component. The project will carry out

deliver project outputs.		capacity assessments of community institutions (VLCs etc.) during the inception phase and incorporate capacity building where necessary.
Failure to create ownership of the project at the local level.	Low	Project design has already involved the key stakeholders in problem identification and project design. The project will also ensure that they are involved in implementation and phase out activities to create ownership at the community level and build in sustainability to project interventions.

NABARD's role in risk management in the project is given below:

NABARD has a Regional Office at the state capital i.e Hyderabad and also has posted an officer, called District Development Manager (DDM) in all most all the districts of the State. NABARD has already earmarked two officers at the Regional Office level, designated as the nodal officers and trained them for implementation of CC adaptation projects.

1. NABARD would be involved in closed periodic structured monitoring – desk as well as field monitoring of the project at all the stages of implementation. Monitoring objectives will be to identify project bottlenecks and risks as early as possible to address them.
2. NABARD officials / teams at district and state level would be involved in project guidance, steering, monitoring, auditing, co-ordination with State, District officials for resolving any bottlenecks in project implementation.
3. Officers from NABARD Head Office will also visit the projects at periodical interval for addressing risks, if any.

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

Even though the project is classified as "Category C" project and is not envisaged to pose any risks indicated under Environmental and Social Policy of Fund any risks that may arise during the project implementation would be mitigated as indicated below:

- Programme implementation teams would be sensitized on these aspects.
- Programme Advisory Committee would specifically review issues related to social and environmental risk during its period meetings.

- NABARD Regional and Head Office would identify specific risks that may arise during implementation based on the monitoring of project and built in reporting mechanism for the same.
- Social audit that would be put in place would also help in mitigation of some of risk enlisted under Environmental and Social Policy of the Fund. Community would be sensitized on contents under Environmental and Social Policy of the Fund.

Mechanism of creation of awareness on Social and Environmental Policy of Fund would be on the following lines:

- Initial orientation during the inception of the project about the systems and procedures.
- Providing guidelines and orientation on the Environmental and Social Policy of the Adaptation Fund to the project team
- Grievance mechanism would be informed to community during the project inception workshop.
- Communication details of implementation entity co-ordinator would be available to direct beneficiaries as well as community at large through display of project information boards placed at common places.

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

Based on the result framework presented below a monitoring and evaluation system will be prepared. Based on the baseline done at the time of PRA bench-mark for each of the proposed interventions would be firmed up. The system will encompass a clear data collection and compilation plans for monitoring qualitative as well as quantitative results indicators using appropriate methods and tools. Data will be collected periodically at specified intervals and analyzed to track the progress. The details on monitoring mechanism are given below.

1. Inspection and annual workshop:

An **Inception workshop** will be held within the first two months of project implementation to:

- introduce the project team,
- orientate key stakeholders on the objectives and results framework,

- provide an update on the project start up activities,
- agree roles and responsibilities of each institution,
- provide an overview of reporting, monitoring and evaluation requirements,
- present the financial reporting procedures and arrangements for audits,
- plan and schedule Steering Committee meetings.
- recheck assumptions and risks, and
- to plan project implementation.

The Programme Co-ordinator will prepare and disseminate the Inception report with an overall workplan and budget for the four year period as well as a detailed workplan and budget for year one with milestones and progress indicators to guide implementation during the first year of the project. The Inception Report will also include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project related partners.

2. **Three Tire System of Monitoring:** A three tier system will be followed to review the progress and reflect critically to ensure effectives and effectiveness of the programme interventions. At the village level participatory monitoring will be done by community and implementing staff. At the district level coordinator will conduct monitoring meetings with implementing staff and community representatives at the state level the Director will monitor and review the work progress as well the results with coordinators and implementing staff. Community representative shall attend the monitoring meeting to share their views and inputs. At all levels monitoring will ensure that the activities planned are completed and the results are achieved.
3. **Quarterly Progress Monitoring**: In case of variation decisions to improve the performance will be made in the quarterly meetings by analyzing the results. Monitoring reports will be prepared based on the analyses and will incorporate the challenges and internal and external difficulties encountered during implementation of activities and in monitoring process. Strategies to overcome the challenges and difficulties to be evolved during the review meetings at each level. The reports will be shared with different stakeholders for various uses. The programme director will attend the quarterly meeting to be aware of the trends and also to ensure the quality of analysis done in the meetings.
4. **Quarterly Progress Reports** will also be prepared by the Site Coordinator and submitted to the Programme Director to ensure continuous monitoring of project activities and to allow for corrective measures in due time. These reports will provide an update on progress on the delivery of outputs, a quarterly expenditure report and a workplan for the next quarter. Where a six-monthly report is being prepared, it shall

subsume the quarterly report (i.e. there will not be double reporting at the six monthly stage). A copy of the report will be given to the village level organization for their records.

5. **Six monthly Progress Reports** will describe progress on implementation as well as lesson learning, a risk update and management and an ongoing assessment of sustainability and acceptance of project interventions by the stakeholders particularly the beneficiaries. The report will also include the expenditure report and a workplan and budget for the following reporting period. The bi-annual progress reports will be submitted to the Progamme Advisory Committee for regular review and approval.

6. **Midterm review** with both internal and external evaluators will be conducted and impact evaluation will be done after the project period as the nature of interventions demands long period to realize its fullest impact An external Mid-Term Evaluation will be conducted mid-way through project implementation. The evaluation will review progress against milestones and assess progress made towards the delivery of outputs and achievement of objectives as well as identify corrective actions if needed. It will focus on the effectiveness of delivery, timelines and efficiency of implementation, and risk management. It will present the initial lessons of project design, implementation and management. The findings will be used to enhance implementation during the final half of the project's term.
7. A **Final Evaluation** will be conducted 3 months before project closure and will focus on the impact and sustainability of project results. The report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, and make recommendations on any actions needed to ensure sustainability, replicability and scaling up.
8. Results and lessons learned from the project will be periodically disseminated within and beyond the project intervention zone using a variety of media (briefing notes, website as well as through existing information sharing networks and forums).

Budget for M & E Plan:

Monitoring and evaluation plan Activity	**Responsible person**	**Yr. I**	**Yr. II**	**Yr. III**	**Yr. IV**	**Total US$**	**Timeframe**
Inception workshops	Programme Director	1,250				1,250	Within 2 months of project starting and yearly thereafter

Inception report	Programme Director					0	Within 2 months of project starting
Impact Assessment (beginning of 2nd and 4th year) during the other years the mid-term and terminal report will include impact study	Programme Director		833		833	1,667	Annual
Bi-annual Progress Reports	Programme Director					0	6 monthly
Quarterly Progress Reports	Programme Director and Project Site Co-ordinator					0	Quarterly
Participatory Monitoring and Evaluation by beneficiaries	Programme Director					0	Quarterly
Annual field visits by representatives of Programme Advisory Committee	Programme Director					0	Annual
Minutes of Advisory Committee Meet	Programme Director					0	Quarterly
Technical Reports	External consultant					0	Periodic
Mid-term Evaluation	External consultant			3,333		3,333	Mid term
Final evaluation	External consultant				5,000	5,000	3 months before end of project
Audits	External auditor	100	100	100	100	400	Every Year
		1,350	**933**	**3,433**	**5,933**	**11,650**	

Reporting Mechanism

- The executing entity, MSSRF will collect the data, analyse and submit reports to the NABARD, the Implementing Entity
- Project/Programme Inception Report : during the Start of programme
- Annual report on Programme Performance Report (PPR)
- Annual Audited financial statement

- Apart from the above reports the monitoring reports will be compiled on half yearly basis.
- NABARD would update the progress of implementation to AFB as per the instruction of Fund Board and sanction terms and conditions.

Monitoring and Progress Reporting:

(A) **Six monthly Progress Reports** will describe progress on implementation as well as lesson learning, a risk update and management and an ongoing assessment of sustainability and acceptance of project interventions by the stakeholders particularly the beneficiaries. The report will also include the expenditure report and a workplan and budget for the following reporting period. The bi-annual progress reports will be submitted to the Progamme Advisory Committee for regular review and approval.

(B) **Quarterly Progress Reports** will also be prepared by the Site Coordinator and submitted to the Programme Director to ensure continuous monitoring of project activities and to allow for corrective measures in due time. These reports will provide an update on progress on the delivery of outputs, a quarterly expenditure report and a workplan for the next quarter. Where a six-monthly report is being prepared, it shall subsume the quarterly report (i.e. there will not be double reporting at the six monthly stage).

(C) At the end of each year an **Annual Impact Assessment** will be carried out by the NABARD to collect and collate indicator data and measure performance against the baseline and targets in the Results Framework. NABARD would work closely with MSSRF (EE) to ensure timely and effective communication of the results to all the key stakeholders. The assessment will include a field survey and case studies and will report on:

- progress made against the indicators and targets,
- delivery of project outputs, and
- lessons learned.

The assessment report will be incorporated into the end of year six monthly report.

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

Development Objectives	Indicators
Goal: To enhance adaptive capacities of the local community and other stakeholders by strengthening their institutional mechanism, restoration and management of coastal resources and building livelihood assets	
Impact: Reduced risk due climate change impact and enhanced adaptive capacities among coastal communities	
Outcome 1: Strengthened institutional capacity to reduce the impact of climate change and sea level rise	70% of men and women among VLI members aware of the climate change impacts on the lives and livelihoods

Output 1: Constituted three village level institutions ensuring equal representation of male and female for participatory planning, implementing, monitoring and sustaining the programme interventions	1. Three VLIs formed with at least 50% of women representation at General Body and Executive Committee levels 1.2. 70 %regularly attend meetings, contribute for decision making and take responsibilities in planning, implementing, monitoring and sustaining the programme interventions 1.3 Three PRA reports available with clearly documented vulnerability context, risks and capacities including the vulnerable groups for planning appropriate interventions 1.4. Entry point activities completed to solve common community concerns
Outcome 2: Training programmes organised to men and women on mangrove restoration techniques and management of coastal resources to enhance their adaptive capacities to climate change	260 members trained on coastal resources conservation for enhancing the adaptive capacities to climate change
Output 2: Trained cadres for conserving the coastal resources like mangroves and managing the IMFFS	2.1. 65 men and 65 women, 10 PRI leaders and 15 NGO and Government officials acquired knowledge on predicted climate change and its impact on coastal resources, environment and community 2.2. 15 men and 15 women are participated in exposure visit for cross learning the IMFFS, mangrove restoration and role of VLI from each village 2.3 50 men and 50 women trained on mangrove nursery, mangrove planting and management
Outcome 3: Enhanced mangrove cover to improve the productive and protective roles of mangroves	IV. 20% of the households get additional income through the capture and culture fisheries from the mangrove restored area
Output 3: Restored mangroves in 200 ha of land and planted saplings of different species	3.1 Canal digging completed in 200 ha 3.2 Planted 400,000 mangrove saplings of different species with 80% survival rate
Outcome 4: Replicable IMFFS model for large scale replication available	50 ha of IMFFS under operation
Output 4: Improved income for the IMFFS farmers in Nali	4.1 Layout prepared in 50 ha in Nali 4.2 Pond preparation completed in 50 ha 4.3 Canal digging completed in 200 ha 4.4 Completed plantation in the farms with 58000 each of *Avicennia* and *Rhizophora* on the bunds with 80% survival 4.5 Released at least 250000 fish/crab/shrimp juveniles in each of the farms
Outcome 5: Outreach to other area for replication of the project activities	Resource materials on mangroves and integrated mangrove-fishery and best practices of adaptive capacity of community to climate change prepared and disseminated
Output 5: Dissemination materials printed and disseminated	5.1 1000 brochures printed and disseminated to stakeholders about climate change, sea level rise and role of mangroves and integrated mangrove-fishery in increasing adaptive capacity of community to change vulnerability 5.2. 5 Best adaptation cases studies documented for dissemination

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

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Village Level institutions actively perform towards sustaining programme activities. Plan Documents incorporating appropriate interventions	3 VLIs formed 3 PRA and vulnerability reports available	VLIs actively participate in planning, implementing and monitoring of project activities and women are empowered to take decisions Completed vulnerability and capacity assessment in 3 villages 3 PRA reports available clearly documenting vulnerability context, risk and capacities	70% Members attending the meeting contributing to decision making.	13333
To train and built the capacity of the stakeholders on adaptive capacities and strengthening livelihood activities and to mainstreaming of the models	20 Percentage of the target households trained on mangrove restoration and IMFFS.	260 skilled man and women continue to sustain the interventions for long term benefits	260 members trained on adaptive capacities and strengthening livelihood activities and to mainstreaming of the models	15000
To integrate ecological security and livelihood security of coastal ecosystems and dependent communities through establishing mangrove bioshield	At least 500 m wide mangrove forest established to combat the storm surges	Increased climate resilience in response to Sea Level Rise and salinization	200 ha of mangroves restored. 80% of mangrove plants survived	106950
To develop and demonstrate replicable models of seawater based agro-aqua farming system as a potential means to adapt climate change effects and sea level rise	50 ha brought under IMFFS	Increased in fisheries resources and enhanced additional income with equitable sharing	65 households engaged in IMFFS	303267
Upscaling and replication of models developed	Mainstreaming of the models for adoption by Government / other NGOs, etc.	Best practices documented and disseminated	No of workshops, publications, monitoring reports	53333

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.*

Financial estimates in US $

Component	Item	YI	YII	YIII	YIV	Total
1	**Stakeholder mobilization and organization**	3333	0	0	0	**3333**
2	**PRA and Entry Point Activities**					
2.1	PRA in the coastal villages (including creation of Base-line)	5000	0	0	0	**5000**
2.2	Entry point activities for 3 villages	5000		0	0	**5000**
3	Meetings/workshops/capacity building	5000	3333	3333	3333	**15000**
4	**Restoring 200 ha of mangroves in degraded area**					
a	Canal digging in 100 ha each in year I and II	37917	37917	0	0	**75833**
b	Mangrove Nursery development for planting in 100 ha	5333	3200	0	0	**8533**
c	Planting of mangrove saplings	3333	3333	0	0	**6667**
d	Causality replacement		2167	2167	0	**4333**
e	Desilting of canals	0	0	3792	3792	**7583**
f	Watch and ward	1000	1000	1000	1000	**4000**
	Sub-total for canal digging	**47583**	**47617**	**6958**	**4792**	**106950**
5	**Integrated Mangrove Fishery Farming system in 50 ha**					
a	Pond preparation in 50 ha	130000	130000	0	0	**260000**
b	Construction of sluice gates	14583	14583			**29167**
c	Planting of mangroves	867	867	217	217	**2167**
d	Release of fishes and shrimps	4167	4167	0		**8333**
e	Watch and ward	1800	1800	0	0	**3600**
	Sub-total for Mangrove Fishery farming	**151417**	**151417**	**217**	**217**	**303267**
6	Knowledge Management	8333	8333	14167	22500	**53333**
7	**Project Execution cost**					
a	Research fellows 2 nos.	7200	7200	7200	7200	**28800**
b	Field Asst - 1 no	1600	1600	1600	1600	**6400**
c	Travel	400	400	400	400	**1600**
e	Contingency and other office expenses	1000	1000	1000	1000	**4000**
f	Monitoring and Evaluation	1,350	933	3,433	5,933	**11650**
	Sub-total for Execution Cost	**11550**	**11133**	**13633**	**16133**	**52450**
8	**Total Project / Programme Cost**	**237217**	**221833**	**38308**	**46975**	**544333**
9	**NIE Management Fee**	20163	18856	3256	3993	46268
10	**Amount of Financing Requested from AFB**	**257380**	**240689**	**41565**	**50968**	**590602**

The details on budget notes is given in the Annexure 1

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

S.No	Major Activity	Time line
1	Stakeholder mobilization and organization	0-6 months
2	Situation analysis	0-6 months
3	Identifying and implementing entry point activities	0-6 months
4	Identification and demarcation of site for mangroves and IMFFS and obtaining necessary approvals from concerned authorities	0-6 months
5	Mangrove restoration	7-24 months
8	Land preparation and development of integrated mangrove fishery farming system (IMFFS)	7-24 months
9	Planting of mangroves and halophytes in the IMFFS farm and participatory monitoring	7-24 months
10	Fish culture in the IMFFS farm and participatory monitoring	18 – 42 months
11	Capacity building and training programmes	3- 42 months
12	Programme Management activities including reporting	3 – 50 month
13	Mid-term monitoring by stakeholder's team	24 month
14	**Final evaluation**	**50 month**

Disbursement schedule in US $

	Upon Agreement signature	One Year after Project Start[a]	Year 2[b/]	Year 3	Year 4[c/]	Total
Scheduled Date	May 2014	May 2015	March 2016	March 2017	March 2018	
Project Funds	118608	118608	221833	38308	46975	544333
Implementing Entity Fee	10082	10082	18856	3256	3993	46268
Total	**128690**	**128690**	**240689**	**41565**	**50968**	**590602**

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

E. **Record of endorsement on behalf of the government[12]** *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:*

Ravi Shankar Prasad, IAS, Joint Secretary, Ministry of Environment and Forest (MoEF), Government of India	Date*: February,07, 2014*

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 Action Plan on 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.	
(Dr. Venkatesh Tagat) *Chief General Manager* *NABARD, Head Office, Mumbai* (Implementing Entity Coordinator)	
Date: *February, 10th, 2014*	Tel. and email: +91 22 2653 0174 +91 9820892803 venkatesh.tagat@nabard.org
Programme Contact Person: Shri. Sanjay Kumar Dora, DGM, NABARD, Head Office, Mumbai	
Tel. And Email: +91 22 2653 9640, +91 8450997360 Email: sk.dora@nabard.org, dora.sanjaykumar@gmail.com	

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

Annexure 1

Budget Notes Details **(USD)**

Budget Note	Item / Particulars	Total	Details
1	Stakeholder mobilization and organization	3333	@ USD1111 per village for 3 villages.
2	PRA in the coastal villages and Baseline document	5000	For 5 days in 3 villages @ USD 833 per village Baseline @USD 833 per village
3	Entry point activities for 5 villages	5000	Drudgery reduction and other critical works prioritized by the community @ USD 1667 per village for 3 villages.
4	Meetings/workshops/capacity building	15000	Specific trainings on mangrove restoration for 200 members and IMFFS for 50 farmers spread over YI and YII and two routine trainings in YIII &Y IV.
	Restoring 200 ha of mangroves in degraded area		
5	Canal digging in 100 ha each in year I and II	75833	Digging of 650 cum /ha @ USD 0.58/cum in 100 ha (Main canal Top width 2.5 m bottom width 1m and side slope 1:1.5, side canal Top width 2 m bottom width 0.5 m and side slope 1:1.5). Total coverage 200 ha in two years.
6	Mangrove Nursery development for planting in 100 ha	8533	Nursery rearing USD 0.03 /plantlet for 160000 plants /100 ha. Total coverage 200 ha in two years.
7	Planting of mangrove saplings	6667	USD 0.02 per plant for 160000 plants/100 ha. Total coverage 200 ha in two years.
8	Causality replacement	4333	25% replacement in second and third years
9	Desilting of canals	7583	10% of canal digging cost
10	Watch and ward	4000	2 persons for 6 months @ USD 60/ month for four years. Watch & ward provided only during peak agri. months and it is assumed that the villagers will take care during lean season
	Integrated Mangrove Fishery Farming system in 50 ha		
11	Pond preparation in 50 ha	260000	# as per the calculations given below
12	Construction of sluice gates	29167	@ USD 583 per ha
13	Planting of mangroves	2167	@ USD 0.05 per plant for planting 640 plants in one ha in 25 ha each in Y I & YII and 25% replacement allowance in Y III &Y IV. Total coverage 50 ha
14	Release of fishes and shrimps	8333	USD 0.017 per seed for 10000 seeds /ha for 50 ha.
15	Watch and ward	3600	2 persons for 6 months @ USD 75/ month for four years. Watch & ward provided only during peak agri. months and it is assumed that the villagers will take care during lean season
16	Knowledge Management	53333	Details provided separately below the table.
	Project Execution cost		
17	Research fellows 2 nos.	28800	USD 300/ month for 2 persons (One with fishery back ground to look after the mangroves and IMFFS and the other with social science background to mobilise the community)
18	Field Assistance - 1 no	6400	One field assistant to help the project execution

Budget Note	Item / Particulars	Total	Details
			and data collection @ USD 133 per month
19	Travel	1600	USD 400 per month in YI and YII and USD 33 per month YIII & YIV
20	Contingency and site office expenses	4000	USD 83 per month
21	Monitoring and Evaluation	11650	See the description below the table
	Sub-total for Execution Cost	**52450**	9.64 % of total project cost
	Total Project Cost	**544333**	
21	**NIE cost**	46268	8.5 % of amount of financing requested
	Amount of Financing Requested	**590602**	

Details on Knowledge Management Component:

Activity	Total	Year 1	Year 2	Year 3	Year 4
i. Preparation of resource materials in local language to increase awareness about climate change and adaptation	6667	6667	0	0	0
ii. Participatory Monitoring of the project activities along with the community	6667	1667	1667	1667	1667
iii. Documenting best practices of adaptation to climate changes for dissemination	5000			2500	2500
iv. Process documentation – field implementation book, field guide	5000		5000	0	0
v. National Seminar and Workshops (1 each)	25000			8333	16667
vi. Brochure and phamphlets	5000		1667	1667	1667
Total	**53333.33**	**8333**	**8333**	**14167**	**22500**

Monitoring and Evaluation Budget Details:

Monitoring and evaluation plan Activity	Responsible person	Yr. I	Yr. II	Yr. III	Yr. IV	Total US$	Timeframe
Inception workshops	Programme Director	1,250				1,250	Within 2 months of project starting and yearly thereafter
Inception report	Programme Director					0	Within 2 months of project starting

Impact Assessment (beginning of 2nd and 4th year) during the other years the mid-term and terminal report will include impact study	Programme Director		833		833	1,667	Annual
Bi-annual Progress Reports	Programme Director					0	6 monthly
Quarterly Progress Reports	Programme Director and Project Site Co-ordinator					0	Quarterly
Participatory Monitoring and Evaluation by beneficiaries	Programme Director					0	Quarterly
Annual field visits by representatives of Programme Advisory Committee	Programme Director					0	Annual
Minutes of Advisory Committee Meeting	Programme Director					0	Quarterly
Technical Reports	External consultant					0	Periodic
Mid-term Evaluation	External consultant			3,333		3,333	Mid term
Final evaluation	External consultant				5,000	5,000	3 months before end of project
Audits	External auditor	100	100	100	100	400	Every Year
		1,350	**933**	**3,433**	**5,933**	**11,650**	

Details on NIE cost:

The project management fee (8.5% of the total budget) will be utilised by NABARD, the National Implementing Entity, to cover the costs associated with the provision of general management support.

Table below provides a breakdown of the estimated costs of providing these services.

Breakdown of costs for the project management fee Cost	**Amount US$**
Financial Management	6,667
Performance Management - Progress Monitoring- Field Monitoring	13,333
Information and Reporting (MIS etc)	8,333
Programme Support - Technical and Other to EE	17,935
Total	**46,268**

Notes:

1. **Financial Management:** This covers general oversight of financial management and budgeting and quality control. NABARD will:

- ensure compliance with standards and internal control processes, transparency.
- manage, monitor and track AF financial resources including allocating and monitoring expenditure based on agreed work plans, financial reporting to the AFB and the return of unspent funds to AF;
- ensuring that financial management practices comply with AF requirements and support audits as required;
- ensuring financial reporting complies with AF standards; and

2. **Performance Management**. This includes:

- Providing oversight of the monitoring and evaluation function of the Executing Agency
- Undertake field monitoring of the project through District Development Manager, Regional Officer (Andhra Pradesh) and Head Office officials.
- providing technical support in the areas of risk management, screening of financial and risk criteria;
- providing guidance in establishing performance measurement processes; and
- technical support on methodologies, TOR validation, identification of experts, results validation, and quality assurance.

3. **Information and Reporting Management**.

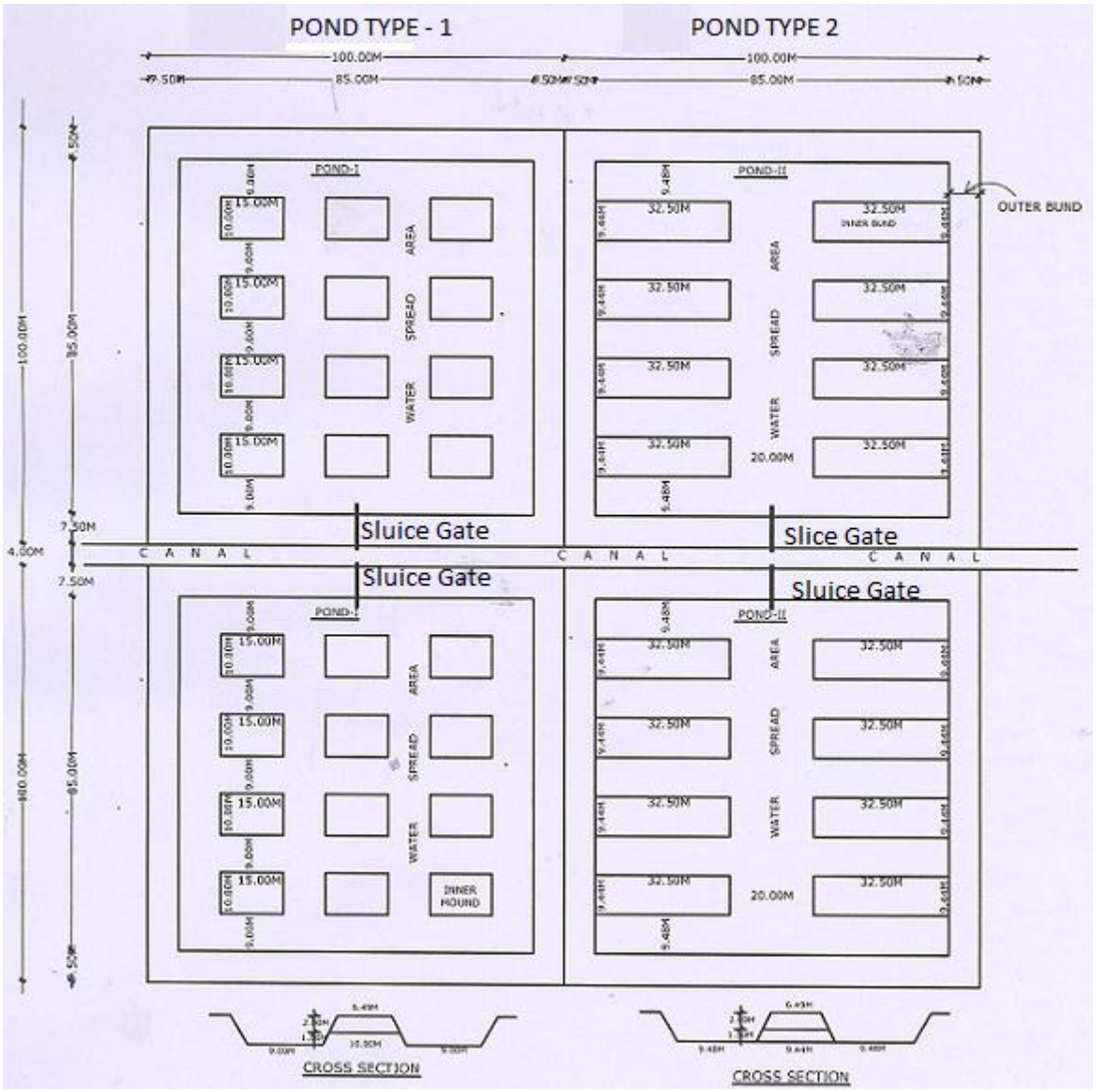
This includes maintaining information management systems and specific project management databases to track and monitor project implementation. Progress reporting to AFB and create platform for information dissemination.

5. **Program Support**. This includes:

- Technical support, troubleshooting, and support missions as necessary;
- policy, programming, and implementation support services;
- supporting evaluation missions and participating in briefing / debriefing;
- providing guidance on AF reporting requirements;

 # Details on IMFFS pond construction:

Fig: Layout Design of IMFFS Pond



Area Calculation Details:

Area of Pond 1		**Area of Pond 2**	
Total Area	= 10000.00 sq. m.	Total Area	= 10000.00 sq. m.
Outer Bund Area	= 2775.00 sq.m.	Outer Bund Area	= 2775.00 sq.m.
Inner Mound Area	= 1800.00 sq.m.	Inner Bund Area	= 2454.00 sq.m.
Water Spread Area	= 5425.00 sq.m.	Water Spread Area	= 4771.00 sq.m.

Cost Calculations Details for IMFFS Pond:

Pond Type 1:

Water Spread Area	Length, (m)	Width (m)	Depth (m)	Quantity (Cum)	Hours of JCB Machine work (hrs.)
Total soil Removal and Transport to the periphery	85	20	1.5	2550	73
Digging of Soil and bund formation	85	20	1.5	2550	73
	180	9	1.5	2430	69
			Total	**7530**	**215**
Excavation rate of Slushy soil by JCB 70					35 cum / hr.
Bucket capacity of JCB					0.32 Cum
JCB Machine Hire (215 hrs. @ USD 16.66 per hr.)					USD 3582
Transportation of Soil to the periphery (2550 cum) – 510 truck load @ USD 1.67 per load					USD 852
Levelling- consolidation of bunds and canal formation – 56 hrs. @ USD 16.67 per hr.					USD 934
Total Cost for 1 ha of Type 1 Pond					**USD 5368**

Pond Type 2:

Water Spread Area	Length, (m)	Width (m)	Depth (m)	Quantity (Cum)	Hours of JCB Machine work (hrs.)
Total soil Removal and Transport to the periphery	85	20	1.5	2550	73
Digging of Soil and bund formation	47.4 (9.48x 5)	65	1.5	4622	132
			Total	**7172**	**205**
Excavation rate of Slushy soil by JCB 70					35 cum / hr.
Bucket capacity of JCB					0.32 Cum
JCB Machine Hire (205 hrs. @ USD 16.66 per hr.)					USD 3415
Transportation of Soil to the periphery (2550 cum) – 510 truck load @ USD 1.67 per load					USD 852
Levelling- consolidation of bunds and canal formation – 56 hrs. @ USD 16.67 per hr.					USD 934
Total Cost for 1 ha of Type 2 Pond					**USD 5200**

Note: Although two type of ponds excavation are proposed, the cost for Pond Type 2 @ USD 5200 which is the lowest cost has been adopted for working out the total cost. However, the payments will be made based on the actual cost during implementation.

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

A. **Record of endorsement on behalf of the government**[2] *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:*

Ravi Shankar Prasad, IAS, Joint Secretary, Ministry of Environment and Forest (MoEF), Government of India	Date: *February, 07, 2014*

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 Action Plan on 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.	
(Dr. Venkatesh Tagat) *Chief General Manager* *NABARD, Head Office, Mumbai* (Implementing Entity Coordinator)	
Date: *February,10, 2014*	Tel. and email: +91 22 2653 0174 +91 9820892803 venkatesh.tagat@nabard.org
Programme Contact Person: Shri. Sanjay Kumar Dora, DGM, NABARD, Head Office, Mumbai	
Tel. And Email: +91 22 2653 9640, +91 8450997360 Email: sk.dora@nabard.org, dora.sanjaykumar@gmail.com	

[2] 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.

रवि एस. प्रसाद
आई.ए.एस
संयुक्त सचिव
Ravi S. Prasad
I.A.S.
Joint Secretary

सत्यमेव जयते

भारत सरकार
पर्यावरण एवं वन मंत्रालय
Government of India
Ministry of Environment and Forests

D.O. No.14/40/2013-CC **Dated: 7th February 2014**

Subject: Endorsement for the proposal on "Conservation and Management of Coastal Resources as a Potential Adaptation Strategy for Sea Level Rise".

In my capacity as designated authority for the Adaptation Fund in India, I confirm that the above national project/programme 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 India.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by National Bank for Agriculture and Rural Development and executed by Dr. M. S. Swaminathan Research Foundation (MSSRF).

Sincerely,

(Ravi S. Prasad)

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

जहाँ है हरियाली।
वहाँ है खुशहाली।।

पर्यावरण भवन, सी.जी.ओ. काम्पलेक्स, नई दिल्ली-110 003 फोन : (011) 24363956, फैक्स : (011) 24369192
PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI-110 003, Ph. : (011) 24363956, Fax : (011) 24369192
E-mail : ravis.prasad@nic.in