Enhancing Climate Resilience of India's Coastal Communities

Environmental and Social Management Framework

31 May 2018

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1 INTRODUCTION

1. This Environmental and Social Management Framework (EMSF) has been prepared in support of a project proposal for "Enhancing climate resilience of India's coastal communities" by the Government of India (GoI) to the Green Climate Fund (GCF). As this project is supported by UNDP in its role as a GCF Accredited Entity, the project has been screened against UNDP's Social and Environmental Standards Procedure and deemed a Moderate Risk (World Bank/International Finance Corporation Category B) project. As such, an Environmental and Social Management Framework has been prepared for the project.

1.1 BACKGROUND

2. The climate system of India ranges from warm equatorial conditions in the south to continental climatic zones in the Himalayan areas. The Indian monsoon cycle largely determines the various climatic zones[1] which results in year-round rainfall in the coastal zones.

3. The length of the coastline totals more than 7,500 km of which ~5,420 km of coast occurs in peninsular India in two coastal plains[2]. The Eastern Coastal Plain is a wide stretch of land between the Eastern Ghats and the Bay of Bengal, stretching from West Bengal in the north east to Tamil Nadu in the south east. The Western Coastal Plain forms a narrow strip of land between the Western Ghats and the Arabian Sea, extending from Gujarat in the north-west to Kerala in the south west.

4. Approximately 250 million people (14% of the country's population or 3.5% of the global population) reside within 50 km of India's coastline. Urbanisation and coastal development have created significant pressures on the coastal areas. Degradation of coastal ecosystems has negative implications for coastal communities that are dependent on the ecosystems for their livelihoods. This coastal population is also particularly at risk to impacts of climate change

5. Climate change in India is predicted to have increasingly severe negative impacts on coastal communities and the ecosystems upon which they depend. The GoI with support from UNDP, is formulating a project on adaptation to climate change impacts for three coastal states of India for submission to the GCF. The project will seek to improve the resilience of vulnerable communities to climate change impacts.

6. Coastal populations in the three target states of the proposed GCF project, namely Andhra Pradesh, Maharashtra and Odisha (Figure 1), are highly dependent on the ecological health of coastal ecosystems for their livelihoods.

7. The selection of Andhra Pradesh, Maharashtra and Odisha as locations for the proposed project's investments was based on several reasons:

   - For the project to catalyse transformational change across the entire Indian coastline, states from both the west and east coast would need to be represented in the project;
   - The three states were categorised as highly vulnerable to climate change over a large percentage of their coastline as per the exposure index within the "Coastal Vulnerability Atlas of India"[3].

1. _____

[1] *MoEFCC. 2015. India: First Biennial Update Report to the United Nations Framework Convention on Climate Change.*

[2] *Indian Network for Climate Change Assessment (INCCA). 2010. Climate Change and India: A 4x4 Assessment. A Sectoral and Regional Analysis for 2030s. INCCA Report #2.*

[3] Coastal Vulnerability Atlas of India (2012). Indian National Centre for Ocean Information Services. Hyderabad.

- Andhra Pradesh has 6 million more people living in coastal districts than in coastal districts of the neighbouring state West Bengal
- The three target states span a wide range of biophysical habitats and climate types and therefore provide an opportunity for the project to invest in ecological infrastructure and coastal livelihoods across a diverse array of:
- Biophysical vulnerabilities – including sea level rise, increased storm surges and coastal erosion as a result of intensified cyclonic activity;
- Coastal ecosystem types – including mangroves, seagrass, saltmarshes, coral reefs and coastal lagoons; and
- Per capita income levels – including states with very low, low and medium per capita incomes.

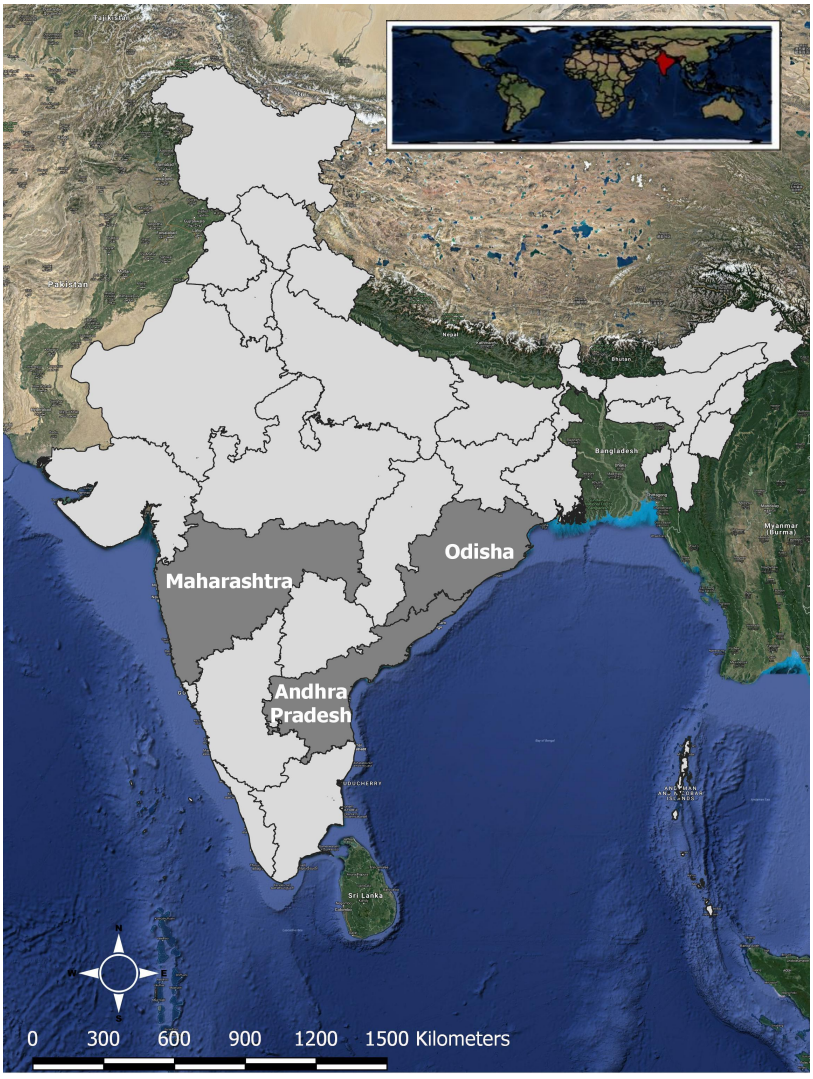

Figure 1 Location of target States

1.2 Overview of the Project

8. The objective of the project is to enhance the resilience of the lives and livelihoods of the most vulnerable populations, particularly women, in the coastal areas of India to climate change and extreme events, using an ecosystem-centred and community-based approach.

9. The project will work at national, state, and community levels to enhance capacity for ecosystem and community-based approaches to adaptation and enable pathways to replication and scale beyond the project to all of India's coastal states. Specific restoration and livelihood interventions will be undertaken in the target states of Andhra Pradesh, Maharashtra and Odisha, with learning shared across all coastal states and their districts, and more widely in the South Asian region.

1.2.1 Summary of Activities

10. The proposed project will have the following activities:

1.2.1.1 Output 1: Enhanced Resilience of Coastal and Marine Ecosystems and their Services

11. This output works at national, state and landscape scales to generate a range of adaptation and sustainable development benefits through the conservation, restoration and maintenance of coastal and marine ecosystems. At a national scale and in all the coastal states, a long-term system will be established for undertaking vulnerability assessment of the coast, for undertaking restoration of coastal ecosystems, and for systematic monitoring of the results, including for carbon sequestration. In project sites in the three states, communities will collaborate closely with the Forestry Department in a co-management approach, both as recipients of work opportunities in restoration efforts, and as on-going partners in maintaining the resource in a healthy condition and helping to prevent illegal activities.

12. Protocols and guidelines will be established, and restoration efforts undertaken, including:

- mangrove restoration through hydrological rehabilitation;
- mangrove restoration through planting;
- restoration of catchments through afforestation to prevent erosion and sedimentation of coastal ecosystems;
- rehabilitation of seagrass beds and saltmarshes through hydrological rehabilitation;
- artificial regeneration of coral reefs through structure placement;
- hydrological rehabilitation of coastal lagoons, e.g. dredging / breaching river mouths;
- restoration of dune vegetation; and
- introduction of new species as shelter belts.

1.2.1.1.1 Activity 1.1. Conducting vulnerability assessment of the coast to inform planning of ecosystem- and community-based adaptation interventions

- Supporting coastal research and m*an*agement institutions to add ecosystem-related parameters to methodologies for guiding vulnerability assessment and national- and state-level planning and decision-making on adaptation and management measures to address climate change.
- Applying the enhanced/revised methodology to establish a system for periodic detailed assessment of vulnerability and adaptive capacity along the entire coastline of India, using the analysis to inform planning of restoration and livelihoods activities for climate change adaptation.
- Developing a Decision-Support Tool for adaptation planning at state and national levels that integrates district-level data with site/district-level assessments to provide decision-makers with dynamic information that is regularly updated using data from census, ecological surveys and other sources.
- Creating an online platform and associated app to facilitate access to information in the Decision-Support Tool for decision-makers, communities, NGOs/CBOs and other relevant stakeholders, as well as to allow them to upload data for tracking changes in ecological and socio-economic vulnerability to climate change in coastal areas.

1.2.1.1.2 Activity 1.2. Community-based conservation and restoration of coastal ecosystems for increasing ecosystem resilience

- Supporting participatory planning in target landscapes of site-specific EbA measures for conservation and restoration of six ecosystem types, based on the analysis of vulnerability to climate change impacts and adaptive capacity undertaken through Activity 1.1.
- Developing detailed, ecosystem- and site-specific protocols and guidelines – based on global and national best practices – for restoration of the various ecosystem types (mangroves, saltmarshes, coral reefs, seagrass beds, dune vegetation, etc.) using an EbA approach.
- Establishing co-management structures in target landscapes to foster community support for and participation in conservation and restoration activities.
- Undertaking ecosystem conservation, restoration and management (including pollution control) activities – based on the EbA protocols and through the co-management structures – in the project sites in the three states.
- Developing and implementing community-based/participatory monitoring and maintenance programmes through the co-management structures to maintain restored ecosystems and capture lessons learned and best practices from the project sites.

1.2.1.2 Output 2: Climate-adaptive livelihoods for enhanced resilience of vulnerable coastal communities

13. This output works primarily in 24 target landscapes in the three states. The will Output help enhance adaptive capacity, including capacity to adapt existing livelihood activities and diversify to climate resilient options, and to do business planning and access finance for scaling up harvesting, agri-and aquaculture operations. Work with engineers and planners in coastal villages and towns will enhance the integration of ecosystem-based approaches with resilient infrastructure. This will also include developing value chains to ensure uptake and the long-term sustainability of these adaptive livelihoods, including support on business planning, access to finance, certification and labelling of eco-products, and access to markets.

14. Technical assistance will be provided to livelihood activities in two categories: a) livelihoods based on coastal ecosystems restored to buffer climate impacts, and establishing value chains to sustain these livelihoods alongside evolving climate impacts; and b) livelihoods that adapt current farming practices to deal with climate impacts on agro-ecosystems. Value chain support activities will be funded by co-finance from the three states. The various livelihood activities are:

- Livelihoods based on coastal ecostystems restored to buffer climate impacts:
- Aquaculture (crab farming, mussel farming, oyste farming, crab hatcheries, ornamental fisheries, integrated duck-fish farming, seaweed farming);
- Processing of aquaculture products (MSMEs for value-added fish products, fishmeal plants, fish and shellfish / bivalve processing units);
- Coastal ecotourism (scuba diving, tour guiding);
- Coastal non-timber forest products (mangrove beekeeping for honey production).
- Livelihoods adapted to specific climate change impacts on agro-ecosystems:
- Climate-smart intensification (System of Rice Intensification (SRI) for paddy farming, drip irrigated mango and cashew production);
- Climate adapted crops (cultivation of aromatic and medicinal plants, mushroom cultivation, intercropping of pepper, nutmeg and cinnamon with coconut and arecanut plantations)
- Processing of climate-adaptive agriculture products (mango ripening chambers and pulp making, virgin coconut oil extraction)

1.2.1.2.1 Activity 2.1. Building climate-resilient livelihoods and enterprises through value chains and strengthened access to markets

- Undertaking participatory, user centric, livelihoods planning in target landscapes – evaluating climate adaptive livelihood options based on vulnerability assessment and preliminary livelihood assessment, and producing value-chain development strategies.
- Providing technical support to community groups to set up the adaptive livelihoods and add value to the products of climate-adaptive aquaculture and agriculture
- Training extension officers and community mobilizers on ensuring that planned livelhoods and value addition activities are climate-risk informed.
- Supporting the development of value chains for climate adaptive livelihoods, facilitating backward linkages for input supply, and forward linkages for processing, packaging, storage, refrigeration, transport and market access
- Providing technical assistance to community groups to set up certification schemes for "eco" products, and to develop bankable business plans to access loan finance for expansion, during or post-project.

1.2.1.2.2 Activity 2.2. Improving capacities of local communities for community-based adaptation and climate-risk management

- . Conducting multimedia public education and awareness campaigns across the three states on climate change and its impacts, and the need to conserve and restore ecosystems to underpin livelihoods and buffer extreme events
- Undertaking village-level capacity building on climate change and EbA in target landscapes in light of evolving climate risks - involving women's groups, self-help groups, producer and fisher organizations, CBOs, NGOs and Panchayat Raj institutions, with focus on women, youth, and marginalized groups
- Delivering training courses for climate-adaptive aquaculture[4], ecotourism[5] and non-timber forest products[6], as well as climate-smart intensification[7] and climate-adapted crops[8] through relevant community-based organizations (e.g. self help groups) and local self-governance institutions (e.g. Gram Panchayats)
- Facilitating sharing of lessons between target landscapes on effective techniques for climate-adaptive livelihoods, including through exchange visits between communities, with focus on women, youth, and marginalized groups.

1.2.1.3 Output 3: Strengthened governance and institutional framework for climate-resilitent management of coastal areas

15. The Output provides pathways to replication and scale by extending the approaches to ecosystem restoration carried out in Output 1 and approaches to climate-adaptive livelihood support carried out in Output 2, across all of India's 13 coastal states and Union Territories, and also shares knowledge on coastal resilience with countries in the wider South Asian region.

1. _____

4 Aquaculture: including crab farming, mussel farming, oyster farming, crab hatcheries, ornamental fisheries, integrated duck-fish farming, seaweed farming, integrated multitrophic aquaculture

5 Coastal ecotourism: including scuba diving, tour guiding

6 Coastal NTFPs: including mangrove beekeeping for honey production

7 Climate-smart intensification: including System of Rice Intensification (SRI) for paddy farming, drip-irrigated mango and cashew production

8 Climate-adapted crops: including Cultivation of aromatic and medicinal plants, mushroom cultivation, intercropping of black pepper, nutmeg & cinammon with coconut & arecanut plantation

1.2.1.3.1 Activity 3.1. Network of institutions for enhanced climate resilience and integrated planning and governance in all coastal states

- Establishing multi-stakeholder coordination structures in target landscapes in the three states to provide a platform for dialogue on and coordination of climate-resilient development planning and co-management of coastal ecosystems.
- Using existing interdepartmental platforms in 13 coastal states – particularly State Action Plans for CC and CZM Authorities – to facilitate integration of EbA approaches into relevant policy and legislation, and to share lessons learned and best practices from target landscapes and states.
- Establishing a pan-Indian Coastal Resilience Network of organizations, tertiary institutions, coordination platforms and coastal districts – to promote knowledge exchanges on integration of climate change adaptation into coastal development planning, with a focus on EbA.
- Supporting the proposed National Coastal Mission in integrating climate change adaptation – and particularly EbA – into its programme of work.

1.2.1.3.2 Activity 3.2. Integrating ecosystem-centric approaches to climate change adaptation into public and private sector policies, plans and budgets, and scaling up finance for EbA

- Supporting the new National Coastal Mission to integrate climate risk management and EbA principles into national policies and schemes, including CAMPA afforestation fund and Smart Cities Mission.
- Facilitating biennial intersectoral dialogues led by the National Coastal Mission - engaging public and private sector role-players on coastal adaptation as a risk management strategy, including fisheries, agriculture, tourism, ports and shipping, oil and gas.
- Equipping the interdepartmental CZM platforms in 13 coastal states to use scenario planning for business as usual vs ecosystem-based adaptation in the coastal zone.
- Undertaking a Targeted Scenario Analysis in each of the three coastal states to make the case for a specific priority policy or investment decision by a public or private sector role-player, enabling a shift from BAU to EbA.
- Developing ecosystem-based adaptation plans for four coastal Smart Cities (Kalyan in Maharashtra; Kakinada and Visakhapatnam in Andhra Pradesh; and Bhubaneswar in Odisha).
- Working through state-level interdepartmental platforms to provide coastal town planners and engineers with training on the Coastal Calculator tool, using EbA for shoreline protection and climate-resilient infrastructure.

1.2.1.3.3 Activity 3.3. Knowledge management for coastal resilience

- Supporting the National Coastal Mission to establish a system for collating data and information on global best practices, lessons learned, evidence from the field and scientific knowledge on ecosystem- and community-based approaches to adaptation in the coastal zone of India.
- Establishing a series of annual workshops under the auspices of the pan-Indian Coastal Resilience Network, involving tertiary institutions, research organizations and relevant NGOs to share research findings related to coastal EbA, and to oversee an impact study of the project.
- Developing and piloting a training course or curricula on EbA, for delivery through administrative training and other relevant institutes at national and state levels, incorporating project experience and lessons especially on community-based adaptation.
- Working through the Pan-India Coastal Resilience Network to develop and disseminate knowledge products at national, regional and international levels and to share experience and learning.
- Developing nation-wide knowledge products translated into local languages for use in the community-level training courses for village self-help groups and CBOs, and women's capacity development programmes.

- Undertaking exposure and exchange visits for national-, state- and district-level government officials and community leaders to promote knowledge sharing on cross-sectoral coastal governance, climate change adaptation and EbA.
- Creating a knowledge exchange platform involving South Asia's five coastal countries for dialogue and sharing learning on ecosystem-and community-based adaptation to climate change in the coastal zone, building on existing forums.

1.2.2 Livelihood Interventions and Soft Infrastructure

16. The project proposes to undertake a number of livelihood interventions and soft infrastructure. These include:

- Undertaking ecosystem conservation, restoration and management activities in the project sites in the three states;
- Supporting community members to develop new and climate adaptive livelihoods.
- Strengthening value chains through promotion of backward linkages and forward linkages, facilitating deals and linking producers to markets;
- Strengthening access to finance for self-help groups and community members.

17. Livelihoods suitable to each landscape will be selected ie not all livelihood interventions are proposed at any one site. This reduces the risk of adverse cumulative impacts.

1.3 Environmental and Social Risk Assessment

18. As this project is supported by UNDP in its role as a GCF Accredited Entity, the project has been screened against UNDP's Social and Environmental Standards Procedure. The Social and Environmental Screening Template was prepared and the project deemed to be a moderate risk (Category B) project. Discussions on the impact assessment are provided in the Social and Environmental Screening Template, which provided the rationale for the project being classified as a moderate risk. This ESMF provides further discussion below.

19. An impact risk assessment was undertaken to assess the impact (*Table 1*) and the probability of each impact (*Table 2*). From this, a significance value was attributed to the potential impact (low, medium, high)

Score	Rating	Social and environmental Impacts
5	Critical	Significant adverse impacts on human populations and/or environment. Adverse impacts high in magnitude and/or spatial extent (e.g. large geographic area, large number of people, trans-boundary impacts, cumulative impacts) and duration (e.g. long-term, permanent and/or irreversible); areas impacted include areas of high value and sensitivity (e.g. valuable ecosystems, critical habitats); adverse impacts to rights, lands, resources and territories of indigenous peoples; involve significant displacement or resettlement; generates significant quantities of greenhouse gas emissions; impacts may give rise to significant social conflict
4	Severe	Adverse impacts on people and/or environment of medium to large magnitude, spatial extent and duration more limited than critical (e.g. predictable, mostly temporary, reversible). The potential risk impacts of projects that may affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples are to be considered at a minimum potentially severe.
3	Moderate	Impacts of low magnitude, limited in scale (site-specific) and duration (temporary), can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures
2	Minor	Very limited impacts in terms of magnitude (e.g. small affected area, very low number of people affected) and duration (short), may be easily avoided, managed, mitigated
1	Negligible	Negligible or no adverse impacts on communities, individuals, and/or environment

Table 1 Rating the 'impact' of a risk

Score	Rating
5	Expected
4	Highly likely
3	Moderately likely
2	Not likely
1	Slight

Table 2 Rating the 'Probability' of a risk

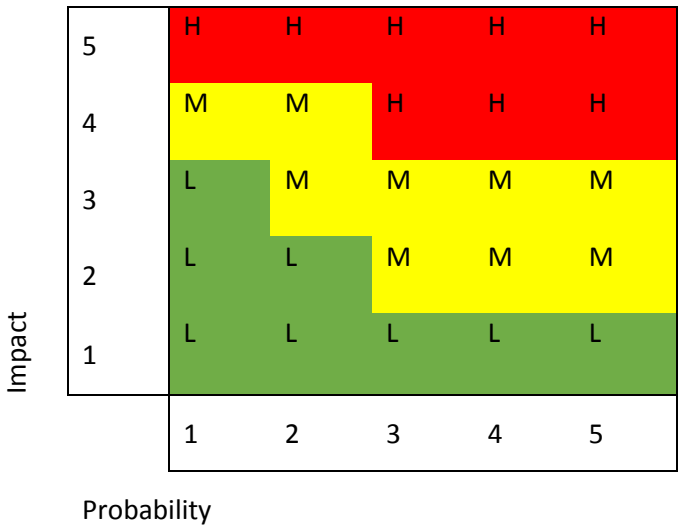

Table 3 Risk matrix

21. When undertaking the risk assessment, all activities were assessed, including, hard/soft infrastructure for livelihood interventions, and restoration interventions in 'ecological infrastructure', i.e natural coastal ecosystems. Specific measures for each matter eg water, erosion, noise etc are discussed along mitigation measures later in this ESMF.

Table 4 Impact and Risk Assessment

Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Output 1: Enhanced Resilience of Coastal and Marine Ecosystems and their Services				
Activity 1.1: Conduction vulnerability assessment of the coast to inform planning of ecosystem and community-based adaptation interventions				
Supporting coastal research and management institutions to add eco-system parameters to methodologies and planning and decision-making to address climate change.	No adverse impacts are likely from this element.	Likelihood: 1 Consequence: 1 Risk: Low		Likelihood: 1 Consequence: 1 Risk: Low
Assessments of coastal vulnerability and adaptive capacity along the entire coastline of India.	This activity is principally a data compilation and mapping exercise. The only impacts would be the installation of equipment to collect data. As such, the study is unlikely to have any significant impact although there is the potential, albeit small to impact the environment or land. The activity will also engage with communities so as they can better understand the implications of EbA.	Likelihood: 2 Consequence:1 Risk: Low	Impacts caused by installation of equipment should be kept to a minimum by appropriate site selection, type of equipment and care when installing. Independent reviews and QA checks at various stages of the vulnerability mapping process should be undertaken to minimise risk of any errors	Likelihood: 1 Consequence: 1 Risk: Low
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation

Provision of decision support tools and online platforms to access tools.	Access to tools and information could potentially be limited, thereby reducing empowerment of those excluded. Data supporting decision-tools may become dated	Likelihood: 1 Consequence: 3 Risk: Low	An online platform and app is to be created and made available to all relevant stakeholders. Through use of the app stakeholders will be able to upload data for tracking changes in ecological and socio-economic vulnerability to climate change in coastal areas, thus keeping data up to date.	Likelihood: 1 Consequence: 2 Risk: Low
Activity 1.2: Community-base conservation and restoration of coastal ecosystems for increasing ecosystem resilience				
Participatory planning in target landscapes for site specific EbA measures for conservation and restoration of 6 ecosystem types.	Appropriate representation of local communities required. Planning processes must choose the correct forms of intervention and maintenance. TLIMPs will be developed in consultation with appropriate technical experts and communities and specifically address the needs of any CVCAs or protected areas, including biodiversity conservation.	Likelihood: 3 Consequence: 3 Risk: Moderate	Watershed plans will use the options assessed as appropriate. Community to be engaged as part of planning process.	Likelihood: 2 Consequence: 3 Risk: Moderate
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Develop detailed, ecosystem- and site-specific protocols and guidelines using an EbA approach	This is a planning activity. To be effective the system, protocols and guidlelines have to be acceptable to and usable by the community. Impacts occurs if above not achieved	Likelihood: 2 Consequence: 3 Risk: Moderate	Engage community as part of development process, and develop agreements on rights and responsibilities, where appropriate.	Likelihood: 1 Consequence: 2 Risk: Low

Implement ecosystem responses upstream through a ridge-to-reef approach.	This activity will involve undertaking reforestation and other restoration interventions. It will not require any acquisition or resettlement. Environmentally, the impacts include the potential erosion and sediment movement during rainfall events while reforestation is taking place. In the long term, these impacts will be mitigated by the reforestation interventions. Socially, the activity could result in changes to livelihoods and the normal day to day activities. It is critical that due diligence be properly undertaken prior to the undertaking of any activity including the development of a Livelihood Plan.	Likelihood: 3 Consequence: 2 Risk: Low	If the appropriate short-term mitigation measures as identified in the ESMF are undertaken, then the impacts should be significantly mitigated. This includes undertaking works outside of monsoon and implementing erosion and sediment controls on-site.	Likelihood: 2 Consequence: 1 Risk: Low
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Developing and implementing community-based monitoring and maintenance programmes.	Risk is that community does not take ownership and monitoring and/or maintenance inadequate.	Likelihood: 2 Consequence: 3 Risk: Moderate	Early and ongoing engagement of community. Provision of ownership through involvement in decision making and then ongoing management. Ensure community sees benefits of activities.	Likelihood: 1 Consequence: 3 Risk: Low
Undertake ecosystem conservation, restoration and management activities	Poorly informed restoration practices and/or inadequate management and monitoring may result in the degradation of pristine ecosystems which may result from artificially-induced changes and intended improvements to ecosystem	Likelihood: 3 Consequence: 3 Risk: Moderate	All restoration measures based on review of international bets practice as outline in Feasibility Study, and informed by further consultant inputs where necessary, with engagement of community. Training. Implement monitoring plans.	Likelihood: 2 Consequence: 2 Risk: Low

Contracting members of the local communities for execution of activities with regards to landscape restoration.	This activity will involve the creation of jobs and temporary work opportunities for the local community. There are unlikely to be any environmental impacts associated with the activity. There is the potential for social impacts including health related issues, and pressure from family members to gain access to the financial benefits that contracted people gain.	Likelihood: 2 Consequence: 3 Risk: Moderate	The project will ensure that people entering work opportunities are provided the proper training and advice to know how to properly manage their activities, both individually and communally.	Likelihood: 1 Consequence: 2 Risk: Low
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Mangrove restoration / rehabilitation	Digging of channels will cause short-term sediment disturbance and turbidity Changes to hydrology caused by channels and permable 'dams' (temporary stick/plank walls to break waves and promote sediment accumulation) Mangrove restoration activities may negatively impact benthic organisms living in the sediment by disturbing their habitat. Local communities, including in some cases members of Dalit and Tribal communities, may rely on mangroves for harvesting wood and forest products – people may be excluded from some areas. Potential exposure of acid sulfate soils	Likelihood: 4 Consequence: 3 Risk: Moderate	Mangroves fall into the Coastal Regulation Zone CRZ-1 where no "hard infrastructure" is permitted, therefore only temporary structures will be emplaced. Restoration protocols (lodged with District Forest Officer) will be established for each site - international and Indian best practices to inform design. Training on protocols to be provided to all workers Undertake works outside of monsoon and implement erosion and sediment controls. Stringent monitoring plans will be developed at each intervention site to monitor any changes in the presence of benthic organisms with adequate capacity development of the community. Temporary exclusion will facilitate restoration of degraded areas. New protection will mean limited to no use of	Likelihood: 3 Consequence: 2 Risk: Moderate

			some areas permanently, but communities will benefit, both from the buffer function of mangroves against storm surges and as their function as nurseries for fish and shellfish. Co-management arrangements will ensure community buy-in on resource use regimes. Prior to any excavation, sediments will be tested for the presence of ASS or PASS, and excavation halted if they are found.	
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
			Site specific EMSPs/environmental checklists to be developed and used	
Hydrological rehabilitation of coastal lagoons	Breaching river mouths can have adverse impacts if appropriate hydrological studies are not done. Increased wave action and currents in immediate vicinity of breach. Potential adverse changes to hydrology.	Likelihood: 4 Consequence: 3 Risk: Moderate	Chilika Lake has been extensively studied in terms of hydrodynamics and historically been restored through breaching of accumulated sand bar to restore tidal exchange. The results in restoring productive ecological systems has received international recognition. The potential for the same approach to be applied to Pulicat Lake will be considered, building on studies done there. No breaching unless studies are done and data collection and modelling demonstrate impacts acceptable.	Likelihood: 3 Consequence: 3 Risk: Moderate

Seagrass restoration	Damage to existing seagrass ecosystems may occur when planting stocks during the collection of planting stocks People may be excluded from certain areas of seagrass beds as a result of restoration / conservation activities	Likelihood: 3 Consequence: 3 Risk: Moderate	Restoration protocols will be established for each site, including development of site specific ESMPs Restored and conserved seagrass ecosystems will provide numerous ecosystem services to coastal communities. Benefits include: i) improved spawning & nursery for fish; ii) raw materials; iii) mannure; iv) livestock feed; and v) medicine. Co-management arrangements will ensure community buy-in on sustainable resource use regimes as they would sense better production after restoration.	Likelihood: 3 Consequence: 2 Risk: Moderate
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Coral reef restoration	Healthy coral ecosystems may be damaged during the collection of coral fragments	Likelihood: 3 Consequence: 2 Risk: Moderate	Coral reefs up to 12nm from shore fall into the Coastal Regulation Zone (CRZ-1). Permission will be sought from the Coastal Zone Management Authorities for any structures, and these will be emplaced in terms of site-specific Restoration Protocols lodged with the District Forest Officer. Coral gardening only requires the uses of small fragments of coral to be successful. Training will be provided before any restoration activities commences. Collection protocol would be developed.	Likelihood: 2 Consequence: 2 Risk: Low

Forest Restoration	Potential erosion and sediment movement during rainfall events while reforestation is taking place. Reforested areas may be illegally exploited for timber and fire wood People may be excluded from certain areas as a result of restoration / conservation activities	Likelihood: 3 Consequence: 3 Risk: Moderate	Restoration work will be undertaken outside of the monsoon season. Restoration of the catchment would also be carried out simultaneously to ensure erosion and sediment controls will be implemented at each restoration site Where timber extraction can be done on a sustainable basis, e.g. in shelterbelts, this will be governed by agreements of sustainable harvesting rates Management of reforested areas will be supported through effective co-management arrangements between communities and the Forestry Departments.	Likelihood: 2 Consequence: 2 Risk: Low
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Output 2: Climate-adaptive livelihoods for enhanced resilience of vulnerable coastal communities				
Activity 2.1: Building climate-adaptive livelihoods and enterprises through value chains and strengthened access to markets				
Support community members to develop climate-adaptive livelihoods.	There is the potential for temporary interruption of existing livelihood activities for individuals who are currently operating in areas that are proposed for EbA interventions.	Likelihood: 3 Consequence: 3 Risk: Moderate	Careful planning and stakeholder consultations will be undertaken prior to the site selection for livelihoods activities to ensure that any temporary interruption to livelihoods (e.g. relocation of aquaculture) is addressed by existing government programmes benefiting the poor or by other means. In such cases, a livelihood	Likelihood: 2 Consequence: 2 Risk: Low
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
			restoration plan will be developed to ensure households have been provided	

			financial means equal to their existing livelihoods income during any disruption that may occur.	
Crab farming	Many of the intertidal creeks, estuaries and inshore areas where this activity will be carried out are ecologically sensitive areas that fall under Coastal Regulation Zone Category I (under the 2011 Coastal Regulation Zone Notification). No permanent construction is allowed in these areas. Temporary structures for traditional fishing and allied activities undertaken by local communities are permitted Potential for salinisation of neighbouring paddy or water storages Risk of expansion into sensitive areas or areas suitable for rehabilitation (saltmash, mangroves) Increased density of aquaculture increases risk of disease Demand for feed	Likelihood: 4 Consequence: 3 Risk: Moderate	Ensure that ponds are impermeable so that migration of saltwater through walls and base does not affect nearby paddy, water storages or groundwater. Select areas that are already under aquaculture, farming or that are unsuitable for habitat restoration. Enclosures made of bamboo poles and mesh nets, usually an area of no bigger than 50 square metres. Expansion will be carefully controlled through ongoing participatory land use planning and monitoring coordinated by the Forest Department and including community co-management Adopt appropriate aquaculture techniques and technology to minimise risk of disease. Use sustainable feed stock	Likelihood: 2 Consequence: 3 Risk: Moderate
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Crab hatcheries	Waste Demand for feed	Likelihood: 3 Consequence: 3 Risk: Moderate	Careful selection of hatchery sites and operators. Relatively few hatcheries to be developed. Provide training. Source sustainable feedstock	Likelihood: 1 Consequence: 2 Risk: Low
Rice intensification	Non-acceptance by farmers Expansion into new areas	Likelihood: 3 Consequence: 2 Risk: Moderate	Engage farmers and demonstrate value Only use existing paddies	Likelihood: 2 Consequence: 1 Risk: Low

Oyster farming	Many of the intertidal creeks, estuaries and inshore areas where this activity will be carried out are ecologically sensitive areas that fall under CRZ-I. Construction is only allowed for facilities that are essential for permissible activities. Over-harvesting of wild spat Bioaccumulation of toxins or other contaminants	Likelihood: 3 Consequence: 3 Risk: Moderate	Traditional fishing and allied activities undertaken by local communities. Framework rafts not permanent and built mostly of natural materials. Protect spat collection areas and regulate number of oyster farmers Water quality will be tested in each new site before constructing rafts and on an ongoing basis through Pollution Control Board monitoring. Depuration tanks to flush contaminants	Likelihood: 2 Consequence: 2 Risk: Low
Mussel farming	As for oysters	Likelihood: 3 Consequence: 3 Risk: Moderate	As for oysters	Likelihood: 2 Consequence: 2 Risk: Low
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Ecotourism skills development	Uncontrolled activities occurring with consequent impacts such as traffic, waste, food price increases Unregulated operators in market	Likelihood: 4 Consequence: 3 Risk: Moderate	Identify tourism opportunities and develop management plans. Engage community in planning. Set up appropriate infrastructure. Provide appropriate training and certification	Likelihood: 3 Consequence: 1 Risk: Low
Fish value-addition	Potential waste production Poor hygiene practices	Likelihood: 3 Consequence: 3 Risk: Moderate	Identify beneficial uses for waste or ensure suitable waste disposal system in place Provide training and appropriate facilities	Likelihood: 2 Consequence: 2 Risk: Low
Fishmeal plants	Fuel use as part of cooking process Odour impacts Waste impacts Unintended fishing practices encouraged (harvesting 'trash fish')	Likelihood: 5 Consequence: 3 Risk: Moderate	Use renewable energy sources eg solar, wind, biogas Identify beneficial uses for waste, minimise waste, provide suitable waste disposal system.	Likelihood: 3 Consequence: 2 Risk: Moderate

			Maximise use of fish waste over by-catch or targetted 'trash fish'. Manage fisheries.	
Fish smoking units	Smoke nuisance to sensitive receptors Inappropriate smoking materials – impacts to environment and/or potential toxicity	Likelihood: 3 Consequence: 2 Risk: Moderate	Site units away from sensitive receptors. Utilise minimal smoke escape systems Ensure that appropriate smoking materials are used	Likelihood: 2 Consequence: 1 Risk: Low
Cultivation of medicinal and aromatic plants	Sensitive areas cleared in favour of cultivation	Likelihood: 2 Consequence: 3 Risk: Moderate	No natural vegetation to be cleared for cultivation.	Likelihood: 1 Consequence: 2 Risk: Low
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Mushroom cultivation	Potential respiratory issues associated with inhalation of spores	Likelihood: 2 Consequence: 2 Risk: Low	Appropriate farming practices, facilities and protective equipment to be used. Provide training to growers.	Likelihood: 1 Consequence: 1 Risk: Low
Honey production	Increased risk of bee disease Increased risk of stings	Likelihood: 2 Consequence: 2 Risk: Low	Adopt appropriate apiary practices	Likelihood: 1 Consequence: 2 Risk: Low
Integrated duck-fish farming	Expansion of ponds into sensitive areas Excessive nutrient loads in water Fish kills / disease	Likelihood: 3 Consequence: 3 Risk: Moderate	Plan and control areas that can be turned over to aquaculture. Training and appropriate aquaculture practices to be implemented, in particular waste management. Monitor water quality.	Likelihood: 2 Consequence: 2 Risk: Low

Ornamental fishery	Indiscriminate harvesting from natural areas Over fishing Ecological imbalance as a result of targetting select species	Likelihood: 3 Consequence: 3 Risk: Moderate	Zone areas for harvesting/non-harvesting. Regulate collecting via permits, closed seasons and/or catch limits. Fisheries Dept./ MPEDA to insist on Water Quality analysis of intake waters Monitor ecological impacts of harvesting. Implement hatchery/breeding program.	Likelihood: 2 Consequence: 2 Risk: Low
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
Activity 2.2 Improving capacities of local communities for community-based adaptation and climate-adaptive livelihoods				
This activity involves public education, awareness campaigns, exposure visits and lesson sharing.	Given the broad target groups, with a focus on women and youth, adverse impacts are not expected as a result of this activity.	Likelihood: 1 Consequence: 1 Risk: Low	Early community engagement. Ensure that vulnerable groups are involved	Likelihood: 1 Consequence: 1 Risk: Low
Output 3: Strengthened coastal and marine governance and institutional framework				
Activity 3.1 Network of institutions for enhanced climate resilience and integrated planning and governance in all coastal states				
Establishment of multi-stakeholder groups and networks. Integrate EbA into relevant policies and legislation	Potential to have bias or poor representation of certain stakeholders	Likelihood: 3 Consequence: 3 Risk: Moderate	Stakeholder group composition will include a wide range of participants, including government, academia, private sector, and community, as appropriate. Gender balance will be sought in the make up of groups.	Likelihood: 2 Consequence: 2 Risk: Low
Activity 3.2 Integrating ecosystem-centric approaches to climate change adaptation into public and private sector policies, plans and budgets, and scaling up finance fo EbA				

This activity will focus on facliating dialogues, scenario planning to move from BAU to EbA, developing	No adverse impacts are anticipated to be associated with this activity. Key risk is failure to shift from BAU to EbA as a result of poor understanding or uptake of EbA principles.	Likelihood: 3 Consequence: 2 Risk: Low	Broad engagement with stakeholders. Demonstrate value to stakeholders, particularly private sector. Ensure depth of training and Train the Trainer to provide sustainability of	Likelihood: 2 Consequence: 2 Risk: Low
Project elements with potential for impacts	Unmitigated Impacts	Pre-mitigation	Avoidance and Mitigation Measures	Post-mitigation
ecosystem-adaptation plans and training users on the coastal Calculator tool.			knowledge and skills.	
Activity 3.3 Knowledge management for coastal resilience				
Knowledge management systems and information sharing	Data collection systems need to be robust and information must be readily available to a wide range of actors.	Likelihood: 2 Consequence: 2 Risk: Low	Data collection, storage systems and knowledge platforms will be robust and will be based on global best practices. Information will be made available through a variety of channels and in multiple languages (including local languages)	Likelihood: 1 Consequence: 2 Risk: Low

1.3.1 Assumptions Underpinning the Development of the Environmental and Social Management Framework

22. The following assumptions have been made in the preparation of this ESMF:

- None of the interventions will require the displacement of people;
- Interventions will not contravene any local, national or international laws;
- Appropriate erosion and sediment control will be undertaken during all stages of the projects; and
- There will be no uncontrolled/unapproved release of pollution and/or chemicals as a result of the projects.

1.3.2 Purpose and Objectives of the Environmental and Social Management Framework

23. An EMSF is a management tool used to assist in minimising the impact to the environment and socially; and reach a set of environmental and social objectives. To ensure the environmental and social objectives of the projects are met, this EMSF will be used by the project implementers to structure and control the environmental management safeguards that are required to avoid or mitigate adverse effects on the environment.

24. The environmental and social objectives of the projects are to:

- Increase the productivity of livelihoods and the populations' capacity to adapt to climate change through various tested interventions in a coordinated manner to effectively address the challenges facing the rural populations of India;
- Encourage good management practices through planning, commitment and continuous improvement of environmental practices;
- Minimise or prevent the pollution of land, air and water pollution;
- Protect native flora and fauna from the impacts of flooding;
- Comply with all applicable laws, regulations and standards for the protection of the environment; adopt the best practicable means available to prevent or minimise environmental impact;
- Describe all monitoring procedures required to identify impacts on the environment; and
- Provide an overview of the obligations of MoEFCC and UNDP staff and contractors in regard to environmental and social obligations.

25. The EMSF will be updated from time to time by the implementing Project Management Unit (PMU)/contractor in consultation with the UNDP staff and MOEFCC to incorporate changes in the detailed design phase of the projects.

1.3.3 Land Issues

26. Land used in this project will be a mix of private, community and government land. Land owner permission will be gained prior to any activates being undertaken on the land. There will be no change in land tenure as a result of the project.

27. There is no requirement for any compulsory land acquisition for the project interventions, therefore no land acquisition framework is included. Restoration will be carried out on state-owned forest land and revenue land, and livelihoods infrastructure will be placed on common property land in villages.

28. In some cases, coastal ecosystems undergoing restoration can continue to be accessed, for example, coral reefs being restored can still provide opportunities for scuba-diving tourism. In other cases, coastal ecosystems will be closed temporarily to allow for natural regeneration, or to allow planted seedlings to become established. (Mangrove habitats can regenerate on their own, provided tidal hydrology and availability of seeds or seedling of mangroves from nearby mangrove patches are not disrupted. Therefore assisting natural regeneration through planting

will be resorted to only where natural recruitment of seedlings does not occur after blockages to tidal flow or other environmental stresses are removed.)

29. Where access to natural resources is temporarily curtailed as a result of project activities for restoration of ecosystems, awareness-raising and involvement of communities in co-management structures will achieve buy-in for these restrictions, explaining the medium to long term benefits to communities. In cases where existing protected areas legislation is being enforced, resulting in a loss of harvesting rights, compensatory areas for access will be provided by the Forest Department wherever feasible. Where the rights of or other forest dwelling communities are temporarily affected, the Forest Rights Act will apply.

30. If there are any cases where access to resources is being permanently curtailed as a result of enhancing the conservation status of an area, the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, and the Wildlife (Protection) Act, 1972, will apply. These laws provide for a process of addressing rights of people in protected areas, continuance of some rights in the case of Sanctuaries, and due compensation where rights are extinguished.

1.3.4 Indigenous Peoples

31. As part of due diligence, an analysis and consultations were undertaken as to the likelihood of any of the project's activities involving socially marginalized groupings. A number of such groupings, e.g. Scheduled Castes and Scheduled Tribes were identified during the consultation. These groups will continue to be represented throughout the project. India has a number of laws that aid in the protection of these groups. The project will be inclusive and seek to involve and empower such groups.

32. Tribal people typically rely on areas of natural habitat eg tribal people living in and around the Krishna Wildlife Sanctuary. The nature of the activities proposed in the project will provide benefits to tribal people through improved governance and management of protected areas, along with rehabilitation of productive habitats such as mangroves and seagrasses.

33. A Social Inclusion Planning Framework (equivalent of an Indigenous People Planning Framework) has been prepared to guide the preparation of specific plans if required (Appendix A).

1.4 Overview of Institutional Arrangements for the Environmental and Social Management Framework Plan

34. The EMSF will be assessed for each sub-project by the MoEFCC and UNDP prior to any works being undertaken. The EMSF identifies potential risks to the environment and social matters from the projects and outlines strategies for managing those risks and minimising undesirable environmental and social impacts. Further, the EMSF provides a Grievance Redress Mechanism for those that may be impacted by the projects that do not consider their views have been heard.

35. The MoEFCC will be responsible for the supervision of the EMSF. The UNDP with gain the endorsement of the MoEFCC and will ensure the EMSF is adequate and followed. The PMU will ensure timely remedial actions are taken by the contractor where necessary.

1.4.1 Administration

36. The MoEFCC will be responsible for the revision or updates of this document during the course of work. It is the responsibility of the person to whom the document is issued to ensure it is updated.

37. The site supervisor will be responsible for daily environmental inspections of the construction site. The MoEFCC will cross check these inspections by undertaking monthly audits.

38. The contractor will maintain and keep all administrative and environmental records which would include a log of complaints together with records of any measures taken to mitigate the cause of the complaints.

39. The contractor will be responsible for the day to day compliance of the ESMF.

40. The MoEFCC will be the implementing agency and will be responsible for the implementation and compliance with the ESMF via the collaborating partners and contractors. The ESMF will be part of any tender documentation.

41. The Supervising Engineer/Project Manager will supervise the contractor, while the MoEFCC will be responsible for environment and social issues.

2 LEGAL AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MATTERS

2.1 LEGISLATION, POLICIES AND REGULATIONS

43. The following legislation is relevant to the project:

Central Government

- Air (Prevention and Control of Pollution) Act 1981
- Ancient Monuments and Archaeological Sites and Remains (AMASR) Act 1958 and the AMASR (Amendent and Validation) Act 2010 - Acts to provide for the preservation of ancient and historical monuments and archaeological sites and remains of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.
- Biological Diversity Act 2002 - An Act to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental there to.
- Child Labour (Prohibition and Regulation) Act 1986 - An Act to prohibit the engagement of children in certain employments and to regulate the conditions of work of children in certain other employments.
- Coastal Aquaculture Authority Act 2005 - An Act to provide for the establishment of a Coastal Aquaculture Authority for regulating the activities connected with coastal aquaculture in the coastal areas and for matters connected therewith or incidental thereto.
- Destructive Insects and Pests Act 1914 - An Act to prevent the introduction into India and the transport from one province to another of any insect, fungus or other pest, which is or may be destructive to crops.
- Disaster Management Act 2005 - An Act to provide for the effective management of disasters and for matters connected therewith or incidental thereto.
- Employment Exchanges (Compulsroy Notification of Vacancies) Act 1959 - The CNV Act makes it mandatory on employer in every establishment in public sector in that state or area shall, before filling up any vacancy in any employment in that establishment, notify that vacancy to such employment exchanges as may be prescribed.
- Environment (Protection) Act 1986 - An Act to provide for the protection and improvement of environment and for matters connected.
- Food Safety and Standards Act 2006 - An Act to consolidate the laws relating to food and to establish the Food Safety and Standards Authority of India for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import, to ensure availability of safe and wholesome food for human consumption and for matters connected therewith or incidental thereto.
- Forest (Conservation) Act 1980 (amended in 1988) - An Act to provide for the conservation of forests and for matters connected therewith or ancillary or incidental thereto.
- Indian Fisheries Act 1987 - An Act to provide for certain matters relating to Fisheries. Allows State Governments to make rules (eg Odisha fishing restrictions).
- Indian Forest Act 1927 - An Act to consolidate the law relating to forests, the transit of forest-produce and the duty leviable on timber and other forest- produce.
- Indian Ports Act 1908
- Inland Vessels Act 1917 and Inland Vessels (Amendment) Act 2007 – Acts relating to the use, certification and prevention of pollution by vessels.

- Insecticides Act 1968 and Insecticides (Amendement) Act ACT 2000 - Acts to regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals, and for matters connected therewith.
- National Co-operative Development Corporation Act 1962 and National Co-operative Developmet Corporation (Amendment) Act 2002 - Acts to provide for the incorporation and regulation of a corporation for the purpose of planning and promoting programmes for the production, processing, marketing, storage, export and import of agricultural produce, foodstuffs and certain other commodities on co- operative principles and for matters connected therewith.
- Scheduled Castes and Scheduled Tribes Orders (Amendment) Act 2002 - An Act to provide for the inclusion in the lists of Scheduled Tribes, of certain tribes or tribal communities or parts of or groups within tribes or tribal communities, equivalent names or synonyms of such tribes or communities, removal of area restrictions and bifurcation and clubbing of entries; imposition of area restriction in respect of certain castes in the lists of Scheduled Castes, and the exclusion of certain castes and tribes from the lists of Scheduled Castes and Scheduled Tribes.
- Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006 - An Act to recognise and vest the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded; to provide for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land. The recognised rights of the forest dwelling Scheduled Tribes and other traditional forest dwellers include the responsibilities and authority for sustainable use, conservation of biodiversity and maintenance of ecological balance and thereby strengthening the conservation regime of the forests while ensuring livelihood and food security of the forest dwelling Scheduled Tribes and other traditional forest dwellers.
- Seeds Act 1966 – An Act to provide for regulating the quality of certain seeds for sale.
- Societies Registration Act 1860 – an Act for the registration of entities generally involved in the benefit of society - education, health, employment etc. …
- Water (Pollution and Cess) Act 1977 - aims to provide for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974.
- Water (Prevention and Control of Pollution) Act 1974 - An Act to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, for the establishment, with a view to carrying out the purposes afore- said, of Boards for the prevention and control of water pollution, for conferring on and assigning to such Boards Powers and functions relating thereto and for matters connected therewith.
- Wild Birds and Animals Protection Act 1912 - An Act to make better provision for the protection and preservation of certain wild birds and animals.
- Wildlife (Protection) Act 1972 and Amendments 2002 and 2006 - Acts to provide for the protection of wild animals and birds and for matters connected therewith or ancillary or incidental thereto.

Andhra Pradesh

- Agricultural Produce and Livestock Markets Act, 1966 - Act No. 16 of 1966 - law relating to the regulation of purchase and sale of agricultural produce, livestock and products of livestock and the establishment of markets in connection therewith.
- Andhra Pradesh Aquaculture Seed (Quality Control) Act, 2006 – an Act to provide for regulating the quality of aqua-culture seed for sale and matters connect therewith.
- Andhra Pradesh Water Tax Act, 1988 - Act No. 11 of 1988 - An Act to provide for rationalization of the levy and collection of Water Tax in the State of Andhra Pradesh and for maters connected

therewith or incidental thereto. The Government shall be entitled to levy and collect in respect of every land receiving water for Irrigation and Aqua-culture purposes from any government source of irrigation notified under Section 4

- Andhra Pradesh Water, Land and Trees Act, 2002. – an Act to promote water conservation, and tree cover and regulate the exploitation and use of ground and surface water for protection and conservation of water sources, land and environment matters.
- Andhra Pradesh Industrial Policy 2015–2020
- Andhra Pradesh State Forest Policy 2002
- Coastal Regulation Zone Act
- Coastal Regulation Zone Notification 1991 and 2011

Maharastra

- Maharashtra Agricultural Produce Marketing (Regulation) (Amendment) Act, 2005 - Act No. 48 of 2005 - This Act amends and regulates agricultural produce marketing. Amendments deal with licensing requirements, administrative and legal proceedings, such as: how to purchase agricultural produce directly from the farmer, how to establish a private market or farmer-consumer market, in one or more than one market area, how to apply to the Director for granting or renewing licence, etc. in Maharashtra.
- The Maharashtra Zilla Parishad and Panchayat Samiti Act 1959
- Maharashtra Marine Fishing Regulation Act
- The Indian Forest Act Maharashtra Unification and Amendment Act
- The Maharashtra Cattle Trespass Act
- The Maharashtra Forest Produce Regulation and Trade Act
- The Maharashtra Supply of Forest Produce by Government Revision of Agreement Act
- Maharashtra Felling of Trees by Occupants belonging to S.Ts. Regulation Act
- Maharashtra M.F.P. Regulation of Trade Act
- Maharashtra Felling of Trees Regulation Act
- Maharashtra Forest Development Tax on Sale of Forest Produce by Government or Forest Development Corporation Continuance Act
- Maharashtra Forest Policy
- Maharashtra Private Forest Act
- Maharashtra Right to Service Act Ordinance No V of 2015
- Maharashtra Transfer of Ownership of Minor Forest Produce in the Schedule Areas and the Maharashtra Minor Forest Produce Regulation of Trade and Amendment Act
- Draft Bamboo Policy
- Eco Tourism Policy
- Fertiliser (Control) Order, 1957/1985 (FCO)
- Maharashtra State Adaptation Action Plan on Climate Change (MSAAPCC).
- Brackish Water Land Leasing Policy
- Comprehensive Marine Fishing Policy – Government of India
- Departmental Stocking Policy
- Protection of Plant Varieties and Farmers' Rights Act (PPVFRA)

Odisha

- Agricultural Produce Markets (Amendment) Act, 2006 - Act No. XX of 2006
- Environment (Protection) Act, 1986
- Land Settlement Act, 1962 - An Act to provide for settlement of Government Land in the State of Orissa. Provides a set of uniform principles regarding lease of Government waste lands over-riding provisions of various Acts, Rules, Orders, customary practices and usage in force in various parts of the State instead of tinkering with the individual laws with the primary objective of governing the settlement of waste lands in a planned manner uniformly throughout the State.
- Marine Fishing Regulation Act, 1982 - Act No. 10 of 1982

- Orissa Cattle and Poultry Feed (Regulation) Act, 1979 – An Act to provide for the regulation of production and quality of cattle and pultry feed in the State of Orissa. Could be relevant to fishmeal plants.
- Orissa Forest Act, 1972 - Act No. 14 of 1972 – delineates areas of protected forests
- Orissa Marine Fishing Regulation Act, 1982– regulates fishing between 1 November and 31 May in Olive Ridley Sea Turtle congregation areas.
- Orissa Irrigation Rule 2010
- State Water Plan 2004
- Odisha Fisheries Policy 2015
- Odisha Marine Fishing Regulation Rule 1983
- State Reservoir Fisheries Policy
- Administration of Odisha Industries (Reciliation) Act 2004
- Odisha Industries (Facilitation) Rules 2005
- State Disaster Management Policy
- Heat Wave Action Plan
- The Disaster Management Act 2005
- Odisha Tourism Policy 2013
- Odisha Entertainment Tax Act 2006
- Odisha Sangeet Natak Akademi Award Rules 2013
- Coastal Regulation Zone (CRZ)
- The Orissa Forest Act 1972
- The Orissa Forest (Amendment) Act 1982
- Odisha Biological Diversity Rules 2012

2.2 Environmental Impact Assessment in India

44. Environmental Impact Assessment (EIA) is an important management tool for ensuring optimal use of natural resources for sustainable development.

45. The Government of India enacted the Environmental (Protection) Act in 1986 making legal requirement of EIA to obtain environmental clearance for construction and operation for all development projects. In 1994, under the Environmental (Protection) Act and Rules of 1986, the Ministry of Environment and Forest (MoEF) issued a notification making environmental clearance legally mandatory for expansion and modernization and for construction of new projects and listed in Schedule I of the notification of 1994.

46. Schedule I contains three categories of projects (1, 2 and 3). The State governments have been delegated powers for some category 2 projects and some category 3 projects may not be required to undergo an EIA process. This delegation of powers to the state government is subject to distance/area restrictions eg environmental clearance is required for any project located within 25 km of reserve forests, ecologically sensitive areas (including National Parks, Sanctuaries, Biosphere Reserves and critically polluted areas) and within 50 km of inter-state boundaries.

47. The first step of EIA process is screening. During the screening, the developer will require pre-feasibility level of information to determine whether or not the project requires EIA. Once it is determined that the project may be required to undergo EIA process detailed engineering, environmental and social studies are to be conducted. The EIA process is shown in Figure 2.

48. Once an application has been submitted by a project authority along with all the requisite documents specified in the EIA Notification, it is scrutinised by the technical staff of the Ministry prior to placing it before the Environmental Appraisal Committees. The Appraisal Committees evaluate the impact of the project based on the data furnished by the project authorities and if necessary, site visits or on-the-spot assessment of various environmental aspects are also

undertaken. Based on such examination, the Committees make recommendations for approval or rejection of the project, which are then processed in the Ministry for approval or rejection.

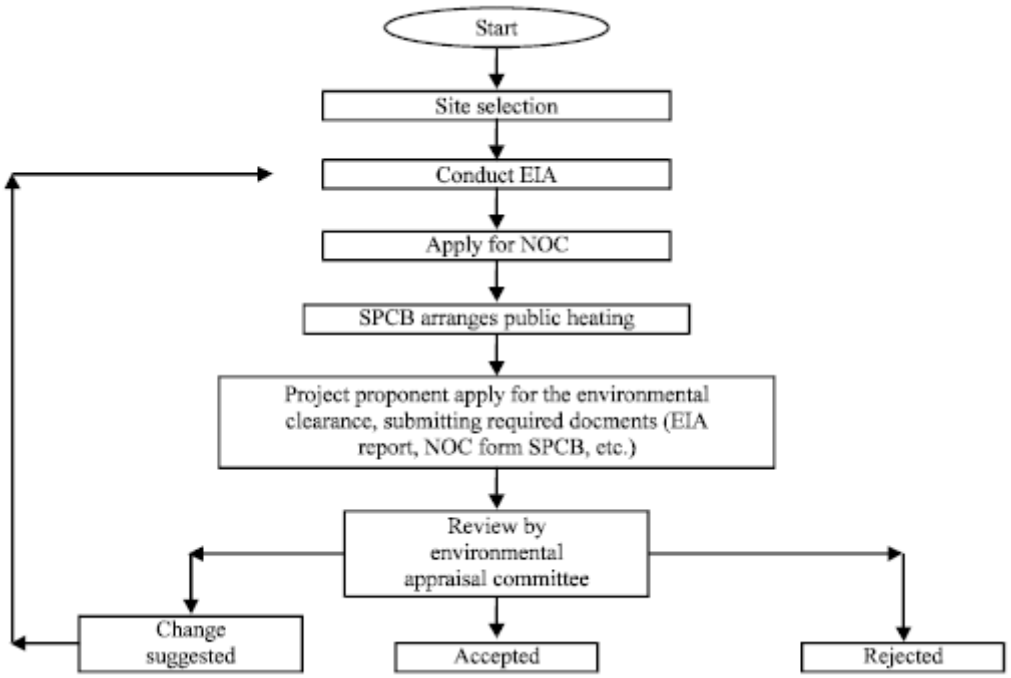

Figure 2 EIA process in India[9]

49. In case of site specific projects such as mining, ports and harbours etc., a two stage clearance procedure has been adopted whereby the project authorities have to obtain site clearance before applying for environmental clearance of their projects. This is to ensure avoiding areas which are ecologically fragile and environmentally sensitive. In case of projects where complete information has been submitted by the project proponents, a decision is taken within 90 days. (http://envfor.nic.in/division/introduction-8).

50. Under the Environment Protection Act, 1986 of India, notification was issued in February, 1991, for regulation of activities in the coastal area by the Ministry of Environment and Forests (MoEF). As per the notification, the coastal land up to 500 m from the High Tide Line (HTL) and a stage of 100 m along banks of creeks, estuaries, backwater and rivers subject to tidal fluctuations, is called the Coastal Regulation Zone(CRZ). The notification includes only the inter-tidal zone and land part of the coastal area and does not include the ocean part. The notification imposed restriction on the setting up and expansion of industries or processing plants etc. in the CRZ.

51. Coastal stretches within 500 metres of the HTL on the landward side are classified into four categories:

- CRZ-1 these are ecologically sensitive areas these are essential in maintaining ecosystem of the coast. They lie between low and high tide line. Exploration of natural gas and extraction of salt are permitted
- CRZ-2 This category includes areas that have already been developed up to or close to the shoreline. For this purpose, the term 'developed area' is used for areas within municipal limits or in other legally designated urban areas that are already substantially built up and have been provided with drainage, approach roads, and other infrastructural facilities.

1. _____

[9] R.B. Khadka and U.S. Shrestha (2011). Process and Procedure of Environmental Impact Assessment Application in Some Countries of South Asia: A Review Study. Journal of Environmental Science and Technology, 4: 215-233

- CRZ-3 rural and urban localities which fall outside the 1 and 2. Only certain activities related to agriculture even some public facilities are allowed in this zone
- CRZ-4 this lies in aquatic area up to territorial limits. Fishing and allied activities are permitted in this zone. Solid waste should be let off in this zone.

52. The CRZ categories have different restrictions, in particular building restriction apply.

53. Coastal States/UTs are required to prepare Coastal Zone Management Plans (CZMPs) as per the provisions of the Coastal Regulation Zone (CRZ) Notification 1991, identifying and categorising the coastal areas for different activities.

54. In terms of *the Environment Protection Act*, any activities being co-financed through the project that are obliged to conduct a Environmental Impact Assessment will do so, including activities in Special Export Zones, ports, harbours, building and construction projects, (enumerated in Schedule of EIA notification, 2006).

2.3 Multilateral Agreements and Biodiversity Protocols

55. The Government of India is a signatory to a number of international and regional agreements and conventions, which are related to the environment. They include:

- 2016 Paris Agreement – global response to the threat of climate change
- 2013 Minamata Convention on Mercury
- 2010 Nagoya Protocol on Access to Genetic Resources and their Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity
- 2008 memorandum o Understanding Concerning the Conservation of Migratory Birds of Prey in Africa and Eurasia
- 2007 Memorandum of Understanding on the Conservation and Management of Dugongs (Dugong dugon) and their Habitats throughout their Range
- 2006 International Tropical Timber Agreement
- 2003 Agreement for the establishment of the global crop diversity trust
- 2003 WHO Framework Convention on Tobacco Control
- 2001 Stockholm Convention on Persistent Organic Pollutants
- 2001 International Treaty on Plant Genetic Resources for Food and Agriculture
- 2001 Memorandum of Understanding concerning Conservation and Management of marine turtles and their habitats of the Indian Ocean and South East Asia
- 2000 Cartagena Protocol on Biosafety on the Convention on Biological Diversity
- 1998 Memorandum of Understanding concerning Conservation Measures for the Siberian Crane
- 1998 Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
- 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change
- 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks
- 1995 Vienna Convention for the Protection of the Ozone Layer
- 1993 Agreement for the Establishment of the Indian Ocean Tuna Commission
- 1992 United Nations Framework Convention on Climate Change
- 1992 Convention on Biological Diversity
- 1991 Western Indian Ocean Tuna Organisation Convention
- 1990 International Convention on Oil Preparedness and Co-operation
- 1988 Agreement fo the Establishment of the Network of Aquaculture Centres in Asia and the Pacific
- 1987 The Montreal Protocol on Substances that deplete the Ozone Layer

- 1985 Agreement for the Establishment of the Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asia and Pacific Region (INFOFISH)
- 1985 Vienna Convention for the Protection of the Ozone Layer
- 1983 Amendment to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Art. XXI)
- 1979 Convention on the Conservation of Migratory Species of Wild Animals
- 1978 Agreement establishing of a Centre on Integrated Rural Development for Asia and the Pacific
- 1976 Agreement establishing the International Fund for Agricultural Development
- 1973 Agreement for the Establishment of a Regional Animal Production and Health Commission for Asia and the Pacific
- 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora
- 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage
- 1971 Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar)
- 1956 Plant Protection Agreement for the Asia and Pacific Region
- 1951 International Plant Protection Convention
- 1948 Statutes of the International Union for Conservation of Nature and Natural Resources (as revised in 1996)
- 1948 Constitution of the International Rice Commission
- 1948 Agreement for the Establishment of the Asia-Pacific Fishery Commission

3 IMPLEMENTATION AND OPERATION

3.1 GENERAL MANAGEMENT STRUCTURE AND RESPONSIBILITIES

56. A high level PMU structure is shown in Figure 3. The key roles are discussed below.

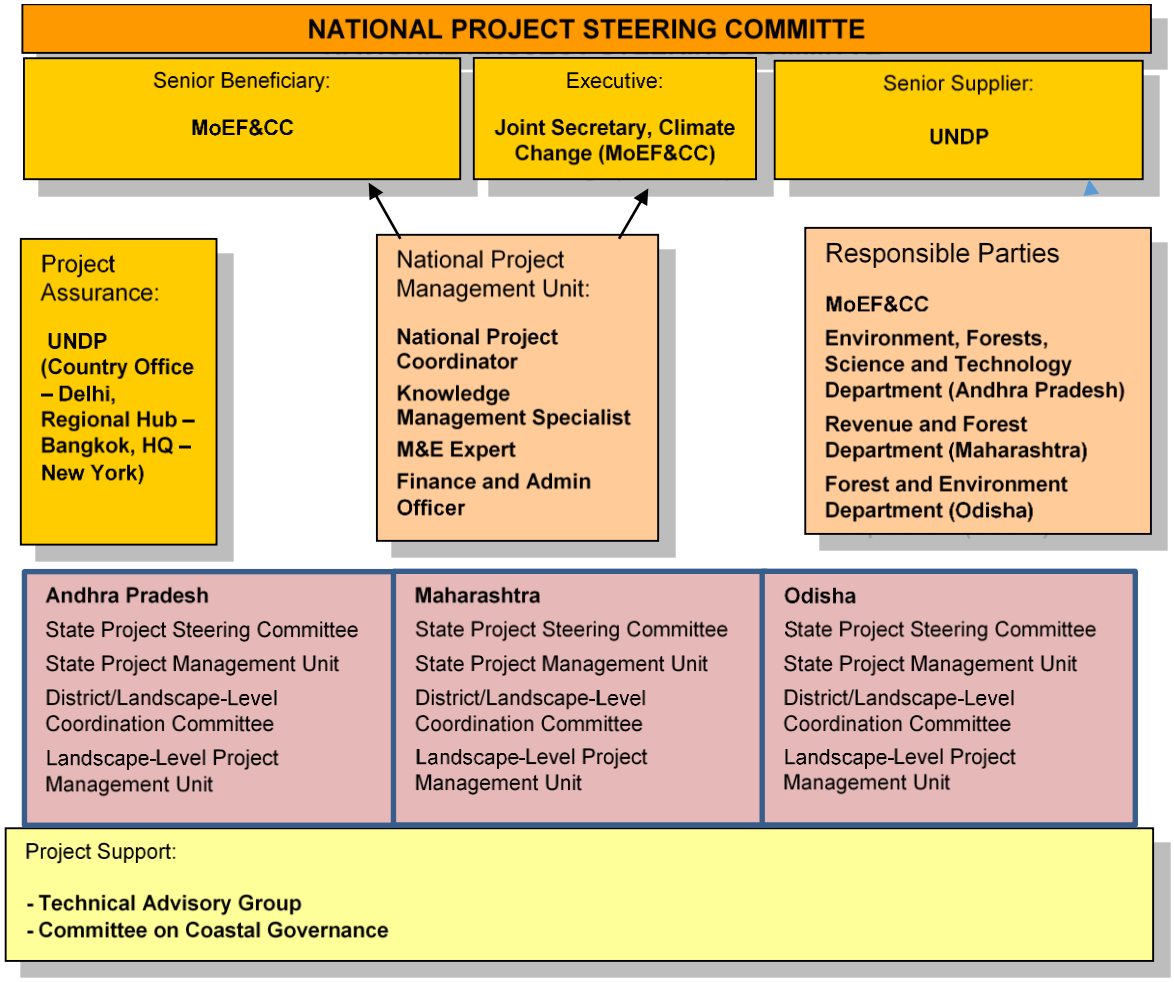

Figure 3 Project organisation structure

3.1.1 National Implementation Structure

3.1.1.1 Implementing Partner and Responsible Parties

57. The Implementing Partner for this project is the Ministry of Environment, Forest and Climate Change (MoEFCC). The MoEF&CC is also the National Designated Authority of the Green Climate Fund and all the national level coordination mechanisms will be under the aegis of the ministry

58. The project will be implemented following UNDP's National Implementation Modality (NIM), according to the Standard Basic Assistance Agreement between UNDP and the Government of India.

3.1.1.2 National Project Steering Committee

59. The MoEF&CC will convene the National Project Steering Committee (NPSC), which will be constituted and chaired by the senior most official or Special Secretary in charge of climate change at the MoEF&CC. The Joint Secretary, Climate Change will assume the role of member secretary of the NPSC, and will be the National Project Director. The steering committee will convene at least twice annually, to review and contribute to the annual work plans of the project states as well as

discuss and approve national level project activities. The NPSC will also be a platform for sharing learnings and good practices across all the Indian coastal states, union territories and islands.

60. Members will comprise of representatives from relevant line ministries including agriculture, forest, environment, MSMEs, skill development, earth sciences, rural development, etc. All the coastal states of India will be represented in the NPSC, including members of the Coastal Zone Management Authority. NPSC will also include representation from relevant coastal institutes and organisations such as the National Centre for Sustainable Coastal Management (NCSCM) among others. The focal points for the State Action Plan on Climate Change (SAPCC) for the coastal states would also be represented in the NPSC. The committee will also include representatives of the private sector and relevant NGOs.

3.1.1.3 National Project Management Unit

61. The NPSC will be supported by the National Project Management Unit (NPMU), who will be responsible for day to day coordination of relevant components of the project at the national level and work in close coordination with the three project states of Andhra Pradesh, Maharashtra and Odisha. The NPMU will be headed by a National Project Coordinator, who will be supported by a Knowledge Management Specialist, Monitoring and Evaluation Expert and a Finance and Administration Officer, amongst others.

3.1.1.4 Technical Advisory Group

62. Technical Advisory Group (TAG) will be established comprising subject matter experts who will provide their expertise and guidance for achieving the project objectives, as required. The TAG will be chaired by the Joint Secretary i/c climate change at MoEF&CC and will be hosted at the NPMU. The successful implementation of this project will require strong technical leadership and high levels of coordination due to its multi-sectoral nature. The TAG will help to steer this process, and will meet on a quarterly basis, or as and when required.

3.1.2 Committee on Coastal Governance

63. A Committee on Coastal Governance will be established, with its secretariat hosted at the NPMU and chaired by the Joint Secretary in charge of climate change at MoEF&CC. This committee will be comprised of governance experts and will convene at least once a year, or as needed, to provide guidance and technical support related to decisions on coastal governance. In particular, the CCG will foster South-South partnerships by providing a knowledge exchange platform in Output 3.3 for engagement with other countries in the region that share common concerns on coastal climate change vulnerabilities and impacts. The CCG will be represented in the NPSC.

3.1.3 State Management Structures

64. The three GCF project states will each have their own implementation arrangements:

65. The Project will be implemented by the Environment, Forests, Science and Technology Department in the State of Andhra Pradesh through its executive units, particularly primarily the Andhra Pradesh Coastal Zone Management Authority (AP CZMA). The Environment, Forests, Science and Technology Department will be a Responsible Party (in UNDP terminology) in terms of an agreement between the national Ministry of Environment, Forest and Climate Change and the Environment, Forests, Science and Technology Department, Andhra Pradesh.

66. The Project will be implemented by the Revenue and Forest Department in the state of Maharashtra through the Mangrove and Marine Biodiversity Conservation Foundation of Maharashtra, (set up set up under the Revenue and Forest Department vide Government Resolution No. S-30/2015/CR 219/F-3 dated 23rd September 2015). The Revenue and Forest Department will be a Responsible Party (in UNDP terminology) in terms of an agreement between the national Ministry of Environment, Forest and Climate Change and the Revenue and Forest Department, Maharashtra.

67. The Project will be implemented by the Forest and Environment Department in the state of Odisha. The Forest and Environment Department will be a Responsible Party (in UNDP terminology) in terms of an agreement between the national Ministry of Environment, Forest and Climate Change and the Forest and Environment Department, Odisha.

68. Each of the three states will have the following basic structures for project execution:

3.1.3.1 State Project Steering Committee (SPSC)

69. A State Project Steering Committee (SPSC) will be set up which will have representation from all important state departments/ agencies to direct and oversee project implementation and management at the state level. Other members will include representatives of the relevant State Departments, Agencies, and other stakeholders including private sector / industries, NGOs nominated by the State Government, representative of UNDP and MOEF&CC. The SAPCC focal point in the state would also be members of the SPSC. The SPSC shall meet at least twice in a year to review the progress of project implementation in the State and take appropriate decisions for the smooth implementation of the project within the State.

3.1.3.2 State Project Management Unit (SPMU)

70. The SPSC will be supported by the State Project Management Unit (SPMU), which will be responsible for coordinating the project at the state level. The SPMU will be headed by the State Project Director (SPD) who will be the Principal Secretary (Forest) or their representative. The SPD will be responsible for overall implementation of the project at the State level, including adherence to the AWP and achievement of planned results as outlined in the Project Document, and for the use of project funds through effective management and well established project review and oversight mechanisms. The SPD also will i) ensure coordination with UNDP, MoEF&CC, various departments and agencies; ii) provide guidance to the project team; iii) review reports and iv) look after other administrative and financial arrangements related to the project. The SPD will be supported by the State Project Manager whose responsibilities shall include: 1) coordinating project implementation with all stakeholders, State Government and central government agencies and UNDP-GCF; 2) organizing the project evaluations; 3) ensuring that there is adequate documentation by all implementing partners at all stages and in collating this documentation; and 4) facilitating the publication of project outputs.

3.1.3.3 District/Landscape-Level Coordination Committee (DLCC/LLCC)

71. At the district level, there would be district/ landscape level project steering committee (DLCCC/LLCC), which will be chaired by the respective District Collectors (DC). The Divisional Forest Officer will act as the District Project Coordinator. Members will include all relevant departments, agencies, and representatives of all village level committees as well as the community mobilizers/ village facilitators. The LLCCs will also be linked to the SPSCs and the NPSC through representation at the national and state PSCs. The LLCC will be responsible for district level planning, implementation, monitoring and coordination. This committee will also endeavor to ensure adequate coordination with the various production sectors at the district level.

3.1.3.4 Landscape-Level Project Management Unit (LLPMU)

72. At the district, the LLPSC will be supported by a District Project Management Unit (DPMU), which will be adequately staffed by persons of relevant expertise who will provide technical leadership for project implementation, monitoring & evaluation, and adaptive management. This will include a livelihood specialist, an ecosystem and climate change adaptation expert, a communication and outreach specialist, and also a financial-cum-administrative assistant for performing the day to day administrative and financial functions of the PMU. The DPMU will be reporting to the District Project Coordinator.

73. The field activities will be implemented by the respective line departments at State, District and Sub District levels, with the involvement of NGOs and CBOs under the overall guidance and supervision

of the State and District level coordination mechanism as above. At the village level, Village Organizations (federations of Self-Help Groups) and Eco Development Committees will be involved in Project implementation especially for eco-restoration and other direct interventions. Village facilitators or community mobilizers will be responsible for coordinating these activities at the village level.

3.1.4 Project Assurance

74. The 'project assurance' function of UNDP is to support the MoEFCC by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. Furthermore, UNDP provides quality assurance for the project; ensures adherence to the NIM guidelines and ensures compliance with GCF and UNDP policies and procedures.

75. A UNDP Programme Officer, or M&E Officer, typically holds the Project Assurance role on behalf of UNDP.

3.2 ADMINISTRATION OF EMSF

76. As the implementing agency, MoEFCC will be responsible for responsible for the implementation of the EMSF via the delivery organisations ie State structures outlined above.

77. The EMSF will be part of any tender documentation. The NPMU will be responsible for the revision or updates of this document during the course of work. It is the responsibility of the person to whom the document is issued to ensure it is the most up to date version.

78. The UNDP and MOEFCC are accountable for the provision of specialist advice on environmental and social issues to the delivery organisations (eg contractors and/or NGOs) and for environmental and social monitoring and reporting. The MOEFCC or its delegate will assess the environmental and social performance of the delivery organisations (eg contractors) in charge of delivering each component throughout the project and ensure compliance with the EMSF. During operations the delivery organisations will be accountable for implementation of the EMSF. Personnel working on the projects have accountability for preventing or minimising environmental and social impacts.

79. Safeguards Manager will be nominated at the National and State level PMUs. These roles may be in addition to other roles that members of the PMUs have. The Safeguards officer in the PMU will be designated as the key officer in charge of the Grievance Redress Mechanism

80. Field Officers will be responsible for daily environmental inspections of the project/construction sites. Field Officer will provide advice on effective environmental management of the project to all project site personnel. Field Officers are also to ensure the environmental awareness of project personnel is maintained through appropriate training. Compliance reports on mitigation measures will be submitted by the Field Officers. An independent review of the compliance may be undertaken during delivery/construction and post-construction where deemed necessary.

81. The delivery organisation eg contractor will maintain and keep all administrative and environmental records, which would include a log of complaints together with records of any measures taken to mitigate the cause of the complaints.

82. The delivery organisation will be responsible for the day to day compliance of the EMSF

3.2.1 General Environmental Contract Performance Clauses

83. Generic contract clauses are provided in Appendix B to assist with environmental and social management works expected to have minor impacts. The mitigation measures described in the appendix reflect measures described in this ESMF and are the core of a generic, standardized Environmental Management Plan (EMP) and the associated minor impacts typical of small works that can be routinely addressed with best industry practice.

84. These clauses are general and may be modified to conform to applicable national laws, contract procedures and actual scope and nature of the works anticipated. These clauses are intended to be included as requirements in the works contract and shall remain in force throughout the contract period.

3.2.2 Environmental procedures, site and activity-specific work plans/instructions

85. Environmental procedures provide a written method describing how the management objectives for a particular environmental element are to be obtained. They contain the necessary detail to be site or activity-specific and are required to be followed for all construction works. Site and activity-specific work plans and instructions are to be issued and will follow the previously successful work undertaking similar projects by the UNDP, GoI and MoEFCC.

3.2.3 Environmental incident reporting

86. Any incidents, including non-conformances to the procedures of the EMSF are to be recorded using an Incident Record and the details entered into a register. For any incident that causes or has the potential to cause material or serious environmental harm, the Field Officer shall notify their superior as soon as possible. The delivery organisation/contractor must cease work until remediation has been completed as per the approval of MOEFCC.

3.2.4 Daily and weekly environmental inspection checklists

87. A daily environmental checklist is to be completed at each work site by the relevant Field Officer and maintained within a register. A weekly environmental checklist is to be completed and will include reference to any issues identified in the daily checklists completed by the field officers. The completed checklist is to be forwarded to MOEFCC for review and follow-up if any issues are identified.

3.2.5 Corrective Actions

88. Any non-conformances to the EMSF are to be noted in weekly environmental inspections and logged into the register. Depending on the severity of the non- conformance, the Field Officer may specify a corrective action on the weekly site inspection report. The progress of all corrective actions will be tracked using the register. Any non-conformances and the issue of corrective actions are to be advised to MOEFCC.

3.2.6 Review and auditing

89. The EMSF and its procedures are to be reviewed at least every two months by UNDP staff and MOEFCC. The objective of the review is to update the document to reflect knowledge gained during the course of project delivery/construction and to reflect new knowledge and changed community standards (values).

90. The EMSF will be reviewed and amendments made if:

- There are relevant changes to environmental conditions or generally accepted environmental practices; or
- New or previously unidentified environmental risks are identified; or
- Information from the project monitoring and surveillance methods indicate that current control measures require amendment to be effective; or
- There are changes to environmental legislation that are relevant to the project; or
- There is a request made by a relevant regulatory authority; or
- Any changes are to be developed and implemented in consultation with UNDP Staff and MOEFCC. When an update is made, all site personnel are to be made aware of the revision as soon as possible eg through a tool box meeting or written notification.

3.3 TRAINING

91. Delivery organisations have the responsibility for ensuring systems are in place so that relevant employees, contractors and other workers are aware of the environmental and social requirements for construction, including the EMSF.

92. All project personnel will attend an induction that covers health, safety, environment and cultural requirements.

93. All workers engaged in any activity with the potential to cause serious environmental harm (e.g. handling of hazardous materials) will receive task specific environmental training.

4 COMMUNICATION

4.1 PUBLIC CONSULTATION AND ENVIRONMENTAL AND SOCIAL DISCLOSURE

95. The EMSF includes public consultation as part of the stakeholder engagement plan. The project was discussed with a wide range of stakeholders including relevant government departments, industry groups, NGOs, and individual community members and approved by Government. Extensive on-ground consultation has been undertaken during the design of the project (as well as during the earlier projects that this project is aiming to upscale) and it is expected that consultation with any affected communities will continue. It is anticipated that based on the communities' needs, the projects will be fully accepted.

96. The UNDP and MOEFCC will develop and release updates on the project on a regular basis to provide interested stakeholders with information on project status. Updates may be via a range of media eg print, radio, social media or formal reports. A publicized telephone number will be maintained throughout the project to serve as a point of contact for enquiries, concerns and complaints. All enquiries, concerns and complaints will be recorded on a register and the appropriate manager will be informed. All material must be published in English and Marshallese as appropriate.

97. Where there is a community issue raised, the following information will be recorded:

- Time, date and nature of enquiry, complaint or concern;
- Type of communication (e.g. telephone, letter, personal contact);
- Name, contact address and contact number;
- Response and investigation undertaken as a result of the enquiry, complaint or concern; and
- Actions taken and name of the person taking action.

98. Some enquiries, complaints and concerns may require an extended period to address. The complainant(s) will be kept informed of progress towards rectifying the concern. All enquiries, complaints and concerns will be investigated and a response given to the complainant in a timely manner. A grievance redress mechanism has been included in the ESMF to address any complaints that may not be able to be resolved quickly.

99. Nominated PMU/contractor staff will be responsible for undertaking a review of all enquiries, complaints and concerns and ensuring progress toward resolution of each matter.

4.2 COMPLAINTS REGISTER AND GRIEVANCE REDRESS MECHANISM

100. During the construction and implementation phases of any project, a person or group of people can be adversely affected, directly or indirectly due to the project activities. The grievances that may arise can be related to social issues such as eligibility criteria and entitlements, disruption of services, temporary or permanent loss of livelihoods and other social and cultural issues. Grievances may also be related to environmental issues such as excessive dust generation, damages to infrastructure due to construction related vibrations or transportation of raw material, noise, traffic congestions, decrease in quality or quantity of private/ public surface/ ground water resources during irrigation rehabilitation, damage to home gardens and agricultural lands etc.

101. Should such a situation arise, there must be a mechanism through which affected parties can resolve such issues in a cordial manner with the project personnel in an efficient, unbiased, transparent, timely and cost-effective manner. To achieve this objective, a grievance redress mechanism has been included in EMSF for this project.

102. The project allows those that have a compliant or that feel aggrieved by the project to be able to communicate their concerns and/or grievances through an appropriate process. The Complaints Register and Grievance Redress Mechanism set out in this EMSF are to be used as part of the project and will provide an accessible, rapid, fair and effective response to concerned stakeholders, especially any vulnerable group who often lack access to formal legal regimes.

103. While recognising that many complaints may be resolved immediately, the Complaints Register and Grievance Redress Mechanism set out in this EMSF encourages mutually acceptable resolution of issues as they arise. The Complaints Register and Grievance Redress Mechanism set out in this EMSF has been designed to:

- Be a legitimate process that allows for trust to be built between stakeholder groups and assures stakeholders that their concerns will be assessed in a fair and transparent manner;
- Allow simple and streamlined access to the Complaints Register and Grievance Redress Mechanism for all stakeholders and provide adequate assistance for those that may have faced barriers in the past to be able to raise their concerns;
- Provide clear and known procedures for each stage of the Grievance Redress Mechanism process, and provides clarity on the types of outcomes available to individuals and groups;
- Ensure equitable treatment to all concerned and aggrieved individuals and groups through a consistent, formal approach that, is fair, informed and respectful to a complaint and/or concern;
- Provide a transparent approach, by keeping any aggrieved individual/group informed of the progress of their complaint, the information that was used when assessing their complaint and information about the mechanisms that will be used to address it; and
- Enable continuous learning and improvements to the Grievance Redress Mechanism. Through continued assessment, the learning may reduce potential complaints and grievances.

104. Eligibility criteria for the Grievance Redress Mechanism include:

- Perceived negative economic, social or environmental impact on an individual and/or group, or concern about the potential to cause an impact;
- clearly specified kind of impact that has occurred or has the potential to occur; and explanation of how the project caused or may cause such impact; and
- individual and/or group filing of a complaint and/or grievance is impacted, or at risk of being impacted; or the individual and/or group filing a complaint and/or grievance demonstrates that it has authority from an individual and or group that have been or may potentially be impacted on to represent their interest.

105. Local communities and other interested stakeholders, including representatives of traditional grievance resolution systems, may raise a grievance/complaint at all times to the MOEFCC. Affected local communities should be informed about the EMSF provisions, including its grievance mechanism and how to make a complaint.

4.2.1 Complaints register

106. Where there is a community issue raised, the following information will be recorded:

107. A complaints register will be established as part of the project to record any concerns raised by the community during construction. Any complaint will be advised to the UNDP and MoEFCC within 24 hours of receiving the complaint. The complaint will be screened. Following the screening, complaints regarding corrupt practices will be referred to the UNDP for commentary and/or advice along with the MoEFCC.

108. Wherever possible, the project team will seek to resolve the complaint as soon as possible, and thus avoid escalation of issues. However, where a complaint cannot be readily resolved, then it must be escalated.

109. A summary list of complaints received and their disposition must be published in a report produced every six months.

4.2.2 Grievance mechanism

110. The Grievance Redress Mechanism has been designed to be problem-solving mechanism with voluntary good-faith efforts. The Grievance Redress Mechanism is not a substitute for the legal process. The Grievance Redress Mechanism will as far as practicable, try to resolve complaints and/or grievances on terms that are mutually acceptable to all parties. When making a complaint and/or grievance, all parties must act at all times, in good faith and should not attempt to delay and or hinder any mutually acceptable resolution.

111. In order to ensure smooth implementation of the Project and timely and effectively addressing of problems that may be encountered during implementation, a robust Grievance Redress Mechanism, which will enable to the Project Authorities to address the grievances of the stakeholders of the Project has been established.

112. All complaints regarding social and environmental issues can be received either orally (to the field staff), by phone, in complaints box or in writing to the UNDP, MOEFCC or the Construction Contractor. A key part of the grievance redress mechanism is the requirement for the project proponent and construction contractor to maintain a register of complaints received at the respective project site offices. All complainants shall be treated respectfully, politely and with sensitivity. Every possible effort should be made by the project proponent and construction contractor to resolve the issues referred to in the complaint within their purview. However, there may be certain problems that are more complex and cannot be solved through project-level mechanisms. Such grievances will be referred to the Grievance Redress Committee. It would be responsibility of the MOEFCC to solve these issues through a sound / robust process.

113. The Grievance Redress Mechanism has been designed to ensure that an individual and/or group are not financially impacted by the process of making a complaint. The Grievance Redress Mechanism will cover any reasonable costs in engaging a suitably qualified person to assist in the preparation of a legitimate complaint and/or grievance. Where a complaint and/or grievance is seen to be ineligible, the Grievance Redress Mechanism will not cover these costs.

114. Information about the Grievance Redress Mechanism and how to make a complaint must be placed at prominent places for the information of the key stakeholders.

115. The Safeguards officer in the PMU will be designated as the key officer in charge of the Grievance Redress Mechanism. The Terms of Reference for these positions (as amended from time to time) will have the following key responsibilities:

a. Coordinate formation of Grievance Redress Committees before the commencement of constructions to resolve issues;

b. Act as the focal point at the PMU on Grievance Redress issues and facilitate the resolution of issues within the PMU;

c. Create awareness of the Grievance Redress Mechanism amongst all the stakeholders through public awareness campaigns;

d. Assist in redress of all grievances by coordinating with the concerned parties;

e. Maintain information on grievances and redress;

f. Monitor the activities of MoEFCC on grievances issues; and

g. Prepare the progress for monthly/quarterly reports.

116. A two-tier Grievance Redress Mechanism structure has been developed to address all complaints in the project. The first tier redress mechanism involves the receipt of a complaint at the project level, typically at village and/or district level. This Tier 1 Grievance Redress Committee should include a representative of traditional management systems where these exist, in order to draw on traditional dispute resolution mechanisms to help address grievances before escalating to the next tier[10].

117. The stakeholders are informed of various points of making complaints (if any) and the PMU collect the complaints from these points on a regular basis and record them. This is followed by coordinating with the concerned people to redress the Grievances.

118. The Safeguards Manager of the PMU will coordinate the activities at the respective State to address the grievances and would act as the focal point in this regard. Any officer given the responsibility of this would coordinate with the Safeguards Manager of the PMU and MoEFCC in redressing the grievances. The designated officer of the Local Authorities is provided with sufficient training in the procedure of redress to continue such systems in future.

119. The complaints can be made orally (to the field staff), by phone, in complaints box or in writing to the UNDP, MoEFCC or the Construction Contractor. Complainants may specifically contact the Safeguards Manager and request confidentiality if they have concerns about retaliation. In cases where confidentiality is requested (i.e. not revealing the complainant's identity to UNDP, MoEFCC and/or the Construction Contractor). In these cases, the Safeguards Manager will review the complaint, discuss it with the complainant, and determine how best to engage project executing entities while preserving confidentiality for the complainant.

120. As soon as a complaint is received, the Safeguards Manager would issue an acknowledgement. The project representative receiving the complaint should try to obtain relevant basic information regarding the grievance and the complainant and will immediately inform the Safeguards Manager in the PMU.

121. The PMU will maintain a Complaint / Grievance Redress register at the State level. Keeping records collected from relevant bodies is the responsibility of PMU.

122. After registering the complaint, the Safeguards Manager will study the complaint made in detail and forward the complaint to the concerned officer with specific dates for replying and redressing the same. The Safeguards Manager will hold meetings with the affected persons / complainant and then attempt to find a solution to the complaint received. If necessary, meetings will be held with the concerned affected persons / complainant and the concerned officer to find a solution to the problem and develop plans to redress the grievance. The deliberations of the meetings and decisions taken are recorded. All meetings in connection with the Grievance Redress Mechanism, including the meetings of the Grievance Redress Committee, must be recorded. The Safeguards Officer for the Grievances Redress Mechanism will be actively involved in all activities.

123. The resolution at the first tier will be normally be completed within 15 working days and the complaint will be notified of the proposed response through a disclosure form. The resolution process should comply with the requirements of the Grievance Redress Mechanism in that it should, as far as practicable, be informal with all parties acting in good faith. Further, the Grievance Redress Mechanism should, as far as practicable, achieve mutually acceptable outcomes for all parties.

1. _____

10 Many community institutions, (such as the caste panchayats, peddalu, padu system etc.,) are organized along caste, kinship or religious lines, and play an important role in resolving conflicts, besides regulating and allocating resource use, ensuring equitable access to resources and providing some form of social insurance. Most communities have evolved their own management systems over time to regulate human interaction with the resource especially when large number of people bank on a limited resource to avoid conflicts.

124. Should the grievance be not resolved within this period to the satisfaction of the complainant, the grievance will be referred to the next level of Grievance Redress Mechanism. If the Safeguards Manager feels that adequate solutions can be established within the next five working days, the officer can decide on retaining the issue at the first level by informing the complainant accordingly. However, if the complainant requests for an immediate transfer to the next level, the matter must be referred to the next tier. In any case, where the issue is not addressed within 20 working days, the matter is referred to the next level.

125. Any grievance related to corruption or any unethical practice should be referred immediately to the Indian Central Vigilance Commission and/or the Anti-Corruption Bureau.of the State and the Office of Audit and Investigation within the UNDP in New York.

126. In addition to the project-level and national grievance redress mechanisms, complainants have the option to access UNDP's Accountability Mechanism, with both compliance and grievance functions. The Social and Environmental Compliance Unit investigates allegations that UNDP's Standards, screening procedure or other UNDP social and environmental commitments are not being implemented adequately, and that harm may result to people or the environment. The Social and Environmental Compliance Unit is housed in the Office of Audit and Investigations, and managed by a Lead Compliance Officer. A compliance review is available to any community or individual with concerns about the impacts of a UNDP programme or project. The Social and Environmental Compliance Unit is mandated to independently and impartially investigate valid requests from locally impacted people, and to report its findings and recommendations publicly.

127. The Stakeholder Response Mechanism offers locally affected people an opportunity to work with other stakeholders to resolve concerns about the social and environmental impacts of a UNDP project. Stakeholder Response Mechanism is intended to supplement the proactive stakeholder engagement that is required of UNDP and its Implementing Partners throughout the project cycle. Communities and individuals may request a Stakeholder Response Mechanism process when they have used standard channels for project management and quality assurance, and are not satisfied with the response (in this case the project level grievance redress mechanism). When a valid Stakeholder Response Mechanism request is submitted, UNDP focal points at country, regional and headquarters levels will work with concerned stakeholders and Implementing Partners to address and resolve the concerns. Visit www.undp.org/secu-srm for more details. The relevant form is attached at the end of the EMSF (Appendix C).

5 KEY ENVIRONMENTAL AND SOCIAL INDICATORS

129. This section identifies the key environmental and social indicators identified for the project and outlines respective management objectives, potential impacts, control activities and the environmental performance criteria against which these indicators will be judged (i.e. audited).

130. This section further addresses the need for monitoring and reporting of environmental performance with the aim of communicating the success and failures of control procedures, distinguish issues that require rectification and identify measures that will allow continuous improvement in the processes by which the projects are managed.

5.1 ECOLOGY

5.1.1 Background

131. India has a rich biodiversity; however urbanisation and large human population and its activities have had a significant impact on natural ecosystems. It is known that the majority of the project areas have been previously disturbed although vegetation still exist in all proposed sites.

132. Figure 4 shows the major vegetation types and land uses across India. The mangroves along the east coast of India is more (80%) than that of west coast (20%) because the terrain of the east coast has a gradual slope as plains compared with the steep gradient along the west coast[11].

5.1.2 Flora and Fauna of Maharastra

133. Maharashtra's forest areas lie mostly along its border with Madhya Pradesh (north and east) and in the west along the slopes of the Sahayadri Hills. Many of these areas have been made into wildlife reserves. Parks and sanctuaries house some of the rare varieties of flora and fauna as the climate and soil conditions favour these rare varieties. Some of the animals commonly found in sanctuaries are Wild Dog, Sambar, Flying Squirrel, Tiger, Bison, Crocodiles, Jungle cats, Sloth Bear, Four Horned Antelope, Chinkara, Chowsinga, Langurs, Black Buck, Panther, Wolf, Jackal, Hyena, Giant Squirrel, Bonnet Monkey,Nigai, Pangolin and many other exotic varieties. Some of the common flora that are found here are Teak, Terminalia, Dalbergia Latifolia, *Terminalia paniculata*, *Adina cordifolia*, Bamboo, Anogeissius, Boswelia, Dalbergia, Shisham, Isnceolata, Logerstroemia, *T. bellercia, Andug Prerocarpuss*, *Prerocarpuss marsupium*, *T. tomentosa* and *Grewia tiliaefolia*.

134. The coastal region of the Maharashtra state has six districts: Thane, Greater Mumbai, Navi Mumbai, Raigad, Ratnagiri and Sindhdurg (popularly known as Konkan). The entire region is hilly, narrow, highly dissected with transverse ridges of the Sahyadri hill ranges (Western Ghats) on its east and at many places extending as promontories, notches, sea caves, embayment, submerged shoals and offshore islands. The upper limits of the coastline are lined by the coastal plateaus.

135. Along the Maharashtra coast, there are about 15 rivers, 5 major creeks and 30 backwater regions. Mouths of these rivers and creeks are wide-open, funnel shaped with shoals.[12] The coastal region of the Konkan Coast has paddy fields as the vegetation. The coastal belt consists of eminent trees like the mango and the coconut and shrubs.

136. Green turtles and olive ridleys are known to nest in Maharashtra in small numbers.

5.1.2.1 Flora and Fauna of Odisha

137. The tidal and littoral swamp forests deserve special mention, being one of the conspicuous and important forest types of the Odisha coast. The tidal and littoral swamp forests extend from Chandipur coasts in Balasore district to Gopalpur of Ganjam district, either as a continuous belt or

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11 http://mangrovesocietyofindia.in/mangrove_biogeography.php

12 http://www.bnhs.org/bnhs/phocadownload/esa.pdf

in scattered patches along the creeks and channels of estuaries including fringes of the Chilika. The characteristic tree species are Karika (Bruquiera), Sundari (Heritiera), Bani (Avicennia), Rai (Rhizophora), Guan (Exocaria), etc. As Hental (Phoenix paludosa) grows here abundantly in clusters, the mangrove forests are locally called 'Hental van' or Hental forests.

138. The mangroves of Odisha are the second largest mangal formation of the country after the Sunderbans of India in both area and in respect of species composition. Unlike the other states of India, the coastal belt of Odisha has experienced severe vegetational devastations leading to rapid shrinkage of many rare and endangered plant communities like mangroves. Due to such devastations, the coastal belt has faced severe oceanic cyclones with high wind velocity which costs many lives. The shrinkage of mangroves population of the coast is mainly due to biotic as well as abiotic interference.

139. Some typical birds representing different orders of the bird families in Odisha include: Grebe, cormorant and darter, grey heron and pond heron, white-necked and black-necked stork, flamingo and ibis, brahminy duck, bar-headed goose and whistling teal; king vulture, tawny eagle, kestrel, brahminy kite and pariah kite, peacock, partridge and quail, crane and waterhen, jacana, plover, sandpiper, snipe and tern; rock-pigeon, green pigeon, spotted and ring doves; parrot and parakeet; cuckoo and crow pheasant; owls; nightjar; horn-bill; kingfisher; copper barbet and woodpecker; drongos and oriole; jungle and common myna, bulbul, weaver bird and babbler bird.

140. Odisha has three species of crocodile, namely the Gharial, the estuarine crocodile and the marsh crocodile. Sanctuaries have been set up for their preservation and growth. The Gharials, which are found only in the Mahanadi and its tributaries, are reared in the sanctuary at Satkoshia on the river Mahanadi covering an area of 795.5 sq km. The other two types are found in Bhitar Kanika covering an area of 161.76 sq. km of water encompassed with mangrove forests. To each of these sanctuaries is attached a corresponding Crocodile Research and Conservation unit. There is also a small crocodile sanctuary at Ramirth inside the Similipal forest.

141. There are two important species of turtle commonly found in Odisha:

- The Green Turtle, a big marine species attaining a length of 1.2 metres and weighing between 135 to 180 kg each found in the Chilika;
- The Pacific or Olive Ridley Sea Turtle (Lepidochelys olivacea), a migratory species. The latter come in thousands from far off parts of the Pacific coasts during winter to lay their eggs at Gahiramatha and Satabhaya in Bhitar Kanika. The place where these turtles lay eggs has come to be known as 'Arribada' (a Spanish word meaning breeding ground).

5.1.2.2 Flora and Fauna of Andhra Pradesh

142. Andhra Pradesh has a variety of flora and fauna. Its varied topography ranging from the hills of Eastern Ghats and Nallamallas to the shores of Bay of Bengal supports varied ecotypes, which in turn support a rich diversity of flora & fauna. The forest in the state can broadly be divided into four major biotic provinces.

- Deccan Plateau - 53%
- Central Plateau - 35%
- Eastern Highland -11%
- East Coastal Plains - 1%

143. The vegetation found in the state is largely of dry deciduous type with a mixture of Teak, and species of the genera Terminalia, Dalbergia, Pterocarpus, Anogeissus. The hills of Eastern Ghats add greatly to the biological diversity and provide centers of endemism for plants, birds and lesser forms of animal life. The varied habitat harbors a diversity of fauna which includes Tiger, Panther, Wolf, Wild Dog, Hyena, Sloth Bear, Gaur, Black Buck, Chinkara, Chowsingha, Nilgai, Cheetal, Sambar and a number of Birds and Reptiles.

144. The long sea coast provides the nesting ground for sea turtles, the back water of Pulicat lake are the feeding grounds for Flamingo & Grey Pelican, the estuaries of river Godavari and Krishna support rich mangrove forests with Fishing Cat and Otters as key stone species.

145. About 40 major, medium and minor rivers flow through the State.Out of these, the most important rivers are (1) The Godavari (2) The Krishna (3) The Pennar and (4) The Vamsadhara. The majority of the mangroves are present in the estuaries of these rivers. The Godavari mangroves are located in the Godavari estuary in the East Godavari district. Krishna mangroves are located in the Krishna estuary of Krishna and Guntur districts. Apart from these estuaries, mangroves are also found in small patches in the coasts of Visakhapatnam, West Godavari, Guntur and Prakasam districts. Out of 63,770 sq.km. of forests in Andhra Pradesh, only 582 sq.km. are under the mangrove forests, which accounts 0.9% of the total forest area of the state[13].

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13http://www.mssrf.org/sites/default/files/Mangroves_of_Andhra_Pradesh_-_Identification___Conservation_Manual%20(1).pdf

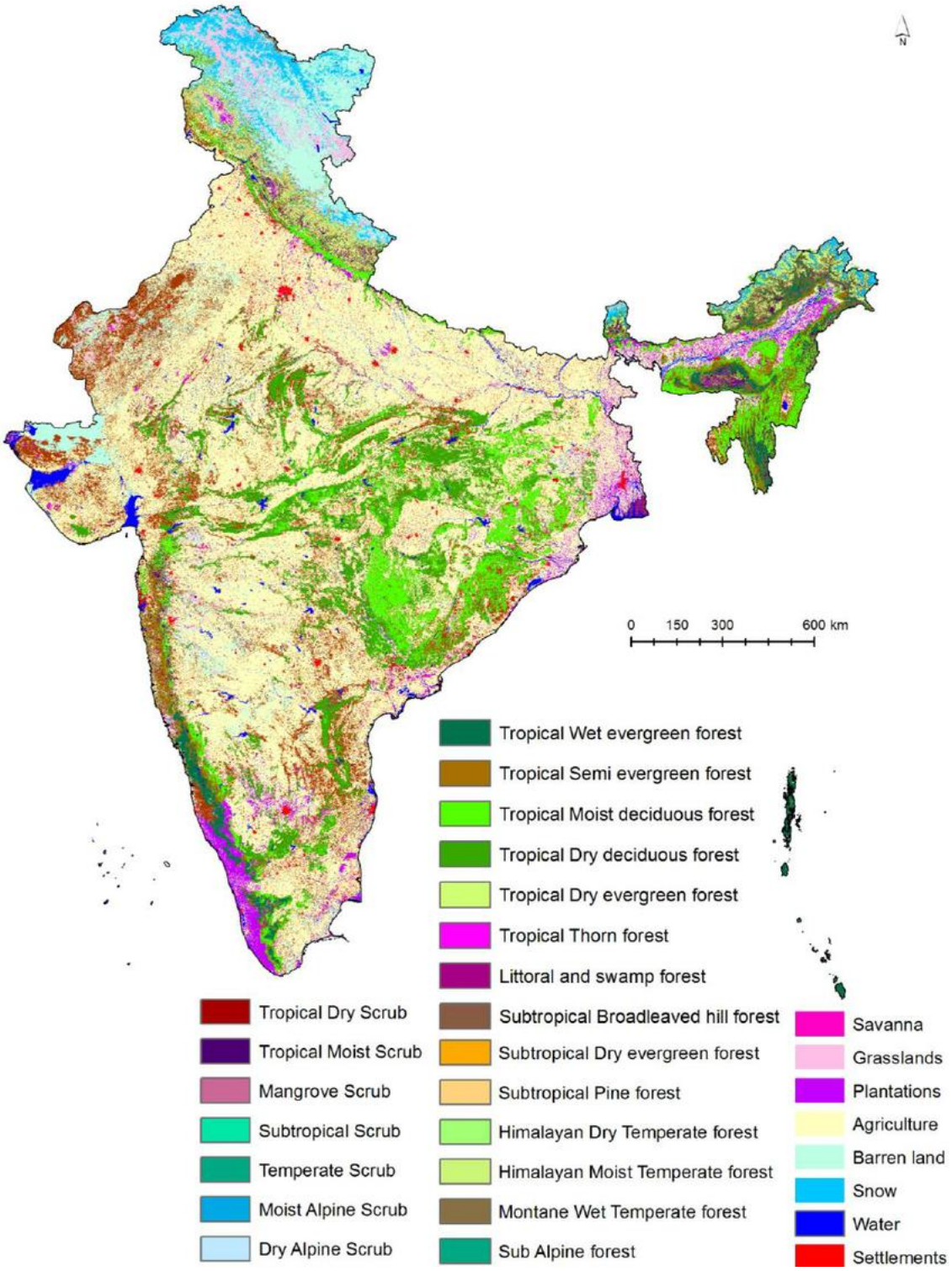

Figure 4 Vegetation and land use in India[14]

5.1.3 Protected Areas and Critically Vulnerable Coastal Areas

146. The following provides an outline of some of the classifications used for the different categories of land use in protected areas in India:

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14 https://www.researchgate.net/figure/285020645_fig7_Fig-7-Vegetation-type-and-land-useland-cover-map-of-India

- **National Park:** An area, whether within a sanctuary or not, can be notified by the state government to be constituted as a National Park, by reason of its ecological, faunal, floral, geomorphological, or zoological association or importance, needed to for the purpose of protecting and propagating or developing wildlife therein or its environment. No human activity is permitted inside the national park except for the ones permitted by the Chief Wildlife Warden of the state under the conditions given in Chapter IV, *Wildlife (Protection) Act, 1972*. There are 103 existing national parks in India covering an area of 40,500 km^2, which is 1.23% of the geographical area of the country (National Wildlife Database, April 2015).
- **Reserved forest:** (also called **reserve forest**) or a **protected forest** in India are terms denoting forest accorded a certain degree of protection. Protected forests are of two kinds - *demarcated protected forests* and *demarcated protected forests,* based on whether the limits of the forest have been specified by a formal notification. Land rights to forests declared to be Reserved forests or Protected forests are typically acquired (if not already owned) and owned by the Government of India. Unlike National Parks or Wildlife Sanctuaries, reserved forests and protected forests are declared by the respective State Governments. At present, reserved forests and protected forests differ in one important way: Rights to all activities like hunting, grazing, etc. in *reserved forests* are banned unless specific orders are issued otherwise. In *protected areas*, rights to activities like hunting and grazing are sometimes given to communities living on the fringes of the forest, who sustain their livelihood partially or wholly from forest resources or products.
- **Wildlife Sanctuary:** Any area other than area comprised with any reserve forest or the territorial waters can be notified by the State Government to constitute as a sanctuary if such area is of adequate ecological, faunal, floral, geomorphological, natural, or zoological significance, for the purpose of protecting, propagating or developing wildlife or its environment. Some restricted human activities are allowed inside the Sanctuary area details of which are given in Chapter IV, *Wildlife (Protection) Act, 1972*. There are 536 existing wildlife sanctuaries in India covering an area of 118,005 km^2, which is 3.59 % of the geographical area of the country (National Wildlife Database, May, 2016).
- **Conservation Reserves:** Conservation reserves and community reserves in India are terms denoting protected areas of India that typically act as buffer zones to or connectors and migration corridors between established national parks, wildlife sanctuaries and reserved and protected forests of India. Such areas are designated as conservation areas if they are uninhabited and completely owned by the Government of India but used for subsistence by communities and community areas if part of the lands are privately owned. These protected area categories were first introduced in the Wildlife (Protection) Amendment Act of 2002 − the amendment to the Wildlife Protection Act of 1972. These categories were added because of reduced protection in and around existing or proposed protected areas due to private ownership of land, and land use.
- **Community Reserves:** Conservation reserves and community reserves in India are terms denoting protected areas of India which typically act as buffer zones to or connectors and migration corridors between established national parks, wildlife sanctuaries and reserved and protected forests of India. Such areas are designated as conservation areas if they are uninhabited and completely owned by the Government of India but used for subsistence by communities and community areas if part of the lands are privately owned. These protected area categories were first introduced in the Wildlife (Protection) Amendment Act of 2002 − the amendment to the Wildlife Protection Act of 1972. These categories were added because of reduced protection in and around existing or proposed protected areas due to private ownership of land, and land use.
- **Marine Protected Areas:** A marine protected area (MPA) is essentially a space in the ocean where human activities are more strictly regulated than the surrounding waters - similar to parks we have on land. These places are given special protections for natural or historic marine resources by local, state, territorial, native, regional, or national authorities.

147. As part of a national coastal zone management strategy, as a first step in conserving coastal ecosystems, all Environmentally Sensitive Areas (ESAs – mangrove, salt marsh, corals, sea grass, horse shoe crab habitats, turtle nesting sites, bird nesting sites, sand dunes and mud-flats) along the entire coast of India have already been mapped by the NCSCM. The NCSCM has also carried out criteria based assessment of the Conservation Value of each of these ecosystems. These areas support a range of habitats and human activities, including existing human settlements and agriculture and aquaculture activities. The project will enhance the protected areas through focus on sustainability and resilience.

148. In the three target states, ESAs, namely, Coringa/East Godavari, Krishna in Andhra Pradesh, Bhitarkanika in Odisha, and Malvan, Achra-Ratnagiri in Maharashtra have been identified as Critically Vulnerable Coastal Areas (CVCAs) and shall be managed with the involvement of local communities including fisherfolk. The NCSCM has prepared a framework for demarcation and assessment of these CVCAs taking in to account resource-dependence of communities living inside these areas and their inclination towards conservation and willingness to participate in management.

149. Elements of the project are proposed within CVCAs and /or protected areas.These include:

- **Maharashtra :** Malvan marine Sanctuary in Sindhudurg, Maharashtra
- **Odisha :** Bhitarkanika National Park, Bhitarkanika Wild Life Sanctuary, Balukhand Konark Wild Life Sanctuary, Chandaka Dampara Wild Life Sanctuary, Chilika (Nalaban) Wild Life Sanctuary and Gahirmatha (Marine) Wild Life Sanctuary
- **Andhra Pradesh :** Pulicat Wildlife Sanctuary; Nelapattu Birds Sanctuary, Coringa Wildlife Sanctuary, Krishna Wildlife Sanctuary, and Telineelapuram bird sanctuary

150. The above areas generally have management plans associated with them. These management plans would be referenced and any proposed activities would be consistent with those plans as well as permissible under the CRZ. The TLIMPs would incorporate the necessary elements of existing protected area management plans.

151. These areas are not areas that are locked away purely for conservation purposes, but are rather areas that support both natural flora and fauna and human populations and their activities. These areas have been recognised as sufficiently special and vulnerable as to warrant special management.

152. CVCAs differ from Critical Wildlife Habitats as declared in India under the *Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006* and the *Wildlife (Protection) Act 1972*. These two Acts delineate critical tiger/wildlife habitat for tiger and other wildlife animals in tiger reserves and protected areas.

153. CVCAs are managed under CRZ Notification, 2011 which reconciles *three* objectives:

- To ensure livelihood security to the fisher communities and other local communities, living in the coastal areas
- To conserve and protect coastal stretches, their unique environment and the marine area
- To promote development through sustainable manner based on scientific principles taking into account the dangers of natural hazards in the coastal areas, sea level rise due to global warming.

154. The CRZ Notification 2011 section V4(a) that:

"(a) Critically Vulnerable Coastal Areas (CVCA) which includes Sunderbans and other identified ecological sensitive areas which shall be managed with the involvement of the local coastal communities including the fisher folk;-

(b) The entire Sunderbans mangrove area and other identified ecologically important areas such as Gulf of Khambat and Gulf of Kutchchh in Gujarat, Malvan, Achra-Ratnagiri in Maharashtra,Karwar and Coondapur in Karnataka, Vembanad in Kerala, Gulf of Mannar in Tamil Nadu,Bhaitarkanika

in Orissa, Coringa, East Godavari and Krishna in Andhra Pradesh shall bedeclared as Critical Vulnerable Coastal Areas (CVCA) through a process of consultation withlocal fisher and other communities inhabiting the area and depend on its resources for their livelihood with the objective of promoting conservation and sustainable use of coastal resources and habitats;

(c) The process of identifying planning, notifying and implementing CVCA shall be detailed in the guideline which will be developed and notified by MoEF in consultations with the stakeholders like the State Government, local coastal communities and fisherfolk and the like inhabiting the area;

(d) The Integrated Management Plans (IMPs) prepared for such CVCA shall interalia keep in view the conservation and management of mangroves, needs of local communities such as, dispensaries, schools, public rain shelter, community toilets, bridges, roads, jetties, water supply, drainage, sewerage and the impact of sea level rise and other natural disasters and the IMPs will be prepared in line with the para 5 above for preparation of Coastal Zone Management Plans;

(e) Till such time the IMPs are approved and notified, construction of dispensaries, schools, public rain shelters, community toilets, bridges, roads, jetties, water supply, drainage, sewerage which are required for traditional inhabitants shall be permitted on a case to case basis, by the CZMA with due regards to the views of coastal communities including fisherfolk."

155. Thus the definition of a CSCA is broader than that of a critical habitat as defined by IFC, which defines critical habitats as:

> *Areas with high biodiversity value, including (i) habitat of significant importance to critically endangered or endangered species; (ii) habitat of significant importance to endemic and/or restricted range species; (iii) habitat supporting globally significant concentrations of migratory and/or congregatory species; (iv) highly threatened and/or unique* ecosystems; and/or (v) areas associated with key evolutionary processes[15].

156. However, both CSVAs and IFC Performance Standard 6 have similar objectives and some areas within the CSVAs would fall within the IFC definition of critical habitat. As indicated, CVCAs are heavily regulated under the CRZ Notification 2011 and all proposed activities have to go through an approval process with MoEF. The Forest Department, as the Responsible Parties for state-level project activities, have protected area management and biodiversity conservation as a core mandate.

157. As required by the CRZ, Integrated Management Plans will be prepared (under the project these will be Target Landscape Integrated Management Plans – TLIMPs), which will include Biodiversity Conservation Action Plans where appropriate. These plans will ensure that in areas of critical habitat no project activities will be implemented unless the requirements of paragraph 17 of IFC Performance Standard 6 can be met.

158. Records of rights and access in terrestrial areas are recorded and settled in a meticulous manner - due to the Tribal /ST status of communities that inhabit the same under the *Wildlife Protection Act*, which is largely terrestrial ecosystem based. The same is not true for coastal marine protected areas, where there is less certainty. There have been demands for a new and separate Marine Protected Area Act and a moratorium on new coastal marine PAs under the existing Act by the National Fishworkers Forum Union.

159. All resource areas in CVCAs with high dependence of communities on natural resources are to be managed by communities with requisite capacity building to strengthen their ability to govern. The Target Landscape Integrated Management Plans (TLIMPs) prepared for CVCAs would promote sustainable use of coastal resources keeping in view conservation of ecosystems, livelihoods including expanding livelihood options and needs of local communities such as dispensaries, schools, etc.

160. The present proposal envisaging a vital role for local communities (including those living in CVCAs) in selection of livelihood activities with focus on sustainable use of ecosystem resources is

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[15] IFC (2012) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation, Washington DC, U.S.A

therefore consistent with the broader national strategy to involve local communities in conservation of ecologically sensitive areas on the coast.

5.1.4 Aquaculture

161. Guidelines are in place to regulate the activity and planning sustainable small-scale coastal aquaculture activities in the coastal districts of Maharashtra, the Fisheries policy of Andhra Pradesh 2015-2020 defines its intent regarding brackish water land lease policies where in suitable coastal areas for aquaculture, and The Govt. of Orissa a policy for leasing of brackish water areas for aquaculture.

5.1.4.1 Crab Farming

162. The crab farming activity has been growing at a compound annual growth rate (CAGR) of 82.55% in the country in terms of area expansion and at 96.87% in terms of production. The growth rate is 149.78% and 157.13% in area and production terms respectively for Odisha; at the rate of 197.11% and 155.91% in area and production terms respectively for Andhra Pradesh and at the rate of 10.40% and 31.23% in area and production terms respectively for Maharashtra. The bulk of this expansion is related to crab farming in pond culture systems, which is a mix of on-growing crabs from seed to marketable size, as well as soft shell crab farming or “fattening”.

163. Currently there is a shortage of seeds (instar) for crab farming. There is currently one existing hatchery producing instar in India. However, it produces considerably more Zoea, the stage before instar, than is needed by the hatchery. This excess zoea is avalable for other hatcheries/nurseries to grow out into instar and then crablets.

164. Wild harvesting of crab from nature at present is taking place in the states as part of the capture fisheries activity. The total crab landing was 56679 mt during 2016, the aquaculture production being only 4410 mt during the same period, the share of aquaculture is only 7.22%. Therefore increased focus on crab aquaculture is required if wild stocks are to be protected.

5.1.4.2 Oysters

165. Oyster harvesting from the wild has been part of the livelihood of the coastal communities in India. Harvesting of oyster is not taking place on a big scale and is of localized nature.

166. Thirty Eight oyster reefs and spat settlement areas sites have been identified so far in Maharashtra. In Odisha, three distinct oyster beds of 5 ha area, in Bahuda estuary have been identified. In Andhra Pradesh, oyster beds have been reported from Sarada estuary, Bhimunipatnam, Upputeru canal, Godavari estuary, Krishna estuary and Pulicat Lake.

167. Oysters produce large volumes of spat and only a small fraction of it can find suitable locations to settle and grow in the wild, therefore, spat collection for aquaculture has minimal impact on survival of wild oysters. Spat can also be produced via commercial hatcheries.

5.1.4.3 Mussels

168. Green mussels occur all along the east and west coast of India. On the east coast it occurs as small beds along Chilka Lake in Odisha, Visakhapatnam and Kakinada in Andhra Pradesh. In Maharashtra it occurs along Bhatia Creek, Malvan and Ratnagiri.

169. For the farming of mussel, the seeds are sourced from the wild. The seeds that settle in the intertidal areas, usually perish because of deposition of fine silts and it is this seed resource that is tapped for stocking.

170. Mussel farming is considered to be a low impact sustainable coastal aquaculture activity as it does not use any artificial feed and grows on natural planktonic organisms and suspended particulate matter. The wastes generated out of the system is in the form of pseudo-faeces and faeces, which are low in nutrient emission, not warranting any major concern. However low the

emission be, the cumulative impact of nutrient loading of the environment needs to be assessed through water quality monitored on an ongoing basis.

5.1.4.4 Ornamental fish farming

171. Over 2 500 species are involved in the global ornamental fish industry, of which over 60% are of freshwater origin. Although relying largely on captive-bred freshwater fishes, the trade also includes significant numbers of fish and invertebrates collected from the wild. Marine fish species constitute more than 15% of the market by value, with about 98% collected from the wild while the rest are captive-bred.

172. The ornamental fish farming activity included in the proposal, deals with mainly the fresh water species. However, one group of marine ornamental fish namely the clown fish will be taken up in Maharashtra. No wild harvesting of fish will be undertaken for the proposed project, and clown fish breeding stock will be provided from a hatchery

5.1.5 Performance Criteria

173. The following performance criteria are set for the construction of the projects:

- No clearance of vegetation outside of the designated clearing boundaries;
- No death to native fauna as a result of clearing activities;
- No deleterious impacts on aquatic environments and terrestrial habitats;
- No introduction of new weed species as a result of construction activities;
- No increase in existing weed proliferation within or outside of any project footprint as a result of construction activities; and
- Successful establishment of rehabilitation works incorporating species native to the local area.

5.1.6 Monitoring

174. A flora and fauna monitoring program will be implemented (Table 5).

175. Weed monitoring will be undertaken and appropriate action taken in the event of alien or noxious species being identified.

176. The delivery organisation will when undertaking works, will compile a weekly report to MoEFCC outlining:

- Any non-conformances to this EMSF;
- The areas that have been rehabilitated during the preceding week; and
- Details of the corrective action undertaken.

5.1.7 Reporting

177. All flora and fauna monitoring results and/or incidents will be tabulated and reported as outlined in the EMSF. The MoEFCC must be notified in the event of any suspected instances of death to native fauna and where vegetation if detrimentally impacted.

178. Table 5 Flora and Fauna Management Measures

Issue	Control Activity (and Source)	Action Timing	Responsibility	Monitoring and Reporting
FF1. Habitat loss and disturbance of fauna	FF1.1 Limit vegetation clearing and minimise habitat disturbance through adequate protection and management of retained vegetation.	During construction	Field Officer	Daily and maintain records
	FF1.2: Minimise noise levels and lighting intrusion throughout construction and operation in the vicinity of any sensitive locations.	During construction	Field Officer	Daily and maintain records
	FF1.3: Ensure that all site personnel are made aware of sensitive fauna/habitat areas and the requirements for the protection of these areas.	During construction	Contractor	Daily and maintain records
	FF1.4 Minimise disturbance to on-site fauna and recover and rescue any injured or orphaned fauna during construction and operation.	During construction	Contractor	Daily and maintain records, report
	FF1.5 To minimise expansion into sensitive areas, expansion shall be carefully controlled through ongoing participatory land use planning and monitoring coordinated by the Forest Department and including community co-management	Construction and operation	MoEFFC	Maintain records
	FF1.6: Hatchery bred seed for crabs and ornamental fish to be used to reduce impacts on wild stocks.	Operation	MoEFFC	Maintain records
	FF1.7: Minimise impact of feed demand – source sustainable food eg maximise use of live food production, artemia cyst hatching and formulated food. Farmers to be trained	Operation	MoEFFC	Maintain records
	FF1.8: Mussel seed collection to be regulated. Where possible, use hatchery bred seed	Operation	MoEFFC	Maintain records

Issue	Control Activity (and Source)	Action Timing	Responsibility	Monitoring and Reporting
FF2. Introduced flora and weed species	FF2.1: Implement an ESCP to reduce the spread of weeds through erosion and sediment entering any waterways and therefore spreading.	Pre and during construction	Contractor	Maintain records
	FF2.2: Revegetate disturbed areas using native and locally endemic species that have high habitat value.	During construction	Field Officer	As required and maintain records
	FF2.3: Minimise disturbance to mature remnant vegetation, particularly canopy trees.	During construction	Field Officer	Daily and maintain records
	FF2.4: Seed is to be weed free	Operation	Field Officer	Maintain records
	FF2.5: The removal of regrowth native trees should be minimised particularly where the width of a forest is narrow.	During construction	Site Supervisor	Maintain records
	FF2.6: Small trees and shrubs shall be removed in preference to large trees.	During construction	Site Supervisor	Maintain records
	FF2.7: Vegetation to be removed shall be clearly marked using paint or flagging tape.	During construction	Site Supervisor	Maintain records
	FF2.8: Environmental weeds and noxious weeds within the project footprints shall be controlled.	During and post construction	Site Supervisor	Maintain records
	FF2.9 To minimise risk of disease due to increased density of aquaculture apprporiate aquaculture techniques and technology shall be adopted	Operation	MoEFFC / Farmers	Maintain records
FF3. Management of Environmentally Sensitive Areas	FF3.1: Use mapping undertaken by NCSCM to identify ESAs and/or Critically Vulnerable Coastal Areas	Design phase	MoEFCC	Maintain Records
	FF3.2 Implement the management of CVCAs outlined in proposal through the development of Target Landscape Integrated Management Plans (IMPs) with communities utilising those habitats.	Design/Operation Phase	Project team & MoEFCC	Maintain Records
	FF3.3: Monitor implementation of TLIMPs	Operation Phase	MoEFFC	Annual review

6 GROUNDWATER

6.1 BACKGROUND

6.1.1 Geology, Topography and Soils

179. India has a diverse geology with different rock types representing the complete spectrum ranging in age from some of the oldest Archaean metamorphites/granitoids to the youngest Quaternary alluvium (Figure 5). Indian subcontinent is tectonically and physio-graphically divided into three broad domains i.e. the Peninsular India, the Extra-Peninsular India and the Indo-Gangetic Brahmaputra Plains.

180. The Plateau of Peninsular India is surrounded by coastal plains of Arabian Sea on the west and Bay of Bengal to the east.

181. India's geographical land area can be categorised into: Deccan Trap, Gondwana and Vindhyan. The Deccan Trap covers almost the entire of Maharashtra, a part of Gujarat, Karnataka, Madhya Pradesh and Andhra Pradesh at its margin. The Deccan Trap was formed as result of sub-aerial volcanic activity during the Mesozoic era. That is why the rocks derived from this region are generally igneous type.

182. The Gondwana and Vindhyan include within its fold, certain parts of Madhya Pradesh, Chhattisgarh, Punjab, Orissa, Bihar, Himachal Pradesh, West Bengal, Maharashtra, Andhra Pradesh, Jammu and Kashmir, Rajasthan and Uttarakhand. Damodar and Sone river valley and Rajmahal hills in the eastern India are huge depository of the Gondwana rocks.

183. The Quaternary sediments in the peninsular India occur along the coastal tracts and inland river valleys by narrow continuous palaeo-beach ridges, interrupted by the prograding deltas of major rivers. They are represented by thick blankets of alluvium, gravel and colluvial deposits, beach sand, kankar, soils of various types and laterite. The Quaternary sediments were laid down in four major depositional environments, namely fluvial, fluvio-marine,marine and aeolian.

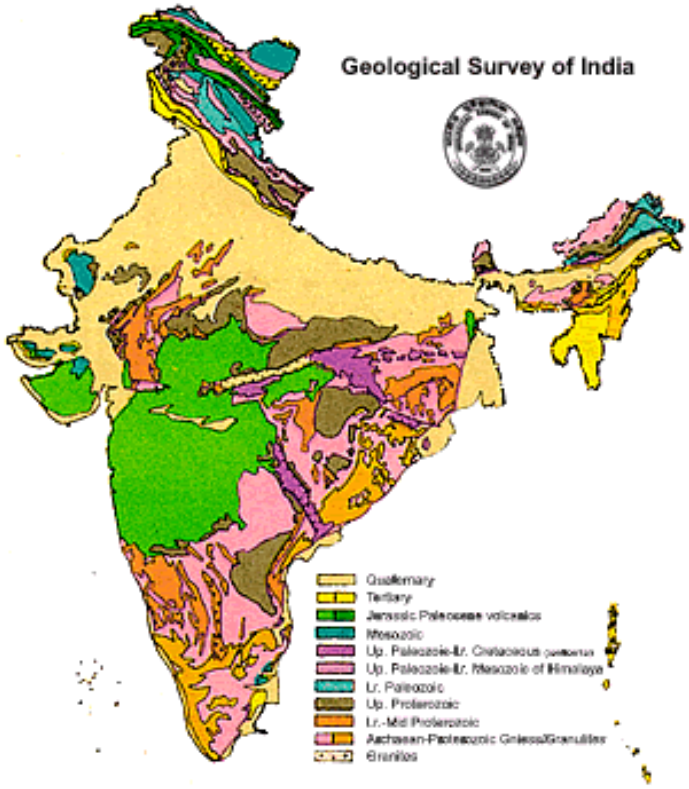

Figure 5 Chronostratigraphic divisions of India[16]

6.1.2 Groundwater

166. Groundwater plays a key role in meeting the water needs of various user-sectors in India. The recharge of replenishable groundwater is contributed by two major sources – rainfall and other sources that include canal seepage return flow from irrigation, seepage from water bodies and artificial recharge due to water conservation structures.

167. Based on the hydrogeological characteristics, India has been classified into 14 principal aquifer systems and 42 major aquifers[17]. Alluvium is the major aquifer system which covers maximum area of around 31 percent of the entire country and is available in Uttar Pradesh, Bihar, West Bengal, Assam, Odisha and Rajasthan. The sandstone aquifer covers around 8 percent area in the country and is available in Chhattisgarh, Andhra Pradesh, Madhya Pradesh, Gujarat, Karnataka and Rajasthan.

168. The rest of the country is covered with the other formations that cover around 60 percent of the area. Among these, basalt aquifer covers maximum of around 17 percent area of the country and is available mostly in Chhattisgarh, Andhra Pradesh, Madhya Pradesh, Rajasthan and in the north eastern states as well as in the Himalayan terrain. Limestone aquifer covers a very small area of around 2 percent in the country and is mainly available in the states of Chhattisgarh, Andhra Pradesh, Karnataka and Gujarat and in the Himalayan states.

169. Around 20 percent of the area of the country is covered by banded gneissic complex (BGC) and gneiss aquifers, which are available almost in all the peninsular states as well as the Himalayan states. The rest 15 percent of the entire area is covered by aquifers namely; schist, granite, quartzite, charnocktite, khondalite, laterites and intrusive.

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16 http://www.portal.gsi.gov.in/portal/page?_pageid=127,529486&_dad=portal&_schema=PORTAL

17 http://www.indiawaterportal.org/articles/aquifer-systems-india-atlas-compiled-central-ground-water-board-2012

The groundwater behavior in the Indian sub-continent is highly complicated due to the occurrence of diversified geological formations with considerable lithological and chronological variations. Broadly two groups of rock formations have been identified depending on characteristically different hydraulics of ground water: porous formations and fissured formations[18] (

170. Figure 7).

- Porous formations have been further subdivided into:
- Unconsolidated - The areas covered by alluvial sediments of river basins, coastal and deltaic tracts. These are by far the most significant ground water reservoirs for large scale and extensive development.
- Semi–consolidated formations - normally occur in narrow valleys or structurally faulted basins.
- Fissured Formations (Consolidated Formations) - occupy almost two-thirds of the country. These formations, except vesicular volcanic rocks have negligible primary porosity. From the hydrogeological point of view, fissured rocks are broadly classified into four types:
- Igneous and metamorphic rocks excluding volcanic and carbonate rocks
- Volcanic rocks
- Consolidated sedimentary rocks
- Carbonate rocks.
- Project specific groundwater studies have not been undertaken, however India has an extensive groundwater monitoring network (Figure 9).
- In general, the irrigation sector remains the main consumer of ground water

6.1.3 Performance Criteria

171. The following performance criteria are set for the project:

- No significant decrease in the quality and quantity of groundwater as a result of construction and operational activities in proximity to the projects;
- Effective implementation of site-specific EDSCPs and other measures to protect groundwater.

172. By following the management measures set out in the EMSF the project will not have a significant impact on water quality across the broader area.

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[18] http://www.india-wris.nrsc.gov.in/wrpinfo/index.php?title=CGWB_Ground_water_resources

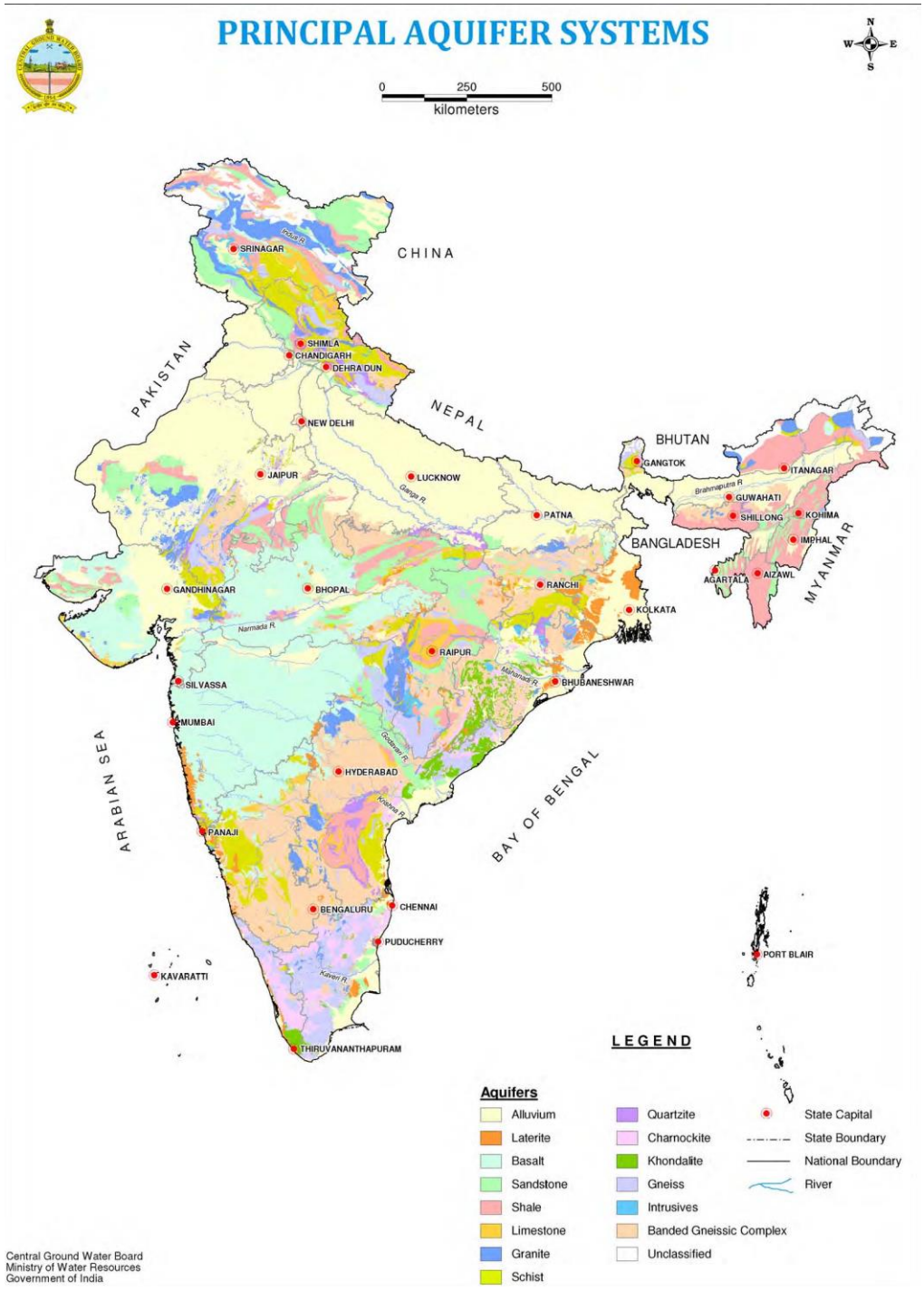

Figure 6 Principal aquifer systems in India[19]

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[19] http://www.indiawaterportal.org/articles/aquifer-systems-india-atlas-compiled-central-ground-water-board-2012

Figure 7 Groundwater yield potential in major aquifers[20]

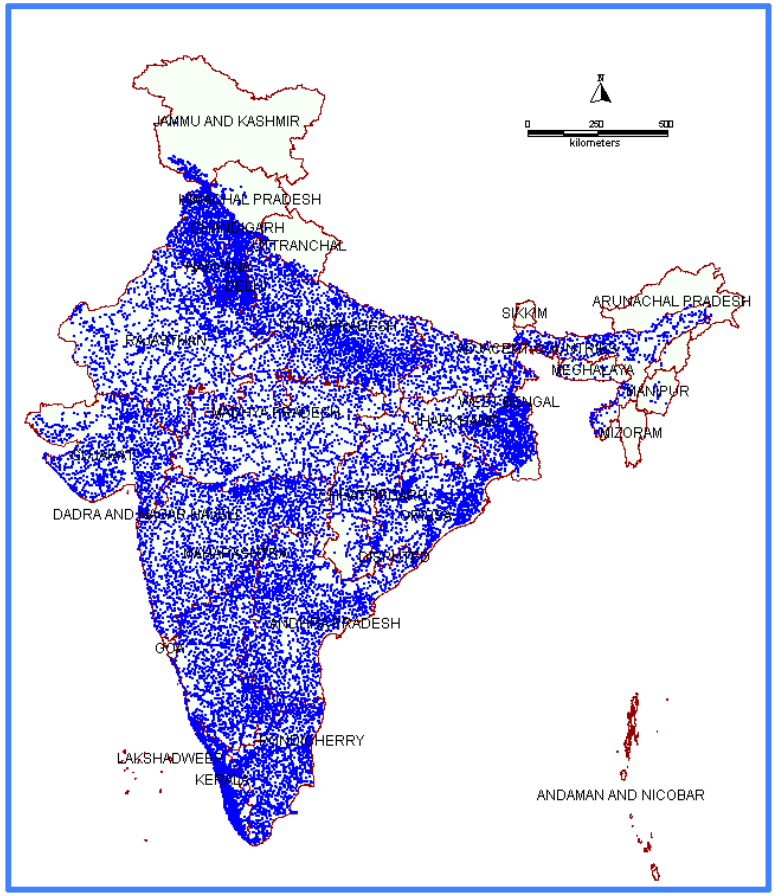

Figure 8 Groundwater monitoring wells (2011)[21]

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[20] http://www.india-wris.nrsc.gov.in/wrpinfo/index.php?title=CGWB_Ground_water_resources

1. [21] http://www.india-wris.nrsc.gov.in/wrpinfo/index.php?title=CGWB_Ground_water_resources

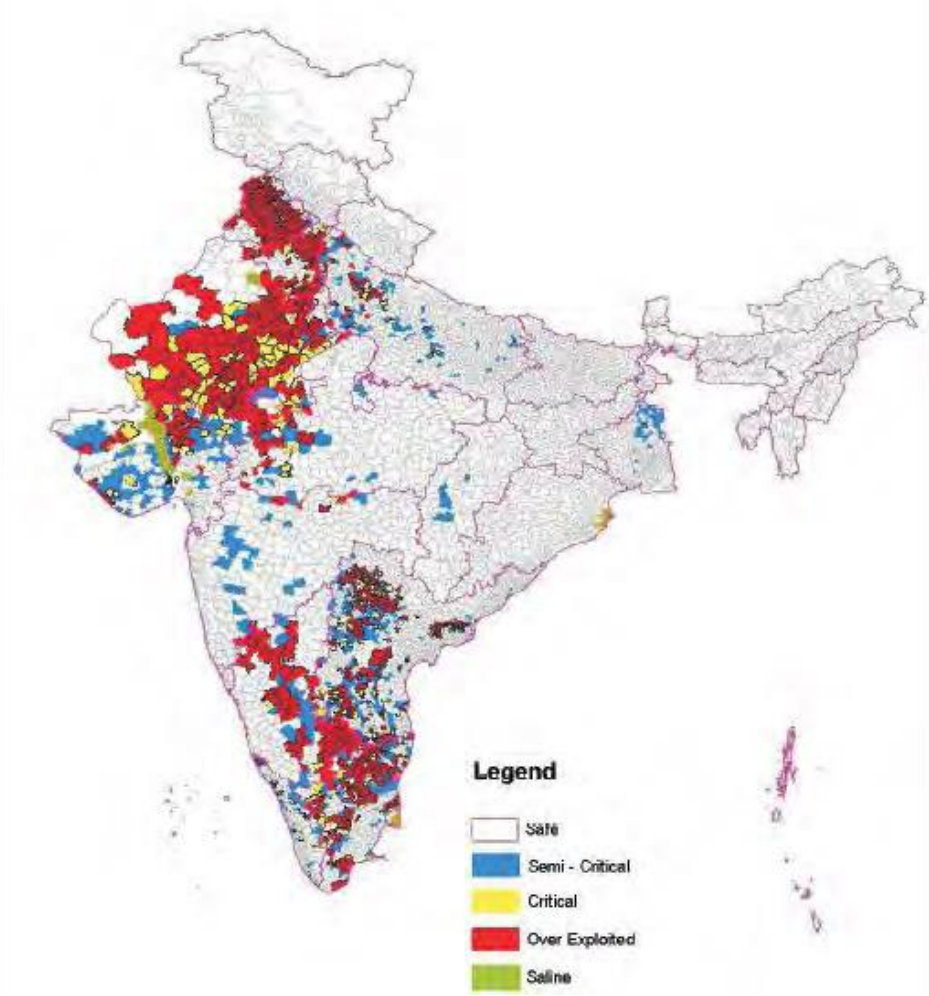

Figure 9 Categorisation of groundwater units[22]

6.1.4 Monitoring

173. Refer to Table 6 for the monitoring requirements for groundwater.

174. Where it is proposed to use groundwater, testing should be undertaken to assess its suitability. Where groundwater recharge is proposed, a groundwater baseline should first be determined.

175. During the project groundwater quality should be assessed initially and then at least every two months. Initial assessment should cover a wide range of parameters (eg depth to water, pH, DO, conductivity, nitrates, phosphates, faecal coliforms, heavy metals, turbidity, hydrocarbons) to provide a baseline and to confirm suitability for intended use. Subsequent monitoring parameters will be determined on need.

176. Ongoing monitoring should form part of the operation of the boreholes.

6.1.5 Reporting

177. All water quality monitoring results and/or incidents will be tabulated and reported as outlined in the EMSF. The MoEFCC must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to water quality is exceeded.

1. _____

[22] http://www.india-wris.nrsc.gov.in/wrpinfo/index.php?title=CGWB_Ground_water_resources

Table 6 Groundwater management measures

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
GW 1: Increase of gross pollutants, hydrocarbons, metals and other chemical pollutants into the groundwater and/or surface water environment.	GW1.1: Conduct regular surface and groundwater quality monitoring in location where the groundwater is likely to be impacted, including assessing the changes to groundwater quality.	Construction and operation phase	Field Officer	Weekly and as required with reporting to MOEFCC and UNDP
	GW1.2: Prevent contaminated surface water from entering aquifers via boreholes and wells - protect from runoff and flooding and keep surrounds clean.	All phases	All Personnel	Weekly
	GW1.3: Designated areas for storage of fuels, oils, chemicals or other hazardous liquids should have compacted impermeable bases and be surrounded by a bund to contain any spillage. Refuelling to be undertaken in areas away from water systems.	Entire construction and operation phase	All Personnel	Weekly with reporting to MOEFCC and UNDP
	GW1.4: Check all vehicles, equipment and material storage areas daily for possible fuel, oil and chemical leaks. Undertake refuelling at designated places away from water systems.	All phases	All Personnel	Daily and maintain records
	GW 1.5: Minimise the use of herbicides and use only biodegradable herbicides that have minimal impact on water quality and fauna. Use only as per directions	All phases	All Personnel	Weekly reporting to MOEFCC and UNDP

6.2 SURFACE WATER

6.2.1 Background

179. In India, rainfall is unevenly distributed spatially and temporally. Over 80 percent of the annual rainfall is received in the four rainy months of June to September. Figure 10 shows the average annual rainfall across India.

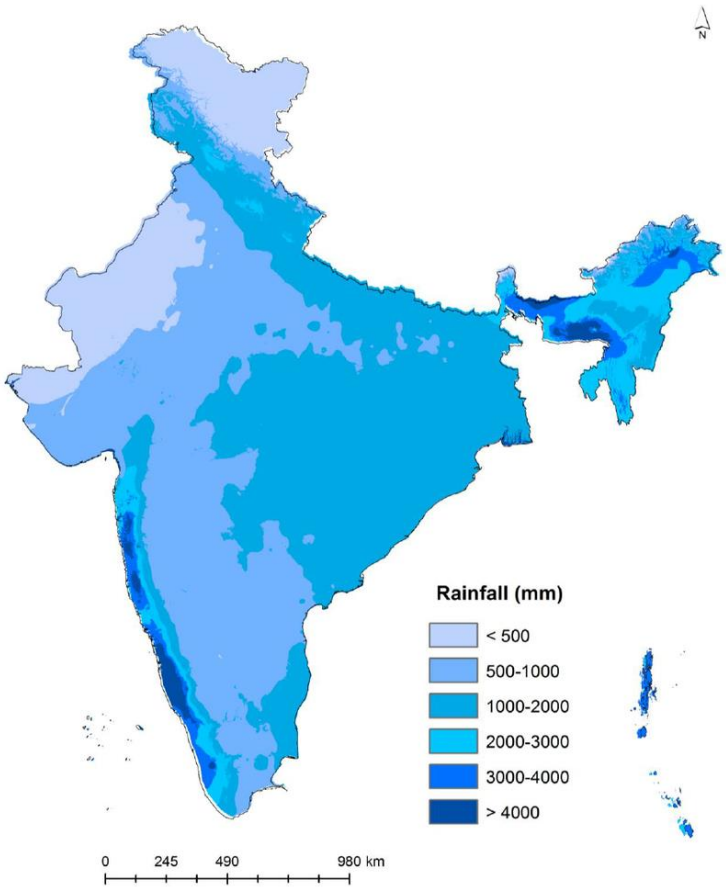

Figure 10 Average annual rainfall[23]

180. Major rivers in the three target State are shown on Figure 11. Seven major rivers along with their numerous tributaries make up the riever system of India. All major rivers of India originate from one of three main watersheds. The southern rivers experience variability in flow over the year.

1. _____

[23] https://www.researchgate.net/profile/Sudhakar_Reddy_C/publication/285020645/figure/fig2/AS:301142941683714@1448809480437/Fig-2-Annual-mean-rainfall-map-of-India.png)

Figure 11 Major rivers of India[24]

181. Specific water quality issues include:

- Degradation of forest cover for farming, and subsequent invasive plants;
- Agricultural chemicals;
- Upland urbanisation increasing pressure on water resource catchments;

1. _____

24 https://en.wikipedia.org/wiki/List_of_major_rivers_of_India#/media/File:India_rivers_and_lakes_map.svg

- Aquaculture waste; and
- Community behaviour and land tenure

182. Water quality can be adversely impacted by aquaculture if the carrying capacity of the waterway is not taken into consideration in the design and management of the farm, that is assessing the physical carrying capacity or suitability of a site based on the natural conditions and needs of the species and culture system

183. By way of exampe, nutrient loading from existing crab farms in two creeks in the Sindhudurg District are is shown in Table 7. This table demonstrates that the nitrogen load from each crab unit is significantly less than the carrying capacity of the creeks. In fact, for the two creeks shown up to 470 ha of additional crab farms would be theoretically possible.

Table 7 Carrying capacity of two creeks in Sindhuburg with reference to nitrogen loading

Source Water	Carrying Capacity of source water for N (kg/day)	Total N load (kg/day) from crab unit	Balance capacity of source water for N loading (Kg/day)	Balance capacity for nutrient loading from crab farm (in Ha)
Achra Creek	672.61	3.43	669.18	470.69
Narignree Creek	293.24	3.26	289.98	474.91
Average	**482.925**	**3.345**	**479.58**	**472.8**

184. Table 7 demonstrates how important it is to understand the carrying capacity of waterways before and during operation of aquaculture facilities. Environmental carrying capacity assessment studies need to take into account the actual nutrient loading from the aquaculture systems and the specific characteristics of the receiving waters, which are governed by the rate of mineralization of the organic wastes and dilution rates, which is a function of tidal amplitude and the bathymetry of the coastal water bodies.

185. The Carrying Capacity assessment of the marine and coastal areas for sustainable aquaculture, including crab farming, provision for waste management as a result of nutrient loading as well as monitoring of the water quality and environment on an on-going basis, have been made in the ''Guideline for Carrying Capacity Assessment of Sustainable, Small-scale Aquaculture Activities to be followed by Mangrove Foundation in Coastal Maharashtra''. The Fisheries policy of Andhra Pradesh 2015-2020 has also provides marketing and pollution control for sustainable brackish water aquaculture in the state.

186. By undertaking some of the works proposed as part of this project, the project will improve water quality at proposed sites. While impacts from aquaculture will be regulated and monitored, to ensure that operations are sustainable.

187. No baseline data has been collected at the site; however, prior to the commencement of works, baseline data will be collected to develop a suitable monitoring regime.

6.2.2 Performance Criteria

188. The following performance criteria are set for the construction of the projects:

- No significant decrease in water quality as a result of construction and operational activities;
- Water quality shall conform to any approval conditions stipulated by UNDP, MoEFCC and/or other government departments, or in the absence of such conditions follow a 'no worsening' methodology; and
- Effective implementation of site-specific EDSCPs.

189. By following the management measures set out in the ESMF, the construction of river works, bridges and drainage and revegetation upstream should not have a significant impact on water quality across the broader area.

6.2.3 Monitoring

190. A standardised water quality monitoring program has been developed for the project. The program is subject to review and update at least every two months from the date of issue. The site supervisor will be required to conduct a visual inspection and take water samples as appropriate for nitrates, phosphates, faecal coliforms, heavy metals, turbidity and oil/grease within or adjacent to their work area as a part of the daily site inspection checklist.

191. Table 8 outlines the monitoring required.

6.2.4 Reporting

192. All water quality monitoring results and/or incidents will be tabulated and reported as outlined in the EMSF. The MoEFCC must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to water quality is exceeded.

Table 8 Water Quality Management Measures

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
W1: Elevated suspended solids and other contaminants in surface water systems.	W1.1: Develop and implement a site specific Erosion, Drainage and Sediment Control Plan (EDSCP) to address drainage control, sediment and erosion controls and stockpiling of during construction of all components of the projects. EDSCP measures to be inspected regularly to ensure all devices are functioning effectively.	Pre Earthworks	Field Officer	Initial set up and then as required with reporting to MoEFCC
	W1.2: Designated areas for storage of fuels, oils, chemicals or other hazardous liquids should have compacted impermeable bases and be surrounded by a bund to contain any spillage. Refuelling to be undertaken in areas away from water systems.	Entire construction and operation phase	All Personnel	Weekly with reporting to MOEFCC and UNDP
	W1.3: Conduct regular surface quality monitoring in location where the water is likely to be impacted.	Entire construction and operation phase	Field Officer	Weekly and as required reporting to MoEFCC
	W1.4: Schedule works in stages to ensure that disturbed areas are revegetated and stabilised progressively and as soon as practicable after completion of works.	Avoid undertaking bulk earthworks during wet season	Field Officer and MOEFCC	Maintain records
	W1.5: Construction materials not to be stockpiled near aquatic environments to prevent release of materials and construction equipment to be removed from near aquatic environments at the end of each working day or if heavy rainfall is predicted.	Entire construction and operation phase	Field Officer	Maintain daily records
	W1.5: Careful selection of hatchery sites (and operators) to reduce likely waste impacts to waterways	Design and construction	MoEFFC	Maintain records
	W1.6: Crab farming pens to be temporary structures to minimise disruption of flow patterns and not create permanent obstacles.	Operation	MoEFFC / Farmers	Maintain records
	W1.7: Water quality to be tested in each new site before construction oyster rafts and on an ongoing basis through Pollution Control Board monitoring	Pre-construction and Operation	MoEFFC / Farmers	Maintain records
	W1.8: Guidelines in respect of the intertidal areas to be formulated for regulating the proposed aquaculture activities. Carrying capacity	Pre-construction	MoEFFC	Maintain records

	of waterways to be determined before commencement of additional aquaculture activities.			
Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
W2: Eutrophication of surrounding aquatic environments and impacts from elevated nutrient levels.	W2.1 Minimise the release of clays and very fine silts into the aquatic environment through the installation of sediment basins, rock checks and sediment fences in appropriate places. Sediment control structures to be inspected regularly.	Operation	All Personnel	Weekly reporting to MoEFCC
	W2.2 Manage the application of fertilisers and other chemicals (if required during rehabilitation/revegetation of any site) to ensure that over application does not occur.	Post Construction	Site Supervisor	Maintain records
	W2.3: Water quality parameters as well as the primary productivity of the waters will be predetermined before such sites are selected. site selection will be governed by the physical carrying capacity as well production carrying capacity assessments	Pre-construction	MoEFFC	Maintain records
	W2.4: Depuration units for oysters are not to release contaminated water into waterways.	Operation	MoEFFC	Maintain records

6.3 EROSION, DRAINAGE AND SEDIMENT CONTROL

6.3.1 Background

193. Soil is a valuable resource of India. Much of the Indian agriculture depends upon the extent and qualities of soil. The nature of soil in a place is largely influenced by such factors as underlying geology, climate, and natural vegetation.

194. Poor management of soils can lead to erosion and subsequent loss of soils and the habitats and livelihoods that it supports. Activities that will be undertaken by the project have the potential to cause erosion, changes in drainage patterns and subsequent sedimentation.

195. It is important to understand the difference between drainage, erosion and sediment controls to determine the right control technique to use in each situation.

- Erosion controls prevent or reduce soil erosion caused by raindrop impact (see photograph below) and sheet flow (downslope movement of water taking the form of a thin, continuous film over relatively smooth soil or rock surfaces).
- Drainage controls prevent or reduce soil erosion caused by concentrated flow by managing the movement of “clean” and “dirty” water through the site.
- Sediment controls trap and retain sediment either moving along the land surface or contained within flowing water (suspended sediment).

6.3.2 Soils

196. Soils in India can be broadly divided into eight major types (Indian Council for Agricultural Research). Figure 12 provides a map of soil types across India. The broad types of soil found in India are[25]:

- Alluvial soils – Materials deposited by rivers, winds, glaciers and sea waves are called alluvium and soils made up of alluvium are alluvial soils. In India alluvial soils are mainly found on the Indo-Ganga- Brahmaputra Plains, Coastal Plains and the broad river valleys of South India. Alluviums are mainly loams, i.e. mixtures of sand and clay. New alluvial loams are very fertile. In the younger stage of the riverine plains, sandy soils are more common. While in the beds of the rivers, it consists generally of pure sands. These soils cannot retain water.
- Black soils – also known as Regur or Black Cotton soil, dark grey to black in colour due to volcanic origin, high clay content, highly moisture retentive, develops cracks when desicated, rich in iron, lime, calcium, magnesium, carbonates and alumina. Poor in phosphorus, nitrogen and organic matter. Occurs in parts of Maharastra.
- Red soils – formed from weathered crystalline rocks in low rainfall areas, more sandy-less clayey, rich in iron (which gives red colour), small amount of humus, poor in phosphorus, nitrogen and lime, slightly acidic, do not retain moisture, porsous and friable. Occurs in parts of Maharastra.
- Laterite soils – formed under high temperature and rainfall (wet/dry spells), silica is leached due to high rainfall, iron and aluminium oxides left behind (laterite), brown to yellowish colour, becomes hard when exposed to atmosphere, used as building material (bricks/blocks). Rich in iron, poor in lime, potash and Magnesium, low humus. Occurs in parts of Andhra Pradesh (prevalent within project target areas).
- Desert soils – contains soluble salts, red-brown in colour, porous and coarse, 90% sand-5% clay, rich in nitrates and phosphates, poor in nitrogen and humus, friable, sandy and low moisture content. Generally not found in target States.

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25 http://www.yourarticlelibrary.com/soil/soil-groups-8-major-soil-groups-available-in-india/13902/

- Mountain soils – found in hill States, formed from deposition of organic matter, rich in humus, poor in potash and lime. Not found in target States.
- Saline and alkaline soils – contains salts like sodium, magnesium and calcium, infertile/unfit for cultivation, sandy to loamy in texture. Occurs in parts of Maharastra.
- Peaty and marshy soils – occur in humid regions, formed by accumulation of organic matter, black in colour, highly acidic and heavy. Occurs in Coastal Orissa

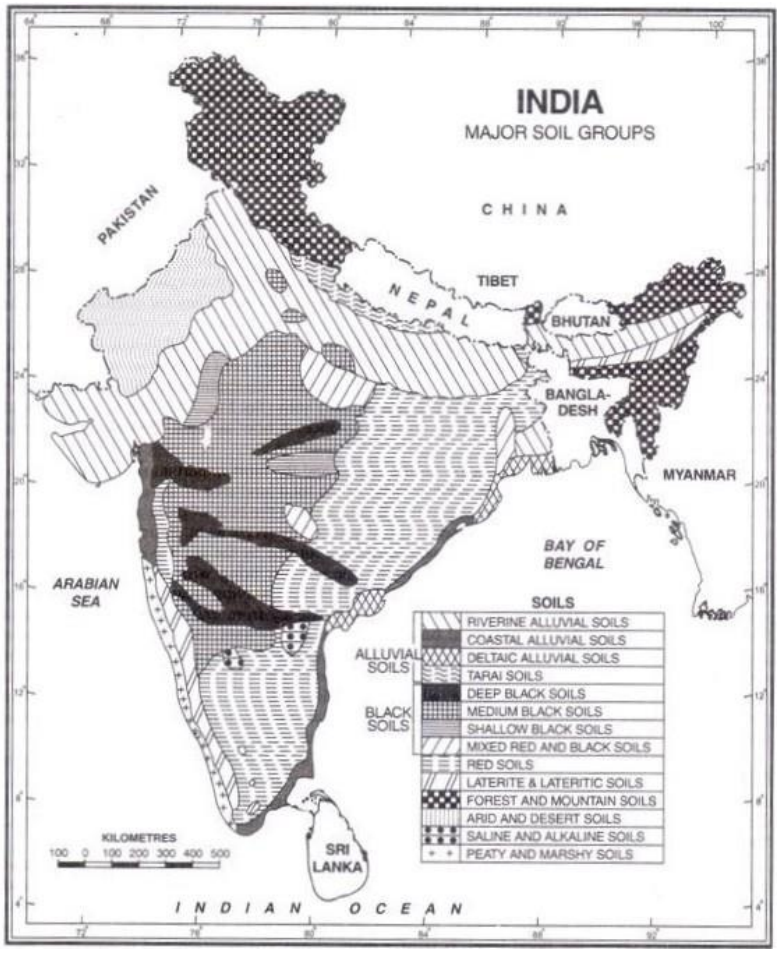

Figure 12 Major soil types in India[26]

197. Soil erosion in India is caused by:

- Poor or non-scientific agriculture agricultural practices which exposes and weakens soils and allows them easily erode by rain wash;
- Wanton destruction of forest and vegetation cover on the soil allowing the natural agents of erosion to get easy access and widespread erosion takes place;
- Over-grazing, which withers away vegetation and soil becomes bare and open to natural agents for erosion; and
- Heavy rainfall and turbulent running water that forces the bare rocks and soils to wear away.

198. Soil erosion depends on several parameters such as type of soil, slope, and vegetation, the nature of topography and rainfall intensity. The loss of soil stability and soil erosion can takes place due to the removal of vegetation cover, and numerous construction activities. It can cause the loss of soil fertility and induce slope instability. Land preparation for the project could result in blockage or alteration of natural flow paths causing changes in the drainage patterns in the area. Effective

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[26] http://www.yourarticlelibrary.com/soil/soil-groups-8-major-soil-groups-available-in-india/13902/

and efficient mitigation measures can not only reduce, but could improve the conditions over the existing conditions.

199. As discussed in Section 6.2.1 (Surface Water), rainfall occurs mostly in the wet season which runs from June to September. Rainfall can have a significant impact on the ability to manage environmental impacts, particularly in terms of managing drainage, erosion and sedimentation. Therefore activities which involve significant disturbance of soil or operating with drainage lines and waterways should be planned to be undertaken during the driest months. It is also important to ensure that all required erosion and sediment control mechanisms are in place before the onset of the wet season.

200. Activities that could result in erosion, drainage and sediment impacts include:

- Excavation of ponds, lakes, rivers, river banks, drainage channels etc;
- Excavation for the in preparation for construction of infrastructure
- Soil disturbance during the revegetation activities especially if undertaken in wet periods;
- Clearing the river of weeds and debris; and
- Sediment movement during drainage works.

201. Activities that have the potential to cause erosion should be undertaken with the likely weather conditions in mind.

6.3.2.1 Acid Sulfate soils

202. Acid Sulfate soils (ASS) or potential acid Sulfate soils (PASS) are naturally occurring soils, sediments or organic substrates (e.g. peat) that are formed under waterlogged conditions. These soils contain iron Sulfide minerals (predominantly as the mineral pyrite) or their oxidation products. Mangroves, salt marshes, floodplains, swamps, wetlands, estuaries and brackish or tidal lakes are ideal areas for ASS formation and therefore there is the potential for it to occur in the project's location.

203. The presence of ASS may not be obvious on the soil surface as they are often buried beneath layers of more recently deposited soils and sediments of alluvial or aeolian origin.

204. In an undisturbed state below the water table, ASS are benign. However if the soils are drained, excavated or exposed to air by a lowering of the water table, the Salfides react with oxygen to form Sulfuric acid. The release of this Sulfuric acid from the soil can in turn release iron, Aluminium and other heavy metals (particularly arsenic) within the soil. Once mobilised, the acid and metals can create a variety of adverse impacts including killing vegetation, seeping into and acidifying groundwater and water bodies, killing fish and other aquatic organisms and degrading concrete and steel structures to the point of failure.

205. Any sediment movement may also expose ASS. Deposits of ASS are commonly found less than five meters above sea level, particularly in low-lying coastal areas, which is where a number of the project's activities will occur. Mitigative controls could potentially be required for the management of ASS during any excavation works due to their locations close to coastal areas.

206. Prior to any excavation, sediments should be tested for their presence of ASS or PASS. Sampling should be undertaken consistent with that proposed by the Queensland Acid Sulfate Soils Investigation Team as described in Ahern *et al* (2004)[27] and laboratory analysis consistent with Ahern *et al* (2004).

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27 Ahern, C. R., McElnea, A. E., & Sullivan, L. A. (2004). Acid Sulfate Soils Laboratory Methods Guidelines. Queensland Department of Natural Resources, Mines, and Energy. Indooroopilly: Queensland Government.

207. If the analysis proves positive, the sediment can be treated by a range of techniques including but not limited to liming the sediment. The contractor should refer to management measures provided by for example by Dear *et al* (2014)[28] to mitigate the impacts. Every effort should be made to ensure there is no direct or residual impact following treatment.

6.3.3 Performance Criteria

208. The following performance criteria are set for the projects:

- No build-up of sediment in the aquatic environments and/or surface and/or groundwater as a result of construction and operation activities;
- No degradation of water quality on or off site of all projects;
- Preferably no disturbance of ASS or PASS; however if there is disturbance, compliance with the management measures discussed above; and
- Effective implementation of site-specific EDSCP.

209. By following the management measures set out in the EMSF, construction and operation activities of the projects will not have a significant impact as a result of sedimentation across the broader area.

6.3.4 Monitoring

210. A standardised sediment control monitoring program has been developed for the projects (Table 9). The program is subject to review and update at least every two months from the date of issue. The Field Officer will be required to:

- Conduct site inspections on a weekly basis or after rainfall events exceeding 20mm in a 24 hour period;
- Develop a site-specific checklist to document non-conformances to this EMSF or any applicable EDSCPs; and
- Communicate the results of inspections and/or water quality testing and ensure that any issues associated with control failures are rapidly rectified and processes are put in place to ensure that similar failures are not repeated.

6.3.5 Reporting

211. All sediment and erosion control monitoring results and/or incidents will be tabulated and reported as outlined in the EMSF. The MoEFCC must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to erosion and sediment control is exceeded.

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28 Dear, S-E., Ahern, C. R., O'Brien, L. E., Dobos, S. K., McElnea, A. E., Moore, N. G. & Watling, K. M., 2014. Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines. Brisbane: Department of Science, Information Technology, Innovation and the Arts, Queensland Government.

Table 9 Erosion, Drainage and Sediment Control Measures

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
E1: Loss of soil material and sedimentation to the surface and/or groundwater systems from site due to earthwork activities	E1.1: Develop and implement an EDSCP for any surface works, embankments and excavation work, water crossings and stormwater pathways.	Construction phase	All Personnel	Maintain records
	E1.2: Ensure that erosion and sediment control devices are installed, inspected and maintained as required.	Construction phase	All Personnel	Maintain records
	E1.3: Schedule/stage works to minimise cleared areas and exposed soils at all times.	Pre and during construction	Field Officer	Maintain records
	E1.4: Incorporate the design and location of temporary and permanent EDSC measures for all exposed areas and drainage lines. These shall be implemented prior to pre-construction activities and shall remain onsite during work	Pre and during construction	Field Officer	Maintain records
	E1.5: Schedule/stage proposed works to ensure that major vegetation disturbance and earthworks are carried out during periods of lower rainfall and wind speeds.	Pre and during construction	Field Officer	Maintain records
	E1.6: Strip and stockpile topsoil for use during revegetation and/or place removed soils back on to agricultural lands.	Pre and during construction	Field Officer	Maintain records
	E1.7: Schedule/stage works to minimise the duration of stockpiling topsoil material. Vegetate stockpiles if storage required for long periods.	During construction	All Personnel	Maintain records
	E1.8: Locate stockpile areas away from drainage pathways, waterways and sensitive locations.	Pre and during construction	Field Officer	Maintain records
	E1.9: Design stormwater management measures to reduce flow velocities and avoid concentrating runoff.	Pre and during construction	Field Officer	Maintain records
	E1.10: Include check dams in drainage lines where necessary to reduce flow velocities and provide some filtration of sediment. Regularly inspect and maintain check dams.	Pre and during construction	Field Officer	Maintain records

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
E1: Loss of soil material and sedimentation to the surface and/or groundwater systems from site due to earthwork activities	E1.11: Mulching shall be used as a form of erosion and sediment control and where used on any slopes (dependent on site selection), include extra sediment fencing during high rainfall.	During construction	All Personnel	Maintain records
	E1.12: Bunding shall be used either within watercourses or around sensitive/dangerous goods as necessary.	During construction	All Personnel	Maintain records
	E1.13: Grassed buffer strips shall be incorporated where necessary during construction to reduce water velocity.	During construction	Field Officer	Maintain records
	E1.14: Silt fences or similar structures to be installed to protect from increased sediment loads.	During construction	Contractors	Maintain records
	E1.15: Excess sediment in all erosion and sediment control structures (eg. sediment basins, check dams) shall be removed when necessary to allow for adequate holding capacity.	During construction	Contractors	Maintain records
E2: Soil Contamination	E2.1: If contamination is uncovered or suspected (outside of the project footprints), undertake a Stage 1 preliminary site contamination investigation. The contractor should cease work if previously unidentified contamination is encountered and activate management procedures and obtain advice/permits/approval (as required).	Construction phase	All Personnel	Daily and maintain records
	E2.2: Adherence to best practice for the removal and disposal of contaminated soil/ material from site (if required), including contaminated soil within the project footprints.	Construction phase	All Personnel	Daily and maintain records
	E2.3: Drainage control measures to ensure runoff does not contact contaminated areas (including contaminated material within the project footprints) and is directed/diverted to stable areas for release.	Construction phase	All Personnel	Daily and maintain records

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
E2: Soil Contamination	E2.4: Avoid importing fill that may result in site contamination and lacks accompanying certification/documentation. Where fill is not available through on site cut, it must be tested in accordance with geotechnical specifications.	Construction phase	All Personnel	Daily and maintain records
E3: Disposal of excess soil/silt	E3.4: Silt removed from dams/ponds/weirs during rehabilitation / maintenance is to be beneficially reused eg composted, returned to farm land, brick making etc. Silt should be tested to confirm suitability for proposed use	Construction and operation phases	MoEFCC	Maintain records

6.4 NOISE AND VIBRATION

6.4.1 Background

212. All construction and operation activities have the potential to cause noise nuisance. Vibration disturbance to nearby residents and sensitive habitats is likely to be caused through the use of vibrating equipment. Blasting is not required to be undertaken as part of this project.

213. Generally, the proposed activities will not result in significant noise generation. However, some noise is possible, particularly during any construction phases. The use of machinery or introduction of noise generating facilities could have an adverse effect on the environment and residents if not appropriately managed.

214. Potential noise sources during construction may include:

- Heavy construction machinery;
- Power tools and compressors;
- Delivery vehicles;
- Labourers.

215. Contractors involved in construction activities should be familiar with methods of controlling noisy machines and alternative construction procedures as contained within specific Indian legislation or in its absence, international good practice may be used if the legislation has not been enacted.

6.4.2 Performance Criteria

216. The following performance criteria are set for the construction of the projects:

- Noise from construction and operational activities must not cause an environmental nuisance at any noise sensitive place;
- Undertake measures at all times to assist in minimising the noise associated with construction activities;
- No damage to off-site property caused by vibration from construction and operation activities; and
- Corrective action to respond to complaints is to occur within 48 hours.

6.4.3 Monitoring

217. A standardised noise monitoring program has been developed for the projects (see Table 10**Error! Reference source not found.**).

218. The program is subject to review and update at least every two months from the date of issue. Importantly, the site supervisor will:

- Ensure equipment and machinery is regularly maintained and appropriately operated; and
- Carry out potentially noisy construction activities during ‘daytime’ hours only.

6.4.4 Reporting

219. All noise monitoring results and/or incidents will be tabulated and reported as outlined in the EMSF. The MoEFCC must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to noise is exceeded

Table 10 Noise and Vibration Management Measures

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
N1: Increased noise levels	N1.1: Select plant and equipment and specific design work practices to ensure that noise emissions are minimised during construction and operation including all pumping equipment.	All phases	Contractor	Maintain records
	N1.2: Specific noise reduction devices such as silencers and mufflers shall be installed as appropriate to site plant and equipment.	Pre and during construction	Contractor	Maintain records
	N1.3 Minimise the need for and limit the emissions as far as practicable if noise generating construction works are to be carried out outside of daylight hours.	Construction phase	All Personnel	Daily and maintain records
	N1.4: Consultation with nearby residents in advance of construction activities particularly if noise generating construction activities are to be carried out outside of 'daytime' hours.	Construction phase	All Personnel	Daily and maintain records
	N1.5 The use of substitution control strategies shall be implemented, whereby excessive noise generating equipment items onsite are replaced with other alternatives.	Construction phase	All Personnel	Daily and maintain records
	N1.6 Provide temporary construction noise barriers in the form of solid hoardings where there may be an impact on specific residents.	Construction phase	Field Officer	Daily and maintain records
	N1.7 All incidents complaints and non-compliances related to noise shall be reported in accordance with the site incident reporting procedures and summarised in the register.	Construction phase	Field Officer	Maintain records
	N1.8 The contractor should conduct employee and operator training to improve awareness of the need to minimise excessive noise in work practices through implementation of measures.	Pre and during construction	Contractor	Maintain records

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
N2. Vibration due to construction	N2.1: Identify properties, structures and habitat locations that will be sensitive to vibration impacts resulting from construction and operation of the project.	Pre and during construction	Contractor	Maintain records
	N2.2: Design to give due regard to temporary and permanent mitigation measures for noise and vibration from construction and operational vibration impacts.	Pre-construction	Contractor	Maintain records
	N2.3: All incidents, complaints and con-compliances related to vibration shall be reported in accordance with the site incident reporting procedures and summarised in the register.	Construction phase	Field Officer	Maintain records
	N2.4: During construction, standard measure shall be taken to locate and protect underground services from construction and operational vibration impacts.	Construction phase	Field Officer	Maintain records

6.5 WASTE MANAGEMENT

6.5.1 Background

220. As the implementing agency, the MoEFCC advocate good waste management practice. The preferred waste management hierarchy and principles for achieving good waste management is as follows:

- Waste avoidance(avoid using unnecessary material on the projects);
- Waste re-use (re-use material and reduce disposing);
- Waste recycling (recycle material such as cans, bottles, etc.); and
- Waste disposal (all petruscible and/or contaminated waste to be dumped at approved landfills).

221. The key waste streams generated during construction are likely to include residual sediment and construction wastes such as:

- The excavation wastes unsuitable for reuse during earthworks;
- Dredge spoil, most of which will be utilised in habitat creation (islands);
- Wastes from construction equipment maintenance. Various heavy vehicles and construction equipment will be utilised for the duration of the construction phase. Liquid hazardous wastes from cleaning, repairing and maintenance of this equipment may be generated. Likewise leakage or spillage of fuels/oils within the site needs to be managed and disposed of appropriately;
- Non-hazardous liquid wastes will be generated through the use of workers' facilities such as toilets; and
- General wastes including scrap materials and biodegradable wastes.

222. Operational wastes will include:

- Aquaculture farm waste
- Fish processing waste (which can be utilised as a feed stock for producing fish meal for aquaculture)
- Domestic waste resulting from tourism
- Agricultural waste

223. Workers involved in construction and operational activities should be familiar with methods minimising the impacts of clearing vegetation to minimise the footprint to that essential for the works and rehabilitate disturbed areas. By doing these activities, the projects should minimise the impact of waste generated by the project.

6.5.2 Performance Criteria

224. The following performance criteria are set for the construction of the projects:

- Waste generation is minimised through the implementation of the waste hierarchy (avoidance, reduce, reuse, recycle);
- No litter will be observed within the project area or surrounds as a result of activities by site personnel;

225. No complaints received regarding waste generation and management;

- Any waste from on-site portable sanitary facilities will be sent off site for disposal by a waste licensed contractor; and
- Waste oils will be collected and disposed or recycled off-site, local oil companies or shipped for recycling.

226. Monitoring

227. A waste management monitoring program has been developed for the projects (Table 11). The program is subject to review and update at least every two months from the date of issue.

6.5.3 Reporting

228. The MoEFCC as implementing agency must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to waste is exceeded.

Table 11 Waste Management Measures

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
WT1: Production of wastes and excessive use of resources	WT1.1: Preference shall be given to materials that can be used to construct the project that would reduce the direct and indirect waste generated.	Pre and during construction	Contractor	Maintain records
	WT1.2: Daily waste practices shall be carried out unless these are delegated to the activities of external waste management bodies.	During construction	Field Officer	Daily and maintain records
	WT1.3: The use of construction materials shall be optimised and where possible a recycling policy adopted.	During construction	Field Officer	Weekly and maintain records
	WT1.4: Separate waste streams shall be maintained at all times i.e. general domestic waste, construction and contaminated waste. Specific areas on site shall be designated for the temporary management of the various waste streams.	During construction	Field Officer	Weekly and maintain records
	WT1.5: Any contaminated waste shall be disposed of at an approved facility.	During construction	Field Officer	Weekly and maintain records
	WT1.6: Recyclable waste (including oil and some construction waste) shall be collected separately and disposed of correctly.	During construction	Field Officer	Weekly and maintain records
	WT1.7: Waste sites shall be sufficiently covered to ensure that wildlife does not have access.	During construction	Field Officer	Daily
	WT1.8: Disposal of waste shall be carried out in accordance with the Government of India requirements.	During construction	Field Officer	Weekly and maintain records
	WT1.9: Fuel and lubricant leakages from vehicles and plant shall be immediately rectified.	During construction	Field Officer	Daily and maintain records
	WT1.10: Major maintenance and repairs shall be carried out off-site whenever practicable.	During construction	Field Officer	Weekly and maintain records
	WT1.11: Where possible, fuel and chemical storage and handling shall be undertaken at central fuel and chemical storage facilities, such as petrol stations.	During Construction	Field Officer	Daily and maintain records

	WT1.12: On-site storage of fuel and chemicals shall be kept to a minimum.	During Construction	Contractor	Daily, maintain records and report any incidents
Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
WT1: Production of wastes and excessive use of resources	WT1.13: Any waste oils and lubricants are to be collected and transported to recyclers or designated disposal sites as soon as possible.	During Construction	Field Officer	Daily and maintain records
	WT1.14: Any dangerous goods stored on site shall be stored in accordance with Indian regulations.	During Construction	Contractor	Daily and maintain records
	WT1.15: Aquaculture wastes will be treated where required. Release is to be as per regulations/permits	Operation	Farmers	As required
	WT1.16: Monitoring of waterways subject to aquaculture waste will be undertaken to determine nutrient and other contaminant loads.	Operation	Farmers	As required

6.6 AIR QUALITY

6.6.1 Background

229. Air pollution in India is quite a serious issue with the major sources being fuel wood and biomass burning, fuel adulteration, vehicle emission and traffic congestion.[1] In autumn and winter months, large scale crop residue burning in agriculture fields - a low cost alternative to mechanical tilling - is a major source of smoke, smog and particulate pollution.[293031]

230. Fuel wood and biomass burning is the primary reason for near-permanent haze and smoke observed above rural and urban India. Fuel wood and biomass cakes are used for cooking and general heating needs. This form of fuel is inefficient source of energy, its burning releases high levels of smoke, PM10 particulate matter, NOx, SOx, PAHs, polyaromatics, formaldehyde, carbon monoxide and other air pollutants.

231. The Air (Prevention and Control of Pollution) Act was passed in 1981 to regulate air pollution. India's Central Pollution Control Board now routinely monitors four air pollutants namely sulphur dioxide (SO2), oxides of nitrogen (NOx), suspended particulate matter (SPM) and respirable particulate matter (PM10). They regularly monitor at 308 operating stations in 115 cities/towns in 25 states and 4 Union Territories of India. The monitoring of meteorological parameters such as wind speed and direction, relative humidity and temperature is integrated with the monitoring of air quality. The monitoring of these pollutants is carried out for 24 hours (4-hourly sampling for gaseous pollutants and 8-hourly sampling for particulate matter) with a frequency of twice a week.

232. The proposed project activities do not generally involve high emission activities and so impacts on air quality would generally be low. None the less, there is potential for some impacts, and in particular odour impacts, to occur as a result of some of the activities.

233. All construction activities have the potential to cause air quality nuisance.

234. The project areas are predominantly village or rural in character. Existing air quality reflects those environments, with dust being the main air quality nuisance.

235. Workers involved in construction and operation activities should be familiar with methods minimising the impacts of deleterious air quality and alternative construction procedures as contained in Indian legislation or international good practice.

6.6.2 Performance Criteria

236. The following performance criteria are set for the construction of the projects:

- Release of dust/particle matter must not cause an environmental nuisance;
- Undertake measures at all times to assist in minimising the air quality impacts associated with construction and operation activities; and
- Corrective action to respond to complaints is to occur within 48 hours.

6.6.3 Monitoring

237. A standardised air monitoring program has been developed for the projects (Table 12). The program is subject to review and update at least every two months from the date of issue. Importantly:

1. _____

29 Badarinath, K. V. S., Kumar Kharol, S., & Rani Sharma, A. (2009), Long-range transport of aerosols from agriculture crop residue burning in Indo-Gangetic Plains—a study using LIDAR, ground measurements and satellite data. Journal of Atmospheric and Solar-Terrestrial Physics, 71(1), 112-120

30 Agricultural Fires in India NASA, United States (2012)

31 Bob Weinhold , Fields and Forests in Flames: Vegetation Smoke and Human Health, National Institutes of Health

- The requirement for dust suppression will be visually observed by site personnel daily and by MoEFCC and UNDP staff when undertaking routine site inspections; and
- Vehicles and machinery emissions – visual monitoring and measured when deemed excessive.

6.6.4 Reporting

238. All air quality monitoring results and/or incidents will be tabulated and reported as outlined in the EMSF. The MoEFCC must be notified immediately in the event of any suspected instances of material or serious environmental harm, or if a determined level with respect to air quality is exceeded.

Table 12 Air Quality Management Measures

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
A.1 Increase in dust levels at sensitive receptors	A1.1: Implement effective dust management measures in all areas during design, construction and operation.	Pre and during construction	All Personnel	Daily and maintain records
	A1.2: Restrict speeds on roads and access tracks.	During construction	Field Officer	Daily and maintain records
	A1.3: Manage dust/particulate matter generating activities to ensure that emissions do not cause an environmental nuisance at any sensitive locations	During construction	Field Officer	Daily and maintain records
	A1.4: Construction activities should minimise risks associated with climatic events (check forecasts).	During construction	Field Officer	Daily and maintain records
	A1.5: Implement scheduling/staging of proposed works to ensure major vegetation disturbance and earthworks are minimised.	Entire construction	Contractor	Daily and maintain records
	A1.6: Locate material stockpile areas as far as practicable from sensitive receptors. Cover if appropriate.	During construction	Field Officer	Daily and maintain records
	A1.7: Source sufficient water of a suitable quality for dust suppression activities complying with any water restrictions.	During construction	Field Officer	Daily and maintain records
	A1.8: Schedule revegetation activities to ensure optimum survival of vegetation species.	During construction	Field Officer	Maintain records
	A1.9: Rubbish receptacles should be covered and located as far as practicable from sensitive locations	During construction	Field Officer	Maintain records

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
A2. Increase in vehicle / machinery emissions	A2.1 Ensure vehicles/machines are switched off when not in use.	During construction	Field Officer	Daily and maintain records
	A2.2 Ensure only vehicles required to undertake works are operated onsite.	During construction	Field Officer	Daily and maintain records
	A2.3 Ensure all construction vehicles, plant and machinery are maintained and operated in accordance with design standards and specifications.	During construction	Field Officer	Daily and maintain records
	A2.4 Develop and implement an induction program for all site personnel, which includes as a minimum an outline of the minimum requirements for environmental management relating to the site.	Pre and during construction	Contractor	Daily and maintain records
	A2.5 Locate construction vehicle/plant/equipment storage areas as far as practicable from sensitive locations.	During construction	Field Officer	Daily and maintain records
	A2.6 Direct exhaust emissions of mobile plant away from the ground.	During construction	Field Officer	Daily and maintain records

6.7 SOCIAL MANAGEMENT

6.7.1 Background

240. Approximately 32% of India's population is categorised as urban. While urbanisation has been relatively slow, India has experienced the rapid rural urban migration, a trend that is expected to continue with its ongoing economic growth. Notwithstanding India's economic growth and improvements in human development, the country is still classified as "lower middle income", with a Gross National Income of US$1,590 per capita in 2015.

241. India is an agrarian society with 70% of the population dependent on agriculture. The agricultural sector consequently plays a central role in the country's food security. Poverty is particularly prevalent in rural areas, where service delivery is comparatively less available when compared to urban areas. Many women in the labour force are engaged in low-paid work, most commonly as rural workers.

242. Among rural communities, women, children and women headed households are considered particularly at risk to poverty. This is partly because the economically active female population is approximately half the size of the economically active male population.

243. Approximately 250 million people (14% of the country's population or 3.5% of the global population) reside within 50 km of India's coastline. Approximately 38% of coastal communities are directly involved with fishing activities, while aquaculture is also an important livelihood activity in the coastal zone.

244. The *three* target states:

- **Andhra Pradesh** - is the fifth largest state in India, covering 160,205 km2 with a population of 50 million people. It has the longest coastline in the country, stretching over 972 km. Approximately 40% of the state's total population lives in the coastal zone, while ~22.8% of the rural population and ~17.7% of the urban population of the state live below the poverty line.
- **Maharashtra** - is one of the most developed states in India, contributing 13% to the country's industrial output. The state covers 307,700 km2 and has a population of 114 million people. The state is highly urbanised with more than 45% of the population living in urban areas, while. 17% of the state's population lives below the poverty line. The most up to date census data shows that 57% of the total population of Maharashtra falls into the rural category. Agriculture is main livelihood for most the Maharashtra's population. About 61% of people depend on agriculture and related activities for their livelihood. Maharashtra has a coastline of 720 km along the Arabian Sea and there are ~75 coastal villages found within 100m of the high tide line in Maharashtra. Fishing is also an important livelihood activity for coastal populations, particularly in Koli, Dhivar, Bhoi and Gabit.
- **Odisha** - is the ninth largest state in India, covering 155,820 km2 with a population of 43.7 million people. Approximately 32.6% of the state's population lives below the poverty line, particularly in rural areas. Odisha has a coastline of 480 km and a large part of the population lives in the nine coastal districts. Odisha is an agrarian state with 22% of the state's domestic product coming from the agricultural sector. More than 50% of state's farmers practice subsistence farming. Fisheries in Orissa make use of the many water resources available, both inland and on the coastline. Coastal communities in Orissa experience many climate- related disasters.

245. In India, according to agriculture census 2010-11, only 12.69 percent women have some kind of land ownership; with absolute ownership, it also include data on leased land. Patterns of landownership highlight disparities between groups (and arguably are at the root cause of other

disparities); besides women other vulnerable groups like Scheduled caste and Scheduled tribes also form major proportion of the landless population in India.

246. While average cultivable landholdings in Orissa are relatively small, particularly in coastal areas, Scheduled Castes are particularly badly off, with average landholdings just over half that of others. Similarly in coastal district of Andhra Pradesh, comprising on an average 16 percent SC population and 6 percent ST population, scheduled caste and scheduled tribes forms majority of the landless community.

247. Individual or collective rights of fishing communities over coastal lands still do not exist and in most cases, communities do not even have titles and deeds for their houses and settlements despite 60 years of Independence. The Coastal Regulation Zone (CRZ) Notification, 1991 makes some mention and reference to customary rights of fishing communities on land in the coastal zone.

248. Ensuring quality education still remain a bigger challenge for Indian government. The Global Monitoring Report 2012 ranked India a low 102 out of the 120 countries on the Education for All (EFA).[32] Literacy rates vary across India, but the national literacy rate is approximately 52%, with literacy of men typically being higher than that of women (around a 20% gap).

249. Violence against women in India is on rise. In India, violence against women have been doubled over last decade. According to the National Crime Bureau report around 2.24 million crimes against women have been reported in last decade which means reporting of 26 crimes in every hour in last decade.[33] Cruelty by husbands and relatives top the list among the major types of crime against women with almost 38 percent cases. Assault on women in intent with outraging modesty, kidnapping and abduction followed the domestic violence in the list.

250. The project has been designed with the assistance of stakeholders and aims to provide benefits to the broader community. Notwithstanding, as with any project that involves construction, some dissatisfaction can occur and conflicts may arise. It is important that potential areas of tension are recognised early and appropriate actions taken to avoid or minimise conflict.

251. The project and its sub-projects do not require involuntary resettlement or acquisition of land although they may impact on land during construction activities which will be temporary in nature.

6.7.1.1 Health and Safety

252. All projects that involve construction carry some element of risk in terms of accidental injury. Key to preventing occupational safety injuries is the design and supply of appropriate facilities and equipment, training in correct use of equipment, and finally empowering people to be responsible for their own safety and that of others.

253. Standard industry practices in OHS will apply to this project. Personal Protection Equipment (PPE) is to be used as appropriate. 'Safety in Design' reviews of project elements are to be undertaken during the detailed design phase and are to include a multi-discipline team to consider potential safety risks from multiple points of view, both in terms of construction and operation and maintenance).

6.7.2 Performance Criteria

254. The following performance criteria are set for the project:

1. _____

32 UNESCO (2014), Education for All Global Monitoring Report 2013-14, United Nations Educational Scientific and Cultural Organization, Paris

33 Crimes against women reported every two minutes in India. Chaitanya Mallapur.2015. http://scroll.in/article/753496/crimes-against-women-reported-every-two-minutes-in-india

- The community has been consulted and project elements have been designed with their informed consultation and participation throughout the project;
- All stakeholders are appropriately represented;
- Avoid adverse impacts to local community during construction and operations and where not possible, minimise, restore or compensate for these impacts;
- Cultural heritage is not adversely impacted;
- Community health and safety is protected and overall well-being benefits derived from the project;
- Complaint and grievance mechanisms are put in place and proactively managed; and
- Long-term social benefits are achieved.

255. Local stakeholders and community members have a key role to play in the implementation and monitoring of the project.

256. Consultation with stakeholders will continue. This will help ensure that stakeholders continue to be aware of the project, its progress and any changes in the project. It will also assist in identifying any issues as they arise.

257. MoEFCC will be responsible for advisory support and extensions services to local beneficiaries along with being responsible for distributing material inputs and providing technical training and backstopping in the implementation of programme activities.

6.7.3 Reporting

258. Records of all consultations are to be kept and reported on monthly basis.

259. The MoEFCC must be notified in the event of any individual or community complaint or dissatisfaction and ensure the Grievance Redress Mechanism is complied with.

Table 13: Social Management Measures

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
SM1: Restoration of ecosystems and potential loss of access	SM 1.1: Carry out community consultation on the purpose and benefits of making changes to land use	Pre-construction	MoEFCC or delegate	Maintain records
	SM 1.2: Get community buy-in on any change of land use	Pre-construction		Maintain records
	SM 1.3: Ensure compliance with the Grievance Redress Mechanism process	Entire construction and operation phase	MoEFCC and UNDP	Maintain records
SM2: Land Tenure	SM2.1: Select sites in consultation with local communities and take into account land tenure as well as legislation regarding state land	Pre-construction	MoEFCC	Maintain records
SM3: Public nuisance caused by construction/operation activities (eg noise, dust etc)	SM 3.1: Carry out community consultation prior to undertaking activities	Pre-construction	MoEFCC	Maintain records
	SM 3.2: Implement appropriate management plans (refer to Noise, Air, ESCP, and Waste sections of the ESMF)	Construction and operation	Site supervisor and MoEFCC	Daily and maintain records
	SM 3.3: Ensure compliance with the Grievance Redress Mechanism process	All phases	MoEFCC	Maintain records
SM4: Migration into sensitive areas	SM4.1: Engage community to provide 'on-ground' monitoring to enable governement enforcement to prevent incursions into sensitive areas.	Construction and operation	MoEFCC	Maintain records
	SM4.2. Engage stakeholders to develop landscape-level plans that identify optimal land use and management within a given project sites	Pre-construction	MoEFCC	Maintain records
	SM4.3: Select areas that are already under aquaculture, farming or are unsuitable for habitat restoration for new operations such as crab farming.	Pre-construction	MoEFCC	Maintain records

SM5: Community Health and Safety	SM5.1 'Safety in Design' (SID) reviews to be undertaken during detailed design phase to identify any potential risk elements that require removal, redesign or mitigation. SID to consider all phases of project – construction, operation, maintenance and demolision. Examples of potential design risks include: work at heights, steep batters, deep water, stairs without rails, enclosed spaces etc.	Pre-Construction	MoEFCC and Contractor	Maintain Records
Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
SM5: Community Health and Safety	SM5.2: Safety reviews of operational procedures to be undertaken periodically during project life. HazID/HazOB /HazOP processes should be part of typical operations (ie identify risks, have a reporting mechanism, and/or undertake hazard and operability studies (HAZOP) (a structured and systematic examination of a complex planned or existing process or operation) in order to identify and evaluate problems that may represent risks to personnel or equipment.	Construction / Operation	Contractor / operators	Maintain Records
	SM5.3: Workers to be provided with the necessary PPE and training to enable them to carry out their tasks safely.	Operation	Contractor / MoEFCC	Maintain Records
	SM5.4: Workers to be deemed 'fit for work' – no child labour, workers not to be under the influence of drugs or alcohol (particularly if operating machinery).	Construction / Operation	GoI	Daily
	SM5.5: Clean water (drinking) and sanitation facilities to be available to workers	Construction / Operation	Contractor / Operator	Daily
SM6: Scheduled castes, Scheduled Tribes and Other Backward Castes	SM6:1: Identify the families in the target areas as part of detailed intervention design and implementation.	Design	MoEFCC	Maintain Records
	SM6.2: Prepare and implement Social Inclusion Plan	All phases	Daily	Maintain Records

6.8 ARCHAEOLOGICAL AND CULTURAL HERITAGE

6.8.1 Background

260. Cultural history, folklore, assets and places are important matters for future planning. There is a need to understand the implications of cultural heritage assets on affecting future urban structure and land uses.Cultural heritage sites, areas, places and practices should be protected and celebrated via subsequent planning tools as an important feature of local identity and sense of place.

261. While no cultural heritage places, buildings and monuments are known to exist in areas where the project will be undertaken, further investigation of places and practices of cultural and historic heritage significance would be undertaken when activities are to be undertaken in or near known areas of historic value.

6.8.2 Performance Criteria

262. The following performance criteria are set for cultural heritage issues related to the project:

- There will be no impact on any important Archaeological, Indigenous and/or Cultural Heritage sites;
- Manage any specific sites of important Archaeological, Indigenous and/or Cultural significance (significant sites);
- Work with the village communities to differentiate between traditional village areas of cultural significance (uses and physical form) within each of the Village fono boundary areas during project implementation.

6.8.3 Monitoring

263. Local stakeholders and community members have a key role to play in the implementation and monitoring of the project.

264. Consultation with stakeholders will continue. This will help ensure that stakeholders continue to be aware of the project, its progress and any changes in the project. It will also assist in identifying any issues as they arise.

265. MoEFCC will be responsible for advisory support and extensions services to local beneficiaries along with being responsible for distributing material inputs and providing technical training and backstopping in the implementation of programme activities.

266. An important Archaeological, Indigenous and Cultural Heritage monitoring program has been developed for the projects. The program is subject to review and update at least every two months from the date of issue. Importantly, the plan should:

- provide cultural heritage awareness training to all construction site personnel (including contractors);
- identify and collect any cultural heritage items worthy of protection;
- consult with the relevant Museums about any important Archaeological, Indigenous and/or Cultural Heritage material discovered during construction; and
- cease work in the area where any human remains are discovered and consult with MoEFCC and UNDP.

6.8.4 Reporting

267. The UNDP and MoEFCC must be notified immediately in the event of any suspected find related to important Archaeological, Indigenous and/or Cultural Heritage.

268. Records of all consultations are to be kept and reported on monthly basis.

Table 14: Archaeological and Cultural Heritage

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
CH1: Damage or disturbance to significant important Archaeological, Indigenous and/or Cultural Heritage during the earth disturbances and land clearing activities	CH1.1: Should damage or disturbance occur to any important Archaeological, Indigenous and/or Cultural Heritage sites, immediately cease work within the area that the site has been observed and consult with the relevant Museum/traditional owner groups, UNDP, MoEFCC and archaeologist available for implementation during construction.	Before and during construction	Contractor	Daily, maintain records and immediately notify UNDP and MoEFCC of any find
CH2: Chance Finds	CH2.1: If, during the execution of the activities, any material is discovered onsite which may be considered of historical or cultural interest, all work shall stop and the supervising contracting officer shall be notified immediately. The area in which the material was discovered shall be secured, cordoned off, marked, and the evidence preserved for examination by the local archaeological or cultural authority. No item believed to be an artifact must be removed or disturbed by any of the workers. Worker are to be made aware of the above and sensitised to the potential of chance finds.	During Construction	Contractor	Maintain records

6.9 EMERGENCY MANAGEMENT MEASURES

269. In the event of actions occurring, which may result in serious health, safety and environmental (catastrophic) damage, emergency response or contingency actions will be implemented as soon as possible to limit the extent of environmental damage.

270. The delivery organisation will need to incorporate emergency responses into the project complying with the requirements under the Occupational, Health and Safety Policy of the delivery organisation and the relevant Indian legislation.

6.9.1 Performance Criteria

271. The following performance criteria are set for the construction of the projects:

- No incident of fire outbreak;
- No failure of water retaining structures;
- No major chemical or fuel spills;
- No preventable industrial or work related accidents;
- Provide an immediate and effective response to incidents that represent a risk to public health, safety or the environment; and
- minimise environmental harm due to unforeseen incidents.

6.9.2 Monitoring

272. An emergency response monitoring program has been developed for the projects (Table 15). The program is subject to review and update at least every two months from the date of issue. Importantly, visual inspections will be conducted by Field Officer daily with reporting to MoEFCC and UNDP staff on a weekly basis (minimum) noting any non-conformances to this EMSF.

6.9.3 Reporting

273. The MoEFCC and UNDP staff must be notified immediately in the event of any emergency, including fire or health related matter including those that have resulted in serious environmental harm.

Table 15 Emergency Management Measures

Issue	Control activity (and source)	Action timing	Responsibility	Monitoring & reporting
E1. Fire and Emergency management and prevention strategies implemented	E1.1: Flammable and combustible liquids bunding/storage areas to be designed in accordance with appropriate international standards	Pre and during construction	Contractor	Daily and maintain records
	E1.2: Fire extinguishers are to be available on site	During construction	Contractor	Daily and maintain records
	E1.3: Communication equipment and emergency protocols to be established prior to commencement of construction activities.			
	E1.4: Train all staff in emergency preparedness and response (cover health and safety at the work site).	During construction	Field Officer	Daily and maintain records
	E1.5: Check and replenish First Aid Kits	During construction	Field Officer	Daily and maintain records
	E1.6: Use of Personal Protection Equipment	During construction	All Personnel	Daily and maintain records
E2. Spill into waterway eg waste, fuel, or other contaminant	E.2.1: Notify authorities immediately in event of spill. Advise location and nature of emergency.	Operation	Farmers	Maintain records
	E.2.2: Where risk of spill exists, suitable barriers/booms/spill kits should be maintained in readiness.	Operation	Farmers	Maintain records
	E2.3: Advise other waterway users of potential contamination risk in event of a spill.	Operation	Farmers	Maintain records
	E2.4: Ensure any aquaculture products (particularly shellfish) have not been contaminated by spill if harvesting for market.	Operation	Farmers	Maintain records

APPENDIX A: SOCIAL INCLUSION PLANNING FRAMEWORK

INTRODUCTION

1. This Social Inclusion Planning Framework (SIPF) has been prepared in support of the project proposal for "Enhancing Climate Resilience of India's Coastal Communities" by the Government of India to the Green Climate Fund (GCF).

2. The Government of India does not consider the concept of "indigenous peoples" applicable to India. India recognizes the legal categories of Other Backward Classes, Scheduled Castes and Scheduled Tribes. Scheduled Castes (SCs) and Scheduled Tribes (STs) are various officially designated groups of historically disadvantaged people in India. The terms are recognised in the Constitution of India and the various groups are designated in one or other of the categories. Scheduled castes and Scheduled tribes form a major proportion of the landless population in India. Scheduled castes and tribal communities are known to live within the project area, and as such, an SIPF has been prepared for the project.

3. This SIPF has been prepared to guide the formulation of project components, ensuring equitable distribution of project benefits between SC/ST and other communities who are affected by the Project. The principal objectives of the SIPF are to:

   - Screen project components early to assess their impacts on tribal community households;
   - Ensure meaningful participation and consultation with SC/ST communities living in the project locations in the process of preparation, implementation, and monitoring of project activities;
   - Provide a framework to mitigate any possible and unintended adverse impacts to SC/ST communities;
   - Ensure that SC/ST communities receive culturally appropriate social and economic benefits from the project;
   - Outline the monitoring and evaluation process of the review and implementation of the plan.

Background

4. The Government of India with support from UNDP, is formulating a project on adaptation to climate change impacts "Enhancing Climate Resilience of India's Coastal Communities" for submission to the GCF. The project will seek to improve the resilience of vulnerable communities to climate change impacts.

Overview of the Project

5. The objective of the project is to enhance the resilience of the lives and livelihoods of the most vulnerable populations, particularly women, in the coastal areas of India to climate change and extreme events, using an ecosystem-centred and community-based approach.

6. The project will work at national, state, and community levels to enhance capacity for ecosystem and community-based approaches to adaptation and enable pathways to replication and scale beyond the project to all of India's coastal states. Specific restoration and livelihood interventions will be undertaken in the target states of Andhra Pradesh, Maharashtra and Odisha, with learning shared across all coastal states and their districts, and more widely in the South Asian region.

Summary of Project Outputs

7. Output 1: Enhanced resilience of coastal and Marine Ecosystems and their Services

8. Activities undertaken under this output will generate a range of adaptation and sustainable development benefits through the conservation, restoration and maintenance of coastal and

marine ecosystems to enhance their resilience. At a national scale and in all the coastal states, a long-term system will be established for undertaking vulnerability assessment of the coast, for undertaking restoration of coastal ecosystems, and for systematic monitoring of the results, including for carbon sequestration. In the 34 target landscapes in the three states, communities will collaborate closely with the Forestry Department in a co-management approach, both as recipients of work opportunities in restoration efforts, and as ongoing partners in maintaining the resource in a healthy condition – managing harvesting of timber on non-timber forest products, controlling pollution and helping to prevent illegal activities.

9. Protocols and guidelines will be established, and restoration efforts undertaken, including i) mangrove restoration through hydrological rehabilitation, e.g. restoring free tidal flow by constructing main and branch canals and opening access to tidal source; ii) mangrove restoration through planting of seedlings/saplings; iii) restoration of catchments through afforestation to prevent erosion and sedimentation of coastal ecosystems; iv) rehabilitation of seagrass beds and saltmarshes through hydrological rehabilitation; v) artificial regeneration of coral reefs through structure placement; vi) hydrological rehabilitation of coastal lagoons, e.g. dredging/breaching river mouths; vii) restoration of dune vegetation; and viii) establishment of shelter belts using a variety of suitable tree species.

10. Output 2: Climate-adaptive livelihoods for enhanced resilience of vulnerable coastal communities

11. This GCF funding and co-finance will be used to support vulnerable communities, whose current fishing and farming livelihoods will be increasingly negatively affected by climate change, to adapt their livelihoods to climate change. These communities are resident in the 34 target landscapes in the three states. The output will help enhance adaptive capacity, including capacity to adapt existing livelihood activities and diversify to climate-resilient options, and to do business planning and access finance for scaling up harvesting, agri/aquaculture operations. This will also include developing value chains to ensure uptake and the long-term sustainability of these adaptive livelihoods, including support on business planning, access to finance, certification and labelling of eco-products, and access to markets. Technical assistance will be provided to livelihood activities (i) that are based on coastal ecosystems restored to buffer climate impacts, and (ii) that adapt current farming practices to deal with climate impacts on agro-ecosystems. Livelihoods include:

    - *Aquaculture:* crab farming, mussel farming, oyster farming, crab hatcheries, ornamental fisheries, integrated duck-fish farming, seaweed farming, integrated multi-trophic aquaculture;
    - *Processing of aquaculture products:* MSMEs for value-added fish products, fishmeal plants, fish and shellfish / bivalve processing units;
    - *Coastal ecotourism:* scuba diving, tour guiding, Coastal non-timber forest products: mangrove beekeeping for honey production;
    - *Climate-smart intensification*: System of Rice Intensification (SRI) for paddy farming, drip-irrigated mango and cashew production;
    - *Climate-adapted crops*: cultivation of aromatic and medicinal plants, mushroom cultivation, intercropping of Black pepper, Nutmeg & Cinnamon with Coconut & Arecanut plantation; and
    - *Processing of climate-adaptive agriculture products:* mango ripening chamber & pulp making, virgin coconut oil extraction.

12. Output 3: Strengthened coastal and marine governance and institutional framework

13. This output provides pathways to replication and scale by extending the approaches to ecosystem restoration carried out in Output 1 and approaches to climate-resilient livelihood support carried

out in Output 2, across all of India's 13 coastal States and Union Territories, and also shares knowledge on coastal resilience with countries in the wider South Asian region. This includes integrating adaptation into public and private sector policies, plans and budgets in all coastal states through a network of institutions, and undertaking targeted valuation and cost-benefit analyses, to motivate for new investments in EbA as well as knowledge sharing on the evidence base for such investments. A wide range of public and private sector role-players in coastal planning and governance will be engaged in order to build their capacity for integrated approaches that lead to new policy and finance shifts enabling ecosystem-based and community-centred adaptation.

14. Presence of Scheduled Caste and Scheduled Tribal Communities in the Project Area

15. In India, socially marginalized groupings are legally recognized in three broad categories - Other Backward Classes (OBCs), Scheduled Castes (SCs) and Scheduled Tribes (STs). The SCs and STs comprise about 16.6 percent and 8.6 percent, respectively, of India's population, as per the 2011 census.

16. The Scheduled Castes are not a homogenous group and are divided into many castes and sub-castes, as well as by language and geography. The "Scheduled Castes" is the legal and constitutional name collectively given to the groups that have traditionally occupied the lowest status in Indian society. These groups are now recognized by the Indian Constitution to be especially disadvantaged because of their past history of inferior treatment, and are therefore entitled to certain rights and preferential treatment. Scheduled castes are known as Dalits – meaning "the oppressed".

17. A total 705 ethnic groups are notified as Scheduled Tribes in the country. In mainland India, the Scheduled Tribes are usually referred to as Adivasis, which literally means indigenous peoples. Adivasi make up 8.6% of India's population or 104 million, according to the 2011 census. Scheduled Tribes are often focused on because their traditional close relationship with nature, including through forests, farming and fishing, which means that their livelihoods are directly impacted upon by climate change.

18. In terms of this project, it is worth noting that most coastal marine fishing communities are not Scheduled Tribes or Scheduled Castes, at most, marine fishers may be categorized as other backward tribes (OBC) and backward tribes (BC), but it varies from state to state

19. India's Scheduled Tribes (STs) are defined in Article 366 (25) as 'such tribes or tribal communities or parts of or groups within such tribes or tribal communities as are deemed under Article 342 to be Scheduled Tribes' and 'declared as such by the President of India through a public notification'. They are identified generally based on certain traits including among others their primitiveness, distinctive culture, geographical isolation, and backwardness.

20. The list of Scheduled Tribes is State and Union Territory specific and a community declared as a Scheduled Tribe in a State need not be so in another State or Union Territory. The essential characteristics, first laid down by the Advisory Committee on Revision of SC/ST lists (Lokur Committee) in 1965 for a community to be identified as Scheduled tribes are:

    - Indications of primitive traits
    - Distinctive culture
    - Shyness of contact with the community at large
    - Geographical isolation and;
    - Backwardness.

21. The SCs and STs vary from State to State. Lists of the SCs and STs are provided at the following links:

- Scheduled Castes: http://socialjustice.nic.in/UserView/index?mid=76750
- Scheduled Tribes: http://tribal.nic.in/ST/LatestListofScheduledtribes.pdf

22. The distribution of Scheduled Castes is shown in Figure A.1, while the distribution of Scheduled Tribes is in Figure A.2.

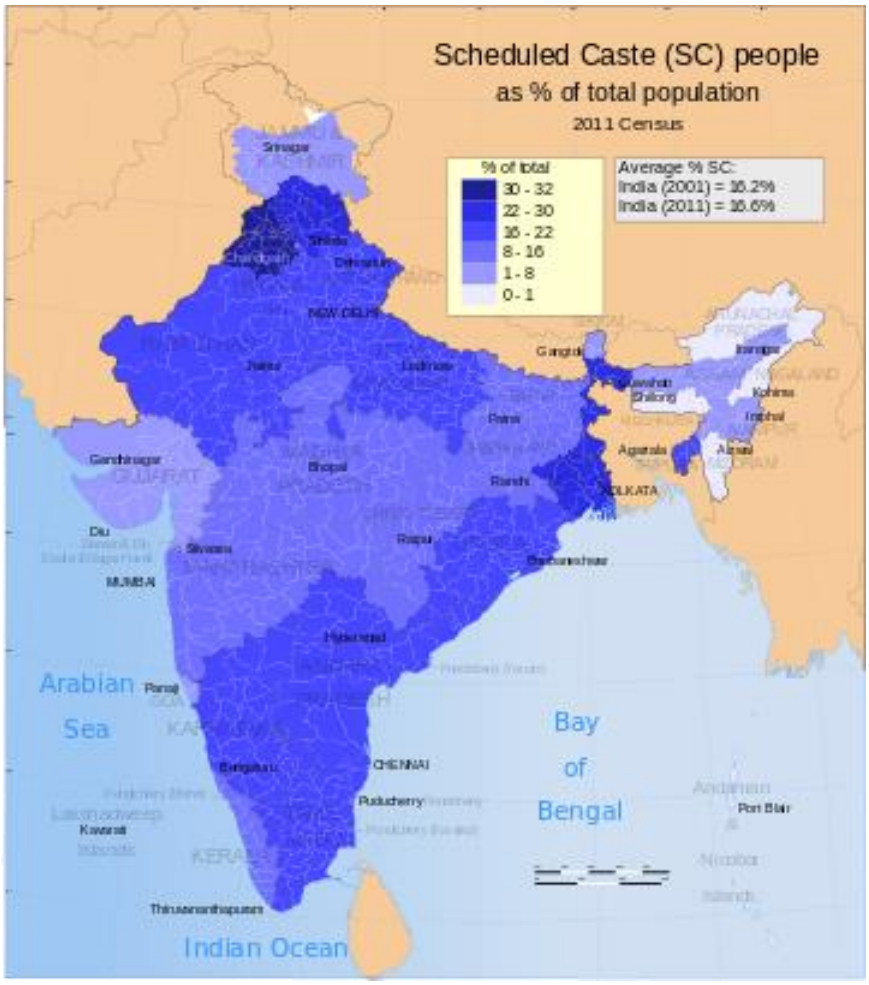

Figure A.1 Distribution of Scheduled Castes by State[34]

23. As noted above, most coastal marine fishing communities are not SCs or STs. However, the National Fish workers forum (NFF), which is a non-political autonomous union (fisheries comes under the unorganised sector) with state level and district bodies/units, has been demanding tribal status for fishers for the long time

1. _____

[34] https://commons.wikimedia.org/w/index.php?curid=33731323

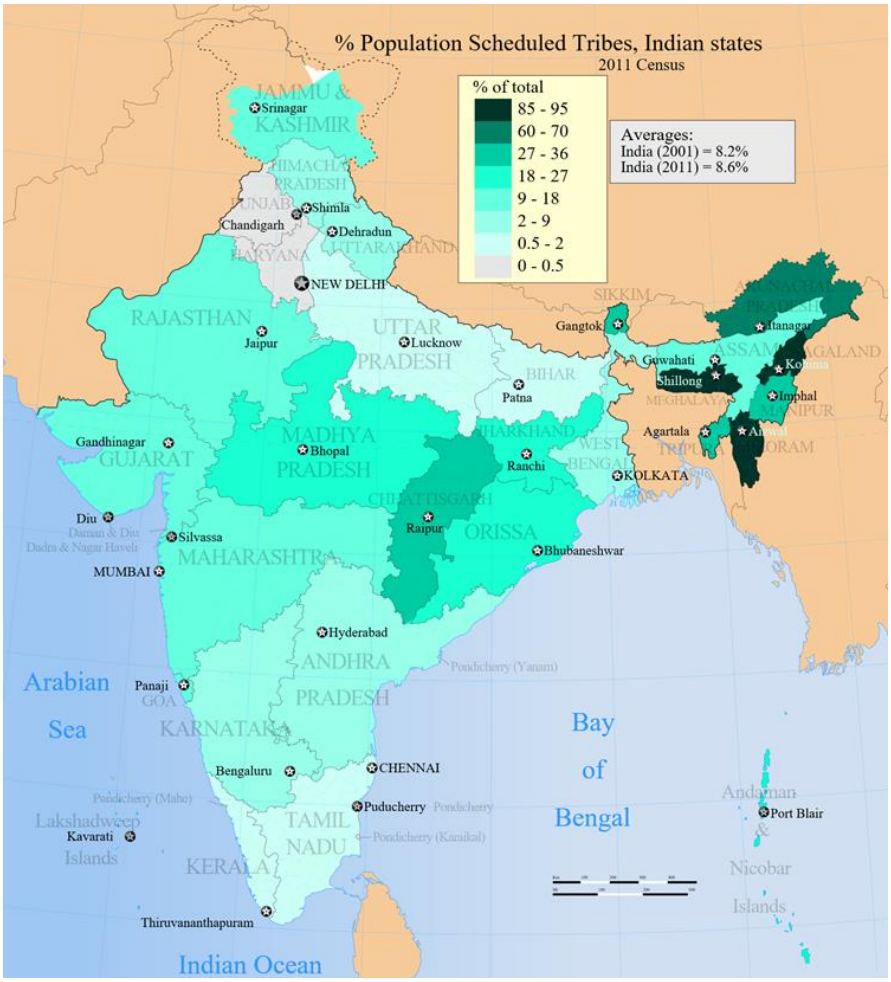

Figure A.2 Distribution of Scheduled Tribes in India[35]

24. The project, and particularly its livelihood activities, is targeted at fishing and coastal communities and peoples in India. A lot of coastal inland fresh and brackish water fishing and aquaculture and salt pan labour may be done by Dalits (SCs). There are SCs and STs in coastal areas (as distinguished from fishing villages/hamlets) that will not be targetted by this project - there may be Dalit hamlets in coastal areas that do venture into the marine fishing areas eg may be involved in farm labouring. There is sometimes tension between fishing and dalit communities.

25. The community institutions, (such as the caste panchayats, peddalu, padu system etc.,) mostly organized along caste, kinship or religious lines, play an important role in resolving conflicts, besides regulating and allocating resource use, ensuring equitable access to resources and providing some form of social insurance. Most communities have evolved their own management systems over time to regulate human interaction with the resource especially when large number of people bank on a limited resource to avoid conflicts. The evolution of traditional management system depended on the resource and the environment in which the resource existed and the interactions between people to extract these resources (Kurien, 1998).

26. In terms of the *Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006*, the Indian Government is committed to recognize and vest the forest rights and occupation of forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers, who have been residing in such forests for generations, but whose rights could not be recorded.

1.

[35] https://commons.wikimedia.org/w/index.php?curid=33732550

This Act not only recognizes the rights to hold and live in the forest land under the individual or common occupation for habitation or for self-cultivation for livelihood, but also grants several other rights to ensure their control over forest resources which, inter-alia, include right of ownership, access to collect, use and dispose of minor forest produce, community rights such as nistar; habitat rights for primitive tribal groups and pre-agricultural communities; right to protect, regenerate or conserve or manage any community forest resource which they have been traditionally protecting and conserving for sustainable use.

27. Fishing communities in India are not homogenous, as they belong to different castes. These communities have their distinct social, cultural governance structures and traditional practices, depending on the coast, where they inhabit. At least 2-3 castes are exclusively involved in marine fishing in each maritime State, and are not related to the mainstream agrarian system, however by and large, fishing villages/hamlets, unlike agriculture villages, are homogenous with a single caste (99.9 %) dominating the village and other castes involved in ancillary support (labour, head loaders etc). Each caste would dominate a certain geographical stretch (being an internal kin network). The next stretch would be dominated by another caste community.

28. In marine fishing hamlets/villages there may be 0.01% or fewer families that belong to SC who work in the ancillary fishing activities, such as head loaders and land-based labour.

29. Besides the traditional caste-based organization of fishing communities, they are also organized into various sectors such as the mechanized sector – boat owner associations, trade unions, cooperatives (both State-run and private), associations based on gear type, self help groups, federations etc

30. Some of the important fishing castes in the project States:

- Andhra Pradesh: Vadabalijas, Jalaris, Pattapu and Palles
- Odisha: Jalaris, Vadabalijas, Kaibartas, Khandayats and Rajbhansis
- Maharastra: Kolis

31. Assumptions Underpinning the Development of the Social Inclusion Planning Framework

32. This framework has been prepared on the basis that none of the interventions will require the displacement/resettlement of people.

33. If necessary, a Social Inclusion Plan will be prepared for each State, based on the outline contained in this SIPF.

34. It should be noted that, in general, most States do not permit the transfer of land of Scheduled Areas to non-tribals. Also, alienation of land in a Scheduled Area can only be made to a tribal group or the government.

LEGAL AND INSTITUTIONAL FRAMEWORK FOR TRIBAL COMMUNITIES

Legislation, Policies and Regulations

35. The following legislation is relevant to the project with respect to Scheduled Castes andTribes:

- Constitution of India
- Scheduled Castes and Scheduled Tribes Orders (Amendment) Act 2002
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006 (FRA) with Rules (including 2012 Amendment) and Guidelines
- The Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act of 1989 and Amendment of 2015

- The Scheduled Tribe's Bonded Labour Abolition Act, 1976
- The Child Labour Abolition Act, 1986
- The Forest Conservation Act, 1980
- The Panchayati Raj Act, 1996
- The Minimum Wages Act, 1948
- The Panchayat (Extension to Scheduled Areas) Act 1996 (PESA)
- The Andhra Pradesh Scheduled Ares Land Transfer Regulation Act, 1950
- The Andhra Pradesh Scheduled Commodities Order, 1973

MULTILATERAL AGREEMENTS AND PROTOCOLS

36. The Government of India is a signatory to a number of international and regional agreements and conventions, which are related to SCs and STs. They include:

- ILO Convention No. 107 concerning the Protection and Integration of Indigenous and Other Tribal and Semi-Tribal Populations in Independent Countries
- Nagoya Protocol on Access to Genetic Resources and their Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity
- International Covenant on Civil and Political Rights
- Convention on the Rights of Persons with Disabilities
- Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment
- UN Convention Against Corruption
- International Covenant on Economic, Social and Cultural Rights
- International Convention on the Elimination of All Forms of Racial Discrimination

IMPLEMENTATION AND OPERATION

GENERAL MANAGEMENT STRUCTURE AND RESPONSIBILITIES

38. The management and implementation of the SIP would be via the same structure as the delivery of the overall project, that is, via the project management structure as described in the ESMF and shown in Figure A3.

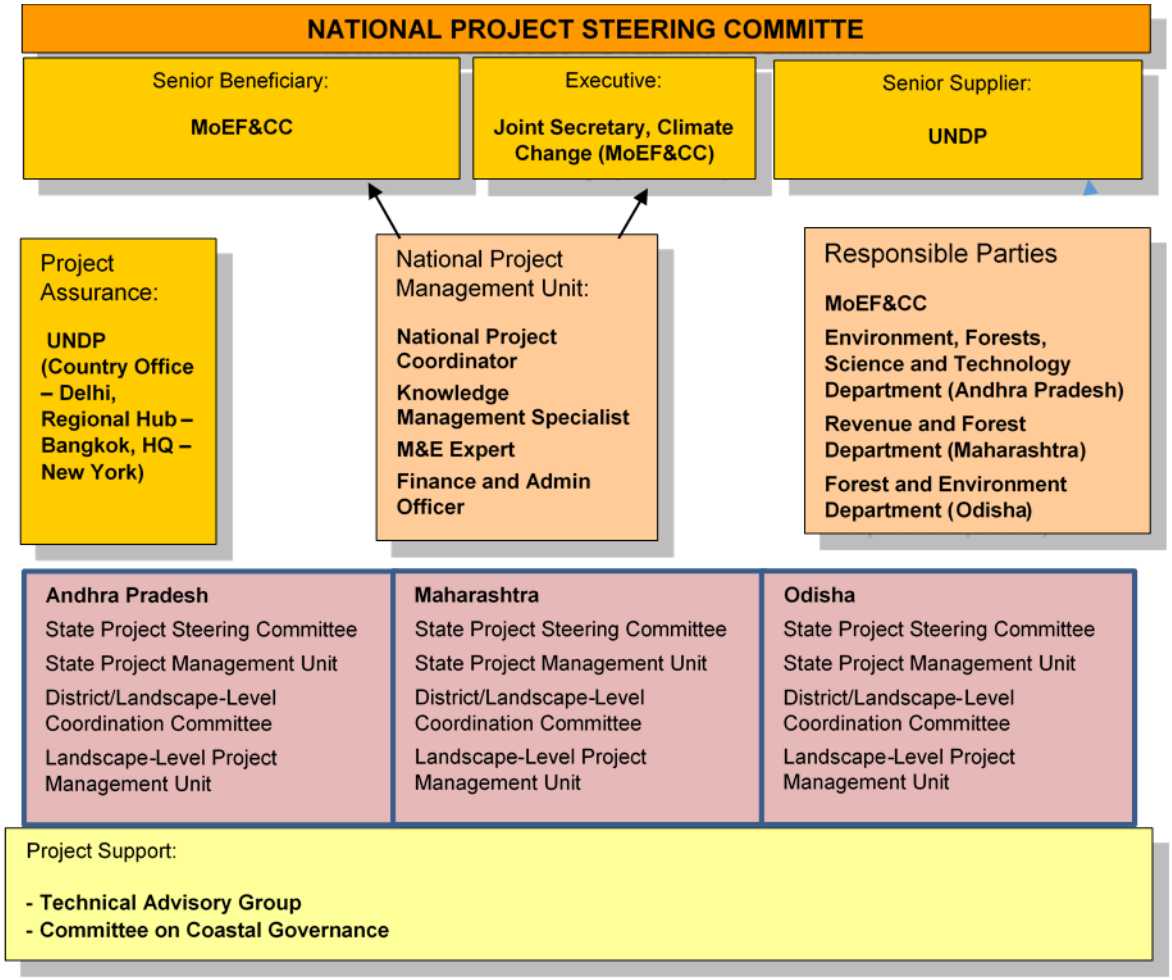

Figure A3 – Project organisation structure

INSTITUTIONAL ARRANGEMENTS, DEVELOPMENT AND IMPLEMENTATION OF SIPS

39. The SIPF will be assessed for each sub-project by the MoEF&CC and UNDP prior to any works being undertaken. The ESMF and SIPF identifies potential risks to the environment and social matters from the projects and outlines strategies for managing those risks and minimising undesirable environmental and social impacts. Further, the ESMF and SIPF provides a Grievance Redress Mechanism for those that may be impacted by the projects that do not consider their views have been heard.

40. The MoEF&CC will be responsible for the supervision of the SIPF. The MoEF&CC with gain the endorsement of the National Project Steering Committee and will ensure the SIPF is adequate and followed. The NPMU will ensure timely remedial actions are taken where necessary.

41. Any State-level SIPs will follow the same institutional arrangements and implementation modalities outlined in the ESMF.

42. Similarly, the grievance mechanism outlined in the ESMF will apply to all aspects of the project.

43. As with environmental aspects (ESMPs), site-specific SIPs will be prepared as necessary during the detailed design stage. SIPs will be developed in close consultation with the SC/STs/OBCs and other communities potentially affected by project interventions.

COMMUNICATION

PUBLIC CONSULTATION AND DISCLOSURE

44. The SIPF includes public consultation as part of the stakeholder engagement plan. The project was discussed with a wide range of stakeholders, including relevant government departments, industry groups, NGOs, and individual community members and approved by Government. Extensive on-ground consultation has been undertaken during the design of the project and it is expected that consultation with any affected communities will continue. It is anticipated that based on the communities' needs, the projects will be fully accepted.

45. The UNDP and Government of India will develop and release updates on the project on a regular basis to provide interested stakeholders with information on project status. Updates may be via a range of media eg print, radio, social media or formal reports. A publicized telephone number will be maintained throughout the project to serve as a point of contact for enquiries, concerns, complaints and/or grievances. All enquiries, concerns, complaints and/or grievances will be recorded on a register and the appropriate manager will be informed. All material must be published in English and local languages as appropriate.

46. Where there is a community issue raised, the following information will be recorded:

a. Time, date and nature of enquiry, concern, complaints and/or grievances;

b. Type of communication (e.g. telephone, letter, personal contact);

c. Name, contact address and contact number;

d. Response and investigation undertaken as a result of the enquiry, concern, complaints and/or grievances; and

e. Actions taken and name of the person taking action.

47. Some enquiries, concern, complaints and/or grievances may require an extended period to address. The complainant(s) will be kept informed of progress towards rectifying the concern. All enquiries, concern, complaints and/or grievances will be investigated and a response given to the complainant in a timely manner. The grievance redress mechanism described in the ESMF to address any complaints and/or grievances that may not be able to be resolved quickly shall also apply to the SIPF.

48. Nominated PMU/contractor staff will be responsible for undertaking a review of all enquiries, concern, complaints and/or grievances and ensuring progress toward resolution of each matter.

MONITORING AND EVALUATION

49. The National Project Steering Committee will convene at least twice annually, to review and contribute to the annual work plans of the project states as well as discuss and approve national

level project activities. The NPSC will be supported by the National Project Management Unit (NPMU), who will be responsible for day to day coordination of relevant components of the project at the national level and work in close coordination with the three project states of Andhra Pradesh, Maharashtra and Odisha. The NPMU will be headed by a National Project Coordinator, who will be supported, amongst others, by a Monitoring and Evaluation Expert.

50. State Project Steering Committees (SPSCs) will have representation from the relevant State Departments, Agencies, and other stakeholders including private sector / industries, NGOs nominated by the State Government, representative of UNDP and MOEF&CC. The SPSC shall meet at least twice in a year to review the progress of project implementation in the State and take appropriate decisions for the smooth implementation of the project within the State.

51. Each SPSC will be supported by a State Project Management Unit (SPMU), which will be responsible for coordinating the project at the state level. The SPMU will be headed by the State Project Director (SPD) who will be the Principal Secretary (Forest) or their representative. The SPD will be responsible for overall implementation of the project at the State level. The SPD also will i) ensure coordination with UNDP, MoEF&CC, various departments and agencies; ii) provide guidance to the project team; iii) review reports and iv) look after other administrative and financial arrangements related to the project. The SPD will be supported by the State Project Manager whose responsibilities shall include: 1) coordinating project implementation with all stakeholders, State Government and central government agencies and UNDP-GCF; 2) organizing the project evaluations; 3) ensuring that there is adequate documentation by all implementing partners at all stages and in collating this documentation; and 4) facilitating the publication of project outputs.

52. At the district level, there would be district/ landscape level project steering committee (DLCCC/LLCC), which will be chaired by the respective District Collectors (DC). Members will include all relevant departments, agencies, and representatives of all village level committees as well as the community mobilizers/ village facilitators. The LLCC will be responsible for district level planning, implementation, monitoring and coordination. The LLPSC will be supported by a District Project Management Unit (DPMU) that will provide technical leadership for project implementation, monitoring & evaluation, and adaptive management.

53. As can be seen above, there are various levels of monitoring and evaluation responsibilities, which will result in the SEPF/SIPs being monitored and evaluated are various implementation levels. It also provides multiple entry points to trigger review of the SIPF/SIPs. The SIPF and sub-plans (SIPs) will be periodically reviewed throughout the life of the project and modified when necessary with the meaningful participation of the SC/ST and other communities who are affected by the Project. Significant grievances eg Tier 2, should be considered an automatic trigger for SIP review.

BUDGET FOR SOCIAL INCLUSION PLANS

54. All costs of related to SIPF implementation have been included in the overall budget for the project. The SIPs will include detailed cost estimates and indicate source of funds for the required activities to facilitate smooth implentation, management and monitoring.

OUTLINE OF THE GCF INDIGENOUS PEOPLES PLAN (SOCIAL INCLUSION PLAN)

55. An “Indigenous People’s Plan” (IPP) is required by the GCF for all projects with substantial impacts on indigenous peoples. As shown in Section 2.1.1, if necessary, a “Social Inclusion Plan” (so named to be suitable for the Indian context) will be prepared for each State, focusing on tribal communities in the state, and based on the outline contained in this SIPF.

56. The level of detail and comprehensiveness of an SIP/IPP is commensurate with the significance of potential impacts on the relevant social groupings. This outline guides the preparation of a GCF Indigenous Peoples Plan, although not necessarily in the order shown.

EXECUTIVE SUMMARY OF THE GCF INDIGENOUS PEOPLES PLAN

57. This section concisely describes the critical facts, significant findings, and recommended actions.

Project Description

58. This section provides a general description of the project; discusses project components and activities that may bring impacts on SCs, STs and OBCs; and identify project area.

Social Impact Assessment

59. This section:

a. reviews the legal and institutional framework applicable to SCs and STs in project context;

b. provides baseline information on the demographic, social, cultural, and political characteristics of the affected SCs and STs; the land and territories that they have traditionally owned or customarily used or occupied; and the natural resources on which they depend;

c. identifies key project stakeholders and elaborate a culturally appropriate and gender-sensitive process for meaningful consultation with SCs and STs at each stage of project preparation and implementation, taking the review and baseline information into account;

d. assesses, based on meaningful consultation with the affected SC/ST communities, the potential adverse and positive effects of the project. Critical to the determination of potential adverse impacts is a gender-sensitive analysis of the relative vulnerability of, and risks to, the affected communities given their particular circumstances and close ties to land and natural resources, as well as their lack of access to opportunities relative to those available to other social groups in the communities, regions, or national societies in which they live;

e. includes a gender-sensitive assessment of the affected SCs and STs perceptions about the project and its impact on their social, economic, and cultural status; and

f. identifies and recommends, based on meaningful consultation with the affected SC/ST communities, the measures necessary to avoid adverse effects or, if such measures are not possible, identifies measures to minimize, mitigate, and/or compensate for such effects and to ensure that SC/ST receive culturally appropriate benefits under the project.

Information Disclosure, Consultation and Participation

60. This section:

a. describes the information disclosure, consultation and participation process with the affected SC/ST communities that can be carried out during project preparation;

b. summarizes their comments on the results of the social impact assessment and identifies concerns raised during consultation and how these have been addressed in project design;

c. in the case of project activities requiring broad community support, documents the process and outcome of consultations with affected SC/ST communities and any

agreement resulting from such consultations for the project activities and safeguard measures addressing the impacts of such activities;

d. describes consultation and participation mechanisms to be used during implementation to ensure SC/ST participation during implementation; and

e. confirms disclosure of the draft and final to the affected SC/ST.

Beneficial Measures

61. This section specifies the measures to ensure that SCs and STses receive social and economic benefits that are culturally appropriate, and gender responsive.

62. Mitigative Measures

63. This section specifies the measures to avoid adverse impacts on SCs and STs; and where the avoidance is impossible, specifies the measures to minimize, mitigate and compensate for identified unavoidable adverse impacts for each affected SC/ST.

Capacity Building

64. This section provides measures to strengthen the social, legal, and technical capabilities of (a) government institutions to address SC/ST issues in the project area; and (b) SC/ST organizations in the project area to enable them to represent the affected SC/ST more effectively.

Grievance Redress Mechanism

65. This section describes the procedures to redress grievances by affected SC/ST communities. It also explains how the procedures are accessible to SCs/STs and culturally appropriate and gender sensitive. It is anticipated this would utilized the already developed Grievance Redress Mechanism established under the Social Inclusion Planning Framework.

Monitoring, Reporting and Evaluation

66. This section describes the mechanisms and benchmarks appropriate to the project for monitoring, and evaluating the implementation of the Social Inclusion Plan. It also specifies arrangements for participation of affected SCs/STs in the preparation and validation of monitoring, and evaluation reports.

Institutional Arrangement

67. This section describes institutional arrangement responsibilities and mechanisms for carrying out the various measures of the Social Inclusion Plan. It also describes the process of including relevant local organizations and/or NGOs in carrying out the measures of the Social Inclusion Plan.

Budget and Financing

68. This section provides an itemized budget for all activities described in the Social Inclusion Plan.

APPENDIX B: STANDARD GENERAL ENVIRONMENTAL CONTRACT CLAUSES

STANDARD GENERAL ENVIRONMENTAL CONTRACT CLAUSES

Generic contract clauses are provided in this annex to assist with environmental and social management works expected to have minor impacts. These mitigation measures are the core of a generic, standardized EMP (Environmental Management Plan) and the associated minor impacts typical of small works which can be routinely addressed with best industry practice. These clauses are general and may be modified to conform to applicable national laws, contract procedures and actual scope and nature of the works anticipated. These clauses are intended to be included as requirements in the works contract and shall remain in force throughout the contract period. These clauses represent the minimum standard of execution for environmental protection and include:

- Permits and Approvals
- Site Security
- Discovery of Antiquities
- Worker Occupational Health and Safety
- Noise Control
- Use and Management of Hazardous Materials, fuels, solvents and petroleum products
- Use and Management of Pesticides
- Use of Preservatives and Paint Substances
- Use of Explosives
- Site Stabilization and Erosion Control
- Traffic Management
- Management of Standing Water
- Management of Solid Wastes -trash and construction debris
- Management of Liquid Wastes

Standard Clauses

1. Permits and Approvals

The contractor shall be responsible for ensuring that he or she has all relevant legal approvals and permits required to commence works.

2. Site Security

The contractor shall be responsible for maintaining security over the construction site including the protection of stored materials and equipment. In the event of severe weather, the contractor shall secure the construction site and associated equipment in such a manner as to protect the site and adjacent areas from consequential damages. This includes the management of onsite, construction materials, construction and sanitary wastes, additional strengthening of erosion control and soil stabilization systems and other conditions resulting from contractor activities which may increase the potential for damages.

3. Discovery of Antiquities
If, during the execution of the activities contained in this contract, any material is discovered onsite which may be considered of historical or cultural interest, such as evidence of prior settlements, native or historical activities, evidence of any existence on a site which may be of cultural significance, all work shall stop and the supervising contracting officer shall be notified immediately. The area in which the material was discovered shall be secured, cordoned off, marked, and the evidence preserved for examination by the local archaeological or cultural authority. No item believed to be an artifact must be removed or disturbed by any of the workers. Work may resume, without penalty of prejudice to the contractor upon permission from the contracting officer with any restrictions offered to protect the site.

4. Worker Occupational Health and Safety
The contractor shall ensure that all workers operate within a safe environment. Sanitation facilities shall be provided for all site workers. All sanitary wastes generated as a result of project activities shall be managed in a manner approved by the contracting officer and the local authority responsible for public health. The contractor shall ensure that there are basic medical facilities on site and that there are staff trained in basic first aid. Workers must be provided with the necessary protective gear as per their specific tasks such as hard hats, overalls, gloves, goggles, boots, etc. The contractor shall provide the contracting officer with an occupational health and safety plan for approval prior to the commencement of site activities.
The contractor must ensure that all workers operate within a safe environment. All relevant Labor and Occupational Health and Safety regulations must be adhered to ensure worker safety. Sanitary facilities must be provided for all workers on site. Appropriate posting of information within the site must be done to inform workers of key rules and regulations to follow.

5. Noise Control
The contractor shall control noise emissions generated as a result of contracting activities to the extent possible. In the case of site locations where noise disturbance will be a concern, the contractor shall ensure that the equipment is in good working order with manufacturer supplied noise suppression (mufflers etc.) systems functioning and in good repair.
Where noise management is a concern, the contractor shall make reasonable efforts to schedule activities during normal working hours (between 8 am and 5 pm). Where noise is likely to pose a risk to the surrounding community either by normal works or working outside of normal working hours or on weekends, the contractor shall inform the contracting officer and shall develop a public notification and noise management plan for approval by the contracting officer.

6. Use and Management of Hazardous Materials, fuels, solvents and petroleum products
The use of any hazardous materials including pesticides, oils, fuels and petroleum products shall conform to the proper use recommendations of the product. Waste hazardous materials and their containers shall be disposed of in a manner approved by the contracting officer in accordance with national laws. A site management plan will be developed by the contractor if the operation involves the use of these materials to include estimated quantities to be consumed in the process, storage plans, spill control plans, and waste disposal practices to be followed. Any plans required shall be approved by the contracting officer.
Elements of the hazardous materials management shall include:
Contractor must provide temporary storage on site of all hazardous or toxic substances in safe containers labeled with details of composition, properties and handling information;
Hazardous substances shall be placed in a leak-proof container to prevent spillage and leaching
Wastes shall be transported and disposed of in a manner approved by the contracting officer compliant with national laws and policies

7. Use and Management of Pesticides
Any use of pesticides shall be approved by the contracting officer and shall conform to the manufacturers' recommendations for use and application. Any person using pesticides shall demonstrate that they have

read and understood these requirements and are capable of complying with the usage recommendations to the satisfaction of the contracting officer. All pesticides to be used shall conform to the list of acceptable pesticides that are not banned by the relevant local authority.
If termite treatment is to be utilized, ensure appropriate chemical management measures are implemented to prevent contamination of surrounding areas, and use only licensed and registered pest control professionals with training and knowledge of proper application methods and techniques.
8. Use of Preservatives and Paint Substances
All paints and preservatives shall only be used with the approval of the contracting officer. Information shall be provided to the contracting officer who describes the essential components of the materials to be used so that an informed determination can be made as to the potential for environmental effects and suitability can be made.
Storage, use, and disposal of excess paints and preservatives shall be managed in conformance with the manufacturers' recommendations and as approved by the contracting officer. The contractor shall provide the contracting officer with a list of materials and estimated quantities to be used, storage, spill control and waste disposal plans to be observed during the execution of the contract. This plan is subject to the approval of the contracting officer.

9. Use of Explosives
Use of explosives shall be at the approval of the relevant local authority and shall be supervised and undertaken by a qualified explosives technician. Blasting will be limited to between the hours of 9:00 am and 4:00 pm unless specifically approved by the local authority and the contracting officer. Any use of explosives shall be permitted only after an explosives management and blasting plan has been approved by the relevant local authority and the contracting officer.
This plan shall include:
Description of the explosive agent, charge description, intended use.
Site safety plan including:
Storage of initiators, booster charges and principal blasting agents
Handling precautions to be observed
Transport to and from site
Security of stored materials
Disposal of excess or damaged explosive materials.
Analysis of risk to surrounding area and mitigation measures to be employed including:
Over-pressure event
Noise
Flying debris
Seismic transmission
Accidental detonation
Name and qualifications for all persons responsible for handling explosive agents

10. Site Stabilization and Erosion Control
The Contractor shall implement measures at the site of operations to manage soil erosion through minimization of excavated area and time of exposure of excavated areas, preservation of existing ground cover to the extent possible, provision of approved ground cover and the use of traps and filtration systems. Where excavations are made, contractor shall implement appropriate stabilizing techniques to prevent cave-in or landslide. Measures shall be approved by the contracting officer.
The contractor must ensure that appropriate erosion control measures such as silt fences are installed. Proper site drainage must be implemented. Any drain clogged by construction material or sediment must be unclogged as soon as possible to prevent overflow and flooding. The use of retaining structures and planting with deep rooted grasses to retain soil during and after works must be considered. The use of bio-engineering methods must be considered as a measure to reduce erosion and land slippage. All slopes and excavated areas must be monitored for movement.

The contractor will establish appropriate erosion and sediment control measures such as hay bales, sedimentation basins, and / or silt fences and traps to prevent sediment from moving off site and causing excessive turbidity in nearby streams, rivers, wetlands, and coastal waters.
An erosion management plan will be required where the potential exists for significant sediment accumulation e in wetlands, lakes, rivers and marine systems. This plan shall include a description of the potential threat, mitigation measures to be applied, and consideration for the effects of severe weather and an emergency response plan.
If works are along coastal marine areas or near major steams and river, water quality monitoring must be done before construction, and at regular intervals to determine turbidity levels and other quality parameters.
Construction vehicles and machinery will be washed only in designated areas where runoff will not pollute natural surface water bodies.

11. Air Quality
When appropriate, the contractor shall provide an air quality management plan for contracting officer approval. This plan will include provisions for the management and control of dust and unnecessary emissions resulting from construction activities. The plan shall include control measures to be implemented including the management of dust generated from transportation and site construction activities as well as excess emissions from vehicles and equipment. Under no circumstances shall site or roadway dusts be managed using oil spray techniques.

12. Traffic Management
In the event that construction activities should result in the disruption of area transportation services, including temporary loss of roadways, blockages due to deliveries and site related activities, the contractor shall provide the contracting officer with a traffic management plan including a description of the anticipated service disruptions, community information plan, and traffic control strategy to be implemented so as to minimize the impact to the surrounding community. This plan shall consider time of day for planned disruptions, and shall include consideration for alternative access routes, access to essential services such as medical, disaster evacuation, and other critical services. The plan shall be approved by the contracting officer.
Elements of the traffic management plan to be developed and implemented by contractor shall include:
Alternative routes will be identified in the instance of extended road works or road blockages;
Public notification of all disturbance to their normal routes;
Signage, barriers and traffic diversions must be clearly visible and the public warned of all potential hazards;
provision for safe passages and crossings for all pedestrians where construction traffic interferes with their normal route;
Active traffic management by trained and visible staff at the site or along roadways as required to ensure safe and convenient passage for the vehicular and pedestrian public;
Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement.

13. Management of Standing Water
Under no circumstances shall the contractor permit the collection of standing water as a consequence of contractor activities without the approval of the contracting officer and consultation with the relevant local environmental health authority. Recommendations from that local authority on how to manage and treat the standing water must be implemented. The condition of the standing water must be monitored by the contractor to ensure that it does not present itself as a breeding ground for any pests such as mosquitoes.

14. Management of Solid Wastes and Construction Debris

The contractor shall provide a solid waste management plan that conforms to the national solid waste management policies and regulations for approval by the contracting officer. The site waste management plan shall include a description of waste handling procedures including collection, storage and disposal through the national waste management system. There will be no open burning of waste material and the contractor shall endeavor to recycle wastes as appropriate through the national waste management system.
Under no circumstances shall the contractor allow construction wastes to accumulate so as to cause a nuisance or health risk due to the propagation of pests and disease vectors.

15. Management of Liquid Wastes
The contractor shall provide the contracting officer with a liquid waste management plan as part of a site waste management plan that conforms to the waste management policies and regulations of the relevant Saint Vincent and the Grenadines authority. Under no circumstances shall the contractor allow construction related liquid wastes to accumulate on or off the site, or to flow over or from the site in an uncontrolled manner or to cause a nuisance or health risk due to its content. The site waste management plan shall include a description of how these wastes will be stored, collected and disposed of in accordance with current law. Additionally the contractor shall provide for the regular removal and disposal of all site wastes and provide the contracting officer with a schedule for such removal.
Specific elements of the contractor's liquid waste management plan shall include: contractor to abide by all pertinent waste management and public health laws; waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities; construction and demolition wastes will be stored in appropriate bins; liquid and chemical wastes will be stored in appropriate containers separated from the general refuse; all waste will be collected and disposed of properly in approved landfills by licensed collectors; the records of waste disposal will be maintained as proof for proper management as designed; whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos); construction related liquid wastes must not be allowed to accumulate on or off the site, or to flow over or from the site in an uncontrolled manner or to cause a nuisance or health risk due to its contents.

7 APPENDIX C: UNDP STAKEHOLDER RESPONSE MECHANISM FORM

71.

72.

73. Guidance for Submitting a Request to the
Social and Environmental Compliance Unit (SECU) and/or the
Stakeholder Response Mechanism (SRM)

74.

75. Purpose of this form

- If you use this form, please put your answers in bold writing to distinguish text
- The use of this form is recommended, but not required. It can also serve as a guide when drafting a request.

76.

77. This form is intended to assist in:

(1) Submitting a request when you believe UNDP is not complying with its social or environmental policies or commitments and you are believe you are being harmed as a result. This request could initiate a 'compliance review', which is an independent investigation conducted by the Social and Environmental Compliance Unit (SECU), within UNDP's Office of Audit and Investigations, to determine if UNDP policies or commitments have been violated and to identify measures to address these violations. SECU would interact with you during the compliance review to determine the facts of the situation. You would be kept informed about the results of the compliance review.

78. And/Or

(2) Submitting a request for UNDP "Stakeholder Response" when you believe a UNDP project is having or may have an adverse social or environmental impact on you and you would like to initiate a process that brings together affected communities and other stakeholders (e.g., government representatives, UNDP, etc.) to jointly address your concerns. This Stakeholder Response process would be led by the UNDP Country Office or facilitated through UNDP headquarters. UNDP staff would communicate and interact with you as part of the response, both for fact-finding and for developing solutions. Other project stakeholders may also be involved if needed.

79. Please note that if you have not already made an effort to resolve your concern by communicating directly with the government representatives and UNDP staff responsible for this project, you should do so before making a request to UNDP's Stakeholder Response Mechanism.

80. **Confidentiality** If you choose the Compliance Review process, you may keep your identity confidential (known only to the Compliance Review team). If you choose the Stakeholder Response Mechanism, you can choose to keep your identity confidential during the initial eligibility screening and assessment of your case. If your request is eligible and the assessment indicates that a response is appropriate, UNDP staff will discuss the proposed response with you, and will also discuss whether and how to maintain confidentiality of your identity.

81. Guidance

82. When submitting a request please provide as much information as possible. If you accidentally email an incomplete form, or have additional information you would like to provide, simply send a follow-up email explaining any changes.

83. Information about You

84. Are you…

    1. A person affected by a UNDP-supported project?

85. Mark "X" next to the answer that applies to you: Yes: No:

    2. An authorized representative of an affected person or group?

86. Mark "X" next to the answer that applies to you: Yes: No:

87. If you are an authorized representative, please provide the names of all the people whom you are representing, and documentation of their authorization for you to act on their behalf, by attaching one or more files to this form.

    3. First name:
    4. Last name:
    5. Any other identifying information:
    6. Mailing address:
    7. Email address:
    8. Telephone Number (with country code):
    9. Your address/location:
    10. Nearest city or town:
    11. Any additional instructions on how to contact you:
    12. Country:

88. What you are seeking from UNDP: Compliance Review and/or Stakeholder Response

89. You have four options:

- Submit a request for a Compliance Review;
- Submit a request for a Stakeholder Response;
- Submit a request for both a Compliance Review and a Stakeholder Response;
- State that you are unsure whether you would like Compliance Review or Stakeholder Response and that you desire both entities to review your case.

13. Are you concerned that UNDP's failure to meet a UNDP social and/or environmental policy or commitment is harming, or could harm, you or your community? Mark "X" next to the answer that applies to you: Yes: No:

14. Would you like your name(s) to remain confidential throughout the Compliance Review process?

90. Mark "X" next to the answer that applies to you: Yes: No:

91. If confidentiality is requested, please state why:

92.

93.

15. Would you like to work with other stakeholders, e.g., the government, UNDP, etc. to jointly resolve a concern about social or environmental impacts or risks you believe you are experiencing because of a UNDP project?

94. Mark "X" next to the answer that applies to you: Yes: No:

16. Would you like your name(s) to remain confidential during the initial assessment of your request for a response?

95. Mark "X" next to the answer that applies to you: Yes: No:

96. If confidentiality is requested, please state why:

17. Requests for Stakeholder Response will be handled through UNDP Country Offices unless you indicate that you would like your request to be handled through UNDP Headquarters. Would you like UNDP Headquarters to handle your request?

97. Mark "X" next to the answer that applies to you: Yes: No:

98. If you have indicated yes, please indicate why your request should be handled through UNDP Headquarters:

18. Are you seeking both Compliance Review and Stakeholder Response?

99. Mark "X" next to the answer that applies to you: Yes: No:

19. Are you unsure whether you would like to request a Compliance Review or a Stakeholder Response? Mark "X" next to the answer that applies to you: Yes: No:

100. Information about the UNDP Project you are concerned about, and the nature of your concern:

20. Which UNDP-supported project are you concerned about? (if known):

21. Project name (if known):

22. Please provide a short description of your concerns about the project. If you have concerns about UNDP's failure to comply with its social or environmental policies and commitments, and can identify these policies and commitments, please do (not required). Please describe, as well, the types of environmental and social impacts that may occur, or have occurred, as a result. If more space is required, please attach any documents. You may write in any language you choose

- …

- …
- …
- …

23. Have you discussed your concerns with the government representatives and UNDP staff responsible for this project? Non-governmental organisations?

101. Mark "X" next to the answer that applies to you: Yes: No:

102. If you answered yes, please provide the name(s) of those you have discussed your concerns with

103. Name of Officials You have Already Contacted Regarding this Issue:

104. First Name	105. Last Name	106. Title/Affiliation	107. Estimated Date of Contact	108. Response from the Individual
109.	110.	111.	112.	113.
114.	115.	116.	117.	118.
119.	120.	121.	122.	123.
124.	125.	126.	127.	128.

24. Are there other individuals or groups that are adversely affected by the project?

129. Mark "X" next to the answer that applies to you: Yes: No:

25. Please provide the names and/or description of other individuals or groups that support the request:

130. First Name	131. Last Name	132. Title/Affiliation	133. Contact Information
134.	135.	136.	137.
138.	139.	140.	141.
142.	143.	144.	145.
146.	147.	148.	149.

150.

151. Please attach to your email any documents you wish to send to SECU and/or the SRM. If all of your attachments do not fit in one email, please feel free to send multiple emails.

152.

153. Submission and Support

154. To submit your request, or if you need assistance please email: project.concerns@undp.org