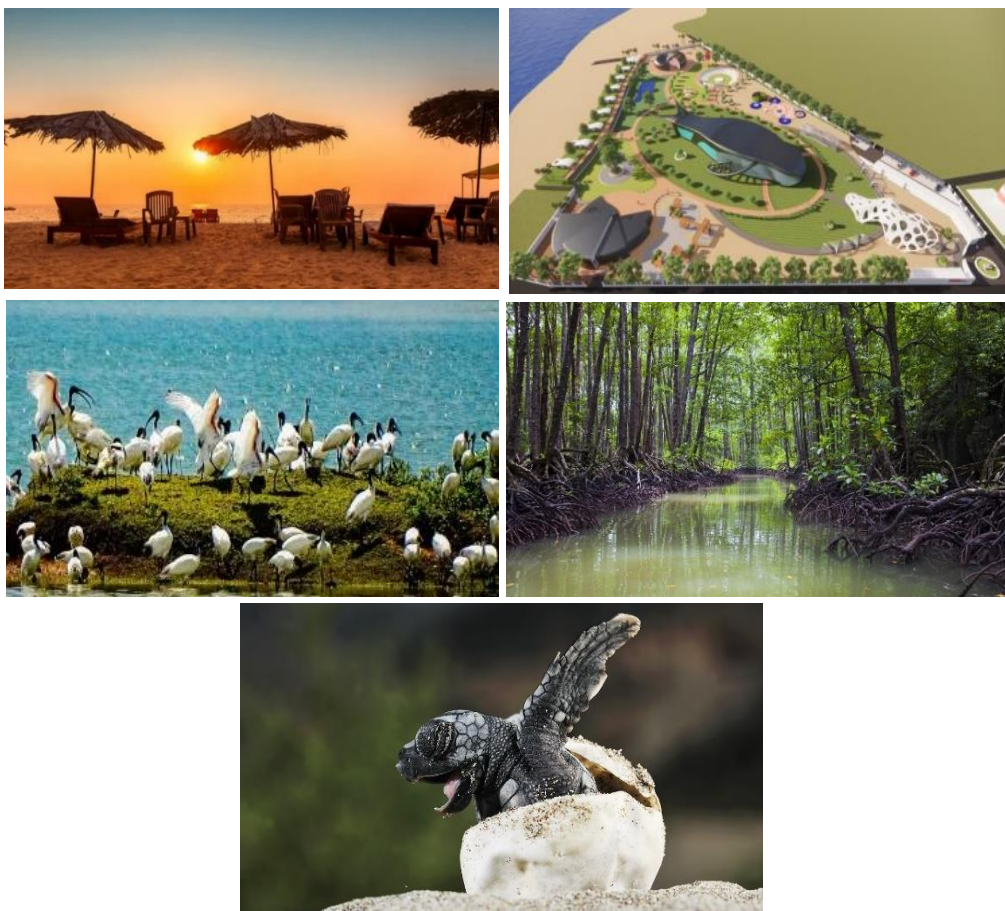


Tamil Nadu – Strengthening Coastal Resilience and the Economy Project (TN-SHORE)



Environmental and Social Management Framework (ESMF)

Tamil Nadu Green Climate Company



Environmental and Social Management Framework for Tamil Nadu Strengthening Coastal Resilience And The Economy Project

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List of Abbreviations

Abbreviation Expansion

AP	Affected Person
ARAP	Abbreviated Resettlement Action Plan
ASI	Archaeological Survey of India
AU	Administrative Unit of Special Project Management Unit
BMC	Biological Management Committees
CBO	Community–Based Organization
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMP	Coastal Management Plan
CPCB	Central and State Pollution Control Board
CPHEEO	Central Public Health & Environmental Engineering Organisation
CPR	Common Property Resources
CTE	Consent to Establish
CTO	Consent to Operate
CVCA	Critically Vulnerable Coastal Areas
CZM	Coastal Zone Management
DCCMSU	District Climate Change Mission Setup
DFOs	District Forest Officers
DI	Depth Interviews
DLC	District Level Committee
DMS	Detailed Measurement Survey
DoECCF	Department of Environment, Climate Change and Forests
DPR	Detailed Project Reports
E&S	Environmental and Social
EbA	Ecosystem-based Approach
ECR	East Coast Road
EDC	Education Development Centre
EHSG	Environmental, Health, and Safety Guidelines
EIA	Environment Impact Assessment
EM	Entitlement Matrix
EPA	Environmental Protection Act
ESA	Ecologically Sensitive Areas
ESF	Environmental and Social Framework
ESCP	Environmental and Social Commitment Plan
ESIA	Environment & Social Impact Assessment
ESMF	Environmental & Social Management Framework
ESS	Environmental and Social Standards
ESDD	Environment and Social Due Diligence
FC	Forest Conservation
FGD	Focus Group Discussion
FI	Financial Intermediaries
FPIC	Free and Prior Informed Consent
GAP	Gender Action Plan
GBV	Gender-Based Violence
Goi	Government of India
GoTN	Government of Tamil Nadu

Abbreviation Expansion

GRC	Grievance Redressal Committees
GRM	Grievance Redress Mechanism
GTNM	Green Tamil Nadu Mission
HH	Households
HPSC	High Powered Steering Committee
IA	Implementing Agency
ICC	Internal Complaint Committee
ICZM	Integrated Coastal Zone Management
ICZMP	Integrated Coastal Zone Management Plan
IEC	Information Education Communication
IMP	Integrated Management Plans
INM	Integrated Nutrient Management
IPM	Integrated Pest Management
IPPF	Indigenous People Planning Framework
JFMCs	Joint Forest Management Committees
LAP	Livelihood Action Plan
LMF	Labour Management Framework
LMP	Labour Management Plan
MCF	Material Collection Facilities
MEPR	Monthly Environment Progress Report
MoEF&CC	Ministry of Environment, Forest and Climate Change
MRF	Material Recycling Facilities
MSP	Marine Spatial Planning
MSDS	Material Safety Data Sheet
NBWL	National Board for Wild Life
NCSCM	National Centre for Sustainable Coastal Management
NCZMA	National Coastal Zone Management Authority
NDMA	National Disaster Management Authority
NGO	Non-governmental Organisation
NO ₂	Nitrogen Dioxide
NOC	No Objection Certificate
NP	National Park
NSDC	National Skill Development Corporation
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
PA	Protected Areas
PAP	Project Affected Person
PF	Protected Forest
PMC	Project Management Consultant
PMGSY	Pradhan Mantri Gram Sadak Yojana
PRA	Participatory Rapid Assessment
PVTs	Particularly Vulnerable Tribal Groups
PMU	Project Management Unit
PWD	Public Works Department
QPR	Quarterly Progress Report
RAP	Resettlement Action Plan
RCC	Regional Cultural Centres

Abbreviation Expansion

RDF	Refused Derived Fuel
RF	Reserved Forest
RPF	Resettlement Policy Framework
RRA	Rapid Rural Appraisal
RRF	Resource Recovery Facility
SBWL	State Board for Wild Life
SC	Scheduled Caste
SCF	Stakeholder Consultation Framework
SCZMA	State Coastal Zone Management Authority
SEA	Sexual Exploitation and Abuse
SEIAA	State Environmental Impact Assessment Authority
SEP	Stakeholder Engagement Plan
SES	Socio-Economic Survey
SH	Sexual Harassment
SHG	Self -Help Groups
SIA	Social Impact Assessment
SM	Social Mapping
SO ₂	Sulphur Dioxide
SPMU	Special Project Management Unit
SPV	Special Purpose Vehicle
ST	Scheduled Tribe
STP	Sewage Treatment Plant
TCPO	Town and Country Planning Organization
TDP	Tribal Development Plan
TNBCA	Tamil Nadu Blue Carbon Agency
TNCCM	Tamil Nadu Climate Change Mission
TNCRM	Tamil Nadu Coastal Restoration Mission
TNGCC	Tamil Nadu Green Climate Company
TNIFMC	Tamil Nadu Infrastructure Fund Management Corporation Limited
TNSCZMA	Tamil Nadu Coastal Zone Management Authority
TN-SHORE	Tamil Nadu Strengthening Coastal Resilience and the Economy Project
TNWM	Tamil Nadu Wetlands Mission
ULB	Urban Local Body
VGAs	Village Grant Agreements
WB	World Bank
WLPA	Wildlife Protection Act
WLS	Wild Life Sanctuary
WPR	Workforce Participation Rate

Executive Summary

The TN-SHORE (Tamil Nadu – Strengthening Coastal Resilience and the Economy Project) program aims to increase the resilience of targeted coastal communities and ecosystems in Tamil Nadu. The program aims to address strengthening institutions for integrated coastal management. Shoreline management, coastal protection and conservation, improving livelihoods for natural resource dependent communities, Enhancing plastic circularity and marine pollution management and Contingent Emergency Response Component (CERC).

Tamil Nadu possesses the third longest coastline of 906 km along the Bay of Bengal uniquely extending into the Arabian Sea, thereby covering east and west coast of India falling in 14 coastal districts viz., Thiruvallur, Chennai, Chengalpattu, Villupuram, Cuddalore, Mayiladuthurai, Nagapattinam, Thanjavur, Pudukkottai, Thiruvarur, Ramanathapuram, Thoothukudi, Tirunelveli and Kanyakumari districts

The coast of Tamil Nadu has 10 out of the 11 Ecologically Sensitive Areas (ESA) listed in the Coastal Regulation Zone (CRZ). Areas falling under Coastal Regulation Zone (CRZ-I) are ecologically sensitive ecosystems, habitats, and geomorphological features. Coastal ecosystem spanning over 540 sq.km includes corals (23.3 sq.km), seagrass beds (398.8 sq.km), saltmarshes (59.4 sq.km) and turtle nesting ground (2.63 sq.km) among the few. Mangroves are extending over 119.1 sq.km can break up storm waves that can exceed 4m in height during cyclones. Geomorphological features along Tamil Nadu coast includes sand dunes and mudflats accounting for 5,868 sq.km, Marine Protected Areas and the Coastal Reserved Forest of 796.16 sq.km.

Recently, the coast of TN is facing degrading severities like coastal erosion (43%), loss of coastal and marine biodiversity (mangroves & coral lost about 17% & 9.7% respectively), plastics & marine litter thereby leading to loss of coastal livelihoods and disruption in coastal ecosystem. These adverse problems have to be swiftly dealt strategically by planning, conserving, restoring and improving the coastal ecosystem.

The SHORE (Strengthening Coastal Resilience and the Economy) Program to be implemented across all the fourteen (14) coastal districts, aims to increase the resilience of targeted coastal communities and ecosystems in India. The following components of SHORE Program correspond to the specific challenges and opportunities and underlying concerns, which the program aims to address.

- (a) **Strengthening institutions for integrated coastal management:** This component aims to enhance the effectiveness and sustainability performance of ICZM tools used by the national and state agencies by expanding the range of technical and management adaptation measures for reducing the vulnerability of coastal ecosystems and livelihoods, as identified in the NCM. This component will finance consulting services, goods, training, and project management costs.
- (b) **Shoreline management, coastal protection and conservation:** This component aims to enhance the ecological sustainability and resilience of the coastal physical and natural assets. Project investments will support interventions for (a) preventing/reducing coastal erosion and its impacts; (b) maintaining the ecological functions of coastal ecosystems and landscapes that deliver protection services to coastal communities from environmental and climate hazards, and (c) strengthening the environmental and ecosystem monitoring systems.
- (c) **Improving livelihoods for natural resource dependent communities:** This component aims to promote climate-resilient and adaptable development in coastal communities. Community livelihood activities with potential to boost community

incomes, promote sustainable use of natural resources, and to enhance the resilience of marine and coastal resources to changing conditions, will be supported.

- (d) **Enhancing plastic circularity and marine pollution management:** This component aims to mitigate the threats to marine and coastal resources from plastic pollution and to reduce the risks of environmental degradation. It will finance location-specific watershed-based activities for reducing plastic leakage and pollution using a “**source to sink**” approach.
- (e) **Contingent Emergency Response Component (CERC):** It will allow the recipient to request the World Bank to reallocate uncommitted project funds, following an eligible crisis or emergency.

Successful implementation of the project will lead to Circular economy & livelihoods, Blue economic growth, Community & official empowerment, Leader in research & development in marine conservation, Premier destination in Eco-tourism, protect our vulnerable communities from adverse impacts, Wetland restoration would increase ecosystem services worth, Mangrove and seagrass act as a major carbon sink, its conservation and restoration would further reduce the carbon footprints.

The other expected project outcomes envisaged for the project are Circular Economy would create 50,000+ families with new livelihood options with recycling centres, the blue economic growth would contribute to 30% revenue increase, impacting 10 million+ people and significantly contribute to GDP, Community and official empowerment would result in 500 trained officials, educate people through workshops for sustainable coastal management and create climate smart villages, Coastal resilience and ecosystems would enhance the quality of life of coastal residents, 5000 hectares of mangrove and seagrass ecosystem restoration and 200 km of coastline rehabilitation, Pollution abatement would cause 5 million local and tourists enjoy cleaner coasts, 20,000 kg/day plastic waste elimination in Chennai and create more blue flagged beaches & clean-up events.

In order to protect the coastal resources and to harness the ocean resources in a sustainable way, the Environmental & Social Management Framework (ESMF) is a mandatory document as per the World Bank Safeguard Policy. A summarised purpose of the ESMF is as follows:

- To establish a framework for assessment and management of E&S risks and impacts in accordance with applicable national and state laws and as per ESS of WB-ESMF.
- To mainstream E&S issues in the planning and implementation stages of various types of sub-projects.
- To provide a framework for the project, it shall disclose information and engage with various types of stakeholders to elicit their participation and support.
- To develop a RPF for identifying and managing adverse social impacts.
- To develop institutional framework for implementation, monitoring and evaluation and for redressal of grievances.
- To plan for Capacity Building (CB) and training as required for the stakeholders.
- To ensure appropriate provisions are included in the various bid/contract stage documents planned to be prepared for the project.

Since, the proposed activities are spread along the entire coast of TN, Strategic project locations representing three districts namely Kanniyakumari, Nagapattinam and Chennai districts which are located geographically at the bottom, middle & top of

coastal TN have been visited to appraise on baseline conditions and assess preliminary risks and impacts associated with the proposed project activities.

The preparation of the ESMF report entailed field visits, team discussions with TNGCC, District Forest Officers (DFOs), staff from Range, fisheries/agriculture department and taking environment and social experts' support. Meaningful Focus Group Discussion (FGD) with coastal people to understand their problem & stakeholder consultations are carried out in a participative manner, involving identified stakeholders like staff of Implementing Agencies, state level Departments, Self-Help Groups (SHG), citizens of select villages (youth, women, elderly), representatives from traditional councils, and vulnerable communities.

The preparation of the ESMF commenced with initial site visits and a comprehensive review of available information, data, and documents, including project appraisal documents, draft project implementation plans and other E&S documents. National and State regulatory requirements, as well as policies and safeguard standards of the World Bank, were assessed for applicability.

The baseline environmental and social data has been collected from several available primary and secondary sources including the Census of India, Central and State Pollution Control Board (CPCB), MoEF&CC, India Meteorological Department, various studies and publications as available in the public domain. Primary data on water, air & marine data were collected & tested for the dip-stick samples collected at 3 districts viz., Chennai, Cuddalore & Ramanathapuram. The above data collection describes the characteristics of coastal Tamil Nadu in terms of physiography, climatic and atmospheric conditions, air, noise, soil, water and marine water quality, sediment quality, marine ecology and socio- economic environment and overall background of the Coastal districts of Tamil Nadu.

The LU/LC study reveals the built-up area was noticed in and around major towns of the coastal districts. The wetlands are observed in river creeks and coastal areas. Moderate dense forest noticed were in the Thiruvallur, Chengalpattu, Villupuram, Cuddalore, Thanjavur, Tirunelveli and Kanniyakumari districts. Also, open forest covers all coastal districts of Tamil Nadu. Overall, Kanniyakumari district is dominating the forest cover of 59% from its total geographical area. There are about 99 ESA site falls in Tamil Nadu and the details like coordinates, type of sensitive area and RAMSAR site.

The generic baseline data pertaining to air, water and marine samples had been collected from three districts namely Kanniyakumari (Thiruvananthapuram), Nagapattinam and Chennai which represents fourteen coastal districts of Tamil Nadu where TN – SHORE projects are planned. The climate of Tamil Nadu is essentially tropical. The results are found to be equivalent to other coastal areas of Tamil Nadu.

Laws, regulations and policies of GoI, GoTN and the World Bank pertaining to the TN-SHORE Project are taken into account. This shall be kept in dynamic condition and shall be updated as and when new laws, regulations and policies are implemented and enforced or the existing ones are amended. Applicable laws, regulations and policies have been considered for effective management of environmental and social aspects.

Applicability of the World Bank Environmental and Social Framework

The Environmental and Social Management Framework (ESMF) of the World Bank has been effectively utilized in the TN-SHORE to comprehensively evaluate, handle, and mitigate any potential risks linked to the direct, indirect, and cumulative impacts associated with project activities. With the exception of ESS9, which is not applicable due to the absence of a financial intermediary's involvement, all other ESSs are relevant and applicable to the TN-SHORE project. In order to address the environmental and social risks, social risk management instruments have been developed, including Environmental and Social Management Framework, Environmental and Social Management Plans, that envisage preparation of other management plans such as SEP, Gender & GBV Action Plan, RPF, TDF and LMP are detailed out. These instruments are designed to ensure proper management and mitigation of the identified risks and impacts within the project's scope.

Environmental and Social Risks Assessment (E&S)

The overall E&S risk rating is categorized as Substantial. A majority of the targeted interventions are small to moderate scale, largely community-driven and nature-based, with limited physical footprint. Select grey coastal protection interventions, expected to be moderate scale, will be implemented only in areas with severe coastal erosion problems and will be informed by Shoreline Management Plans. Thus, risks and impacts are anticipated to be localized, manageable and reversible.

The Environmental Risk Rating is assessed to be Substantial mainly due to risks like are (i) Increased access to ecologically- sensitive areas while implementing the management plans for these ecosystems, (ii) Short term pollution-related impacts while undertaking civil works to build/rehabilitate/expand waste-management/ erosion-control infrastructure, (iii) Sourcing of materials for plantation and implementing soil and water conservation and erosion control measures in environmentally-sensitive areas and (iv) Installation of engineering solutions (like flow traps, chutes) in hotspots of rivers and estuaries, to control plastic inflow into the sea.

The potential risks and impacts can be avoided and reduced through screening of sub-projects to avoid sensitive areas, hotspots and no-go areas and to improve the subproject design to minimize risks and impacts, embedding of strategic E&S, timely implementation of mitigation measures, where avoidance and minimization, are not possible; and a robust coordination and monitoring mechanism.

The project is expected to socially benefit low-income households and community groups directly and indirectly through livelihood support, incentives for entrepreneurship, technology transfers, and enhanced coastal infrastructure, through project interventions on coastal zone management, strengthening plastic-value chain and enhancing blue economy opportunities (eco-tourism, aquaculture, fisheries, afforestation). The improved livelihoods and employment opportunities will have positive spillovers for community members not directly supported through project interventions. Self-help groups, especially those led by women, will be key beneficiaries. Mangrove plantations and rehabilitation work will be carried out by the local community thus generating additional employment opportunities. However, inclusion and equity issues may remain a concern in accessing the benefits of the project. Some activities such as construction, plantation, restoration, etc. might have private or public land needs. The establishment of mangrove plantations and building of small infrastructure to the extent possible will be carried out on public land.

Structures, such as street vendor stalls, may need to be moved or relocated for implementation of projects such as restoration of natural coastal resources. Fences may need to be erected to protect coastal resources which could block access to people's lands or public spaces like part of a beach. Temporary displacement of vendor stalls/small businesses/ small informal establishments such as fisherman hut/informal fish landing sites/ women vendors may have adverse impacts with regards to access; loss of livelihood and security of the concerned people. Vendors or small businesses removed or displaced from their original locations may be unable to return to these once they have been rehabilitated, thus facing loss of income. The scope of construction works expected would not result in significant influx.

Consistent with the requirements of ESS 4 relating to security risks, TNGCC as part of the preparation of Detailed Project Reports (DPRs), will undertake consultations with communities in the area to elicit their concerns, if any, and the forest officials (range officer and forest guards); and the summary of these consultations will be recorded in the DPRs. Based on this, commensurate measures of orientation and training will be listed in the ESMPs (embedded in the DPR).

Identification of Environmental & Social Impacts, Risks & its mitigation measures

The criteria for determining significance are generally specific for each environmental and social aspect but generally, the magnitude of each potential impact is defined along with the sensitivity of the receptor. It is evident that most of the TN-SHORE Project Activities falls within Low to Moderate, while some activities are categorised as substantial. It is observed from the analysis that component 3,4 and 5 mainly falls in Low to Moderate.

The overall the activities are rated as 'Substantial' due to

- I. Geographical setting of the project in different landscapes/watersheds covering a large costal stretch and
- II. The weak capacities of the district and village level implementing & monitoring agencies on understanding, identifying and mitigating environmental risks and impacts;
- III. Exposure of workers and communities to health and safety hazards from the civil works and human-marine animal life conflict;
- IV. Temporary restriction or limitations on accessing project area resources, conserved areas which may have temporary impact on livelihood. However, physical displacement of fisherman communities, and any vulnerable groups which are closer to the project and their households or any adverse impacts on customary lands, and cultural properties is not anticipated due to the project activities as they are planned to avoid these areas.

The potential environmental & social risks of the project are envisaged to be temporary, localized, predictable, manageable, reversible and can be readily mitigated as project activities are largely small to medium scale and mostly driven by the mitigate measures planned already.

Construction activities are proposed for all projects under TN-SHORE wherein, land requirements will be served by sourcing government owned land or government

poramboke¹ land. In case any project requires private land acquisition, then small scale lands shall be met through public or community owned land (and will be a part of the site selection criteria). The impacts due to construction activities will be inevitable, but can be greatly managed through following proper ESMP's and will be largely reversible. Some project villages have the presence of multi-ethnic communities. To manage capacity gaps on participatory processes, major impetus on TN-SHORE Project as well as village level community institutions and collectives on approaches and methods for community mobilization, vulnerability mapping, participatory planning and social inclusion, supporting preparation and roll out of a robust stakeholder engagement strategy and staffing the SPMU with domain expert specialists e.g. community engagement & participatory planning), in addition to Social Development Specialists. The project will also engage full time environmental experts to bridge the gap in assessing and managing risks, strengthening community institutions, involving various stakeholders right from the planning process to implementation and management of project and sub-projects thereby the overall impact will be negligible or net positive.

The SEA/SH risk is assessed as moderate (using the SEA/SH risk assessment tools for social protection and civil works projects). Since the scale of construction is limited, the risk of labour influx for the host population related to SEA/SH related risks is expected to be minimal. The laws against SEA/SH are to be followed at community, block, village, district and state level to prevent these types of impacts.

Application of Environmental and Social Management Framework

The ESMF has been developed for use by all PIAs. A step-by-step methodology has been provided that can be followed along with engineering and institutional interventions required for the sub-project activities.

Application of ESMF will vary by nature of activities i.e.

A. Works: Hard infra (e.g. turtle conservation centres, Dugong conservation centre or MRFs) or Environment friendly interventions (Wetland Conservation & Restoration, degraded wetlands, etc.)

B. Goods: Procurement of trash barriers for plastic management, manjappai (yellow bag)

C. Engagement initiatives: e.g. Blue flag beaches or plastic circularity advancing Meendum Manjappai, Fish Net Collection and Incentivization Programme, Beach Cleanups, Mainstreaming Rag pickers, etc.

D. Studies: e.g. Strengthening Coastal Management through Integrated Coastal Zonal Management (ICZM)

ESMF will be applied to the overall project through a four-stage process as described below:

- Stage I: Subproject Assessment and Analysis-ES Screening,
- Stage II: Subproject Formulation and Planning- ES instruments preparation,
- Stage III: ES Implementation, Monitoring and Reporting and
- Stage IV: Review and Evaluation of ES completion.

¹ Poramboke land is a type of government land that cannot be used for private purposes, including agriculture or housing. The term is derived from the Tamil word "poramboku," which means waste or useless. Poramboke land can be used for public purposes, such as roads, canals, and water bodies¹²³.

Updation of the ESMF

This ESMF will be a "live document" and can be revised as and when needed to fulfil the needs of the nation's laws and the Bank ESF, unexpected scenarios and/or changes in the project. The subcomponent design would thus be evaluated, and suitable management measures would be integrated by upgrading the Framework. Any updates to the legal or regulatory framework of the nation or state will likewise be covered by these adjustments. Additionally, the laws and procedures would be modified as necessary in conjunction with the World Bank and the implementing agencies/departments based on the application and implementation experience of this framework. The modified ESMF's finalized version will be sent to the WB for review and approval.

Stakeholder engagement and public disclosure

Consultations were conducted as an integral part of the TN-SHORE project to gather valuable insights and engage multiple stakeholders. The consultations aimed to discuss environmental and social issues, identify community needs, and align project interventions accordingly. Stakeholders consulted include members of Self Help Groups, DFO, Fisheries Department, community people etc. Overall findings revealed strong support for the project, with stakeholders emphasizing the importance of disseminating detailed project information, improving connectivity, providing local employment opportunities, and addressing the specific needs of local communities.

Information disclosure

Project related information shall be disclosed through website of TNGCC. The PMU/PIU and other associated line departments shall provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected persons and other stakeholders. For illiterate people, other suitable communication methods will be used.

. A concise executive summary of project and draft ESMF report (in Tamil (local language)), providing all necessary details of proposals, implementation arrangements, project locations, likely issues and mitigation, and monitoring measures and grievance redress mechanism, is made available to the stakeholders. During project implementation, relevant information about any major changes to the project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

The following reports shall be made available on the website of TNGCC and the offices of PMU, PIUs, State and District Libraries, Local municipal and gram panchayat office and other public places for public reference and shall also be uploaded on respective websites:

1. Summary of ESMF (in Tamil (vernacular language) and English)
2. ESMF Report (in English)

All relevant project information will be translated into Tamil (vernacular language) and will be disclosed to the public through the Panchayat, District Magistrate's office, concerned project offices, websites of PMU.

1. INTRODUCTION

General

Coastal and maritime space of India are essential for achieving sustainable economic development. They provide inputs to India's blue economy sectors such as tourism, fisheries, agriculture, transport, mining, and services. India has embarked on a mission to capture the huge growth potential of the coastal and marine resources through their optimal utilization and protection. Endowed with abundant natural resources and biodiversity of global significance, India's coastal and marine ecosystems provide multiple national, local, and global benefits. The coastline, which stretches over 7500 km, is home to 250 million people and 18,000 known species of flora and fauna. Mangroves, sand dunes, coastal wetlands, coral reefs, mudflats, and reserved forests provide important ecosystem services, support disaster risk reduction and mitigation functions, improve livelihoods and provide economic benefits.

Despite ecological richness and contribution to the national economy, India's coastal ecosystems continue to deteriorate. Many economic activities along the coast overlap and lead to competing demands between users and adversely impact coastal ecosystems and diminishing their value. Pollution, intensive commercial fishing, and development pressure, climate-induced weather extremes and coastal erosion make ecosystem-dependent communities particularly vulnerable. Coastal states continually experience human and natural pressures and the adverse impacts of climate change. They are highly exposed to climate hazards that include cyclones and rising sea levels, bringing floods and erosion, which in turn, inflict a great loss of lives and livelihoods, especially among the mostly impoverished coastal communities.

Project Description

The SHORE (Strengthening Coastal Resilience and the Economy) Program aims to increase the resilience of targeted coastal communities and ecosystems in India. The following components of SHORE Program correspond to the specific challenges and opportunities and underlying concerns, which the program aims to address.

- (f) **Strengthening institutions for integrated coastal management:** This component aims to enhance the effectiveness and sustainability performance of ICZM tools used by the national and state agencies by expanding the range of technical and management adaptation measures for reducing the vulnerability of coastal ecosystems and livelihoods, as identified in the NCM. This component will finance consulting services, goods, training, and project management costs.
- (g) **Shoreline management, coastal protection and conservation:** This component aims to enhance the ecological sustainability and resilience of the coastal physical and natural assets. Project investments will support interventions for (a) preventing/reducing coastal erosion and its impacts; (b) maintaining the ecological functions of coastal ecosystems and landscapes that deliver protection services to coastal communities from environmental and climate hazards, and (c) strengthening the environmental and ecosystem monitoring systems.
- (h) **Improving livelihoods for natural resource dependent communities:** This component aims to promote climate-resilient and adaptable development in coastal communities. Community livelihood activities with potential to boost community incomes, promote sustainable use of natural resources, and to enhance the resilience of marine and coastal resources to changing conditions, will be supported.
- (i) **Enhancing plastic circularity and marine pollution management:** This component aims to mitigate the threats to marine and coastal resources from plastic pollution and to reduce the risks of environmental degradation. It will finance location-specific watershed-based activities for reducing plastic leakage and pollution using a “**source to sink**” approach.

- (j) **Contingent Emergency Response Component (CERC):** It will allow the recipient to request the World Bank to reallocate uncommitted project funds, following an eligible crisis or emergency.

Characteristics of the project location

Tamil Nadu is the southernmost state of India. Located on the south-eastern coast of the Indian peninsula, Tamil Nadu is straddled by the Western Ghats and Deccan Plateau in the west, the Eastern Ghats in the north, the Eastern Coastal Plains lining the Bay of Bengal in the east, the Gulf of Mannar and the Palk Strait to the south-east, the Laccadive Sea at the southern cape of the peninsula and the state is divided into 38 districts. Figure 1-1 shows the location of Tamil Nadu in the Indian Map and its geographical boundary.

Tamil Nadu possess the third longest coastline of 906 km along the Bay of Bengal uniquely extending into the Arabian Sea, thereby covering east and west coast of India falling in 14 coastal districts viz., Thiruvallur, Chennai, Chengalpattu, Villupuram, Cuddalore, Mayiladuthurai, Nagapattinam, Thanjavur, Pudukkottai, Thiruvarur, Ramanathapuram, Thoothukudi, Tirunelveli and Kanyakumari districts which are shown in Figure 1-1.

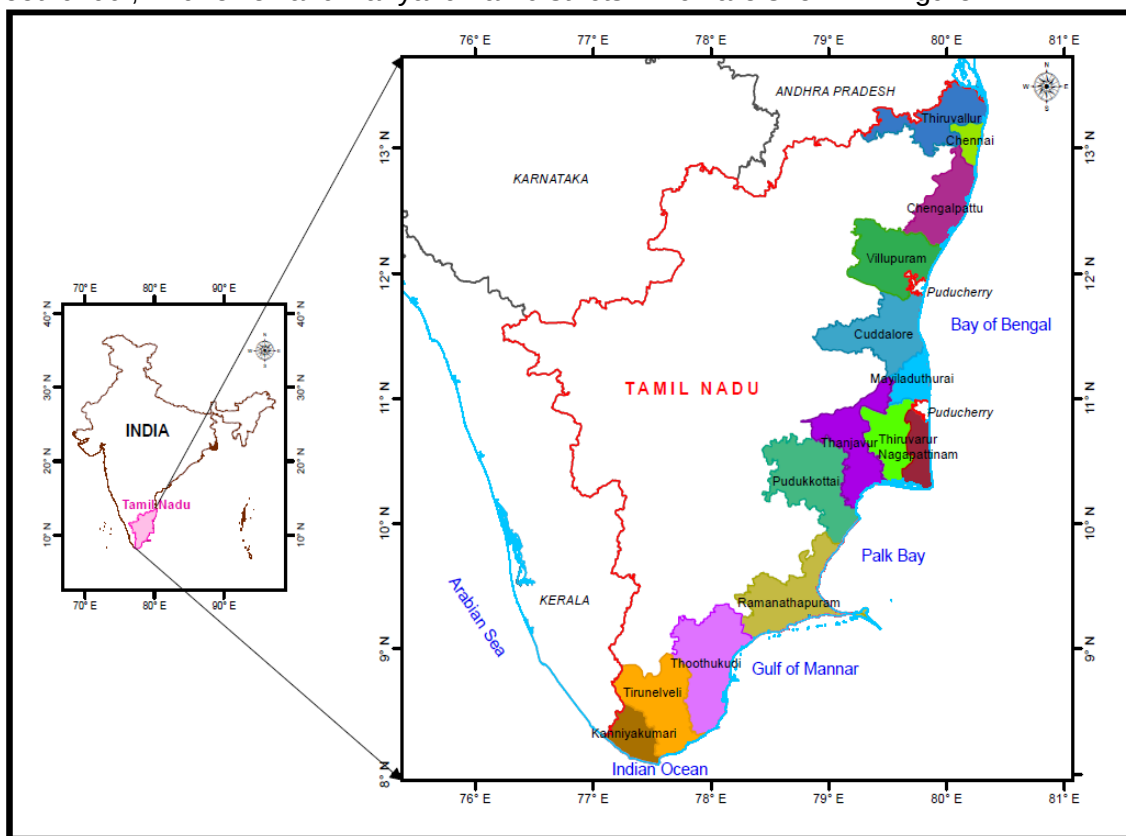


Figure 1-1 Location map of the study area

The coast of Tamil Nadu has 10 out of the 11 Ecologically Sensitive Areas (ESA) listed in the Coastal Regulation Zone (CRZ). The ESA of Tamil Nadu includes the large stands of mangroves of Pichavaram and Muthupet; the biosphere of Palk Bay and Gulf of Mannar in the south. On the other hand, Pulicat being the second largest coastal lagoon is spread over Tamil Nadu and Andhra Pradesh in the north.

This coastal strip also houses 160 small and big beaches. Areas falling under Coastal Regulation Zone (CRZ-I) are ecologically sensitive ecosystems, habitats, and geomorphological features. Coastal ecosystem spanning over 540 sq.km includes corals (23.3 sq.km), seagrass beds (398.8 sq.km), saltmarshes (59.4 sq.km) and turtle nesting ground (2.63 sq.km) among the few. Mangroves extending over 119.1 sq.km can break up storm

waves that can exceed 4m in height during cyclones. Geomorphological features along Tamil Nadu coasts include sand dunes and mudflats accounting for 5,868 sq.km, Marine Protected Areas and the Coastal Reserved Forest of 796.16 sq. km.

The fragile yet highly productive coastal ecosystems of TN is under increasing stress due to rapid urbanization and development needs. Coastal TN best exemplifies the 'Development versus Environment' conundrum. This area of interaction between the terrestrial and marine process faces a high concentration of population, exploitation of renewable and non-renewable natural resources, solid waste, discharge of industrial effluents and municipal sewage from upland sources, marine plastic, and oil pollution. Due to the aggressive development, it witnessed over the past half-century, today; Tamil Nadu's 906 km coastline hosts 5.3 percent of its total population distributed in 14 coastal districts. Coastal development in India is best explained by the existence of a large number of coastal cities, including one megacity Chennai and many coastal towns. Change in land uses to accommodate industrialization, urban uses, fishing harbors, and recreational activities cause alterations along the water edge with resultant erosion/accretion. Various land uses and activities are vying for coastal space with resultant degradation of coastal zones and associated ecosystems. Degradation and fragmentation of coastal ecosystems have negative implications for coastal communities who are dependent on these for their livelihoods.

Recently, the coast of TN is facing degrading severities like coastal erosion (43%), loss of coastal and marine biodiversity (mangroves & coral lost about 17% & 9.7% respectively), plastics & marine litter thereby leading to loss of coastal livelihoods and disruption in coastal ecosystem. These adverse problems have to be swiftly dealt strategically by planning, conserving, restoring and improving the coastal ecosystem.

The rich repository of biodiversity, forest, coastal and marine habitats that provide important ecosystem. The TN coastal region is one of the highest contributors to fisheries production in India, which in turn contributes the economy as a major source.

Project beneficiaries

Successful implementation of the project will lead to

- Circular economy & livelihoods,
- Blue economic growth,
- Community & official empowerment,
- Leader in research & development in marine conservation,
- Premier destination in Eco-tourism,
- Protect our vulnerable communities from adverse impacts,
- Wetland restoration would increase ecosystem services worth,
- Mangrove and seagrass act as a major carbon sink, its conservation and restoration would further reduce the carbon footprint.

The other expected project outcomes envisaged for the project are;

- The Circular Economy & Livelihoods would create 50,000+ families with new livelihood options with recycling centres,
- The blue economic growth would contribute to 30% revenue increase, impacting 10 Million+ people and significantly contribute to GDP,
- Community and official empowerment would result in 500 trained officials, educate people through workshops for sustainable coastal management and create climate smart villages,
- Coastal resilience and ecosystems would enhance the quality of life of 10 Million+ residents, 5000 hectares of mangrove and seagrass ecosystem restoration and 200km of coastline rehabilitation,

- Pollution abatement would cause 5 Million local and tourists enjoy cleaner coasts, 20,000 kg/day plastic waste elimination in Chennai and create more blue flagged beaches & clean-up events.

The above points are some of the project outcomes anticipated due to the proposed project. In addition, the entire project would improve the living standards of the coastal people, conserve and protect coastal biodiversity resulting in net positive effect towards green ecosystem.

Need and purpose for ESMF

The project design of TN-SHORE subsumes good environmental and social management. It is designed to promote the best environmental and social practices for the coastal space and has an inbuilt planning component; with a strong base on studies and research. Key subprojects has been identified on the basis of TNGCC's recommendation to GoTN. Those activities which are unavoidable in the coastal space; and are most beneficial to the environment are phased for immediate implementation. Project activities considered relate to improving the coastal environment; leveraging the concepts of resource efficiency. ESMF would be applicable to the 14 coastal districts where the projects are planned.

Depending on the nature and location, the project initiatives such as coastal protection measures waste management, development of infrastructure facilities for livelihood support are likely to result in positive and negative impacts on the project area during their construction and O&M phases. These impacts would assume importance when the project locations are in proximity to sensitive areas. Hence, there is a need for systematic safeguards management with a pre-defined framework for risk mitigation.

ESMF is an instrument that examines the E&S issues and impacts associated when a project consists of a program and/or series of sub-projects, and the impacts cannot be determined until the program or sub-project details have been identified. The ESMF presents principles, guidelines and procedures to screen, assess, approve, manage and monitor the mitigation measures of environmental and social impacts of the project activities/subprojects during the planning stage itself.

As all project locations are not finalized, it is pertinent to identify and manage associated environmental & social risks due to the project/components, it is required to prepare an ESMF for the project. This ESMF covers the World Banks Environmental and Social Standards ESS1 to ESS10 and provides a comprehensive understanding of potential effects on the environment and local communities.

In order to protect the coastal resources and to harness the ocean resources in a sustainable way the Environmental & Social Management Framework (ESMF) is mandatory document as per World Bank safeguard policy. To achieve this, M/s. TNGCC has retained M/s. ABC Techno Labs India Pvt. Ltd., as a consultant to prepare the ESMF for TN-SHORE project. The summarised purpose of the ESMF is as follows,

- To establish a framework for assessment and management of E&S risks and impacts in accordance with applicable national and state laws and as per ESS of WB ESF.
- To mainstream E&S issues in the planning and implementation of various types of sub-projects.
- To provide a framework by project shall disclose information and engage with various types of stakeholders to elicit their participation and support.
- To develop a RPF for identifying and managing adverse social impacts.
- To develop institutional framework for implementation, monitoring and evaluation and for redressal of grievances.
- To plan for Capacity Building (CB) and training
- To ensure appropriate provisions are included in the various bid/contract stage documents.

Methodology of ESMF Report

The preparation of the ESMF report entailed field visits, team discussions with TNGCC, District Forest Officers (DFOs), staff from Range, fisheries/agriculture department and taking environment and social experts' support. Meaningful Focus Group Discussion (FGD) with coastal people to understand their problem & stakeholder consultations are planned to be carried out in a participative manner, involving identified stakeholders like staff of Implementing Agencies, state level Departments, Self-Help Groups (SHG), citizens of select villages (youth, women, elderly), representatives from traditional councils, and vulnerable communities.

The preparation of the ESMF commenced with initial site visits and a comprehensive review of available information, data, and documents, including project appraisal documents, draft project implementation plans and other E&S documents. National and State regulatory requirements, as well as policies and safeguard standards of the World Bank, were assessed for applicability. To understand the role of other departments, regular consultations are planned to be held with various agencies involved for the proposed SHORE project.

Since, the proposed activities are spread along the entire coast of TN, strategic project locations representing three districts namely Kanniyakumari, Nagapattinam and Chennai districts which are located geographically at the bottom, middle & top of coastal TN have been visited to appraise on baseline conditions and assess preliminary risks and impacts associated with the proposed project activities.

Typically, ESMF includes the following:

1. Brief description of project components including description of type of activities eligible for financing,
2. ESMF screening procedures (criteria, process, environmental and social due diligence process, ESIA/ESMP documentation),
3. Understanding of applicable policies & procedures for conducting Environmental & Social assessment,
4. Operating requirements (diagnosis of legal and institutional framework, applicable safeguards),
5. Environmental/social baseline,
6. Implementation arrangements,
7. Public/ stakeholders consultation and disclosure process/procedures,
8. Environmental & social management & mitigation measures for the project covering issues raised during consultation,
9. Monitoring and reporting arrangements against ESS,
10. Grievances redressal mechanism
11. Training and capacity building recommendations and
12. Various Guidelines, Indicative ESMPs, Monitoring Formats, etc.



2. ENVIRONMENTAL AND SOCIAL BASELINE

General

The baseline environmental and social data has been collated from several available secondary sources including the Census of India, Central and State Pollution Control Board (CPCB) datas, MoEF&CC, India Meteorological Department, various studies and publications as available in the public domain. Primary data on water, air & Marine data were collected & tested by M/s. ABC Techno Labs India Pvt Ltd, Chennai for the dip-stick samples collected at 3 districts viz., Chennai, Cuddalore & Ramanathapuram. This section describes the baseline characteristics of coastal Tamil Nadu in terms of physiography, climatic and atmospheric conditions, air, noise, soil, water and marine water quality, sediment quality, marine ecology and socio- economic environment. In order to have overall background view of the Coastal districts of Tamil Nadu.

Location and Geography

The project location falls in southern part of India and is bordered by Kerala to the west, Karnataka to the northwest, Andhra Pradesh to the north, the Bay of Bengal to the east and the Indian Ocean in the south. Tamil Nadu is the eleventh largest state in India and covers an area of 1,30,058 km². Tamil Nadu is the only state in India which has both the Western Ghats and the Eastern Ghats mountain ranges which meet at the Nilgiri hills. The Western Ghats dominate the entire western border with Kerala, effectively acting as a barrier between two states. The eastern part of Tamil Nadu are fertile coastal plains. The northern parts are a mix of hills and plains. The central and south-central regions are arid plains. The coastal area of Tamil Nadu divided into 14 districts which shown in Figure 2-1. The TN - SHORE project is applicable to these 14 districts and the proposed project components/activities may fall either on the seashore or interior of the coastal districts.

Coastal Morphology of Tamil Nadu

The coastal stretch is very unique by its varied morphological formation and a kind of exposure to either Indian ocean, Gulf of Mannar, Palk Bay or Bay of Bengal. The classification shows that it comprises of about 57% sandy beach, 38% mudflats and 5% rocky coast. The coastal processes happening along the Tamil Nadu coast is markedly variable according to the geographical location.

Tamil Nadu coast is shaped with bed rocks, hill promontories, pocket beaches, long beaches, low and raised sand dunes, wide accumulation of coastal alluvium, offshore rocks, Coral Islands, sand hills, bays, tidal flats, tidal swamps, marshy land, salt pan, near shore and offshore submerged reef, tidal rivers, tidal inlets, estuaries, creeks, spits, sand bars, sea grass beds, pearl banks, sea weed beds, mangrove forests, brackish water lakes, canal nested with rivers and creeks. The diversified classification is owed due to the presence of Sri Lankan Island and the peninsular formation exposed to different seas namely Indian Ocean and Bay of Bengal.

The segment from Neerody in the west and Chennai in the north is divided into 9 parts as shown in the table 2-1 according to the sea condition. The entire Tamil Nadu coast had the brunt of devastation during 2004 tsunami. Most of the estuaries are occupied by rich mangroves. Their presence is very densely observed at Manarkudy, Punnaikkayal, Devipatnam to Kodiakkarai, Muthupet, Cuddalore, Pichavaram, Kaluveli, Muttukadu, Ennore, and Pulicat Lake. The coastal morphological map of TN is shown in Figure 2-1.

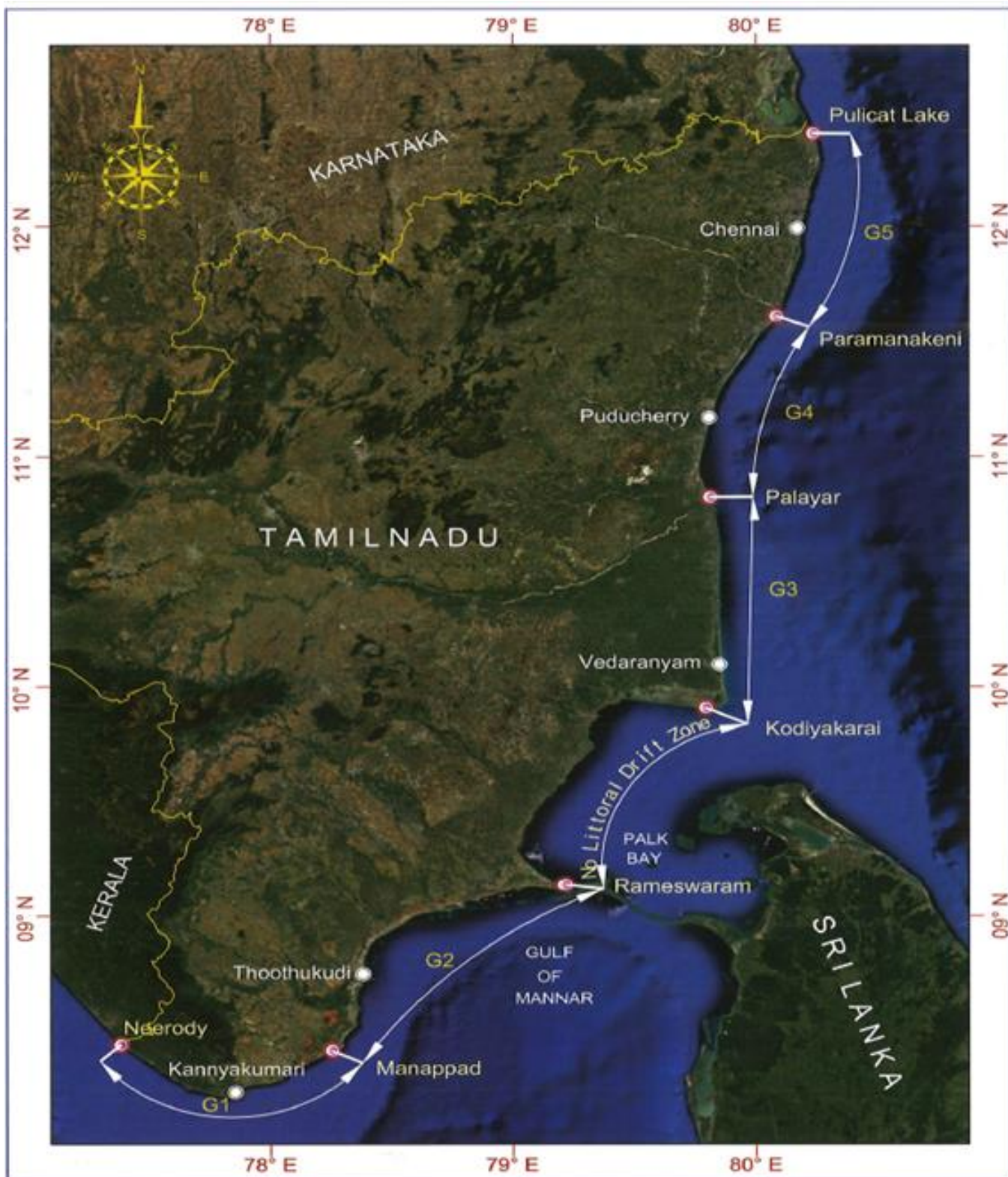


Figure 2-1 Coastal Morphological Map of TN

Table 2-1 Coastal segment of Tamil Nadu

Coastal stretch	Major feature
Neerody to Kanniyakumari (Indian ocean – west coast)	➤ Rocky coast ➤ Western coast of Tamil Nadu
Kanniyakumari to Thoothukudi (Indian ocean – east coast & Outer Gulf of Mannar)	➤ Rocky coast ➤ Direct influence of Indian ocean
Thoothukudi to Mandapam (Inner Gulf of Mannar)	➤ Intertidal bedrocks ➤ Tuticorin V.O.C. Major Port ➤ Offshore islands ➤ Coral reefs ➤ Coastal landforms
Mandapam to Dhanuskodi (Gulf of Mannar at south & Palk bay at north)	➤ Rameswaram Island ➤ Shallow near shore ➤ Offshore islands ➤ Pamban Pass and Pamban Port ➤ Backshore dunes and sandy beaches
Mandapam to Devipatnam (Southern end of Palk Bay)	➤ Calm and shallow Palk Bay ➤ Seaweed & sea grass ecosystem ➤ Littoral drift sink
Devipatnam to Vedaranyam (PalkBay)	➤ Calm and shallow Palk Bay ➤ Seaweed & sea grass ecosystem ➤ Littoral drift sink
Vedaranyam to Puducherry (Southern end of east coast exposed to Bay of Bengal)	➤ Bay of Bengal Sea front ➤ Exposed to cyclonic activities ➤ Stable, accreting and eroding beach
Puducherry to Mahabalipuram (Bay of Bengal)	➤ Eroding and stable coast ➤ Mahabalipuram shore temple
Mahabalipuram to Pulicat lake (Bay of Bengal)	➤ Marina Beach ➤ Chennai Port & Ennore Port

The above 9 types of coast are merged into 3 types of coast according to the morphology and to suit ESMF studies and the uniqueness namely (i) Coromandel Coast, (ii) Palk Bay Coast and (iii) Gulf of Mannar (including kanniyakumari coast).

Coromandel Coast

The area from Pulicat Lake to Vedaranyam forms the Coromandel Coast. The stretch between Vedaranyam and Puducherry along the extreme south of the east coast bordering Bay of Bengal is protected from the waves generated by the southwest monsoon due to the presence of Sri Lankan Island. The littoral drift coming from the north along the east coast reach get deposited between Nagapattinam and Vedaranyam. The near shore seabed between Kodiyakarai and Velankanni is extremely shallow. The stretch between Puducherry to Chennai is present with long Buckingham Canal running parallel to the shoreline interconnecting various creeks, lagoons and bays. The coastline from Marakkanam to Mugaiyur remains stable with well elevated rows of sand dunes and the landfall is filled with marine sediments up to 2 - 3 km inland. Mahabalipuram to Pulicat Lake coastline is comprised of long and straight sandy beach exposed to open sea with elevated backshore and dune vegetation and thickly populated covered by port, tourist spots and historical monuments. The coastal region is backed up with wide sand dunes up to 500 m distance inland.



Pulicat lake to Mahabalipuram



Mahabalipuram to Puducherry



Puducherry to Vedaranyam

Figure 2-2 Photographs of Coromandel Coast

Palk Bay Coast

The area from Vedaranyam to Mandapam forms the Palk Bay Coast. The coast from Mandapam to Devipatnam is 40 km long and it forms the southern side of the Palk Bay. The near shore is very shallow and formed as the extension of calcareous reef from Rameswaram Island through Pamban Pass. Devipatnam to Vedaranyam is very unique due to its presence along the shallow Palk Bay and against wave's protection offered by the Sri Lankan Island. The near shore is deposited with silt and clay and the coastline is absence of sandy beaches. Due to the low landform, the tidal ingress into the land is more leading to the presence of large salt pans.

Gulf of Mannar Coast

Although the area from Mandapam to Thoothukudi is called Gulf of Mannar & the area from Thoothukudi to Neerody is called Kanniyakumari Coast. For the ESMF preparation of TN-SHORE Project, the coastal stretch from Dhanuskodi to Kanniyakumari is considered as Gulf of Mannar to reduce the variables. There are number of coral banks and islands present in Gulf of Mannar. Beach is very flat and narrow between Tuticorin and Sippikulam. Offshore islands via Pandian Island, Van Island, Kasuvari Island, Vilangu Shuli Island and Kariya shuli Islands are present within 5 km distance from the coastline along this segment and offer protection from wave action. The backshore of this coastal segment largely consists of salt pans. The Vaippar River joins Gulf of Mannar near Sippikulam. An extensive coastal lowland is seen between Sippikulam and Vembar. Mandapam to Dhanuskodi (Rameswaram Island) is a unique coastal formation in India, a long Pamban Pass with navigational passage between Gulf of Mannar and Palk Bay, long sand spit of Dhanuskodi and the origin of Ram-Sethu Bridge (Adam's Bridge).

The Kanniyakumari coast consist of 2 types of Coastal stretch such as Neerody – Kanniyakumari and Kanniyakumari – Thoothukudi. Neerody - Kanniyakumari coastline is comprised of Kondalites and Charconites combines hill promontories with patches of rocky outcrops, bed rocks and offshore reef. The beach and top of the seabed at near shore are covered with accumulation sand over the underlain rocks. The rivers Thamirabarani and Palayar are joining in this stretch. The Kanniyakumari coast is predominantly comprised of sandy beaches with intermittent presence of rocks at Enayam, Colachel, Muttom and Kanniyakumari. The stretch between Manappad and Tuticorin is very prominent for the formation of offshore reefs and Pearl Banks. Manappad Point is a high sandy promontory with a rock substratum.



Dhanuskodi to Mandapam



Mandapam to Thoothukudi



Thoothukudi to Kanniyakumari



Kanniyakumari to Neerody

Figure 2-3 Photographs of Gulf of Mannar Coast

The above morphological features of the coast would be suitable for TN- SHORE project location planned in the G.O. according to the merit and use.

Land use / Land cover

Information on existing LU/LC, its spatial distribution and change are essential pre- requisite for land use planning of any projects. In order to use the land optimally, it is not only necessary to have information on existing LU/LC but also its capability to monitor the dynamics of land use change. The distribution of LU/LC of coastal districts of Tamil Nadu state as per 2019 data as shown in Figure 2-5.

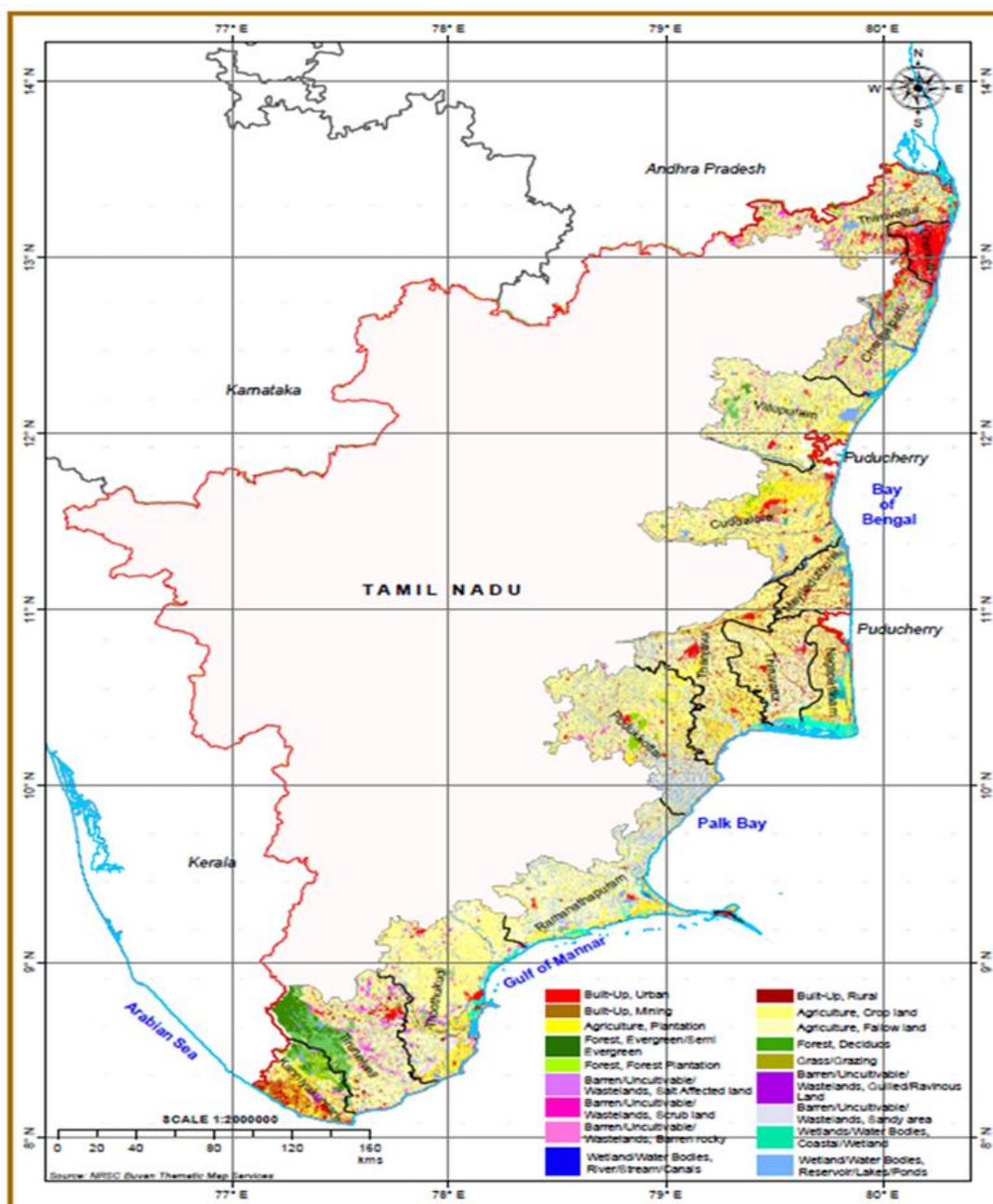


Figure 2-4 Land Use/Land Cover Map of Coastal districts - Tamil Nadu

The built-up area was noticed in and around major towns of the coastal districts. About 56% of the people of coastal districts are farmers and dependent on agriculture land. The geographical area of the coastal districts which shown in Figure 2-6. From the data it can be seen the highest geographical area falls in Villupuram district and the lowest area in Chennai. The major land use in coastal districts falls in agriculture. Forest areas are also noticed in the western Ghats in Kanniyakumari district. The wetlands are observed in river creeks and coastal areas. The area under wastelands was observed in big patches in the Thirunelveli district, southern part of Tuticorin district, south western part of Pudukottai district, eastern part of Thiruvannamalai district, middle, western parts of Chengalpattu districts and western part of Thiruvallur districts in Tamil Nadu state. The wetlands were noticed in the north of Thiruvallur, east of Chengalpattu, south of Nagapattinam and Thiruvannamalai districts. The LU/LC details of individual districts are shown in Table 2-2 & Figure 2-7.

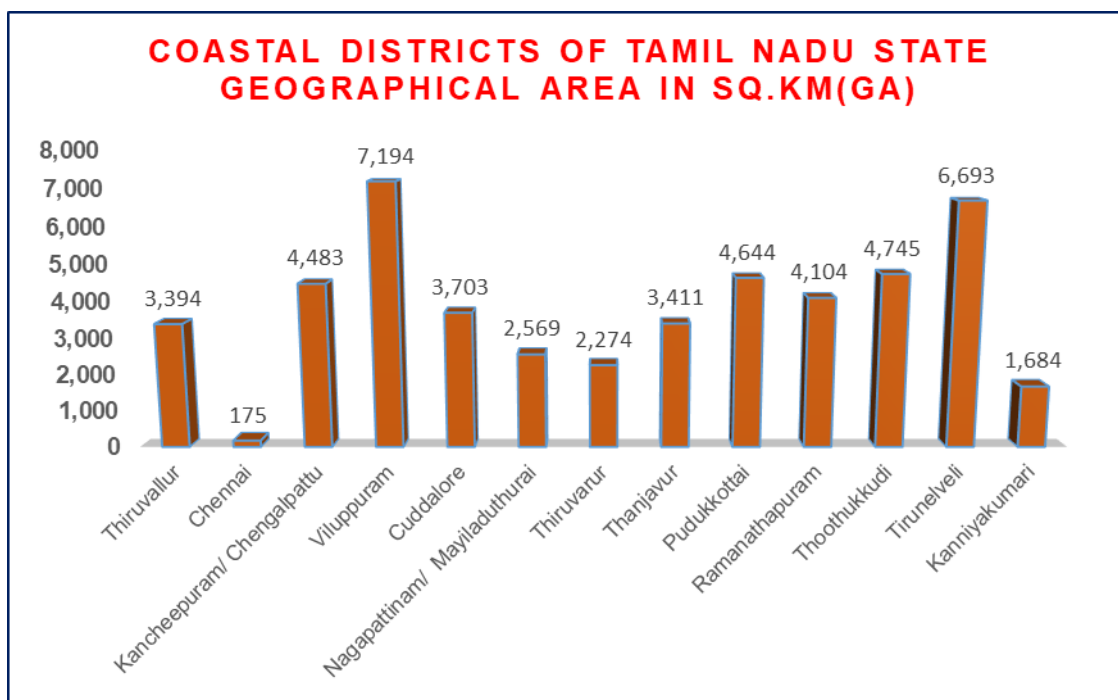


Figure 2-5 Tamil Nadu Coastal districts Geographical area

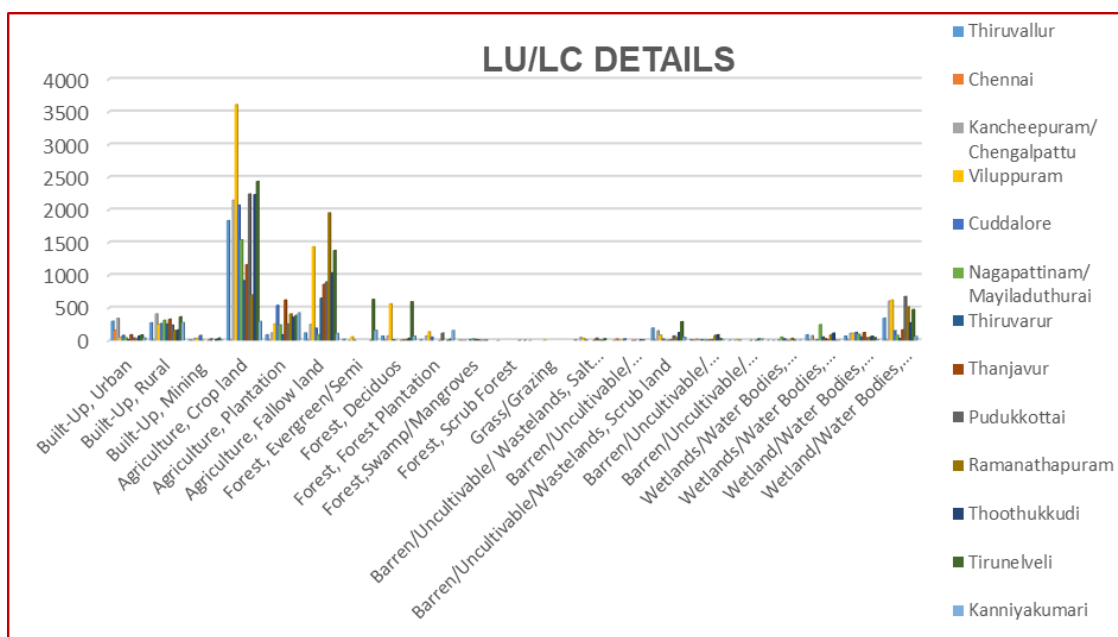


Figure 2-6 Land Use / Land cover Details of all the Coastal Districts

Table 2-2 Land Use / Land cover details of coastal districts

Sl. No	District	Built-Up (Urban, Rural, Mining)	Agriculture Land (Crop, Fallow, Plantation)	Forest Land (Evergreen, Deciduous, Forest plantation)	Forest, Swamp/ Mangroves	Forest, Scrub Forest	Grass/ Grazing	Wasteland (Barren, Sandy, Gullied, Salt Affected, Scrubland)	Wetlands /Water Bodies,	Wetland/ Water Bodies,	Wetland/ Water Bodies,
									Coastal/ Wetland	Reservoir/ Lakes/Ponds	Reservoir /Lakes/Ponds/ Streams/ River
1	Thiruvallur	575.5	2037.9	96.9	3.0	0.0		213.3	87.4	341.6	409.0
2	Chennai	154.9	2.8	2.5	0.8			27.8	1.2	0.9	5.2
3	Kancheepuram/ Chengalpattu	778.6	2509.3	138.1	3.5			215.0	74.5	604.3	714.0
4	Viluppuram	324.2	5297.1	750.7			3.8	145.3	4.1	619.2	729.0
5	Cuddalore	415.8	2794.8	60.8	14.5			64.9	20.4	149.8	274.0
6	Nagapattinam/ Mayiladuthurai	349.6	1867.5	0.3	24.3			9.5	293.7	78.8	173.0
7	Thiruvarur	265.4	1650.7		15.0			4.6	78.3	30.9	84.0
8	Thanjavur	414.5	2638.7	1.7	10.5			20.8	28.2	161.9	283.0
9	Pudukkottai	298.4	3392.4	122.4	1.8	1.5		123.8	8.7	673.5	715.0
10	Ramanathapuram	174.3	3056.1	17.8	4.3			129.4	117.3	513.9	562.0
11	Thoothukkudi	248.2	3624.4	37.2	2.4	1.3		226.2	117.5	269.7	334.0
12	Tirunelveli	486.7	4198.2	1242.8				377.5	0.8	475.3	519.0
13	Kanniyakumari	319.1	823.5	379.1		0.2		76.2	7.1	61.1	69.0
Total		4805.1	33893.3	2850.2	79.9	3.0	3.8	1634.3	839.1	3980.7	4870.0

*Source: India state of Forest Report, 2019.

**All units are in sq.km²

Forests in the Coastal districts of Tamil Nadu

The area under forest were classified as dense, moderate and open. In view of this, very dense patch of forest were identified in the Thirunelveli, Kanniyakumari and Villupuram districts which is well connected with western Ghats and Moderate dense forest noticed in the Thiruvallur, Chengalpattu, Villupuram, Cuddalore, Thanjavur, Tirunelveli and Kanniyakumari districts also open forest covers all coastal districts of Tamil Nadu. Overall, Kanniyakumari district is dominating the forest cover of 59% from its total geographical area. The forest details in all the 14 coastal districts are shown in Figure 2-8 & Table 2-3.

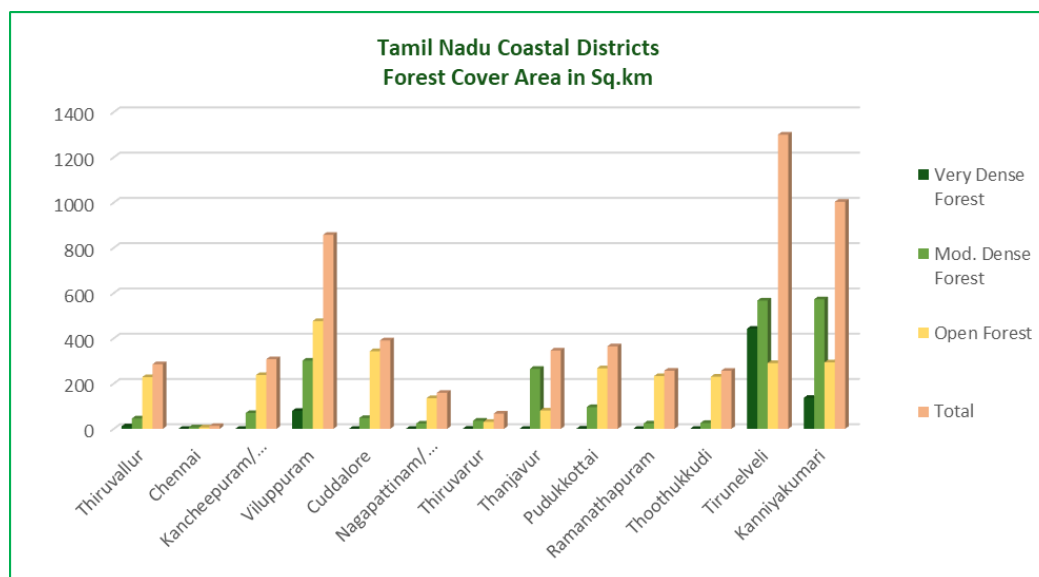


Figure 2-7 Forest cover area in coastal Tamil Nadu

Table 2-3 Coastal Districts Wise Forest Cover - Tamil Nadu

Sl. No.	District	Geographical Area (GA)	Very Dense Forest	Mod. Dense Forest	Open Forest	Total	% GA
1	Thiruvallur	3,394	11	45.87	228.8	285.67	8.42
2	Chennai	175	0	6.34	6.5	12.84	7.34
3	Kancheepuram/ Chengalpattu	4,483	0	69.95	237.83	307.78	6.87
4	Viluppuram	7,194	79.48	301.56	476.52	857.56	11.92
5	Cuddalore	3,703	0	47.86	343.1	390.96	10.56
6	Nagapattinam/ Mayiladuthurai	2,569	0	23.53	135.66	159.19	6.20
7	Thiruvallur	2,274	0.46	35.94	31.07	67.47	2.97
8	Thanjavur	3,411	0	265.06	81.13	346.19	10.15
9	Pudukkottai	4,644	0.91	96.04	267.84	364.79	7.86
10	Ramanathapuram	4,104	0	23.84	233.11	256.95	6.26
11	Thoothukkudi	4,745	0	26.08	230.6	256.68	5.41
12	Tirunelveli	6,693	442.45	567.02	290.77	1,300.24	19.43
13	Kanniyakumari	1,684	137.18	572.65	293.71	1,003.54	59.59
Total		49,073	671.48	2,081.74	2,856.64	5,609.86	11.43

*Source: India state of Forest Report, 2019.

**All units are in sq.km²

Water bodies

Water bodies were seen largely in the Pudukottai, and Ramanathapuram districts and the north eastern parts especially in Thiruvallur and Chengalpattu Districts. The river plains in Tamil Nadu are formed by the rivers Palar, Cheyyar, Pennar and Vellar in the north; Kaveri and its tributaries in the central region, Vaigai, Vaippar and Thamirabarani in the south. The Northern Rivers of Tamil Nadu are Araniyar, Kotralaiyar, Palar, Cheyyar, Kedilam, Manimuthar and Thenpennar. Cheyyar and Agaram are two tributaries of Palar. The main river of the state is Kaveri and its tributaries in its lower courts drain the districts of Nagapattinam, Thanjavur, Thiruvarur and Thirucharapalli. Kaveri along with its tributaries, Bhavani, Noyyal, Moyar and Amaravathi is the most important source of canal irrigation. Towards the south of Tamil Nadu, there are few rivers like Vaigai (Madurai), Vaippar (Virudhunagar), Thamirabarani (Thirunelveli), Gundar (Thoothukudi, Ramanathapuram), Chittar (Thirunelveli) and Kothaiyar (Kanniyakumari). Most of the soils of the plains of Tamil Nadu are alluvial, formed by these rivers flowing in the east. The map depicting the Major and Minor rivers in Coastal Tamil Nadu is shown in Figure 2-9.

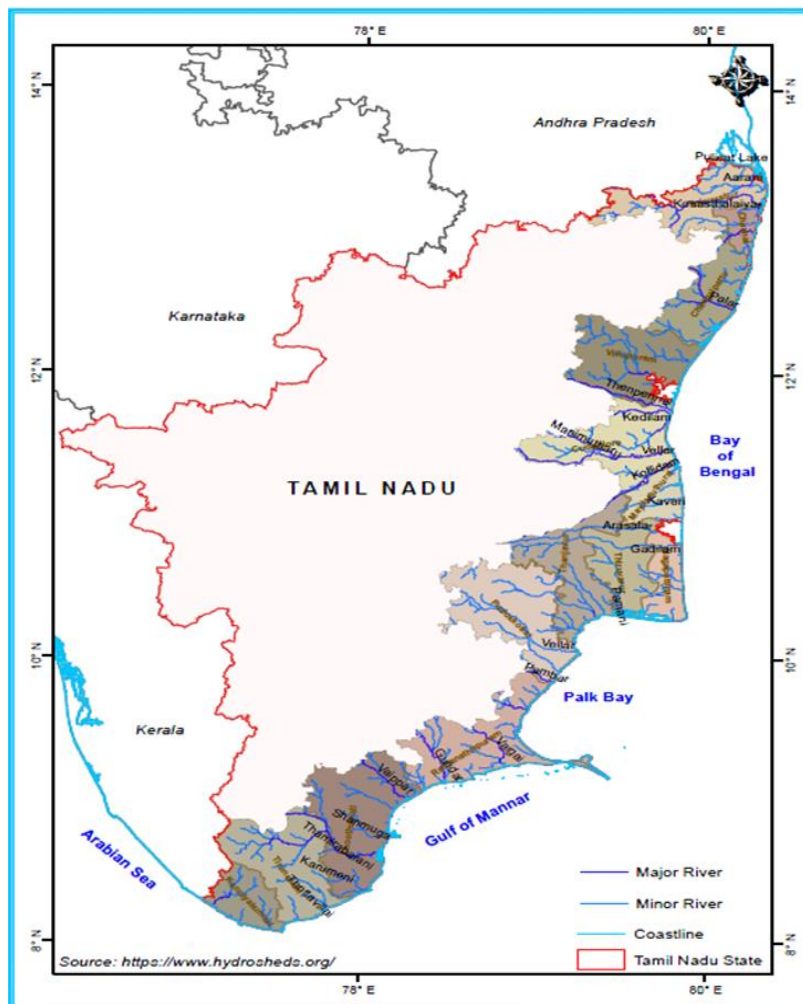


Figure 2-8 Major and Minor rivers in Coastal Tamil Nadu

Ecologically Sensitive Areas

There are about 99 ESA site falls in Tamil Nadu and the details like coordinates, type of sensitive area and RAMSAR site.

Baseline scenario of Tamil Nadu Coast

The generic baseline data pertaining to air, water and marine samples collected from three districts namely Kanniyakumari (Thiruvananthapuram), Nagapattinam and Chennai which represents fourteen coastal districts of Tamil Nadu where TN – SHORE projects are planned. However, the baseline data pertaining to the project site are to be generated during detail ESIA report by the respective consultant. The details on the type on study, no. of locations, parameters tested, its period and frequency during the ensuing study are tabled below.

Table 2-4 Baseline Monitoring schedule

S.No.	Type	Locations	Parameters	Period and frequency
1	Ambient Air Quality	3 locations	PM10, PM2.5, Sulphur dioxide (SO ₂), Oxides of nitrogen (NO ₂), Carbon monoxide (CO), Hydrocarbon (HC), Volatile Organic Compounds (VOC's)	24-hr (8hr for CO) average samples twice a week for a month
2	Ground water	3 locations	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals.	Once
3	Surface water	3 locations	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coli forms / 100ml), Heavy Metals	Once
4	Noise	3 locations	24hrly Day and Night time Leq levels	Once
5	Soil	3 locations	Organic matter, C, H, N, Alkalinity, Acidity, heavy metals and trace metal, Alkalinity, Acidity.	Once
6	Marine Water	3 locations	pH, NTU, Temperature, TSS, TDS, DO, BOD, Salinity, Phosphate and Heavy Metals	Once
7	Marine Sediment	3 locations	pH, TOC, TPH & Heavy Metals	Once

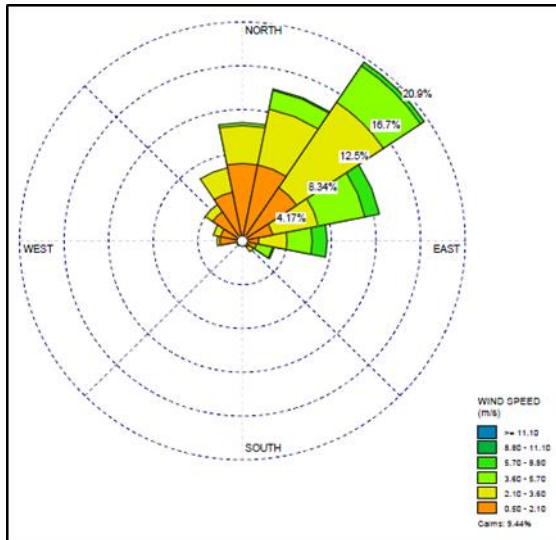
Climate

The climate of Tamil Nadu is essentially tropical. The nearest IMD station of the three districts have been considered and enumerated below shown in Table 2-5.

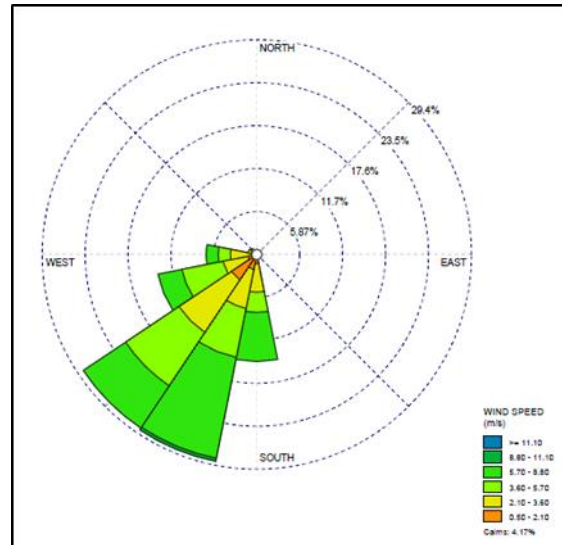
Table 2-5 Weather data of Chennai, Nagapattinam & Thiruvananthapuram

S.No	Location	Temperature (°C)			Relative humidity (%)			Wind speed (m/s)		Rain fall (in mm)
		Min	Max	Avg.	Min	Max	Avg.	Avg.	Predominant wind direction	
1.	Chennai (November 2023)	23.7	32.2	27.12	57.73	97.04	86.81	2.158	NE	508
2.	Nagapattinam (September 2023)	24.1	37.3	29.6	40.72	100	71.85	4.31	SW	68
3.	Thiruvananthapuram (May 2023)	22.9	34.8	30.45	53.42	97.6	73.77	2.15	W	121

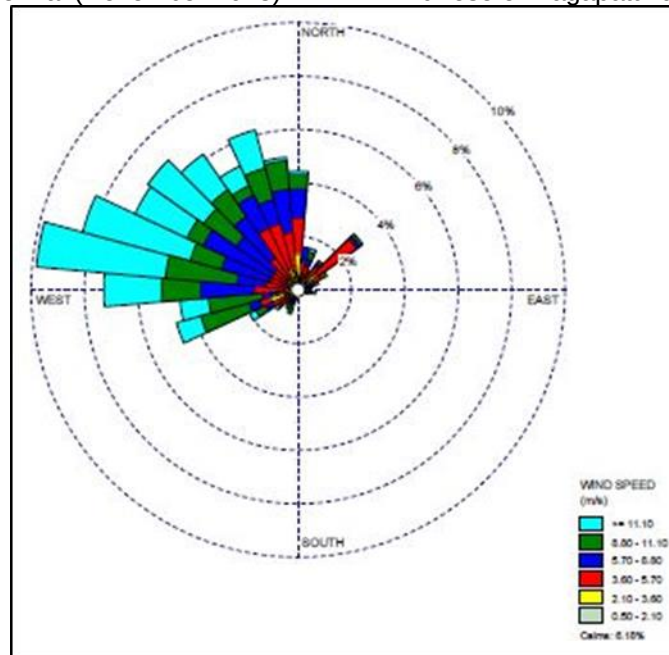
Source: IMD station



Wind rose of Chennai (November 2023)



Wind rose of Nagapattinam (September 2023)



Wind rose of Thiruvananthapuram (May 2023)

Figure 2-9 Wind rose of the study area from IMD Station

Air Environment

Ambient air quality of has been studied for the area of Thazankuppam in Chennai, Nagapattinam and Manavalakurichi in Kanniyakumari. The monthly trend of PM₁₀, PM_{2.5} Nitrogen Dioxide (NO₂) & Sulphur Dioxide (SO₂) was found within permissible limit of CPCB standard.

Overall the project area maintains good constant air quality and satisfactory category. From the analyzed results it can be concluded that all the results are permissible limits issued by MoEF & CC. The location of monitoring stations and NAAQ analysis parameters and its limits are tabulated as follows.

Table 2-6 Ambient Air Quality monitoring locations

Location Code	Locations	Latitude	Longitude
AAQ1	Thazankuppam, Ennore, Chennai	13°13'48.08"N	80°19'42.17"E
AAQ2	Nagapattinam	10°45'52.24"N	79°50'35.75"E
AAQ3	Manavalakurichi, Kanniyakumari	8° 8'52.97"N	77°18'2.66"E

Table 2-7 NAAQ Parameters & Standards

S.No	Parameters	NAAQ standards: 2009	
1	Sulphur Dioxide (SO ₂), µg/m ³	50 (Annual)	80 (24 Hours)
2	Nitrogen Dioxide(NO ₂), µg/m ³	40 (Annual)	80 (24 Hours)
3	Particulate Matter (PM _{2.5}), µg/m ³	40(Annual)	60 (24hours)
4	Particulate Matter (PM ₁₀), µg/m ³	60 (Annual)	100 (24 hours)
5	CO, mg/m ³	2 (8 hours)	4 (1hour)
6	Pb, µg/m ³	0.5 (Annual)	1(24 hours)
7	O ₃ , µg/m ³	100 (8hours)	180 (1hour)
8	NH ₃ , µg/m ³	100 (Annual)	400 (24 hours)
9	Benzene, µg/m ³	5 (Annual)	5 (Annual)
10	Benzo (a) pyrene, ng/m ³	1 (Annual)	1 (Annual)
11	Arsenic, ng/ m ³	6 (Annual)	6 (Annual)
12	Nickel, ng/ m ³	20 (Annual)	20 (Annual)

Noise environment

The main objective of monitoring of ambient noise levels was to establish the baseline noise levels in the surrounding areas and to assess the total noise level in the environment of the study area.

Table 2-8 Noise Quality monitoring locations

Sampling Location Code & Name	Location	Zone	Coordinates	
			Latitude	Longitude
N1	Thazankuppam, Ennore	Residential Area	13°13'48.08"N	80°19'42.17"E
N2	Nagapattinam	Residential Area	10°45'52.24"N	79°50'35.75"E
N3	Manavalakurichi	Residential Area	8° 8'52.97"N	77°18'2.66"E

Soil characteristics

It is essential to determine the potential of soil in the area and identify the current impacts of urbanization on soil quality and also predict impacts, which may arise due to the project. Accordingly, a study of assessment of the baseline soil quality has been carried out.

Table 2-9 Soil sampling locations

CodeNo	Location	Latitude	Longitude
S1	Thazankuppam, Ennore	13°13'48.08N	80°19'42.17"E
S2	Nagapattinam	10°45'52.24"N	79°50'35.75"E
S3	Manavalakurichi	8° 8'52.97"N	77°18'2.66"E

Water quality

Similarly, water quality parameters of ground water resources and surface water resources have been studied for assessing the water environment. The purpose of this study is to assess the water quality characteristics for critical parameters. The analysis of ground water is compared with IS:10500 and the surface water analytical results are compared with Designated Best Use norms released by CPCB. From the results it can be observed surface and ground water source are well protected within the permissible limit.

Table 2-10 Water sampling locations

Location Code	Locations	Latitude	Longitude
Ground water			
GW1	Thazankuppam, Ennore	13°13'48.08"N	80°19'42.17"E
GW2	Nagapattinam	10°45'52.24"N	79°50'35.75"E
GW3	Manavalakurichi	8° 8'52.97"N	77°18'2.66"E
Surface water			
SW1	Madhavaram Lake	13°12'9.78"N	80°15'9.66"E
SW2	Kaduvaayar (Vadavoor)	10°42'53.89"N	79°48'46.39"E
SW3	Valliyaru	8°10'55.59"N	77°19'5.75"E

Marine water

One-time marine water monitoring was conducted by qualified Marine Expert of ABC Techno Labs India Pvt Ltd, Chennai. Samples of marine water for analysis were collected at three (3) selected locations using a 5L Van Dorn Water Sampler (PARTEX make) for analysing major physio-chemical and biological parameters.

Table 2-11 Marine water sampling location

Monitoring location Code	Latitude	Longitude	Water Depth
MW1	13°13'46.96"N	80°22'57.20"E	Surface
MW2	10°44'30.52"N	79°51'31.31"E	Surface
MW3	8° 7'27.70"N	77°19'0.75"E	Surface

Marine Sediment

Geochemical and texture analysis were carried out for understanding the characteristics of sediments. Metals such as Cadmium (Cd), Copper (Cu), Chromium (Cr), Iron (Fe), Manganese (Mn), Nickel (Ni), Zinc (Zn), Lead (Pb) were estimated from all the stations. Grain size analyses were accomplished to determine the contribution of various sediment components such as sand, silt and clay. In addition, samples of benthos from the sediments were also collected. Marine sediment quality monitoring was carried out at 3 (Three) locations in the study area to understand the physical and chemical characteristics of the sediments.

Table 2-12 Marine Sediment sampling locations

Monitoring location Code	Latitude	Longitude
MS1	13°13'46.96"N	80°22'57.20"E
MS2	10°44'30.52"N	79°51'31.31"E
MS3	8° 7'27.70"N	77°19'0.75"E

Biodiversity of Tamil Nadu Coast

The coastline of Tamil Nadu is located on the southeast coast of Indian Peninsula and forms a part of Coromandel Coast of Bay of Bengal and Indian Ocean. It is 906.9 km long and is the third longest coastline in the country after Gujarat. Chennai, the capital of the state and an important commercial and industrial center in the country is located in the northern part of the

coast with Kanyakumari, forming the southern tip where Indian Ocean, Bay of Bengal and Arabian Sea meet. It also shares maritime border with Sri Lanka across the Palk Strait in Gulf of Mannar. The coastal corridor consists of 14 districts with 15 major ports and harbors, sandy beaches, lakes and river estuaries. Tamil Nadu is the only state in India with territory on both the eastern and western coastlines.

The coast is also endowed with varied coastal habitats like mangroves, corals, seaweeds, sea grass beds, salt marshes, mudflats, sand dunes etc. The State also has a number of rivers, estuaries and lagoons. The rivers flow west to east towards the Bay of Bengal. Some of the important rivers are Cauvery, Vaigai, Tamiraparani, and Pennar. The River Cauvery forms the major estuary in Tamil Nadu and the minor estuaries include Vellar, Pazhayar, Adyar etc. The lagoons are Pulicat lake (South) and Muthupettai.

Pulicat Lagoon is the second-largest brackish water body in India. It is considered one of the four most ecologically important coastal bio regions in Tamilnadu along with Palk Bay, Point Calimere and Pichavaram.

This bio-region is a mosaic and confluence of diverse ecologies hosting coastal sand dunes, riverine distributaries, backwaters, creeks, saltmarshes, mangroves tropical dry evergreen forests, scrubs, grasslands and the lagoon itself that spills into and is fed by the Bay of Bengal. The sand barrier islands are Olive Ridley Sea Turtle (*Lepidochelys olivacea*) nesting grounds. The entire coast hosts seagrass beds, mangroves, biologically active mudflat and coastal sand dunes. It is also an important foraging and breeding ground for numerous marine faunas.

Corals

In Tamilnadu, the coral reefs are distributed along the Gulf of Mannar, Palk Bay and at restricted places in Chennai, Pondicherry and Cuddalore. Coral reef formation in the Gulf of Mannar is of Fringing type, which is bordered around the 21 uninhabited islands. The reefs of the Gulf of Mannar Biosphere Reserve and Palk Bay are the only major coral formations along the mainland coast of India. A discontinuous barrier termed Mannar Barrier extends over a distance of 140 Km from Tuticorin to Pamban in the Gulf of Mannar. There are 117 coral species identified so far in Gulf of Mannar. They belong to 40 genera and 14 families. Coral reef diversity of Gulf of Mannar and Palk Bay comprises of fourteen families, 40 genera and 117 species. Among the 89 genera recorded in India, only 40 are reported so far in this ecosystem. Species such as *Montipora monasteriata*, *M. informis*, *M. squamosa*, *M. turgescens*, *M. venosa*, *M. verrucosa*, *M. digitata*, *M. millepora*, *M. manauliensis*, *Acropora digitifera*, *A. secale*, *A. intermedia*, *Pocillopora verrucosa*, *Porites mannarensis*, *P. exserta* and *Goniopora stutchburyi* are common in these islands. Species such as *Montipora millepora*, *M. jonesi*, *M. manauliensis*, *M. edwardsi*, *M. exserta*, *Porites exserta* and *P. mannarensis* are reported only from Gulf of Mannar and Palk Bay. All coral species are protected under Schedule-I of the Indian Wildlife Protection Act (1972).

Mangroves

Tamilnadu has two major mangrove forests. The Pichavaram mangrove is located 200km south of Chennai covering an area of 1,100 ha. The whole mangroves consist of 51 small and large islands and are bathed with seawater during high tide and fresh water from irrigation channels during low tide.

The Muthupet mangrove forest which spreads over an area of approximately 6,800 ha. of which only 77.2ha. (4%) is occupied by well grown mangrove and the remaining 96% of the area is covered by poorly grown mangrove vegetation, situated near Point Calimere on the southeast coast of the peninsular India

Totally 13 species of mangroves associates belonging to 12 genera and 12 families were recorded in Pichavaram Mangrove forest. Six associates *Suaeda maritima*, *Suaeda monoica*,

Ipomoea pes-caprae and *Sesuvium portulacastrum* were observed as dominant species. Overall, 17 species of mangroves and mangrove associate species were reported from 13 estuaries of the Palk Bay region. Muthupet mangrove wetland of Vedaranyam area is located in the southern most end of the Cauvery delta in the districts of Nagapattinam, Thiruvavur and Thanjavur. Muthupettai. Mangroves spread to an area of about 6,800 ha, in which *Avicennia marina* is the single dominant mangrove species accounting for about 95% of the vegetative cover. The distribution of various species of mangroves in Shingle, Krusadai, Poomarichan, Manoliputti, Manoli, Musal (Hare), Mulli, Poovarasampatti, Anaipar, Upputhanni, Kasuwar, Valai, Appa, Nallathanni, Karaichalli, Van Tivu, Thalayiari, Vallimunai, Puluvunnichalli and Vilanguchalli islands of Gulf of Mannar revealed dominant species of *Avicennia marina*, *Rhizophora mucronata*, *Bruguiera cylindrica*, *Ceriops decandrus*, *Lumnitzera racemosa*, *Exoecaria agallocha* and *Suaeda spp.*

Sea grasses

Among the 6 Indian genera of sea grasses, 11 species are recorded from Palk Bay of Tamil Nadu. Of the 11 species, *Cymodocea serrulata*, *Halophila ovalis*, *Halodule pinifolia* and *Syringodium isoetifolium* are predominantly distributed. *Halodule wrightii* occur only in Akkalmadam in Rameswaram. 13 species of seagrasses under 6 genera occur in the Gulf of Mannar region. *Enhalus acoroides*, *Halophila ovalis*, *Halophila ovata*, *Halophila beccari*, *Halophilastipulacea*, *Thalassia hemprichii*, *Cymodocea serrulata*, *Cymodocea rotundata*, *Halodule uninervis*, *Syringodium isoetifolium* are some of the seagrasses available in the Gulf of Mannar.

Seaweeds

In India, so far 650 species of marine algae with a maximum of 320 species of Rhodophyta followed by 165 species of Chlorophyta and 150 species of Phaeophyta have been recorded. Out of these, Tamilnadu has the maximum of 302 species.

A total number of 147 species of algae comprising 42 species of green algae, 31 species of brown algae, 69 species of red algae and 5 species of blue green algae distributed in Gulf of Mannar islands.

Turtles

Out of the four species of sea turtles recorded in India, the Olive Ridley Sea Turtle (*Lepidochelys olivacea*) is the only species that has been recorded from Chennai's beaches. This species has been listed under Appendices I and II of The Convention on Migratory Species (Bonn Convention) and is protected under Schedule I of The Wildlife (Protection) Act, 1972. It is listed under Appendix I of CITES and is a vulnerable species. Between November and March, the turtles lay their eggs along the Chennai coast. Turtle Nesting Zones are found across the coast of Chennai. Pulicat, Adyar Estuary, Kovalam, Odiyur, and Marakanam (adjacent to Kaliveli) coasts are Olive Ridley Sea Turtle nesting sites.

Along the coast of Nagapattinam, olive ridleys and green turtles were observed, of which the former constituted 98.1%.

In the Gulf of Mannar, olive ridleys (59.6%) and green turtles (35.2%) together constituted 94.8%, while the other three species were rare and constituted only 5.2% of the total.

Marine Mammals

Occasionally marine mammals and turtles have been observed to get washed ashore.

Dolphins

These animals are oceanic in Palk Bay area. It is likely that only the fragile and the infirm move towards Palk Bay here as they are known from their strandings. So far no mass stranding of *Stenella longirostris* and *Tursios truncatus* has been observed in the area of Palk Bay.

Dugong

Dugong dugon are commonly known as sea cows. In India, the dugong occurs in the Gulf of Mannar and Kutch, the Palk Bay and in the Andaman and Nicobar Islands. All these areas have sea grass beds, which are good foraging ground for the Dugongs. The most favoured dugong habitats are the Gulf of Mannar and Palk Bay. Sea cow is the flagship species of Gulf of Mannar and Palk Bay ecosystems.

Archaeological and Cultural Heritage Sites

Tamil Nadu Coastal districts are rich in cultural heritage and traditions. The place has ancient and interesting historical and heritage sites of national importance. There are 7 Archaeological Survey of India (ASI) protected sites and 3 Heritage sites namely, Alamparai fort, Ancient harbor, Tharangampadi fort, Manora monuments – Mallipattanam, Valinokkam fort, Tiruvallur statue, Swami Vivekananda meditation point, Mahabalipuram, Ramanathaswamy temple and Tiruchendur senthilandavar temple. The map showing the Archaeological and Cultural Heritage Sites are shown in Figure 2-11.

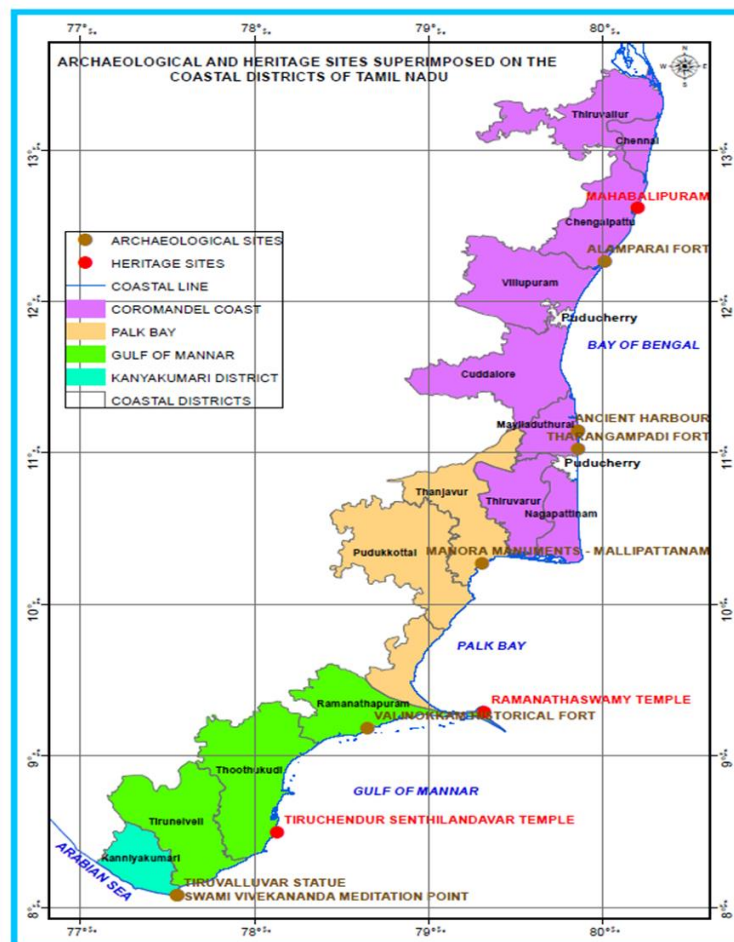


Figure 2-10 Archaeological and Cultural Heritage Sites of Coastal TN

Social baseline data

This section gives a brief note on socio-economic condition of the TN coastal districts which are likely to have impact due to the proposed projects. The comprehensive explanation covers geographical area, decadal population growth rate, demography details pertaining to total population, SC, ST population, physical infrastructure, transport & linkages, gender profile, work force details and level of education. The geographical area of the coastal district ranges from 175 (Chennai) to 6,693 (Tirunelveli) km². These details are mostly drawn from the 2011 census data and district websites, because 16th Indian Census was postponed due to COVID-19 pandemic. These details are extracted in to the following headings which will give panoramic view of the project site which is also tabulated at the end of this section.

Population

TN coastal districts total population stand at 3,48,95,158 people comprising of 1,57,05,519 males and 1,57,15,039 females. Approximately 5.3% of the state's population resides in coastal areas, reflecting the predominantly agrarian and fishermen communities of the state. The population density in coastal district ranges from is 330 persons (Ramanathapuram) per km² to 26,558 persons (Chennai) per km² indicating a low to very high population concentration across the coastal districts geographical area. The total geographical area of the coastal district is 45,097 km². These demographic indicators play a significant role in shaping the social and economic landscape of coastal district, with a focus on their development and sustainable growth.

Sex ratio

The sex-ratio of coastal district ranges from 986 to 1,023 females for every 1,000 males, indicating a relatively favourable to alarming gender balance in the coast. Out of 14 districts, 6 district has 986 to 987 and balance 8 districts are recorded with 1,017 to 1,045 females. Moreover, the higher sex ratio is observed in the southern coastal districts than the north districts of TN. Further, the sex ratio has shown improvement between the census years 2001 and 2011, reflecting positive trends in gender equality and women's empowerment. This indicates the state's efforts towards promoting gender equity and women's welfare, contributing to a more balanced demographic composition. However, despite the improvement, there may still be areas for further progress in addressing gender-related issues and promoting gender inclusivity in various aspects of the society.

Literacy rate

The literacy rate of the state is 80.09%, indicating a high level of education among its population. The literacy rate ranges from 71.88 (Villupuram) to 91.8 (Mayiladuthurai) indicates good literacy rate of coastal people. These figures highlight the state's dedication to promoting education and ensuring a literate population, which is essential for socio-economic development and overall progress. The focus on education has contributed to empowering individuals and uplifting communities of coastal districts.

Workforce Participation

Coastal district workforce participation is substantial, with a total of 1,49,28,298 individuals actively engaged in various economic activities. Among them, 74,53,723 are males and 45,88,933 individuals are females. The overall Workforce Participation Rate (WPR) in the state is 39.99%, indicating a significant proportion of the population actively contributing to the workforce. This highlights the importance of rural livelihoods and agriculture/fishing related activities in driving economic growth and supporting the livelihoods of a considerable segment of the population in TN. The active participation of the workforce in diverse economic activities

contributes to the state's socio-economic development and plays a crucial role in shaping its overall progress.

Scheduled Tribes

Tamil Nadu has a total Scheduled Tribe (ST) population of 0.79 million which constitute about 1.1 % of the total population of the state. There are 36 sub-group of Tribes in the State. The main tribes among them are Malayali, Toda, Kurumbas, Paniyan, Irular, Kattunayakan, Kanikkar, Palliyan, Kadar, etc. Of which Toda, Kota, Kurumbas, Kattunayakan, Paniyan and Irular have been designated as 'Primitive Tribes'. There are pockets of tribal habitations especially concentrated in the Hills.

The total scheduled tribes population in the coastal districts is 1,97,763 which constitutes approximately 0.56 % of the state's coastal population (males, numbering 99,093 and females numbering 98,670). Out of 14 coastal districts of Tamil Nadu state where the project will be implemented, Kalrayan Hills in Villupuram district comes under Integrated Tribal Development Programme (ITDP). The urban and rural areas of all 14 coastal districts of Tamil Nadu have tribal population. Schedule Tribe Population in coastal districts is described below:

Table 2-13 Schedule Tribe Population in coastal TN

Sr. No.	Coastal District of Tamil Nadu	Schedule Tribe Population		
		Rural	Urban	Total
1.	Thiruvallur	35044	12199	47243
2.	Chennai	0	10061	10061
3.	Chengalpattu			3028
4.	Villupuram	71370	3489	74859
5.	Cuddalore	9923	5779	15702
6.	Mayildathurai			486
7.	Nagapattinam	2210	1546	3756
8.	Tiruvarur	939	2095	3034
9.	Thanjavur	1340	2221	3561
10.	Pudukottai	835	448	1283
11.	Ramanathapuram	501	604	1105
12.	Thoothukudi	1264	3647	4911
13.	Tirunelveli	3822	6448	10270
14.	Kanyakumari	3741	3541	7282

Source: 2011 Census Data

Note:

- Chengalpattu district came into existence on 29 November 2019 after bifurcation of Kanchipuram district.
- Mayiladuthurai was bifurcated on 28-12-2020 from Nagapattinam district

Scheduled Caste

TN coastal districts exhibits a varied population with scheduled tribes, scheduled castes, and other castes. The percentage of scheduled caste is 18.84% with a total population of 65,73,916. The male population is about 32,81,713 and female population is about 32,92,203.

Economy base

Almost 44% of its people currently directly reliant on agriculture and fishing related sectors, TN economy is mainly agrarian whereas the coastal districts falls in and fishing related economy. However, the Chennai is mainly industry-based economy. The State's main crop is rice. The crop varies in Kanniyakumari, Tirunelveli and Mayiladuthurai crops are mixed Banana and paddy. Numerous horticultural and plantation crops, such as jackfruit is common in all coastal district. TN is a well-developed state and some of the coastal district like

cuddalore, Thirunelveli are covered with industrial area. The reason could be well developed infrastructure facilities like road and rail connectivity.

TN coastal area is endowed with forest resources also, covering around 11.43% of its geographical area. The state hosts various types of forests, very dense, moderately dense, and open forest including tropical evergreen, semi-evergreen, and moist deciduous forests. The major forest type in the project region is mixed forest. Additionally, grasslands and swamps can be found in the plains. TN plays a major role in the state's ecological balance, providing habitat for diverse flora and fauna. About 99 ESA sites are falling within the coastal districts alone.

The coastal districts forests of TN are not only important for biodiversity conservation but also serve as a significant source of tourist places for the state. In terms of timber, non-timber forest products such as bamboo, cane, medicinal plants, and various fruits contribute to the local economy to the districts of Kanniyakumari alone.

Although the mangrove forests are intact, the other land forest area, despite the less amount forests, faces challenges such as extraction of forest resources by intruders have led to severe forest degradation, soil erosion, and a decline in canopy density. The state government has been making efforts to promote participatory and sustainable forest management and conservation as part of its forestry sector reforms and poverty alleviation measures.

Preserving and restoring the health of mangroves/ sea grasses is crucial for maintaining ecosystem services, such as water retention, soil conservation and climate regulation. The TN shore project aims to strengthen forest landscapes by implementing protection measures, restoring degraded areas, and adopting advanced technologies for better forest planning and wildlife conservation.

The demographic profile of the State and project district as per census 2011 is presented in Table 2-14.

Transport and linkages

The coastal districts are well connected by roads and rails. All the fourteen districts are well connected by broad gauge rail connectivity and better road connectivity. The state government already developed East Coast Road (ECR) which passing all the 14 districts. Internally all districts and villages are well connected by MDR. Most of the project locations are well connected by roads. The existing infrastructures would be sufficient to meet the project requirements. Further major ports like Chennai, Ennore and Tuticorin are located in the district of Chennai and Thoothukudi and about 15 minor ports are also available on the coast.

Fishing communities

The maritime state of Tamil Nadu is blessed with 1,076 km long coast line and 41,412 km² continental shelf area with an Exclusive Economic Zone (EEZ) of 1.9 lakh km², contributing 5.95 lakh tons of marine fish production. This supports the livelihood of 10.48 lakh marine fishers through 5,830 mechanised and 45,685 traditional fishing crafts which are actively engaged in fishing. Tamil Nadu possess 3.83 lakh ha. of effective inland water resources comprising reservoirs, major irrigation tanks, minor irrigation tanks, short seasonal tanks, ponds, rivers, backwaters and derelict water bodies. The Inland fisher population is 2.35 lakh. An estimated brackish water area of 56,000 ha. is under capture fisheries and an area of 6115.68 ha. is under coastal aquaculture production, mainly shrimp aquaculture.

Tamil Nadu is enriched with Marine, Brackish water and Inland fishery resources amenable for capture and culture fisheries. Substantial focus is being given on the economic and social dimensions of fishery resources by the Government of Tamil Nadu. The Indian Fisheries Act, 1897 paved the way for the formulation of fisheries legislations across India. The Fisheries

sector plays an important role in the socio-economic development of the country by providing livelihood to large number of fishers, generating employment opportunities in allied sectors and ensuring nutritional security.

Tamil Nadu ranks 3rd in total marine fish production of the country. Tamil Nadu exported 1.14 lakh MT of marine products and earned a foreign exchange of Rs.6,559.64 crore during 2021-22.

The per capita fish consumption of the State has also increased from 9.3 kg during 2020-21 and is expected to increase to 10.66 Kg during 2021-22. With the increase in demand for fish, there is a need for augmenting the overall fish production of the State substantially from all the available fishery resources. However, aquaculture is emerging as a prominent activity for enhancing fish production and income generation in rural areas. Integration of fish culture with agriculture has proved to be an option for augmenting the unit productivity from aquaculture systems. The Government is determined to enhance the fish production three-fold in the coming years.

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Table 2-14 Social Baseline of TN coastal Districts

S.No	Name of the District	Geographical Area in sq.km	No. of Taluks	No. of Villages	Total Population			Decadal Growth	Sex Ratio	Literacy Ratio
					Male	Female	Total			
1	Thiruvallur	3394.00	9.00	617.00	1876062.00	1852042.00	3728104.00	35.30	987.00	84.03
2	Chennai	175.00	10.00		2335844.00	2310888.00	4646732.00	6.98	989.00	90.18
3	Chengalpattu	2944.96	8.00	636			2556244			
4	Kanchipuram	4483.00	10.00	1019.00	2012958.00	1985294.00	3998252.00	39.00	986.00	84.50
5	Villupuram	3715.33	9.00	928.00	1740819.00	1718054.00	3458873.00	8.00	987.00	71.88
6	Cuddalore	3703.00	7.00	828.00	1311697.00	1294217.00	2605914.00	14.02	987.00	78.04
7	Mayiladudurai	1169.00	4.00	287.00			9,18,356		1045.00	91.80
8	Nagapattinam	2569.00	8.00	434.00	624094.00	637194.00	1261288.00	8.57	1030.00	82.00
9	Thiruvarur	2274.00	6.00	547.00	626693.00	637584.00	1264277.00	8.10	1017.00	82.86
10	Thanjavur	3411.00	8.00	805.00	1182416.00	1223474.00	2405890.00	8.60	1,035	82.64
11	Ramanathapuram	4175.00	8.00	429.00	682658.00	670787.00	1353445.00	13.96	983.00	72.32
12	Thuthukudi	4707.00	19.00	480.00	865021.00	885155.00	1750176.00	11.32	1023.00	86.16
13	Thirunelveli	6693.00	11.00	465.00	1520912.00	1556321.00	3077233.00	13.80	1023.00	82.50
14	Kanyakumari	1684.00	4.00	63.00	926345.00	944029.00	1870374.00	11.60	1019.00	91.70
		45097.29		7538.00	15705519.00	15715039.00	34895158.00			

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Table 2-15 Details of work force participation, SC & ST in TN Coastal Districts

S.No	Name of the District	Work force participation			Scheduled Tribes			Scheduled caste			Density
		Male	Female	Total	Male	Female	Total	Male	Female	Total	
1	Thiruvallur	1103563.00	434491.00	1538054.00	23692.00	23551.00	1.26	410526.00	411120.00	22.03	1098.00
2	Chennai	1968079.00	1808197.00	3776276.00	5207.00	4854.00	0.22	389001.00	390666.00	16.78	26553.00
3	Chengalpattu										
4	Kanchipuram	1181308.00	1181308.00	1673814.00	20605.00	20605.00	1.03	474264.00	473817.00	23.71	892.00
5	Villupuram			1703249.00	37570.00	37289.00	0.02	510869.00	504847.00	0.29	561.00
6	Cuddalore	749633.00	420247.00	1169880.00	7,943	7,759	0.60	383943.00	380001.00	29.32	704.00
7	Mayiladudurai				239	246	0.05	2,407	2,619	1	
8	Nagapattinam			85,632	1092.00	1122.00	0.17	228725.00	232151.00	36.50	616.00
9	Thiruvarur	369853.00	170315.00	540168.00	1466.00	1568.00	0.24	214717.00	216210.00	34.08	556.00
10	Thanjavur	680483.00	293596.00	974079.00	1,739	1,822	0.15	225859.00	229203.00	18.91	705.00
11	Ramanathapuram			602977.00	559.00	546.00	0.08	125015.00	123993.00	18.30	330.00
12	Thuthukudi			748095.00			0.28			19.88	369.00
13	Thirunelveli	876175.00	560279.00	1436454.00	5109.00	5161.00	0.33	279570.00	290144.00	18.51	460.00
14	Kanyakumari	524629.00	154991.00	679620.00	3554.00	3728.00	0.39	36817.00	37432.00	3.97	1111.00
		7453723.00	4588933.00	14928298.00	99093.00	98670.00	4.82	3281713.00	3292203.00	242.83	33955.00

Table 2-16 Demographic Profile of coastal TN

Sl. no.	Parameter	Parameter Description	
1	Population	Total – 3,48,95,158 Male – 1,57,05,519; Female – 1,57,15,039	5.3 % of the state population live in the coastal area Density is ranging from 350 persons per km ² to 26,558 km ²
2	Villages	7,538 Nos	14 coastal districts
3	Sex Ratio	From 986 to 1023 females for 1000 males	Between census 2001 and 2011, sex ration has increase The sex ratio of the State is more than the national average (943 females per 1000 males)
4	Literacy Rate	71.88 to 91.8%	The literacy rate of the State is more than the National Literacy Rate i.e., 74.04 percent.
5	Workforce Participation	Total – 1,49,28,298 Male – 74,53,723; Female – 45,88,933 -	The overall Workforce Participation Rate (WPR) is 39.99 %.
6	Scheduled Tribes	Population – 1,97,763 (0.56%) Male – 99,093 Female – 98,670	-
7	Scheduled caste	Population – 65,73,916 (18.84%) Male – 32,81,713 Female – 32,92,203	-



3. REGULATORY FRAMEWORK, APPLICABLE LAWS, POLICIES, STANDARDS AND PROCEDURES

This chapter deals with the laws, regulations and policies of GoI, GoTN and the World Bank pertaining to the relevant TN-SHORE Project is discussed here. This section shall be updated as and when new laws, regulations and policies are made and enforced or the existing ones are amended. Applicable laws, regulations and policies need to be considered for effective management of environmental and social aspects. It doesn't present a legal opinion on the applicability of the law but serves as guidance for the application of the legal and regulatory provisions to the current project context. As the project is falling on the 14 coastal districts of Tamil Nadu, the CRZ Notification and the requirement of statutory clearances from Tamil Nadu Coastal Zone Management Authority (TNSCZMA) and Ministry of Environment, Forest and Climate Change (MoEF&CC) as applicable.

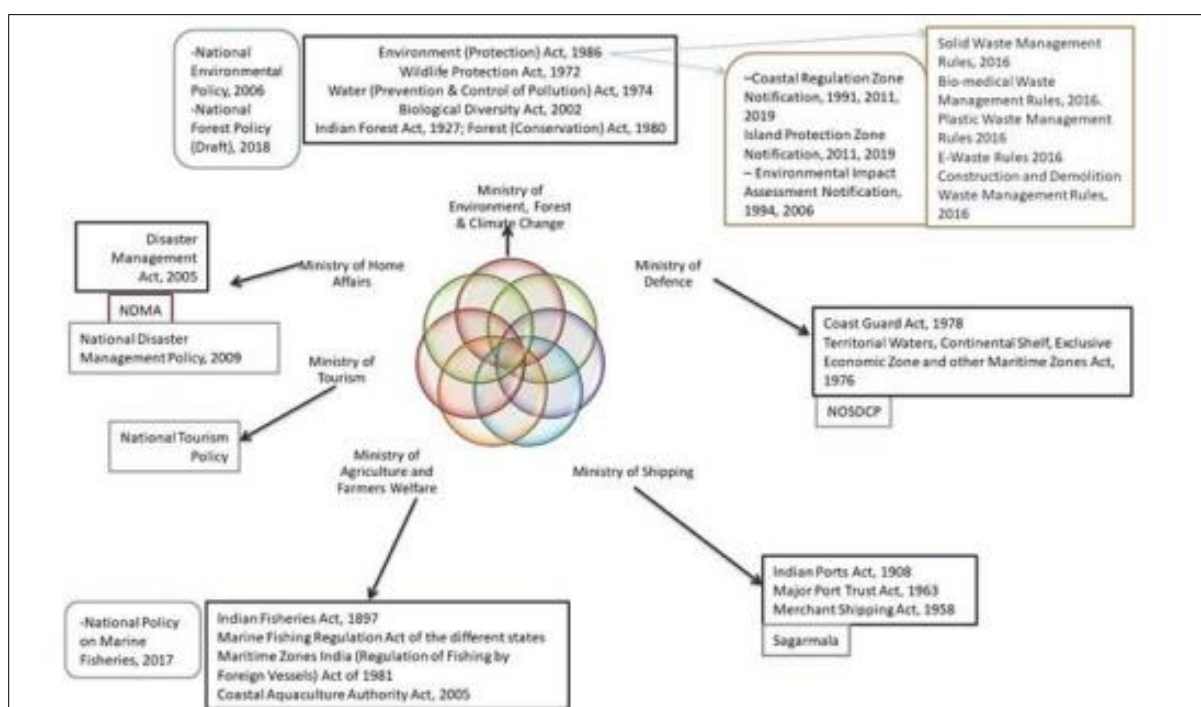


Figure 3-1 Legislation & Policy Instruments applicable to sub-projects

Indian National and State Laws, Regulations and Policies

There are several existing national/state level laws and policies potentially applicable to the Project. The following Table 3-1 details the various regulatory frameworks pertaining to the TN-SHORE project. As outlined in Chapter 7, it is the responsibility of the Environmental & Social expert to categorize the applicable laws based on the specific project or sub-project activities/ conditions.

Table 3-1 Relevancy of various Environmental Legislations under GOI and GOTN

Name of relevant Act/Policies/Rules	Objective	Applicability to Subproject Interventions
Environment (Protection) Act, 1986	EPA (1986) is an umbrella Act that provides for introduction of various regulations aimed at environmental conservation and protection	Applicable to this project because investment is likely to happen in construction of conservation centre (biodiversity, turtle, dugong & wetland), blue flag beaches, natural & community-based tourism, wetland conservation & restoration, erosion control and coral restoration which requires construction materials at site. Consent to Establish (CTE), Consent to Operate (CTO) from the Pollution Control Board during construction and operation phase of the project, applicable standard of ambient Air, water, noise quality standard (published by CPCB) shall be applied under this act.
Water (Prevention and Control of Pollution) Act 1974, amendments	This Act is applicable for maintaining or restoring wholesomeness of water. Central Board and state board are empowered to enforce them	
Air (Prevention and Control of Pollution) Act 1981	Applicable to reduce Air pollution during construction, operation phases of the project. The Rules are applicable as the construction related activities supported by the project have the potential to create air pollution.	
The Noise Pollution (Regulation and Control) Rules 2000	Applicable to reduce noise pollution during construction, operation phases of the project. The Rules are applicable as the construction related activities supported by the project have the potential to create noise pollution.	
Environmental Impact Assessment Notification, 2006 & amendment	The Notification makes it mandatory clearance for Building and Construction projects that have $\geq 20,000$ sq.m.	Applicable to buildings of a scale larger than 20,000 sq.m. However, educational institutions fall in the above criteria have been exempted from the requirement of Environmental Clearance subject to sustainable environment management. But CTE & CTO is to be obtained for such units.
Coastal Regulation Zone Notification, 2011 & 2019.	The Notification makes it mandatory clearance for project activities lying in CRZ Zones from SEIAA, GoTN or MoEF&CC.	Applicable to coastal activities envisaged in the Coastal Regulation Zones as demarcated in the notification and ecologically sensitive areas (conserving marine ecology).

Name of relevant Act/Policies/Rules	Objective	Applicability to Subproject Interventions
Public Works Department - Effective Management of Ground Water - Regulations for Management of Ground Water and Issue of No Objection Certificate / License for Extraction of Ground Water in Tamil Nadu State, 2014.	To regulate and control groundwater extraction in Tamil Nadu. Rural drinking water supply schemes.	Applicable in case of extraction of ground water for academy/commercial purpose from a fresh bore well. NOC from PWD, Groundwater Circle shall be applied under this guideline. No extraction of ground water without prior approval from PWD shall be allowed under the project.
E-Waste Management Rule, 2016, amended 2018	To regulate & manage e-waste generated during the manufacture, using of any electrical and electronic equipment and channelize it for recycling or disposal	Applicable The project includes conservation centres, labs and administrative units which include purchase of electronic hardware. The likely generated E-waste should be managed as per this Rule.
Indian Forest Act 1927	This act enables the state to acquire ownership over forests and their produce and regulates access, use and extraction of forest resources for consumptive use. Section 26 of this act restricts grazing to only identified grazing units or in adjoining forest ranges.	Applicable In Project components of enhanced plantation on government forest area like mangrove and sea grass and to ensure non-encroachment of forest land and limiting access to and use of forest resources in Reserve Forests, unless specifically permitted in Protected Areas (PAs) it prevents/ regulates right of community/ individual to access any portion of protected forest for extracting forest produce, cut grass and pasture cattle.
The Indian Wildlife (Protection) Act, 1972	Applicable for protection to listed species of flora and fauna and establishes a network of ecologically important Protected Areas (PAs) Under section 33 of WLPA, 1972- Control of sanctuaries. The Chief Wildlife Warden shall be the authority who shall control, manage and maintain all sanctuaries	Applicable All the ecotourism activities have been planned outside of the boundary of National Park, Wildlife sanctuary areas. However, this act will be applicable in eco-tourism activities under the project takes place in future (in case of any activities involves in NP, WLS, Eco sensitive zones) the wildlife approval from SBWL/NBWL shall be applicable.

Name of relevant Act/Policies/Rules	Objective	Applicability to Subproject Interventions
	and for that purpose, within the limits of any sanctuary, may construct such roads, bridges, buildings, fences or barrier gates and carry out such other works as he may consider necessary for the purposes of such sanctuary.	
Ecotourism guidelines in and around protected areas 2021	To regulate and encourage planned development of areas in and around protected areas	Applicable As per guideline, ordinarily only basic tourist conveniences such as toilets, rain-shelters, zero impact or seasonal tented camping facilities, hiking/ biking trails, dirt tracks, hides/ machan etc. shall be allowed to be developed on the forest land. Ecotourism activity should only be proposed in buffer area of the protected areas. The Ecotourism sites planned under the TN-SHORE project shall follow this guideline.
Occupational safety, health administration and working Conditions code, 2020	Regulating the occupational safety, health and working conditions of the persons employed in an establishment and for matters connected therewith	Applicable Labour influx and management during construction, operation phases of the project will fall under purview of this code.
The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010	The Act aims to stop the encroachment and construction around the monuments and other sites of archaeological importance. An area of a radius of >100-300 meters from a protected monument is considered as regulatory /prohibited. Permission of the National Monuments Authority needs to be taken in case of repair/renovation in the prohibited area or regulated area.	Applicable The screening process under the ESMF will determine possibility of any activities in the 'prohibited or regulated area' around protected monuments. The activities planned within regulated area of ASI monuments shall obtain Clearance/NOC from ASI.
Forest (Conservation) Act, 1980, revised	Permits judicious and regulated use of forest	Applicable The project is envisaged to protect and restore the degraded forest landscapes.

Name of relevant Act/Policies/Rules	Objective	Applicability to Subproject Interventions
guidelines of 2004, 2014, 2017 and amendment 2023	land for non-forestry purposes.	As per section 2 of the Act, the activities related to any work relating or ancillary to conservation, development and management of forests and wildlife is allowed.
Tamil Nadu Forest Act 1882 & amendments	Envisaged to consolidate the law relating to forests, the transit of forest-produce and the duty leviable on forest-produce & Declaration of RF, PF	
Guidelines for extraction of trees from non-forest areas, 2010	The guidelines are framed regarding the extraction of trees from non-forest areas including plantations in non-forest areas	Applicable Project interventions at this stage does not require tree cutting in non-forest areas, however in case of any tree cutting the guideline applies.
Forest Right Act - 2006, The Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Forest Right) Act, 2006	To recognize and vest certain forest rights in the forest dwelling Scheduled Tribes and other traditional forest dwellers such as the collection of Minor Forest produce, access to grazing grounds and water bodies, traditional areas of use by nomadic or pastoral communities etc.	Applicable Civil work-related activities such as Infrastructure development in forest area (if any) may need forest approval, hence NOC from Forest Rights Committees of respective Gram Panchayat and Village Committees under Area Autonomous District Council via District magistrate (District Level Committee (DLC) on Forest Rights Act, 2006) shall be required under this act.
Biological Diversity Act 2002, and Biological Diversity Rules, 2004	Applicable for conservation of biological diversity, sustainable use of its components, fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto.	Applicable project activities having to access biological resources near the environmental sensitive areas including national parks, wildlife sanctuaries and biodiversity heritage sites, causing erosion of the ecosystem and environmental damage. Biological Management Committees (BMC) and people's biodiversity register are two important aspect of this rule. Biodiversity Management plan is prepared by BMC based upon People's biodiversity register. In case of any activity planned, it is mandated to share of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith.
Insecticide Act 1968; Insecticide Rules 1971; Insecticide (Control) Order 1985	The GOI has notified various Acts for the control and prevention of pollution due to pesticides and fertilizers. The Act to	Applicable The project investments are likely to involve use of pesticides (in high-tech nurseries and plantation activities). These activities will comply with the requirements of the Insecticide Act – especially regarding non-use of banned pesticides, safe use of

Name of relevant Act/Policies/Rules	Objective	Applicability to Subproject Interventions
	regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animal	pesticides, etc. Central Insecticides Board, GoI, banned pesticides will not be part of the TN-SHORE project.
Solid Waste Management Rules, 2016	The provisions of the act prevent littering and mandate proper segregation, collection, storage, and disposal of municipal solid waste.	Applicable Project Interventions with reference to New Infrastructure Development (infra under building, ecotourism sites) may involve waste management during various phases of the project
Construction and Demolition Waste Management Rules, 2016	Rules and regulation for construction & Demolition Waste.	Applicable Construction waste management shall be major activity in the construction works.
The Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act 1996	This Act provides for safety, health and welfare measures of buildings and construction workers in every establishment which employs or employed during the preceding year ten or more such workers. These measures include fixing hours for normal working day, weekly paid rest day, wages for overtime, provision of basic welfare amenities like drinking water, washrooms, urinals, crèches, first aid, canteens, and temporary living quarters within or near the work site.	Applicable As this project because investment is likely to happen for construction activities.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	This international convention, to which India is a signatory category, lists the endangered flora and fauna and regulates trade of these species.	Applicable Since the project involves conservation & protection of endangered species.
Wetland (Conservation	To ensure better conservation and	Applicable

Name of relevant Act/Policies/Rules	Objective	Applicability to Subproject Interventions
and Management) Rule 2010	management and to prevent degradation of existing wetlands in India.	As project involves conservation & restoration of coastal wetlands.
Fisheries Act	Applicable for sustainability of stakeholders.	Applicable As project involves conservation of coastal ecosystem include fishes.
Motor vehicle act		Applicable The staff/FGD/experts needs to travel to the project sites for surveys and workshops.
Vessels usage in MPA (Gulf of Mannar)	To ensure better conservation and management of ESA.	Applicable As project fall in Gulf of Mannar, which is declared biosphere, the vessels to be used in line with the present practise. (Battery operated/manual vessels)
National Green Tribunal	To adjudicating environmental cases.	Applicable. To ensure the effective and expeditious disposal of cases, related to environmental laws.
Plastic waste management rules	Rules and regulation for plastic waste management.	Applicable During the project implementation, it is necessary for plastic waste segregation in support the conservation and restoration of coastal wetlands.

Table 3-2 World Bank - EHS Guidelines

Name of relevant Act/Policies/Rules	Objective	Applicability to Subproject Interventions
World Bank EHS	This Act is applicable for maintaining or restoring. ➤ Air Quality, ➤ Water Quality and Resource Use, ➤ Waste Management, ➤ Occupational Health and Safety, ➤ Community Health and Safety.	Applicable To maintain standard of ambient Air, water and waste management. Also provides safety measures to the workers.

Table 3-3 Relevant Social Rules and Regulations under GOI and GOTN

Name of relevant Act/Policies/Rules	Objective	Relevance to Subproject Interventions
The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	The Act include the following key provisions related to land acquisition, resettlement and rehabilitation: • Mandatory social assessments to determine whether the said acquisition serves a larger public purpose or not; • Requirement to ascertain the minimum land requirements for the purpose for which land is being acquired; • Assessment of the impact of land acquisition on life, livelihoods, public infrastructure, common properties, customary rights and community assets of impacted communities and areas; • Identification of steps to minimize any adverse or negative impacts of the acquisition; • Social and economic cost-benefit analysis of the land acquisition to ascertain those benefits outweigh the costs; • Livelihoods support for affected persons, including compensation and support for permanent or temporary relocation using realistic assessments; • Detailed census and social impact assessment of affected families to map their socio-economic profile, potential losses or impacts; • Special provisions for disadvantaged and vulnerable persons and households; mandatory settlement of compensation and assistance before actual land acquisition; setting up of mechanisms for consultations, grievance redress and information disclosure.	Applicable in case of acquisition of private land.
The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2017 by GOTN and its subsequent amendments.	The State Rules mirror the requirements under the national legislation and provides some additional provisions	Applicable in case of acquisition of private land.
Protection of Women from	The Act ensures woman's right to reside in her matrimonial home. This Act has a special feature with specific provisions under law which provides	Applicable As it empowers women to seek legal redress,

Name of relevant Act/Policies/Rules	Objective	Relevance to Subproject Interventions
Domestic Violence Act, 2005	protection to a woman to „live in violence free home.	ensures their safety, and provides mechanisms for financial compensation, rehabilitation, and support.
Tamil Nadu Act 039 Of 2002: Tamil Nadu Prohibition of Harassment of Woman (Amendment) Act, 2002	To protect the women from any type of harassment and to live peacefully in the society.	Applicable To strengthen the existing law by expanding its scope and providing stricter measures to prevent and penalize harassment, especially in public spaces and project environments.
Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013	The Act is meant to serve as guidelines for the employees subject to the provisions of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.	Applicable To provide a safe working environment for women by addressing sexual harassment in workplaces
Child Labour (Prohibition and Regulation) Act, 1986	The Act prohibits employment of children (those who have not completed their fourteenth year) in certain occupations and processes (part II, Section 3). The Act also specifies conditions of work for children, if permitted to work.	Applicable To protect children from exploitation and ensuring their rights to education, health, and a safe environment.
Tamil Nadu Child Labour (Prohibition and Regulation) Rules, 2016 and its subsequent amendments.	The Act prohibits employment of child labour those have not completed age of 14.	
The Bonded Labour System (Abolition) Act 1976	States that all forms of bonded labour stand abolished, and every bonded labour stands freed and discharged from any obligations to render any bonded labour	Applicable To ensure that these staff/workers are not exploited and are provided with fair wages, safe working conditions, and access to essential welfare measures. By regulating the employment of contract labor, the rules contribute to the broader goal of promoting social justice and equitable labor practices in the workforce.
Minimum Wages Act, 1948	This Act provides for fixing minimum rates of wages and associated rules in employments.	
Workmen's Compensation Act, 1923 & Rules 1924	The Act requires if personal injury is caused to a workman by accident arising out of and during his employment, his employer should be liable to pay compensation in accordance with the provisions of this Act.	
The Contract Labour (Regulation and Abolition) Rules, 1971	The Act requires every principal employer of an establishment to make an application to the registering officer in the prescribed manner for registering the establishment. The Act and its Rules apply to every establishment in which 20 or more workmen are employed on any day on the preceding 12 months as contract labour and to every contractor who employs or who employed on any day preceding 12 months, 20	

Name of relevant Act/Policies/Rules	Objective	Relevance to Subproject Interventions
	or more workmen. It does not apply to establishments where the work performed is of intermittent or seasonal nature. An establishment wherein work is of intermittent nature will be covered by the Act and Rules if the work performed is more than 120 days in a year, and where work is of a seasonal nature if work is performed more than 60 days in a year.	
The Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act 1996	This Act provides for safety, health and welfare measures of buildings and construction workers in every establishment, which employs or employed during the preceding year ten or more such workers.	
The Inter-State Migrant Workmen (Regulation of Employment and Conditions Service) Act, 1979, 1980, 1981 and the Inter-State Migrant Workmen (Regulation of Employment and Conditions Service) (Tamil Nadu) Rules, 1983, 1984, 1985	To regulate the employment of migrant workers who move from one state to another in search of work, ensuring their rights are protected.	Applicable As the local labor workforce may not be available at that particular time.
The Right to Information Act, 2005	The Act provides for setting out the practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority	Applicable To ensure transparency of the project's stages for all stakeholders.
Occupational Safety, Health and Working Conditions Code, 2020	The Act gives consolidate multiple existing labor laws related to occupational safety and health, making compliance easier for employers and workers.	Applicable To enhance the safety and health standards for workers by setting out clear guidelines and requirements for workplaces.
The Code on Social Security, 2020	This Act reform the various social security laws in the country.	Applicable To provide a comprehensive framework for social security benefits to workers across different sectors, thereby enhancing their welfare and protection.

Applicability of the World Bank Environmental and Social Framework

The objective of WB's ESF is to facilitate achievement of these project development outcomes, through a system that integrates sound E&S management into Projects. Ten (10) Environmental and Social Standards (ESSs) set out in ESF provide for explanations on mandatory requirements that apply to the Borrower and projects. These Environmental and Social Standards (ESSs) of World Bank's new Environmental and Social Framework (ESF) are as follows:

Table 3-4 World Bank's ESF (ESSs), applicability and relevancy to TN-SHORE Project

ESS	ESS Objectives	Applicability to TN-SHORE	Relevancy with Reasons
ESS 1 Assessment and Management of Environmental and Social Risks and Impacts	To identify, evaluate and manage the environment and social risks and impacts of the project in a manner consistent with the ESSs.	TN-SHORE project interventions will cause environmental and social risks and project is categorized as substantial.	This standard is relevant; the ESMF study was undertaken as per the provisions of ESS1. Interventions are within fragile ecosystems, involving the constructions of centres, transplantation of foreign materials (PVC frames) and potential disturbance to existing mangrove habitats by mangrove boardwalk. Involves creation of material recycling facility may causes air and water pollution.
ESS 2: Labour and Working Conditions	To promote safe, healthy and fair working conditions for all types of labour involved in the project and provide them with platform to raise their concerns.	The TN-SHORE project will involve employment of direct and contracted workers during construction and operation phases.	Construction activities require skilled labour, and for project implementation, workshops, trainings the environmental and social experts are involved.
ESS 3: Resource Efficiency & Pollution Prevention and Management	To promote the sustainable use of resources, and minimizing pollution including climate pollutants, pesticide use and hazardous/non-hazardous waste from project activities.	TN-SHORE sub project interventions will involve use of natural resource for construction activities and pesticides in agriculture and horticulture/Nursery activities.	This standard is relevant, given the opportunities to promote the efficiency of resource use and prevent pollution from activities to be financed under the project.
ESS 4: Community Health and Safety	To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances,	Although the nature and scale of the most of the project activities are not expected to pose any community health risk, yet construction activity may pose temporary risks to the health and safety of affected	This standard is relevant, as there are communities in the vicinity/ surroundings of sub-project locations, and appropriate management measures would be required.

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ESS	ESS Objectives	Applicability to TN-SHORE	Relevancy with Reasons
		communities from project activities in the vicinity.	
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	- To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use and to improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure - To ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and the informed participation of those affected	The project will exclude any sub-project activities that (i) involve private land acquisition or lead to involuntary resettlement of households or which create economic displacement or loss of livelihoods for communities, and; (ii) may have significant, adverse, irreversible impacts on customary lands, natural or cultural resources.	To ensure that small scale, scattered land requirements are made available by the communities (included in the selection criteria of the sub-projects). And to manage any impacts related to that. Applicable in case of acquisition of private land.
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	To protect and conserve biodiversity and habitats promote sustainable management of living natural resource and support livelihoods of local communities, through the adoption of practices that integrate conservation needs and development priorities	The Project envisages activities, which may have direct or indirect impacts on biodiversity and living natural resource.	The Projects are located at the 14 coastal districts and activities such as mangrove boardwalk, seagrass, coastal wetlands conservation and restoration (Pallikaranai) are located within CRZ fragile ecosystems, with potential stress on mangrove & seagrass habitats.
ESS 7: Indigenous People/ Sub Saharan African	To avoid adverse impacts of projects on Underserved Tribal Local Communities, or when avoidance is not possible, to	TN-SHORE sub projects involve/affect may affect tribals at certain locations – all of which are not known at present	This standard is relevant as there are tribal communities in the project area.

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ESS	ESS Objectives	Applicability to TN-SHORE	Relevancy with Reasons
Historically Underserved Traditional Local Communities	minimize, mitigate and/or compensate for such impacts		
ESS 8: Cultural Heritage	To protect cultural heritage from the adverse impacts of project activities and support its preservation.	Possible chance finding of notified cultural heritage site, beliefs, etc. may be located near the project areas.	Given the vast geographical area of the state across which subprojects would be located, there is a possibility of cultural heritage related concerns, including chance finds, coming-up in the case of certain sub-projects under the proposed operation.
ESS 9: Financial Intermediaries	To set out how the FI will assess and manage environmental and social risks and impacts associated with the subprojects it finances.	There are no FIs involved in this project.	Not relevant.
ESS 10: Stakeholders Engagement and Information Disclosure	- To establish a systematic approach to stakeholder engagements that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties - To provide project-affected parties with accessible and inclusive means to raise issues and grievances and allow Borrowers to respond to and manage such grievances.	Project shall conduct free, prior and informed consultations and shall obtain consent and overall community support.	This standard is relevant, as stakeholders need to be consulted throughout the project preparation and implementation period and also duly informed through disclosure of project related information.

Key gaps of the ESF with the National Framework:

The table below compares each of The World Bank's Environmental and Social Standards with the equivalent national and state environmental and social acts/policies/ regulations and the gaps, including the remedial measures to fill the gaps.

ESS	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
ESS-1 Assessment and Management of Environmental and Social Risks and Impacts	Environment Protection Act/ Rules 1986 and amendments till date EIA Notification 14th Sep 2006 and amendments till date. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	As per the MoEF&CC EIA Notification 2006, embankment works do not require any EIA or approval from MoEF&CC or TNPCB. Borrowing of the earth will require permissions from TNPCB and will require prior environment clearance under the mining of minor minerals category. The PMU and PIUs will ensure that the ESS1 provisions are implemented through PMC and monitored by E&S Specialists of PMU and PIUs.
ESS 2: Labour and Working Conditions	Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 Workmen Compensation Act, 1923 The Inter-State Migrant Workmen (Regulation of Employment and Conditions Service) Act, 1979, 1980, 1981 and the Inter-State Migrant. Workmen (Regulation of Employment and Conditions Service) (Tamil Nadu) Rules, 1983, 1984, 1985. The Child Labour (Prohibition & Regulation) Amendment Act, 2016 The Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act 1996 Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act) Contract Labour (Regulation & Abolition) Act 1970 Payment of Wages Act, 1936 Employees Provident Fund and Miscellaneous Provision Act, 1952 Maternity Benefit Act, 1951 The Contract Labour (Regulation and Abolition) Rules, 1971.	The national and state legal provisions cover almost all requirements in ESS2 and the requirements of a functional GRM for different types of workers. For this project, a Labour Management Plan is prepared to regulate working conditions and management of labour relations including worker specific GRM, terms and conditions of employment, code of conduct, non- discrimination and equal opportunities, protection of labour force, prohibition of child/force labour and provision of OHS requirements. The main gap that LMP will cover is the OHS requirements of direct and contracted workers. The other gaps that the LMP fills are the provision of Code of Conduct for workers, GBV prevention measures, GRM for workers, etc. The PMU and PIUs will ensure that the ESS2 provisions are implemented through PMC and monitored by E&S Specialists of PMU and PIUs. The concerned Labor Officers will also be

	Occupational Safety, Health and Working Conditions Code, 2020. The new labour codes of India; 1) Code on Social Security, 2020, 2) Code on Wages, 2019, 3) Industrial Relation Code, 2020 and 4) Occupational Safety, Health, and Working Conditions Code, 2020.	monitoring.
ESS 3: Resource Efficiency and Pollution Prevention and Management	Air (Prevention and Control of Pollution) Act, 1981, 1987 Water Prevention and Control of Pollution) Act, 1974, 1988 Noise Pollution (Regulation and Control Act) 2000 and amendments till date Hazardous & Other Waste (Management and Trans- boundary Movement) Rules, 2016 Manufacture, Storage & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date The Batteries (Management and Handling) Rules 2001 Construction and Demolition Waste Management Rules, 2016 Vehicle Act 1988 Central Motor Vehicle Rules 1989 Energy Conservation Act, 2001 Roof-top Rain Water Harvesting, 1999	The majority of ESS3 requirements are directly addressed by existing regulations and indirectly for resource efficiency and climate change aspects, including pollution prevention and management. The PMU and PIUs will ensure that the ESS3 provisions are implemented through PMC and monitored by E&S Specialists of PMU and PIUs. The TNPCB will also be monitoring these.
ESS 4: Community Health and Safety	Hazardous & Other Waste (Management and Trans- boundary Movement) Rules, 2016 Disaster Management Act, 2005 Plastic waste management Rules, 2016 E-Waste Management Rules, 2016 Rights of Persons with Disabilities Act, 2016 Air (Prevention and Control of Pollution) Act, 1981, 1987 Water Prevention and Control of Pollution) Act, 1974, 1988 Noise Pollution (Regulation and Control Act) 2000 and amendment till date Manufacture, Storage & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date The Batteries (Management and Handling) Rules 2001 Construction and Demolition Waste Management Rules, 2016 Vehicle Act 1988 Central Motor Vehicle Rules 1989 Bureau of Indian Standards	These existing laws and rules are to protect community health and safety. Hence, these laws and rules fulfil the community health and safety requirements. The BIS standards and building codes address the community health and safety requirements. In addition, an ESMP is prepared to be implemented by the contractors, keeping community health and safety in mind. This ESMP deals with community health and safety which includes OHS plan, labour Influx management Plan, workers camp management plan, traffic and road safety management plan, etc. The PMU and PIUs will ensure that the ESS4 provisions are implemented through PMC and monitored by E&S Specialists of PMU and PIUs.

ESS 5: LA, Restriction on Land Use and Involuntary Resettlement	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2017 by GOTN and its subsequent amendments.	Gap exists specifically related to aspects such as the identification of non-titleholders as PAPs and cut off dates for non-titleholders. The gaps are addressed with suitable provisions in RPF. The PMU and PIUs will ensure that the ESS5 provisions are implemented through PMC and monitored by E&S Specialists of PMU and PIUs. The Revenue Department, through the concerned Deputy Commissioners, will be part of the implementation and monitoring.
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	The Forest (Conservation) Act, 1980 and Amendments and The Forest (conservation) Rules 1981 and Amendments. The Indian Wildlife (Protection) Act, 1972 Tamil Nadu Forest Act 1882 & amendments Forest Right Act -2006, The Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Forest Right) Act, 2006 Biological Diversity Act 2002, and Biological Diversity Rules, 2004 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Wetland (Conservation and Management) Rule 2010 Fisheries Act.	Provisions from the acts meet the ESS requirements. ESMP is prepared to address the wildlife presence and movement outside the protected area and in and around the project corridor. The PMU and PIUs will ensure that the ESS6 provisions are implemented through PMC and monitored by E&S Specialists of PMU and PIUs. The Forest Department and the concerned Wildlife Wardens will be monitoring the implementation of these measures.
ESS 7: Indigenous Peoples	Article 366 (25) of the Constitution of India Article 244(1) of Constitution of India – The Fifth Schedule under Article 244(1) of a subsequent Act of Constitution “Scheduled Areas” as such areas as the President may by order declare to be Scheduled Areas after consultation with Governor of that State. Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 Panchayats (Extension to the Scheduled Areas) Act, 1996	The legislation meets the requirements of ESS, including FPIC. The PMU and PIUs will ensure that the ESS7 provisions are implemented through PMC and monitored by E&S Specialists of PMU and PIUs. The concerned Tribal Development Councils will monitor these provisions.

ESS Cultural Heritage	8:	The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010 The Treasure Trove Act 1878. Ecotourism guidelines in and around protected areas 2021.	The legislation meets the requirements of ESS. The Chance Finds procedures are available in the legislation. The chance find procedures are included in ESMP. Impacts on religious structures (not protected, but social and cultural value) will be mitigated or managed through provisions for restoration. The PMU and PIUs will ensure that the ESS8 provisions are implemented through PMC and monitored by E&S Specialists of PMU and PIUs.
ESS Financial Intermediaries	9:	Not Applicable	-
ESS 10: Stakeholder Engagement and Information Disclosure		EIA Notification 14th Sep 2006 and amendments till date. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 Panchayats (Extension to the Scheduled Areas) Act, 1996 Right to Information Act, 2005	The legislation partly covers this ESS with the act requiring providing information when asked for. Almost all government agencies have GRM and Citizen Charters detailing the redressal and service services. ESS 10 has the provision for borrower to respond grievances of PAP's related to the environmental and social performance of the project in a timely manner as well as to proactively disclose publicly project related information. The PMU and PIUs will ensure that the ESS10 provisions are implemented through PMC and monitored by E&S Specialists of PMU and PIUs.

4. ASSESSMENT OF PROBABLE IMPACTS, SIGNIFICANCE & MITIGATION MEASURES

The purpose of this chapter is to predict the likely environmental & social risks, impacts that could result from construction and operation of the proposed TN-SHORE project activities & development of suitable mitigation measures.

Overall Environmental and Social Risks (E&S)

The overall E&S risk rating is categorized as Substantial. A majority of the targeted interventions are small to moderate scale, largely community-driven and nature-based, with limited physical footprint. Select grey coastal protection interventions, expected to be moderate scale, will be implemented only in areas with severe coastal erosion problems and will be informed by Shoreline Management Plans. Thus, risks and impacts are anticipated to be localized, manageable and reversible. Additionally, Tamil Nadu has implemented successful pilots in the coastal zones and have the experience and familiarity with implementing safeguard policies of ADB and JICA.

The Environmental Risk Rating is assessed to be Substantial mainly due to the following risks;

- i. Increased access to ecologically- sensitive areas while implementing the management plans for these ecosystems;
- ii. Temporary pollution-related impacts while undertaking civil works to build/rehabilitate/expand waste-management/ erosion-control infrastructure;
- iii. Sourcing of materials for plantation and implementing soil and water conservation and erosion control measures in environmentally-sensitive areas;
- iv. Contamination of soil and water due to increased use of fertilizers/pesticides in afforestation sub projects; and
- v. Installation of engineering solutions (like flow traps, chutes) in pollution hotspots of rivers and estuaries, to control plastic inflow into the sea.

The potential risks and impacts can be avoided and reduced through screening of sub-projects to avoid sensitive areas, hotspots and no-go areas and to improve the subproject design to minimize risks and impacts, embedding of strategic E&S assessment and planning in the ICZMPs, timely implementation of mitigation measures, where avoidance and minimization, are not possible; and a robust coordination and monitoring mechanism.

The project is expected to socially benefit low-income households and community groups directly and indirectly through livelihood support, incentives for entrepreneurship, technology transfers, and enhanced coastal infrastructure, through project interventions on coastal zone management, strengthening plastic-value chain and enhancing blue economy opportunities (eco-tourism, aquaculture, fisheries, afforestation). The improved livelihoods and employment opportunities will have positive spill overs for community members not directly supported through project interventions. Self-Help Groups, especially those led by women, will be key beneficiaries. Mangrove plantations and rehabilitation work will be carried out by the local community thus generating additional employment opportunities. However, inclusion and equity issues may remain a concern in accessing the benefits of the project. Some activities such as construction, plantation, restoration, etc. might have private or public land needs. The establishment of mangrove plantations and building of small infrastructure to the extent possible will be carried out on public land. Structures, such as street vendor stalls, may need to be moved or relocated for implementation of projects such as restoration of natural coastal resources. Fences may need to be erected to protect coastal resources which could block access to people's lands or public spaces like part of a beach. Temporary displacement of vendor stalls/small businesses/ small informal establishments such as fisherman hut/informal fish landing sites/ women vendors may have adverse impacts with regards to access; loss of livelihood and security of the concerned people. Vendors or small businesses removed or displaced from their original locations may be unable to return to these once they have been

rehabilitated, thus facing loss of income. The scope of construction works expected would not result in significant influx.

The TN-SHORE is planned for arial survey by using drones. In that case Drone rules, 2021 will be followed, the anticipated risks are lack of maintenance/servicing of drone, unsuitable take off/landing area, lack of competence of drone operator, operation of drone in poor weather conditions, collision with external obstacles (e.g. birds, trees, spectators/community members etc.) and operation of drone without proper licensing / permits. The risks can be reduced by proper maintenance as per supplier guidance, use of drone as per manufacture guidelines, take-off and landing areas is to be agreed with the community, Barriers/ signage will be provided. Operator must be fully conversant with and trained on the use of the drone, should poses the authorised license for operation. Drone must not be flown any higher than 400 ft above the earth's surface.

Further, there are Security risks concerns as the powers and duties of officers and employees of the Tamil Nadu Forest Department empower Forest Services Officers to use arms/ weapons as part of their routine duties of monitoring poaching, self-defense and illegal tree felling activities. However, assessment comprising site visits and interactions with communities and also review of existing systems indicated that no security risk assessments (SRA) and SMPs are required, given the low risks involved in the kind of activities (mangrove plantation/restoration, etc.) proposed under the project. Specifically the assessment indicated that: i) there are existing protocols that guide the use of weapons in situations only restricted to instances of poaching, self-defense and illegal tree felling; ii) trainings are provided to the forest guards and range officers on these protocols; iii) clear mechanism of reporting of incidents if any, exists in both states; iv) that there have not been any incidents concerning the use of force in the 14 coastal districts in Tamil Nadu in the last 3-4 years. Hence as is outlined in the ESMF and SEP, borrowers as part of the preparation of Detailed Project Reports (DPRs), will undertake consultations with communities in the area to elicit their concerns, if any, and the forest officials (range officer and forest guards); and the summary of these consultations will be recorded in the DPRs. Based on this, commensurate measures of orientation and training will be listed in the ESMPs (embedded in the DPR).

Identification of Environmental & Social Impacts, Risks & its mitigation measures

The criteria for determining significance are generally specific for each environmental and social aspect but generally, the magnitude of each potential impact is defined along with the sensitivity of the receptor. Generic criteria for defining magnitude and sensitivity are summarized in the following subsections.

The E&S activity-wise Risks/Impacts, Mitigation Measures, ESS Applicable, Intensity of Impact & Responsibilities for each activity proposed under TN-SHORE Project is covered as a matrix in Table 4-1. In the subsequent sections, these impacts are discussed and suitable mitigation measures are included. ESIA studies for each subproject should modify and further detail out this analysis as applicable, based on site/project studies, professional judgment and public consultations.

Table 4-1 Potential Environmental and Social Risks and Impacts

S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
Component 1				
1	Design/Planning of Infrastructure and Buildings at Conservation Park at Kadambur, Chengalpattu District, • Conservation area for bamboos, Palms, medicinal Plants • Establishment of Rock Garden with arrangements of water falls. • Rose Garden • Aquatic habitat for housing aquatic vegetation • Arboretum of Indigenous and exotic species • Natural garden for indigenous flowering species • Plant museum with library and state of art Herbarium with seed preservation center. • Demonstration area for vegetation of models, sacred groove concept. • Tree houses • Nature trails, cycle path and road for battery operated vehicles. • Bird viewing platforms and watchtowers	• Possible impacts on encroachments, squatters and access/temporary disruption during construction stage. • Impact on nearby community health due to water stagnation causing mosquito generation and water borne diseases. • Improper disposal of wastes and waste water/sewage may affect health of nearby communities. • Health effect due to VOC emissions from paint and solvents. • Soil and ground water contamination by improper disposal of paint wastes affecting health of nearby community. • Risk of fire during storage of paints and solvents. Toxic fumes from paint fire may affect health of nearby community. • Occupational health and safety issues among workers. • Fall from height, slip and tripping, Injuries and accidents. • Construction wastes, hazardous wastes (used oil from DG sets/construction machines) and solid wastes. • Use of weedicides and herbicides may have adverse environmental impacts. • Construction of cycle path and road for battery operated vehicles may alter natural drainage causing flooding and erosion. • These can obstruct reptile's movement path causing killing of reptile. • Danger of falling of visitors and staff from height. • Sewage and Waste water generation cause water	1,2,3,4,5,6	M

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
		pollution, • Solid wastes generation, • Air and noise generation from DG sets from impact on health of nearby community & biodiversity park due to improper disposal of wastes, air, noise and water pollution. • Solid waste/plastic waste generation from tourists. • Generation of wastewater and sewage from public amenities and toilets. Impact on health of nearby community due to improper disposal of wastes, sewage and wastewater. • Increase in water demand/requirement. • Increased number of vehicles causing air/noise pollution. • Traffic congestion at and around Biodiversity Park. • Effluent and wastes generation Biodiversity Conservation Park. • Risk of discrimination in employment, wage/payment discrepancies and unclear engagement terms, Poor labour conditions at the work site accommodation without ventilation, lack drinking water and sanitation facilities, no cleaning and sweeping, mosquitos, etc. • Risk of sexual harassment of female workers.		
2	Turtle Conservation Centre at Guindy Children Park, Chennai	• Impacts on Protected Area (Guindy National Park) due to the proposed project. • Aesthetic appearance & homogeneity to the surrounding. • Increase in energy consumption due to the proposed activity. • Use of traditional construction materials. • Generation and improper disposal of solid wastes and wastewater/sewage from conservation centre including toilets and washrooms used by tourists, resulting in land & water pollution, mosquito	1,2,3, 6	M

S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
		breeding which may affect nearby health of community. - Land and water resources contamination through improper disposal of solid wastes which may affect nearby health of community. - Exhaust emissions and high noise generation from Other Construction Vehicles, Equipment and Machineries to be deployed at construction site. - Exhaust emissions & high noise may affect health of community and disrupt the biodiversity. - Health effect due to VOC emissions from paint and solvents. - Soil and ground water contamination by improper disposal of paint wastes affecting health of nearby community. - Risk of fire during storage of paints and solvents & toxic fumes from paint fire may affect health of community. - Unsafe acts and conditions at the work sites. - Occupational health and safety issues among workers. - Fall from height, slip and tripping. - Injuries and accidents. - Increased use of water for concrete curing. - Increase in water demand for concrete curing. - Construction wastes and hazardous wastes (used oil from DG sets/construction) have potential for contamination of soil and surface/ground water sources if these are disposed improperly may affect community health & to the National Park. - Risk of sexual harassment of female workers.		
3	International Dugong Conservation Centre (IDCC) at Manora, Thanjavur	Flooding and storm water accumulation around IDCC Site may result in erosion, mosquito's generation resulting in health issues in nearby communities.	1, 2, 3,4, 5,6	M

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
		- Land and water resources contamination through improper disposal of solid wastes which may affect nearby health of community. - Procurement of construction materials from illegal sources resulting legal action on subproject/contractor. - Exhaust emissions and high noise generation from Other Construction Vehicles, Equipment and Machineries to be deployed at construction site. - Impacts on Biodiversity and habitats due to cutting/damage mangrove in protected area during construction phase. - Impact of birds and habitats through air and noise pollution. - Risks to areas near CRZ III A & CRZ I A, mangrove habitat and Dugong habitat, which need specialized attention for conservation of critical habitats. - Exhaust emissions & high noise may affect health of community. - Risk of discrimination in employment. - Risk of wage/payment discrepancies and unclear engagement terms. - Poor labour conditions at the work site, like accommodation without ventilation, lack of drinking water and sanitation facilities, proper hygienic conditions, etc, Discrimination in employment; Wage/payment discrepancies and unclear engagement terms. - Occupational health and safety issues due to unsafe acts and conditions, air and noise pollution, lack of drinking water and sanitation facility. - Risk of sexual harassment of female workers.		
4	Championing Pallikaranai: Advancing Wetland Conservation & Restoration	Impacts on Wetland due to the proposed project cycle.	1, 2, 3, 6	S

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
	- Removal of debris from the wetland such as construction debris, solid waste, garbage, etc. - Bunds formation and consolidation of bund around the - Marshland boundary & native species plantations - Clearing of blocks in the waterways that feed the marsh - Removal of Eichhornia plants in the entry point of the channel by deploying floating machinery - Removal of Aquatic & Terrestrial Weed and planting the native species - Installation of a Floating Bar screen to filter floating inorganic materials like plastic papers, bottles etc. - Improvement of Interpretation Centre at Karapakkam like repairing of ceilings, improving the wooden bridges, establishment of watch towers & provide public amenities, etc.	- Generation and improper disposal of solid wastes and wastewater/sewage from conservation centre including toilets and washrooms used by tourists, resulting in land & water pollution, mosquito breeding which may affect the wetlands & health of nearby community. - Removed debris may contain toxic elements and bacteria which could affect the workers & health safety of the community. - Dust generation. - Use of machineries in wetland, - De-silting of channels from 0.5 to 2.5m below the Chart datum to facilitate free flow of water from the southern part of the 200-foot road to the northern part thereby affecting soil characteristics, flora & fauna. - Extraction of Eichhornia plant & impacts on worker doing the activity. - Chances of contamination at disposal site by chemicals absorbed by Eichhornia. - Effect on wetland its flora & fauna. - Risk of discrimination in employment. - Risk of wage/payment discrepancies and unclear engagement terms. - Poor labour conditions at the work site, like lack of drinking water and sanitation facilities, proper hygienic conditions, etc., Discrimination in employment.		
Component 2				
5	Building Bio-shields for Habitat Rehabilitation and Mangrove restoration in Coastal districts - Establishment of a mangrove Plant nursery - Removal of shrubs in degraded areas before plantation	- Possibility of injury to persons & mangrove while stepping into deeper dense mangrove muddy areas during site visit & ground truth verification. - Impacts on ecosystem due to human interventions since mangrove is planned to be restored in National Parks, Reserved Forest & other ecologically sensitive areas.	1, 2,3,4, 6	M

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
	- Formation of approach channel from main/branch canal & construction of fishbone-type channels for plantation in degraded areas - Transport of saplings from nursery by boat and walking on mangrove areas - Plantation of mangrove samplings in degraded areas	- Effect of removal activity on fragile ecosystems and swamps. - Use of machineries. - Injuries during clearing of blockages. - Removal of bottom sediments. - Loss of Benthic organisms. - Presence of water stagnation during canal formation causing turbidity and affect the aquatic flora & fauna - Risk and injury involved during construction activity digging the canals, construction of fishbone channels for planting seedlings and plantation activities. - Affects the aquatic ecosystem (eggs) to boat operations. - Affects mangrove due to movement of boats. - Possible injuries to the people involved in the project - Risk of discrimination in employment. - Risk of wage/payment discrepancies and unclear engagement terms. - Wage/payment discrepancies and unclear engagement terms. - Risk of incidence of gender-based violence due to unhealthy working conditions. - Risk of sexual harassment of female workers. - Impact on fishing activities during plantation.		
6	Restoration of Degraded Coastal Wetlands Focusing on Seagrass Meadows in the Gulf of Mannar and Palk Bay, Tamil Nadu, and Assessment of Blue Carbon Stock - To Strengthen Climate Adaptation, Promote Resilience and Enhance Livelihood Sustainability	- Impacts on ecosystem due to human interventions since sea grass is planned to be restored in National Parks, Protected Areas & other ecologically sensitive areas. - Low success rate may be attributed to poor site selection, high sedimentation, reduced light, strong waves and currents, animal foraging, etc. - Pollution impacts on the surrounding area arising	1, 2,3, 6	M

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
	- Collection of Seagrass Shoots from Donor Sites - Transport of PVC frames tied with Seagrass shoots to the targeted sites	- from wastages and improper disposal in the seas. - May create stress if not collected from appropriate donor sites and in a careful manner. - Risk related to diving equipment failures. - Affects the aquatic ecosystem due to boat operations. - Impact on marine process due to deployment of foreign materials (PVC frames). - Possible injuries to people carrying out the activity. - Solid wastes and disturbed PVC frames within sea water due to marine process and fishing activities. - Possible injuries to the people involved in the project (including divers). - Risk of wage/payment discrepancies and unclear engagement terms.		
7	Erosion Control and Coral Restoration at Kariyachalli Islands, Gulf of Mannar ecosystems, - Construction of artificial reef modules - Deployment of artificial reef modules - Monitoring of Coral Rehabilitation - Collection of seagrass shoots from donor sites - Construction of PVC frames - Deployment of PVC frames with seagrass - Monitoring of Seagrass Restoration - Coral/seagrass restoration	- Artificial reef modules may contain toxic materials, which can harm marine ecology on its decomposition. - Any possible injuries during the activity. - Improper deployment of AR Modules, substrates and oceanographic dynamics may impact survival and growth of corals at Kariyachalli Islands. - Improper collection of seagrass sprigs from donor sites may create stress on existing seagrasses (more than 5% would create stress). - Construction of PVC frames wastages for transplantation of seagrass shoots may have adverse impacts on the environment. - Deployment of PVC frames with seagrass may have impacts on the natural ecosystem process in the sea floor, and on seawater as well as may cause plastic pollution. - Diving equipment failure during deployment & anchoring - Improper deployment of PVC frame with seagrass and oceanographic dynamics may impacts survival	1,2,3,6	S

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
		and growth of seagrass restoration at Kariyachalli Islands. - Labour related risk during deployment of heavy artificial reef modules/PVC quadra pods would include safety issues while at work under water; occupational health and safety risks due to exposure of workers to unsafe conditions while working inside sea water, etc. - Discrimination in employment. - Wage/payment discrepancies and unclear engagement terms.		
8	Strengthening Coastal Management through Integrated Coastal Zonal Management (ICZM), Marine Spatial Planning (MSP), Coastal Management Plan (CMP) for Critically Vulnerable Coastal Areas (CVCA), Integrated Management Plan (IMP) and Valuing Ecosystem Services with Capacity Building and Outreach Initiatives - Assessment of the turtle nesting grounds, sand dunes, sandy beaches and biologically active mudflats in environmentally sensitive areas - Identification of current stakeholders and resource dependent coastal communities - Assessment of health status of the four ecologically sensitive areas. - Assessing the resource use and current resource governance ability of the community adopting Community Based Resource Management (CBRM) framework	- Baselines survey and assessment can disrupt or harm the wildlife habitats or natural vegetation/ mangroves in turtle nesting grounds, sand dunes, sandy beaches and biologically active mudflats in environmentally sensitive areas. - Improper identification of stakeholders and resource dependent coastal communities are not identified properly, it can have negative impacts on the project progress. - Assessment of health status, ecologically sensitive areas may be disrupt or it can harm the wildlife habitats, mangroves, etc - If location specific integrated management plan is not prepared, it may have adverse environmental risk and impacts on critically vulnerable coastal areas. - Field surveys and ground truthing might for demarcation of temporal and spatial may lead to habitat disruption and damage to mangrove. - Providing comprehensive training to diverse groups, including local communities, government officials and SHGs, can be logistically challenging. - Language of capacity building and outreach initiatives may barriers in knowledge transfer as	1,2,5, 6, 10	S

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
	- Preparation of an Integrated Management Plan for Gulf of Mannar (CVCA) - Demarcation of temporal and spatial planning extents for integrated planning - Preparation of a comprehensive base map for the area - Preparation of Coastal Profile - Identifying the coastal issues, conflicts, synergies and the stakeholders - Preparation of Sectoral or Area based following subplans: - Shoreline Management Plan; Plan for Conservation of Natural / Cultural Resources; Emergency Preparedness and Disaster Management Plan; Water Management Plan; - Pollution Management Plan; - Livelihood Management Plan; Tourism Management Plan; Industrial Development Plan; Coastal Agriculture Development Plan; Fisheries Management Plan; Plan for Infrastructure Development and Service Delivery; Marine Spatial Plan; - Valuing Ecosystem Services with Capacity Building and Outreach Initiatives Preparation of Management Plan (MP) for ESA and Integrated Management plan (IMP) for CVCA, IMP, ICZM Plan	many government officials, communities members, SHGs may not be conversant with English. - Survey, field studies and activities can interfere with uses of the shoreline, potentially affecting local tourism and community interests like fishing, etc. - During field studies and data collection local labour may be engaged, hence labour related issues. - While working on turtle nesting grounds, sand dunes, sandy beaches and biologically active mudflats, mangroves, etc in close vicinity of sea, safety of workers engaged in survey and field studies will be an issue.		
Component 3				
9	Blue Flag Beaches	Fisherman communities may oppose Blue flag beach certification as they might be disturbed/evicted from beach and their livelihood may be affected.	1, 10	L

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
		Blue flag certification will affect fishermen as land used to anchor their boats will be taken away.		
10	Sustainable Tourism	- Sustainable tourism might lead to disrupt local culture or traditions due to higher inflow of tourists. - Incidents of GBV and sexual harassment of women vendors may increase, if required preventive measures are not taken. - Sustainable tourism will involve local communities, proper distribution of income is very important. There is possibility that elite groups of people from community may be usual beneficiary and vulnerable members of community may be ignored in fair distribution of income, is crucial challenge.	1, 10	M
11	Diversified livelihoods for a thriving Blue Economy	- Communities may resist/oppose to change their livelihood for thriving blue economy. - Knowledge and training acquired for diversified livelihood might not translate into sustainable livelihoods/ businesses. - Coastal community members who are digitally challenged or are not tech savvy might may not participate in the program. - Market viability for the new products or services under diversified livelihoods might be low.	10	M
Component 4				
12	Advancing Meendum Manjappai Identification of plastic waste hotspots	Only positive environmental impacts are anticipated, as it will help authorities to implement targeted efforts for plastic waste management along the river and coastal ecosystems.	1, 3, 10	L
13	River System Investments (Floating Trash Barriers)	- To prevent the entry of plastic waste into the marine ecosystem, floating trash barriers will be installed. - This will have positive impacts. - If plastic wastes collected from trash barriers is dump on bank for long duration, it can contaminate soil. - Risk of primary suppliers' workers	1, 2, 3, 4, 10	M

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
14	Digital Waste Exchange Platform	Only positive impact is anticipated as digital waste exchange platform is aimed at connecting collection facilities.	--	--
15	Coastal Waste Collection (CWC) Centre	- People working in recycling centre could be at risk of exposure to dirty plastics and unhygienic conduction causing health issues as well as surrounding community. - Inadequate communication with community in the vicinity.	1, 2, 3, 5, 10	L
16	Material Recycling Facility (MRF)	- People engaged in wastes segregation for recycling could be at risk of exposure to dirty plastics wastes and unhygienic conduction causing health issues. - At the recycling facility air pollution may be an issue during recycling of plastic.	1, 2, 3, 10	M
17	Fish Net Collection and Incentivization Programme	Only positive impacts are anticipated. No negative adverse impact on environment is anticipated.	10	--
18	Recycled Plastic Products	Recycled plastic products may contribute to air pollution during recycling and production of recycled products.	1, 2, 3, 10	M
19	IEC Programs and Community engagement	- Only positive impacts are anticipated. - No negative adverse impact on environment is anticipated.	--	--
20	Fish Net Collection and Incentivization Programme	- Would be difficult to manage fish net waste if local fishermen communities do not cooperate with the program, - Inadequate communication on program guidelines, benefits	2 and 10	M
21	SUP free tourist places	Resistance to change and tourist preferences for plastic may hinder adoption.	10	L
22	Beach Clean-ups	Risk of incidence of gender-based violence due to unhealth working conditions.	3, 10	L
23	Mainstreaming Rag pickers	Un-hygienic/ unhealthy conditions;	1, 2, 10	M

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
		24 Risk of incidence of gender-based violence due to unhealthy working conditions; - Risk of sexual harassment of female rag pickers.		
24	Energy-efficient Systems	- Energy-efficient Systems are beneficial for environment. - However, generation and disposal of e-wastes during replacement of existing traditional energy system by energy-efficient systems (for example incandescent lighting to LED lights, etc) can lead to adverse impacts on soil and community health.	1, 3, 4, 10	L
25	Climate-smart Horticulture practices	- Localised impacts soils may be observed as it will require treatment of soil for new crops and cropping pattern will take place as a part of climate-smart horticulture practices. - Micro fauna and birds may be affected by change in climate-smart agricultural practices.	1, 3, 6, 10	L
26	Efficient water management	Efficient water management will have overall positive impacts; However, adverse impacts due to localised air and water pollution and wastes disposal are anticipated.	1, 3, 4, 10	M
27	Harnessing renewable energy sources, such as solar	- Possibility of damage of solar power plants during high winds and cyclones. - Hazardous wastes /e- waste generation in the form of broken solar panels, in case of damage.	1, 3, 10	L
28	Solid Waste Management	- Adverse impact on environment & community due to improper disposal of solid waste - May affect the health safety of workers involved in waste collection & management	1, 2, 3, 4, 10	L
29	Climate proofing including Re-naturalisation of Canal, Climate Information Centre with Automatic Weather Stations (AWS)	Mostly positive impacts except possible accidents & injuries during construction.	1, 2	L
30	Ennore Creek Restoration - Removing Silt from Creek - Transportation of silt	Desilting can have serious and long-lasting negative impacts on the environment as it may damage or destroy benthic organisms, fish	1, 3, 4, 6	S

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S.No.	Activity	Potential Risks and Impacts	Applicable ESSs	Risk category (L/M/S)
	- Disposal of silt - Identification of sewage drains entering into creek. - Design of Sewage Treatment System - Construction, erection and commissioning of Sewage treatment plant (STP) - Operation and Maintenance of Treatment System - Identification, characterisation and quantification of solid wastes disposal locations in the creek Design of solid waste management system	spawning grounds and make creek banks unstable. - Benthos micro-invertebrate present in creek bed may be affected during desilting activities. - Spillage of silt on the roads. - Fugitive dust and exhaust emissions from vehicles transporting silt. - Flow of silt with runoff during rains resulting increase in turbidity. - If locations of sewage and other drains being discharged in Ennore Creek are not ascertained, interception, diversion, treatment and disposal may be affected. - Improper selection of design parameters may affect performance Sewage Treatment System. - Improper management and disposal of septage/faecal sludge may lead to contamination of soil and ground water sources causing land and water pollution and ultimately impact on community health. - Dust, exhaust and noise generation during excavation of tanks and foundation of STP may affect health of nearby community. - Discrimination in employment. - Wage/payment discrepancies and unclear engagement terms. - Occupational health and safety issues due to unsafe acts and conditions, air and noise pollution, lack of drinking water and sanitation facility, - Risk of incidence of gender-based violence due to unhealth working conditions, and - Risk of sexual harassment of female workers.		

The project components and activities with relevant E&S risks and its impacts are summarized below

Component 1 consists of Biodiversity Conservation Park at Kadambur, a Sea Turtle Conservation Center at Guindy, and an International Dugong Conservation Center at Thanjavoor and Wetland Conservation at Pallikarani. These activities involve construction processes that can lead to short- to medium-term impacts like construction waste generation & improper disposal of waste, pollution, and effects on critical habitats (e.g., mangroves, dugongs). This activity also leads to soil and water contamination. OH&S issues among the workers is also expected, use of insecticide & herbicide may affect the environment. In case of Dugong centre, flood and storm water accumulation may lead to erosion & mosquito generation leads to health issues of the surrounding community. Risks areas near CRZ-III & I A are also expected for mangrove and dugong habitat. As the construction, impacts on laborers, and there are risks related to gender-based violence (GBV). There is potential for increased tourist flow, which can affect nearby villages. The identified applicable ESS are 1, 2, 3, 4, 5 & 6 and the risk is categorized as **Moderate**. As Environment friendly interventions intervention is planned the risk can be minimized.

Component 2 consists of coral restoration at Kariyachilli Island, Gulf of Mannar, enhancing coastal resilience like mangroves and sea grasses and blue carbon solutions and capacity building. The mangrove & seagrass restoration leads to injury to persons and mangroves while stepping to deeper dense mangroves during site visit, ground truth verification and execution. Remove of bottom sediments leads to loss of benthic organisms. The expected social impacts are fishing, GBV, wage payment discrimination, discrimination in employment. The applicable ESS are 1, 2, 3, 4 & 6 in case of rehabilitation of mangroves, 1, 2, 3, & 6 in case of sea grass meadows and coral restorations. Strengthening of ICZM & MSP, IMP in critically vulnerable coastal areas is expected to have 1, 2, 5, 6 & 10. Hence coral restoration & ICZM are categorized under **Substantial** and seagrass and blue carbon activity is under **Moderate Risk**.

Component 3 consists of blue flag beaches, sustainable tourism centres and diversified livelihoods. The expected potential risks are disrupt local culture or traditions due to higher inflow of tourists, Incidents of GBV and sexual harassment of women vendors may increase and Elite groups of people from community may be usual beneficiary and vulnerable members of community may be ignored in fair distribution of income. While the mangrove boardwalk construction could pose risks to protected areas, the involvement of fishing communities might lead to resistance, particularly if the certification of blue flag beaches disrupts their livelihoods. Additionally, increased tourism could raise risks of sexual exploitation, abuse, or harassment (SEA/SH) for women vendors. The Applicable ESS for blue flag & sustainable tourism are 1 & 10 and the risk categorized under **low & Moderate**. In case of diversified livelihood for thriving, blue economy is 10 and risk category **Moderate**.

Component 4 focuses on pollution abatement, specifically the management and reduction of plastic waste in coastal and marine environments. It consists of climate smart village which covers energy efficient systems, climate smart horticulture practices, efficient water management, harnessing renewable energy and solid waste management. A key construction activity here is the establishment of a material recycling facility centre. This component also includes software-based interventions like awareness and incentive programs targeting Abandoned, Lost, and Discarded Fishing Gears (ALDFG) and promoting climate-smart coastal villages. The recycling process, however, could result in increased air and water pollution, thereby the risk categorized under **Moderate**, and the applicable ESS are 1, 2, 3, 4, 6 & 10.

From the above matrix, it is evident that most of the TN-SHORE Project Activities falls within Low to Moderate, while some activities are categorised as substantial.

The overall the activities are rated as 'substantial' due to

- (i) Geographical setting of the project in different landscapes/watersheds covering a large coastal stretch and
- (ii) The weak capacities of the district and village level implementing & monitoring agencies on understanding, identifying and mitigating environmental risks and impacts;
- (iii) Exposure of workers and communities to health and safety hazards from the civil works and human-marine animal life conflict;
- (iv) Temporary restriction or limitations on accessing project area resources, conserved areas which may have temporary impact on livelihood. However, physical displacement of fisherman communities, and any vulnerable groups which are closer to the project and their households or any adverse impacts on customary lands, and cultural properties is not anticipated due to the project activities as they are planned to avoid these areas.

The potential environmental & social risks of the project are envisaged to be temporary, localized, predictable, manageable, reversible and can be readily mitigated as project activities are largely small to medium scale and mostly driven by the mitigate measures planned already.

No massive construction activities are proposed for most projects under TN-SHORE, land requirements for project activities is planned in such a way that most of the proposed activities will be developed in government owned land or government poramboke land. In case any project requires private land acquisition, then small scale lands shall be met through public or community owned land (and will be a part of the site selection criteria). The impacts due to construction activities will be inevitable, but can be greatly managed through following proper ESMP's and will be largely reversible. Some project villages have the presence of multi-ethnic communities. To manage capacity gaps on participatory processes, major impetus on TN-SHORE Project as well as village level community institutions and collectives on approaches and methods for community mobilization, vulnerability mapping, participatory planning and social inclusion, supporting preparation and roll out of a robust stakeholder engagement strategy and staffing the SPMU with domain expert specialists e.g. community engagement & participatory planning), in addition to Social Development Specialists. The project will also engage full time environmental experts to bridge the gap in assessing and managing risks, strengthening community institutions, involving various stakeholders right from the planning process to implementation and management of project and sub-projects thereby the overall impact will be negligible or net positive.

The SEA/SH risk is assessed as low (using the SEA/SH risk assessment tools for social protection and civil works projects). Since the scale of construction is limited, the risk of labour influx for the host population related to SEA/SH related risks is expected to be minimal. The laws against SEA/SH are to be followed at community, block, village, district and state level to prevent these types of impacts.

5. APPLICATION OF ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

Environmental and Social Management Framework (ESMF) is a tool for use by a project proponent to identify and address the potential environmental and social concerns or impacts of a project across all stages from planning stage to its implementation and post-implementation operations. Keeping this in view, the present ESMF has been developed for use by all PIAs. A step-by-step methodology has been provided that can be followed along with engineering and institutional interventions required for the sub-project activities.

Application of ESMF will vary by nature of activities i.e.

- A. **Works** -- Hard infra or Environment friendly interventions e.g. turtle conservation centres, Dugong conservation centre or MRFs or Environment friendly interventions e.g. Wetland Conservation & Restoration, degraded wetlands, etc.
- B. **Goods** – Procurement of trash barriers for plastic management, manjappai (yellow bag)
- C. **Engagement initiatives** e.g. Blue flag beaches or plastic circularity Advancing Meendum Manjappai², Fish Net Collection and Incentivization Programme, Beach Cleanups, Mainstreaming Rag pickers, etc.
- D. **Studies** e.g. Strengthening Coastal Management through Integrated Coastal Zonal Management (ICZM)

ESMF will be applied to the overall project through a three-stage process as described below:

Stage I: Sub-project Assessment and Analysis –ES Screening

All activities in the above categories (a, b, c, and d) will be assessed against the negative Exclusion list below.

Table 5-1 ES Screening

Sl.No.	List of activities
1	Any activity that converts or leads to conversion and/or degradation of significant areas of critical natural habitats (areas officially protected) and/or Sites of Conservation Importance and designated forest areas; including extraction of raw materials from such areas.
2	Purchase or use of pesticides (or any activity involving pesticides that are banned by the Government of India and World Health Organisation), insecticides, herbicides, and other dangerous chemicals; asbestos (e.g., Asbestos Cement pipes for irrigation, Asbestos Cement sheets for roof) and other investments detrimental to the environment.
3	Any activity that violates the provisions of applicable National 78 including Coastal Regulation Zone Notification, 2019 of MoEFCC and EP Act and State / Local body laws.
4	Construction of any new large water storage structures - such as weirs, barrages, and dams or any activity directly or indirectly related to the safety of dams, new large irrigation canals, new branch canals and new offtake structures.
5	The introduction of any new exotic marine species (note: this provision does not apply to any native and/or naturalized species, or any micro-algae that is imported

² Meendum manjappai translates to yellow cloth bag again...it is aimed to discourage use of plastic bags

Sl.No.	List of activities
	as live feed)
6	Construction of permanent buildings within the wetlands or walls in or around wetlands which will interrupt water flow, tidying of wetlands or mangroves by the removal of dead wood that serves as habitat for multiple fish species Filling of wetlands within protected areas and outside, in strategic landscapes.
7	Establishing aquaculture/mariculture activities in close proximity to designated protected marine/terrestrial habitats, or projects involving large scale mariculture/aquaculture activities.
8	The use of artificial Reefs, soft and hard structures may contribute to stabilizing the coast, but they can also generate significant unintended downstream impacts. Hence, they should be considered only if a strong scientific basis is established following the preparation of Shoreline Management Plans (SMPs).
9	Involuntary land taking involving major impacts such as loss of shelter, livelihood or sources of livelihood.
10	Any waste management project (solid or liquid) which do not consider it in an integrated manner – without proper plan from source till disposal and / or for large cities/towns.

A. Works (hard infra or Environment friendly interventions interventions)

Once the above exclusion list is confirmed, for all activities involving works, DPMU is to prepare an Environment and Social Due Diligence Report using E&S scoping and screening checklists to identify E&S risks and impacts and determine risk category of the sub-project (L/M/S). These would be interventions involving:

- ◆ Hard interventions such as infrastructure (rehabilitation centre, in-situ/ex-site conservation works, sheds, residential/non-residential buildings, etc. and/or
- ◆ Environment friendly interventions such as mangroves, shelter belt plantations, afforestation, nature/eco-tourism trails, etc.

E&S screening and scoping templates (SF 1) provided in Annexure 1 shall be used to screen works/ interventions are further classified based on the location i.e. within dam area or outside the sub-project area. Each activity is reviewed for the applicability under-sub project, location of applicable activity as within sub-project area or beyond dam area and likely risks and impacts. The SF-1 format will be used to scope out or ascertain the types of E&S risks for each of the interventions e.g. Risk/Impact Water Quality, Fisheries, Conservation area, Protected Area, Ecological, Occupational Health, Physical Environment, Cultural, Tribal presence, impact on private land/assets/encroachers/squatters, labor, migrant labor and GBV risks – each of these corresponding to the ESS 2-8. As explained earlier, ESS1 is the overarching ESS and shall govern the applicability of ESS 2-8 and ESS 10, for each of the interventions of the sub project.

The second format (SF-2) is used to assess the extent of risk/impact intensity for each of the identified E&S risk and will be used to categorize the risk level as Low/Moderate/Substantial/ High.

Based on the findings of the above two format, the risk categories for all different types of E&S risk and impacts would be summarized and the highest of the risk categories would be assigned as overall risk category for the given sub-project. Based on the above findings, an “E/S Due Diligence” report for each sub-project would be prepared.

Stage II: Subproject Formulation and Planning-ES instruments

Based on risk category, a Standard ESMP (See Appendix 1) will be prepared.

- ◆ If risk category is L or M Standard ESMP including mitigation plans for the relevant ESS and update the Standard ESMP if required.
- ◆ If risk category is Substantial³, DPMU should undertake detailed ESIA as per agreed Terms of Reference (TORs) and prepare a sub-project specific ESMP including mitigation instruments as per relevant ESS. E.g. Pallikaranai wetlands conservation

For Low or Moderate Risk projects, a standard ESMP shall be developed wherein specific plans e.g. SEP or LMP will be included within the ESDD. However, if need be, the Standard ESMP would be customized based on study of sub-project information, proposed interventions, their magnitude and locations; assessing the relevance and applicability of laws, regulations and procedures for assessment including relevance of WB ESS requirements, development and implementation plans of the projects; approach to consultations or engagement with stakeholders.

The standard ESMP shall comprise set of actions that need to be completed by Implementing Agency and by the contractor. The contractor specific actions shall be annexed in the bid document and contract document. All standard ESMP plans shall be prepared by DPMU with support from and reviewed through their E & S specialists available in the SPMU.

³ Examples where sub projects may get classified as Substantial are – construction requiring land taking vide acquisition, interventions that might involve adverse impacts on biodiversity spots or natural habitats etc.

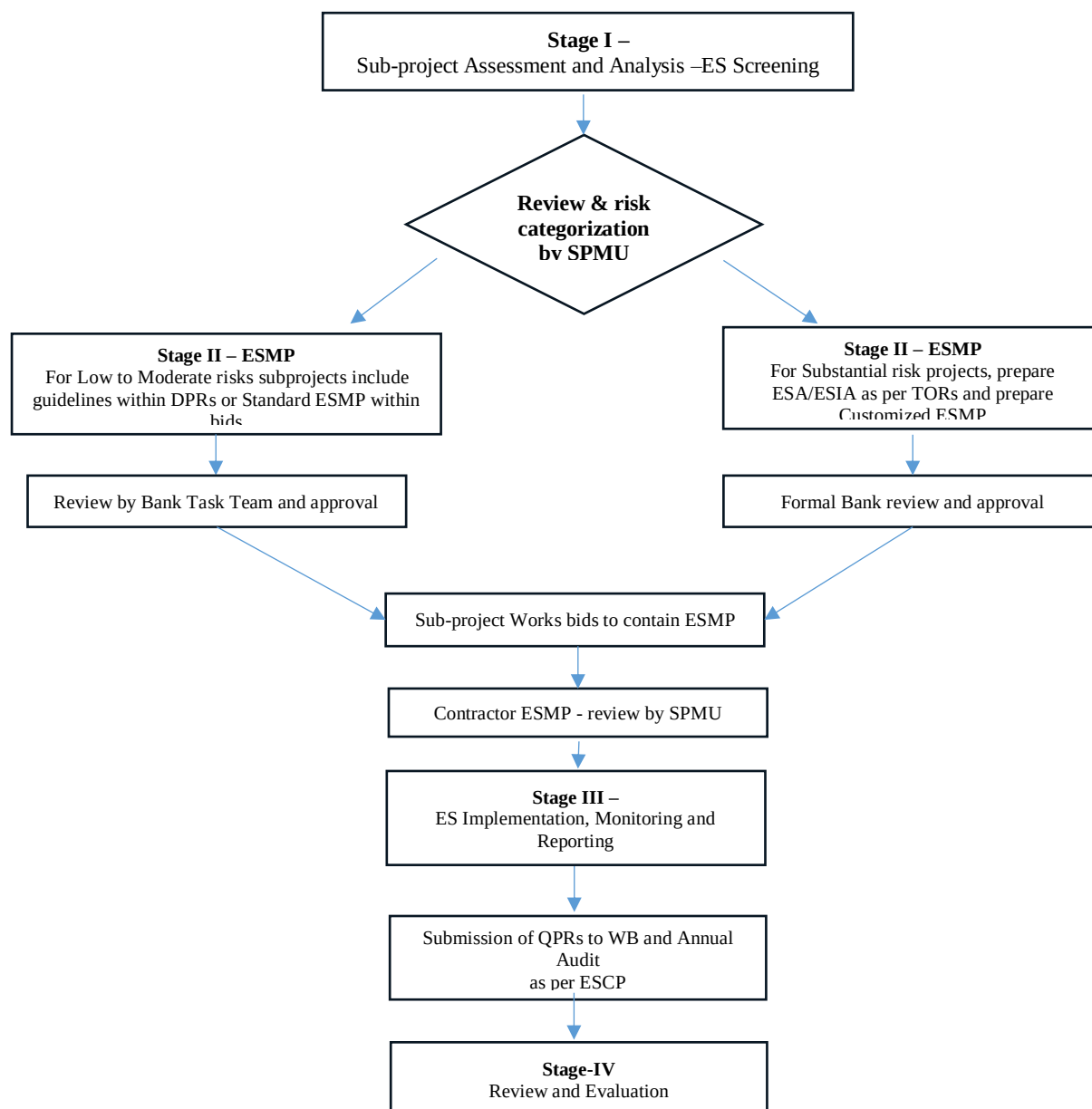


Figure 5-1 Stages of ESMF

ESMF includes Frameworks to meet the requirements for relevant ESS – GBV Risk Mitigation Framework (ESS1), Occupational Health and Safety (ESS2), Resource Management Plan (ESS3), (ESS4), Resettlement Policy Framework (ESS5), Bio-Diversity Conservation and Management Plan (ESS6), Tribal Development framework (ESS7). (Stakeholder Engagement Framework (ESS10) is prepared separately).

ESMP includes Resettlement Action Plan, Tribal Development Plan, Stakeholder Engagement Plan, Labour Management Procedure, Community Health Safety Management Plan, Bio Diversity Conservation and Management Plan, Cultural Heritage Management Plan, Construction Debris and Solid Waste Management Plan, Pollution Prevention and Environmental Quality Management Plan

Substantial Risk sub-projects: For all such sub-projects a detailed ESIA shall be conducted through an independent ESIA agency in accordance with the Terms of Reference (ToR)⁴ prepared and agreed with SPMU. The TORs require to: define project's 'study area' or project influence area and conduct surveys on existing environment & socio-economic profile/setting from authentic secondary sources and primary surveys; review of Environmental & Social Legal requirements; carry out analysis of impacts and management measures; provide environmental inputs to engineering feasibility studies. Further if required, conduct Social Impact Assessment including qualitative and quantitative surveys to identify potential adverse impacts on land, assets, encroachments, community assets; impacts on disadvantaged and vulnerable; impacts on tribals; develop mitigation plans in accordance with the entitlement policy and assistance package: identify gender concerns/gaps; identify types of project workers/labor and associated risks; possibility of migrant labor leading to GBV⁵ risks; undertake stakeholder assessment & consultations, providing modes for citizen engagement and GRM⁶ (including for anonymous, vulnerable and disadvantaged). Based on the ESIA findings, an Sub-project specific ESMP will be developed and depending upon the relevance of ESS 2-8, relevant plans such as Resettlement Action Plan (RAP)⁷, Tribal Development Plan (TDP)⁸, Biodiversity Management Plan, Cultural Heritage Management Plan or Procedures⁹ etc. will be prepared and included within ESMP. For all projects, Contractor would be required to prepare Contractor-ESMP (C-ESMP that includes camp management plan, labor influx management plan, OHS measures etc.). This ESMP plan shall be ready before the sub project bids are issued and relevant plans would be included in the bid document.

The preparation of E/S assessment and management instruments, proportionate to the risks, as specified herein this ESMF is stated as a requirement in the Environment and Social Commitment Plan.

B. Goods

Include provisions relating to OHS, primary suppliers and SEA/SH etc. within procurement documents (bids/contracts)

C. Engagement initiatives

In all such activities, firstly all stakeholders including communities involving disadvantaged and vulnerable groups will be mapped. Communication specialist at SPMU shall work closely with DPMUs and PEAs and also refer to the Project's Stakeholder Engagement Plan (SEP) to ensure all stakeholders are covered. Following which guidelines will be issued to ensure engagement of these groups and commensurate manpower/budget resources will be specified.

E. Study consultancies (services)

The studies undertaken under the project shall be taken following finalization of TORs in discussion with and approval of the Bank. Based on the nature of these studies, the TORs will require the assessment of relevant ESS in terms of their risks, impacts and follow on requirements.

⁴ToR for hiring agency for conducting ESIA studies placed at Annexure 1

⁵ GBV/SEAH action plan placed at Annexure 8

⁶ Ref SEP

⁷ Template placed at Annexure 6

⁸ TDP placed at Annexure 7

⁹ToC for Bio-diversity management placed at Annexure 11

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Table 5-2 Components Applicable ESS and its Mitigation Approach

S.No.	Activity	Applicable ESSs	Risk category	Mitigation Approach
Component 1				
1	Design/Planning of Infrastructure and Buildings at Conservation Park at Kadambur, Chengalpattu District,	1,2,3,4,5,6	M	ESDD including E&S screening and including standard/customized ESMP for buildings with provisions relating to OHS, SEA/SH, biodiversity plan etc. annexed to the Bid and contract document
2	Turtle Conservation Centre inside Guindy Children Park, Chennai	1,2,3, 6	M	ESDD including E&S screening and including standard/customized ESMP for buildings with provisions relating to OHS, SEA/SH, biodiversity plan etc. annexed to the Bid and contract document
3	International Dugong Conservation Centre (IDCC) at Manora, Thanjavur	1, 2, 3,4, 5,6	M	ESDD including E&S screening and including standard/customized ESMP for buildings with provisions relating to OHS, SEA/SH, biodiversity plan etc. annexed to the Bid and contract document
4	Championing Pallikaranai: Advancing Wetland Conservation & Restoration	1, 2, 3, 6	S	ESIA as per TORs followed by customized ESMP that is annexed to the bid and contract documents
5	Building Bio-shields for Habitat Rehabilitation and Mangrove restoration in Coastal districts	1, 2,3,4, 6	M	ESDD including E&S screening followed by ESMP included within DPR covering provisions for all relevant ESSs
6	Restoration of Degraded Coastal Wetlands Focusing on Seagrass Meadows in the Gulf of Mannar and Palk Bay, Tamil Nadu, and Assessment of Blue Carbon Stock - To Strengthen Climate Adaptation, Promote Resilience and Enhance Livelihood Sustainability	1, 2,3, 6	M	ESDD including E&S screening followed by ESMP included within DPR covering provisions for all relevant ESSs
7	Erosion Control and Coral Restoration at Kariyachalli Islands, Gulf of Mannar ecosystems,	1,2,3,6	S	ESIA as per TORs followed by customized ESMP that is annexed to the bid and contract documents

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S.No.	Activity	Applicable ESSs	Risk category	Mitigation Approach
8	Strengthening Coastal Management through Integrated Coastal Zonal Management (ICZM), Marine Spatial Planning (MSP), Coastal Management Plan (CMP) for Critically Vulnerable Coastal Areas (CVCA), Integrated Management Plan (IMP) and Valuing Ecosystem Services with Capacity Building and Outreach Initiatives	1,2,5, 6 10	M	Include TORs for assessment of relevant ESS and propose commensurate recommendations
9	Ennore Creek Restoration	1, 3, 4, 6	S	ESDD including E&S screening followed by ESMP included within DPR covering provisions for all relevant ESSs
Component 3 Strengthening Plastic Circularity				
10	Advancing Meendum Manjappai Identification of plastic waste hotspots	1, 3 10	L	Guidelines to be issued for engagement of all identified stakeholders including vulnerable and disadvantaged categories
11	River System Investments (Floating Trash Barriers)	1, 2, 3, 4, 10	M	Inclusion of clause relating to primary suppliers in the bid & contract documents
12	Digital Waste Exchange Platform	--	L	Ensure platform is usable for those with digital literacy
13	Coastal Waste Collection (CWC) Center	1, 2, 3,4, 5	M	ESDD including E&S screening followed by ESMP included within DPR covering provisions for all relevant ESSs
14	Material Recycling Facility (MRF)	1, 2, 3, 10	M	ESDD including E&S screening followed by ESMP included within DPR covering provisions for all relevant ESSs
15	Fish Net Collection and Incentivization Programme	--	L	Guidelines to be issued for engagement of all identified stakeholders including vulnerable and disadvantaged categories
16	Recycled Plastic Products	1, 2, 3, 10	L	Guidelines to be issued for engagement of all identified stakeholders including vulnerable and disadvantaged categories

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S.No.	Activity	Applicable ESSs	Risk category	Mitigation Approach
17	IEC Programs and Community engagement	10	L	Guidelines to be issued for engagement of all identified stakeholders including vulnerable and disadvantaged categories
18	Fish Net Collection and Incentivization Programme	2 and 10	L	Guidelines to be issued for engagement of all identified stakeholders including vulnerable and disadvantaged categories
19	SUP free tourist places	10	L	Guidelines to be issued for engagement of all identified stakeholders including vulnerable and disadvantaged categories
20	Beach Clean-ups	4, 10	L	Guidelines to be issued for engagement of all identified stakeholders including vulnerable and disadvantaged categories
21	Mainstreaming Rag pickers	1, 2, 10	L	Guidelines to be issued for engagement of all identified stakeholders including rag pickers, including vulnerable and disadvantaged categories and also providing them with gloves, etc.
Component 4 – Climate Smart Villages				
22	Energy-efficient Systems	1, 3, 4, 10	L	Guidelines/ESMP included within DPR covering provisions for all relevant ESSs
23	Climate-smart Horticulture practices	1, 3, 6, 10	L	Guidelines/ESMP included within DPR covering provisions for all relevant ESSs
24	Efficient water management	1, 3, 4, 10	L	Guidelines/ESMP included within DPR covering provisions for all relevant ESSs
25	Harnessing renewable energy sources, such as solar	1, 3, 10	M	Guidelines/ESMP included within DPR covering provisions for all relevant ESSs
26	Solid Waste Management	1, 2, 3, 4, 10	M	Guidelines/ESMP included within DPR covering provisions for all relevant ESSs

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S.No.	Activity	Applicable ESSs	Risk category	Mitigation Approach
27	Climate proofing including Re-naturalisation of Canal, Climate Information Centre with Automatic Weather Stations (AWS)	1	M	Guidelines/ESMP included within DPR covering provisions for all relevant ESSs
Component 2 Blue Flag Beaches, Sustainable Tourism, and Diversified Livelihoods for a thriving Blue Economy				
28	Blue Flag Beaches	1, 10	L	Guidelines to be issued for engagement of all identified stakeholders including vulnerable and disadvantaged categories
29	Sustainable Tourism	1, 10	M	Guidelines/ESMP included within DPR covering provisions for all relevant ESSs
30	Diversified livelihoods for a thriving Blue Economy	1, 5, 10	M	Guidelines/ESMP included within DPR covering provisions for all relevant ESSs

Table 5-3 ESS Instrument-Annexure list

ESS	Type of plan/instrument	Brief description of content	Annexure with indicative TOC/guideline
1	Standard ESMP	Includes provisions for addressing risks relating environmental and social aspects in each sub project or dam. This will be a standard ESMP for sub projects identified as low to moderate risk (as per ESDD). Substantial risk sub projects will undergo Detailed ESIA and an ESMP. This will also include recommendations as per SEA or SH/GBV and disadvantaged and vulnerable groups	2
2	Labor Management Procedure	Lay down and spell out the requirements relating to: provision of terms and conditions of employment; promoting of non-discrimination and equal opportunity; worker's organization etc. and finally a mechanism to redress grievances mechanism to the direct and contracted workers.	3
4	Community Health, Safety Guidelines /Plan	This plan will include framework for in relation project workers, and any risks of labor influx, such as communicable and non-communicable diseases. CoC for contractors in relation to workers at site will also be included.	3-4
5	Resettlement Action Plan	In accordance with SIA findings and RPF provisions, RAP will be prepared that enumerates nature and quantum of each type of impact and impacted persons by socio-economic category and entitlement measures, budget	4
6	Tribal Development Plan	In accordance with ESDD/SIA findings and TDF, the TDP shall be prepared to include: applicable legal and institutional framework and baseline data; framework for meaningful consultation tailored to Indigenous Peoples/Tribal during project implementation; Measures for ensuring Indigenous Peoples/Tribal receive social and economic benefits that are culturally appropriate and gender sensitive and steps for implementing them; measures to avoid, minimize, mitigate, or compensate Indigenous Peoples/Tribal for any potential adverse impacts that were identified in the social assessment, and steps for implementing them; the cost estimates, financing plan, schedule, and roles and responsibilities or implementing the Indigenous Peoples/Tribal Plan;	5

Review Process:

1. **Works:** All such ESMPs and other relevant Plans for **Low to Moderate risk projects** once prepared by respective DPMUs will be reviewed by SPMU and shared with the Bank task team for approval before the same are included in the respective bid documents. At least one E&S screening report for different nature of interventions will be approved by Bank task team to verify for completeness, compliance and consistency and also risk categorization (L-M-S). In addition, for other Low to Moderate risk sub-projects, Bank will review a selection of sub-projects, through desk review /site visits and provide suggestions and guidance for improvements, if required.
2. In the case of **Substantial risk category**, WB will formally review and approve all reports for their disclosure and usage in bid/contract documents. Implementation of all such ESMPs will be monitored by SPMU and progress status will be shared with the SPMU and Bank for information on quarterly basis.
3. **Goods:** DPMUs shall prepare and share bid/contract documents with SPMU for its review. SPMU shall share the same with Bank task team to confirm if provisions relating to labour, OHS, GBV/SEA are included. SPMU shall share at least **one set of such bid/contract documents** for each variety of procurement with Bank task team for its review and comments.
4. **Engagement initiatives:** Communication specialist at SPMU shall work closely with DPMUs and PEAs to draft guidelines and approach to engaging with stakeholders for each type of activity. Once done, SPMU shall share at least **one set of such guidelines** for each type of engagement initiative, with Bank task team's review and comments.
5. **Studies:** SPMU shall review the TORs prepared by the DPMUs/PEAs and share with Bank for confirmation of all ESF aspects. Once finalized these shall be tendered.

Stage III: ES Implementation, Monitoring and Reporting

Incorporating ESMP into contract documents

Contract agreement with contractor/micro plans will have all the provisions of ESMP embedded in the contract and agreed upon. It will be ensured that the contractors will implement those provisions and ensure adequate safeguard compliance, which will also be monitored and evaluated from time to time by different agencies.

On-site implementation of the ESMP

The contractor shall implement all the ESMP measures applicable for the project right from mobilization. This shall be discussed with site engineers and workers and record on its implementation shall be maintained. Contractor will submit the Monthly Progress Reports to the PIU/DPMUs and

Reporting to World Bank

SPMU, Department of Forests, GoTN will submit Quarterly Progress Reports (QPRs) to the World Bank providing updates on progress of activities under each component and highlighting constraints, if any for discussions and rectification.

Linkage with ESCP

The Environmental and Social Commitment Plan (ESCP) outlines important activities and measures, any specific documents or plans, and the due dates for each. The ESCP which will be a part of legal agreement and will be signed by Implementing Agency (IA) and will require the IA to comply with the provisions of any other E&S documents required under the ESF and

referred to in the ESCP, such as the Environmental and Social Management Plans (ESMPs), Labor Management Procedures (LMP), Stakeholder Engagement Plan (SEP), etc. It specifies in detail the preparations that must be made with timeframe and responsibility. Adherence to the ESMF processes and provisions will therefore be monitored through this ESCP document between The World Bank and GoTN.

Stage IV: Review and Evaluation of ES completion

The review and evaluation of Environmental and Social (ES) completion is an essential stage to ensure a project has met its environmental and social standards as mentioned in the ESMF report. This process ensures the effectiveness of Environmental and Social Management Plans, along with mitigation measures and the monitoring of environmental and social risks which are implemented. The evaluation compliance checks with local and international regulations, stipulating the project adhered to legal frameworks. Also, the evaluation ensures the proper allocation and use of project funds, preventing any misappropriation. This stage comprehensive's the ES measures, problems faced, and provides recommendations for future projects. This thorough review establishes a foundation for improving the structure and execution of subsequent projects.

6. CAPACITY BUILDING

The main objective is to build and strengthen the capability of PMU, PIUs, NGOs and other staff, to integrate sound environmental and social management principles into sub- project implementation. The capacities of the officials from the local administrative bodies, and other implementing departments like the Department of Forests, Department of Management and Climate Change, Tamil Nadu Pollution Control Board (TNPCB) would be strengthened. The capacity building would be to help them map and manage environmental and social risks along with facilitating stakeholder engagement and participation.

One of the components of TN-SHORE is to strengthen the various institutions in the State for Integrated Coastal Management. This involves building, dedicated and sensitized trained personnel among youth representatives, locals, forest guards, and select SHGs. In view of the specialized training and capacity building required, it is necessary to identify nodal training institutes that will work closely with PMU for conceptualizing, designing and conducting training programs on the ESMF. The project may conduct these trainings in partnership with, experienced consultants/ autonomous institutions specialized in environment and social safeguards management. The project can also send the trainees for custom-made trainings on Environmental and Social Management at autonomous institutions like Engineering College of India, which conducts such programs.

TN-SHORE also plans to build the capacities of locals (especially women and communities dependent on natural resources such as fisher folk) for:

- a. **Enhancing their livelihoods** by skilling them with technology, business management, marketing, etc.
- b. **Create awareness** about the need to protect the shoreline and the local biodiversity. This includes training them on eco-friendly sustainable ways of living and appropriate methods for waste disposal.

TN-SHORE will undertake in-depth and hands-on trainings for various stakeholders (at state, district, block, and village levels) including project staff of SPMU and PIU, consultants, contractors, field facilitators, and local community groups in the following themes:

- Orientation on ESMF
- Implementation of ESMPs
- Occupational health and safety,
- Community health and safety,
- Labour Management,
- Biodiversity Management,
- Green building
- Ecotourism
- Integrated Pest Management (IPM) Plan
- Emergency Preparedness and Response,
- Construction Supervision and Audit,
- GBV and SEA-SH risk mitigation measures,
- Stakeholder Engagement,
- Procedures for land-take and preparation of Abbreviated Resettlement Action Plans (ARAPs) if applicable, and
- Grievances redress measures.

Table 6-1 Trainings for key stakeholders to be covered as part of TN-SHORE

Suggested list of topics (not exhaustive)	Audience	Frequency	Responsibility
➤ Identification and assessment of E&S risks ➤ E&S monitoring and reporting ➤ Incident and accident reporting ➤ Application of SEP and the grievance/ beneficiary feedback mechanism	➤ Officials of SPMU	➤ Once in a year	➤ Environmental & Social Expert
➤ Implementation of ESMPs ➤ Community health and safety ➤ Labour management ➤ Gender-based violation risk mitigation measures ➤ Biodiversity protection and enhancement ➤ Application of SEP and the grievance/ beneficiary feedback mechanism ➤ Monitoring and reporting	➤ Officials of PIU (Local administrative bodies, Officials of other implementing departments such as Dept. of Forest, Fisheries, Coastal Zone Management Authority) and Contractors	➤ Once in a six months	➤ Environmental & Social Expert
➤ Community health and safety ➤ Biodiversity protection and enhancement ➤ Ecotourism ➤ Sustainable ways to improve fish (and other coastal) produce ➤ Waste disposal, especially riverine and marine plastic litter	➤ Coastal communities	➤ Once in a six months	➤ Environmental & Social Expert

Budget of ESMF Application

The total budget for implementing the ESMF is estimated to be INR 33.5 crores, which includes the SEP. The detailed breakdown of the budget for SEP is provided in a separate Stakeholder Engagement Plan. This budget fund will be coming from the project funds, and the approvals will be given by TNGCC.

This component will finance:

- (i) Consulting services, goods, training, monitoring equipment and project management costs.
- (ii) Hiring of E&S experts on a contractual basis at the IA level;
- (iii) Setting up a monitoring and evaluation (M&E) system that will conduct the Annual Evaluation exercise. SPMU and DPMUs will provide adequate budget for preparation and implementation of all safeguard instruments from the counterpart funding, besides for conducting trainings, exposure visits and capacity building events.

7. INSTITUTIONAL ARRANGEMENTS FOR IMPLEMENTATION, MONITORING AND GRIEVANCE REDRESSAL

1. In Tamil Nadu, the project will be implemented as the '**Tamil Nadu Coastal Restoration Mission**' by the State Project Management Unit housed in the **Tamil Nadu Green Climate Company (TNGCC)** under the Department of Environment, Climate Change and Forests, Government of Tamil Nadu. The SPMU is headed by a Project Director, comprising department officials and supported by consultants for implementation of technical, financial, procurement, environmental and social safeguards aspects. District Climate Change Missions (DCCMs) have been established in coastal districts with representatives from other departments for coordinating the project implementation in the field.
2. A **High Powered Steering Committee (HPSC)** chaired by the Chief Secretary including all relevant senior officials has been established for oversight and guidance to steer convergence, regional integration, and coordinated actions. The HPSC will be chaired by the Chief Secretary and includes the Additional Chief Secretaries / Principal Secretaries of all participating line departments. Such vertical alignment and oversight and guidance from HPSC will ensure efficient and effective project delivery, facilitate interdepartmental coordination, and pave the way for convergence.
3. **Project Management:** The project will be implemented by the Department of Environment, Climate Change and Forests, Government of Tamil Nadu through a two-tier implementation structure:
 - (i) State Project Management Unit housed in the Tamil Nadu Green Climate Company (TNGCC) under the Department of Environment, Climate Change and Forests, Government of Tamil Nadu; and;
 - (ii) Project Executing Agencies (PEAs) at state level and through their field offices district level.

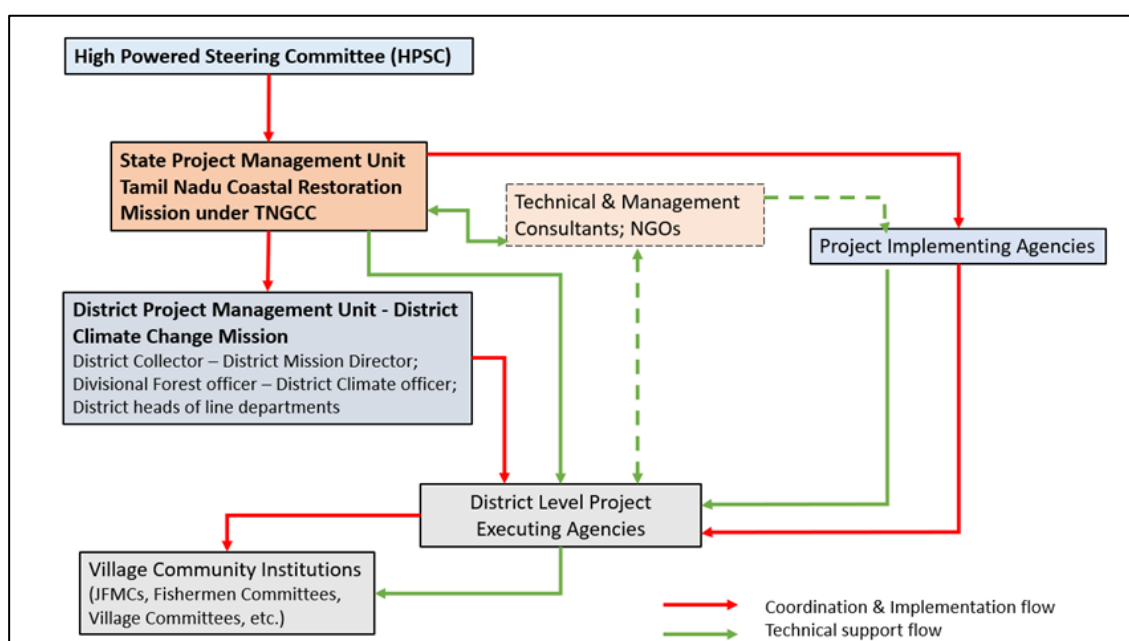


Figure 7-1 Project Organogram

4. **National/ State Clearance:** When the projects / sub projects attracts under EIA notification, 2006 then the clearance is mandatory before implementation of any

activity. The TNGCC should engage a NABET accredited consultant to obtain the clearances for the project/ sub projects as per EIA notification, 2006 (and its amendments). And also engage the environmental expert in obtaining the consents for the subjected project/sub project activity.

5. **State Project Management Unit (SPMU):** Tamil Nadu Green Climate Company (TNGCC) is a registered Company under the Tamil Nadu under section 8 of the Companies Act 2013 and operates as a 'Not-for-Profit' Company created as a Special Purpose Vehicle (SPV) to implement the Tamil Nadu State Action plan for Climate Change (TNSAPCC). The TNGCC is headed by the Additional Chief Secretary, Department of Environment, Climate Change and Forests, with a Board of Directors comprising Secretaries from key line departments. TNGCC is already implementing three pivotal government missions, viz.: i) Tamil Nadu Climate Change Mission; ii) Green Tamil Nadu Mission, and; iii) Tamil Nadu Wetland Mission. TNGCC will be implementing SHORE as a fourth mission called "Tamil Nadu Coastal Restoration Mission" and serve as the SPMU for SHORE. The SPMU in TNGCC shall bring increased synergy among different missions and ensure: i) greater convergence with other activities and schemes of the Government; ii) avoidance of duplication and double dipping; iii) strengthening the existing institutions, and; iv) improved coordination and adopting an integrated approach for coastal zone management. The SPMU will be headed by a Chief Mission Director/Mission Director who will be the project Director for TN-SHORE. The Board of Directors of TNGCC would support in interdepartmental coordination, approval of annual work plans and budget, and monitoring of the SHORE project. The SPMU will be staffed through internal staff from the Forest Department as well as supported by a team of technical (including environmental and social), finance, procurement and project administration specialists and consultants.



Figure 7-2 Structure of SPMU

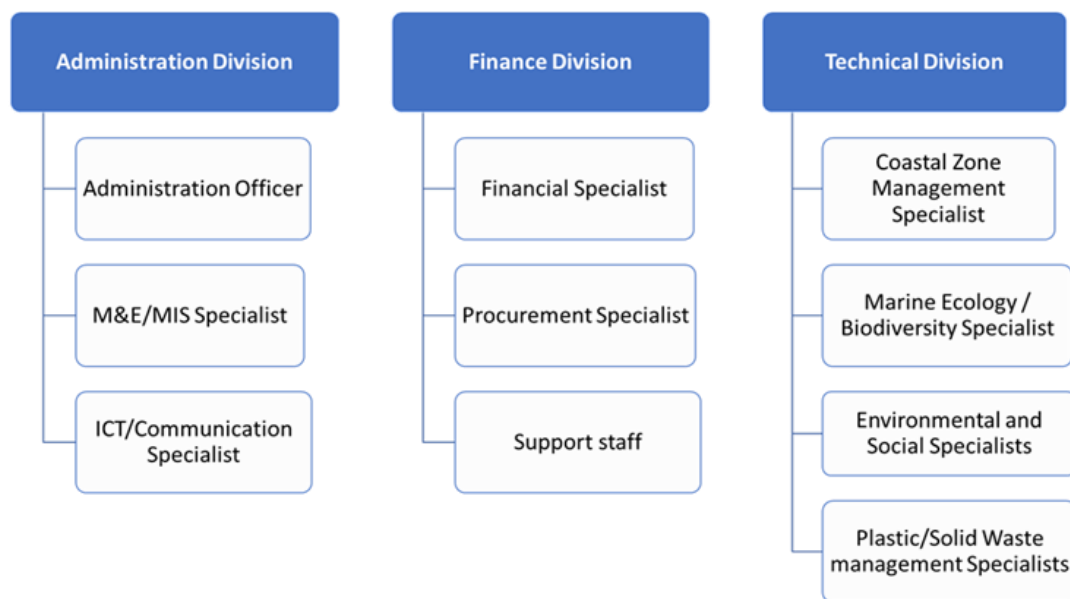


Figure 7-3 Supporting divisions of SPMU

6. **Project Executing Agencies (PEAs):** The PEAs shall be responsible for the overall implementation of the activities pertaining to the respective coastal districts. The PEAs have head office at state level and the project on the ground will be implemented through the district Project Executing Agencies, which are at the district level under the guidance of District Climate Change Mission. The PEAs will prepare the annual plans and budgets requirements, which will be approved by the SPMU. The PEAs will be responsible for management of contracts and implementation of community led activities with Village Committees/ JFMCs. The following implementing agencies have been identified: (a) SPMU in TNGCC at state level; (b) Tamil Nadu Pollution Control Board – PEA; (c) Green Tamil Nadu Mission – PEA implementation through District Forest Officers (DFO); (d) Tamil Nadu Forest Department – PEA implementation through DFOs (forests) / wild life wardens; (e) Conservation Authority of Pallikaranai Marsh Land – PEA; and (f) Department of Environment and Climate Change – PEA; (g) Tamil Nadu Wilderness Experiences Corporation - PEA and (h) District Rural Development Agency (DRDA) – PEA.

Table 7-1 Roles and Responsibilities

Agency/Individual	Roles and responsibilities
State Project Management Unit – PMU Including E&S specialists and communication expert)	Review and approval of ESMF Coordinate among other implementation agencies/ Review and approve all sub-projects in respect of E&S aspects (screening, preparation of ESMP or inclusion of guidelines or inclusion of provisions within DPRs) Review reports submitted by DPMUs and submit to WB for approval
District Project Executing Agencies	Participate either themselves, or identify suitable representative, during all face-to face stakeholder meetings. Review and sign-off minutes of all engagement events; periodic reports to DPMUs for review and onward sending to SPMU Assure participation/ inclusion of stakeholders from vulnerable groups. Management of contracts, implementation of community led activities with Village Committees/ Joint Forest Management Committees (JFMCs) etc.

Roles and Responsibilities of Environmental and Social Safeguard specialist at PMU - TNGCC

- a. To verify periodically that all sub-projects are in line with the prevailing national, state and local legislation on the one hand, and the World Bank policies on the other.
- b. To ensure that ESMF is being fully integrated with the SHORE sub-project appraisal cycle, by identifying the project category before issuing the Terms of Reference to the design consultants and evaluating the proposals with respect to their completeness and compliance.
- c. To carry out Site Visits to sub-project implementation sites to monitor as well as provide onsite training as required. Prepare reports on visits / training to document the visit, observations for improvement required, need for follow-up etc.
- d. To provide necessary documents to the external auditors for carrying out annual E&S audit.
- e. To arrange to conduct analytical studies based on sub-project experience in order to influence policy changes that will lead to better management of environmental and social issues.
- f. To retain documents, reports and other records pertaining to ESMF.
- g. To prepare and submit quarterly progress reports to the GoTN, the World Bank and other agencies as required.
- h. To report to Higher officials on all matters pertaining to ESMF.

Roles and Responsibilities of Environmental and Social Safeguard specialist at PIU of PEAs

- a. Include design related measures of the ESMP in the project design and DPR;
- b. Include ESMP in the bidding documents and civil works contracts, including requirement of staff (EHS supervisor) with contractor for ESMP implementation;
- c. Provide necessary budget in the project for ESMP Implementation;
- d. Ensure that the bid/contract documents include specific provisions requiring contractors to comply with all applicable labour laws and core labour standards including: (a) Labour welfare measures and provision of amenities; (b) Prohibition of child labour as defined in national legislation for construction and maintenance activities; (c) Equal pay for equal work of equal value regardless of gender, ethnicity, or caste; (d) Elimination of forced labour; (e) The requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS/ COVID 19, to employees and local communities surrounding the project sites.
- e. In the pre-bid meeting, provide insight into ESMP measures, and overall compliance requirements to the bidders; and
- f. Obtain all clearance/permissions as required for implementation of subproject, prior to invitation of bids and/or prior to award of contract / prior to construction as appropriate.
- g. Prior to start of construction organize an induction course for the training of contractors, preparing them on ESMP implementation, environmental monitoring, and on taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.
- h. Guide contractor on updating ESMP / preparing Construction - Environmental Management Plan (C-ESMP) at the start of the project.
- i. Update ESIA and ESMP; ensure that ESIA reflects the final design being implemented by contractor.
- j. Conduct public consultation and information disclosure as necessary;
- k. Take corrective actions when necessary to ensure no environmental impacts;
- l. Address any grievances brought about through the grievance redress mechanism in a timely manner as per the ESMP.
- m. Implement corrective or preventative actions in case of non-compliance or new/unanticipated impacts.

- n. Inform PMU promptly in case if any significant impacts surfaces, which were not identified in the ESIA and develop necessary corrective actions as necessary and ensure implementation by the contractors; include all such impacts and suggested actions in the Quarterly Environmental Monitoring Reports;
- o. Implementation grievance redress system, and undertake appropriate actions to redress the complaints; ensure that complaints/grievances are addressed in a timely manner and resolutions are properly documented;
- p. Review and approve monthly progress reports submitted by Contractor on ESMP compliance;
- q. Prepare quarterly environmental monitoring reports and submit to PMU; and
- r. Provide any assistance in environmental safeguard related tasks as required by PMU to ensure compliance and reporting to World Bank.

Roles and Responsibilities of Environment, Health and Safety (EHS) supervisor at Contractor

- a. Understand the ESMP requirements and allocate necessary resources (budget, staff, etc.);
- b. Understand the regulatory compliance requirements related to labour welfare, safety, environment etc.
- c. Mobilize EHS Supervisor prior to start of construction work;
- d. Prepare C-ESMP and submit to PMC/ PIU;
- e. Ensure that all regulatory clearances (both projects related and contractor related) are in place prior start of the construction work;
- f. Prepare and submit Construction waste management (CWM) plan and Traffic management plan;
- g. Implement the mitigation measures as per the ESMP including CWM and traffic management plans;
- h. Follow the ESMP measures/guidelines for establishment of temporary construction camps, construction waste disposal sites, and material borrow areas, etc.;
- i. Implement ESMP and ensure compliance with all the mitigation and enhancement measures;
- j. Conduct environmental monitoring (air, noise, water, etc.), as per the ESMP;
- k. Undertake immediate action as suggested by PMC/PIU to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation;
- l. Submit monthly progress reports on ESMP implementation to PMC/PIU;
- m. Act promptly on public complaints and grievances related to construction work and redress in a timely manner in coordination with PMC/PIU; and
- n. Comply with applicable government rules and regulations.

8. SUPERVISION, MONITORING, AND REPORTING

A periodic supervision and monitoring mechanism are key to ensure the implementation of the project activities in an environmentally and socially acceptable manner and in line with the acts/ policies of GoI, GoTN, ESMF, ESMPs, and World Bank's ESS. This would also help to assess the progress made in the implementation of the project activities and measure the impact of the same. It would provide timely feedback for course correction and decision-making.

Sub-project review, implementation and reporting system

The reporting system will be a bottom-up mechanism in the implementation framework. During the construction phase, the contractors will undertake the monitoring and reporting of the environmental parameters. To enable the coordination and reporting in a streamlined manner on the ESMF application at a sub-project level, the (i) Monthly Progress Report, (ii) Quarterly Progress Report and (iii) Reporting to World Bank are mandated under this ESMF

Monitoring of statutory compliances and key parameters

The regulatory compliance shall be monitored for each sub-project and component at the planning and implementation stage by the implementing agency and report to the PMU at the state level.

TN-SHORE will have a strong governance structure (aligned at the kickoff stage of the project) to ensure that each activity conducted generates a defined measurable value (quantitative) or has a lasting impact (qualitative). Activities will be firmed up to deploy a self-sustainable, autopilot operation in the defined 5-year period. The below table captures the high-level key metrics/ parameters governed across the four key project components.

Monitoring of Statutory Compliances and Key parameters

The regulatory compliance shall be monitored for each sub-project and component at the planning and implementation stage by the implementing agency and report to the SPMU at the state level.

TN-SHORE will have a strong governance structure to ensure that each activity conducted generates a defined measurable value (quantitative) or has a lasting impact (qualitative). Activities will be firmed up to deploy a self-sustainable, autopilot operation in the defined 5-year period. The below table captures the high-level key metrics/ parameters governed across the four key project components.

Table 8-1 Key Monitoring Parameters

Area	Activity	Monitoring Frequency	Measurement metrics
Capacity building	Baseline training needs assessment and endline capacity development assessments conducted	3-6 months	➤ Personnel trained ➤ No. and type of topics covered ➤ No. and type of blue cadre members increased, and no. of new achievements unlocked by blue cadre ➤ No. of workshops conducted and topics covered
	State-state knowledge exchange	6 months	➤ No. of field exposure visits to other states implementing successful practices
	Enterprise capacity strengthened	6 months	➤ No. of trainings conducted on enterprise skills (digital payments, business mgmt., packaging, marketing, etc.) and a range of topics
Preparation of plans	Development of baseline and evidence generation	One time	➤ Adequacy of stretches covered under baseline study
	Tracking of implementation of plans and revision of baseline	Annual	➤ Grassroot level annual monitoring of parameters as midline evaluation
Implementation	Infrastructure deployed (green and grey)	Annual	➤ Type and location-wise no. of physical infra elements deployed (e.g., volume of plastic litter collected at arresting structures)
	Afforestation	Annual	➤ % Change in green cover from baseline year
	Coastal Protection	Annual	➤ Status of coral reef and seagrass restoration
Improving Livelihoods	Alternate livelihood options for women	Annual	➤ Number of women embracing alternate livelihood ➤ % change in diversified livelihood

Annual Environmental and Social Audit/ Third party audit

SPMU of TNGCC will undertake annual audits of its portfolio to review the status of ESMF compliance. The audit will focus on the process followed for categorization and approval of E & S reports, obtaining clearance from competent authority (If applicable), disclosures and related aspects. The audit will also be based on field visits to all ongoing projects categorised as Moderate & Substantial & to some low categorised projects to verify the implementation on the ground and solicit feedback from the affected people and other stakeholders. The audit will be carried out every year for the activities being implemented periodically till its completion. The draft audit report shall be forwarded to the TNGCC (SPMU/AU) for review and suggestions; and upon approval after incorporating the comments, the final audit report will be disclosed.

The Auditors shall:

- Support the SPMU in preparing the audit plan.
- Prepare compliance reports for sub-project activities in line with ESMF guidelines and other statutory requirements as applicable through scheduled or unscheduled audits.

- Conducting random field visits and review compliance, especially in environmentally or socially sensitive areas.
- Review the performance of the project through an assessment of periodical monitoring reports submitted by the line departments and SPMU.
- Share audit findings with the SPMU to aid in timely decision making and adopting appropriate mitigation actions, if necessary.

SPMU/AU will review these audit reports and identify technical, managerial, policy or regulatory issues with regards to the compliance of the ESIA and ESMP reports. The identified technical issues will be duly incorporated in the subsequent projects, policy and regulatory issues will be debated internally by the SPMU/AU and determine the need for appropriate interventions for actions. These interventions may include appropriate revision of institutional aspects, monitoring mechanism, revision / updation of ESMF document or suitable analytical studies to influence policy or programs of the State.

Thus, Provisions in the ESMF for safeguards management include:

- Dedicated Environmental and Social Specialists at all levels: Contractor, Implementing Agency, SPMU of TNGCC for ESIA preparation, approval, disclosure, supervision and reporting,
- Reporting on Safeguards / ESMPs: Monthly Implementation Report (or as and when required) by Implementing Agency to SPMU of TNGCC, Quarterly consolidated report will be prepared by SPMU/Administrative Unit of TNGCC for record and will be forwarded to World Bank as and when required,
- Annual Environmental and Social Audit for all sub-projects , and
- Capacity building and cross learning for Environmental and Social Management.

Updation of the ESMF

This ESMF will be a "live document" and can be revised as and when needed to fulfil the needs of the nation's laws and the Bank ESF, unexpected scenarios and/or changes in the project. The subcomponent design would thus be evaluated, and suitable management measures would be integrated by upgrading the Framework. Any updates to the legal or regulatory framework of the nation or state will likewise be covered by these adjustments. Additionally, the laws and procedures would be modified as necessary in conjunction with the World Bank and the implementing agencies/departments based on the application and implementation experience of this framework. The modified ESMF's finalized version will be sent to the WB for review and approval.

9. STAKEHOLDER ENGAGEMENT AND PUBLIC DISCLOSURE

During project preparation, the following public consultation meetings will be/were conducted consultations were conducted in different project locations covering the districts and included Self Help Groups, DFO, Fisheries Department, community people etc. A detailed discussion guide was prepared to capture the socio-economic status, concerns, challenges and requirements of the people. The consultations were initiated with a detailed introduction and discussion about the concept of TN-SHORE project and its aims and objectives and its components. The project development objective - to increase coastal protection and conservation, enhance livelihood benefits and reduce marine pollution in coastal communities of the State of Tamil Nadu, were also explained during stakeholder consultations.

People expressed their opinions and concern and also their feedback on prevailing socio economic and environmental issues in their areas. Sub groups were formed for gender disaggregated discussions. Further SHG members, farmers, panchayat members, DFO, Fisheries department and Political groups were also consulted. The main components the TN-SHORE project were explained verbally to all the groups that were consulted.

The feedback received from various levels and categories of consultations during the period of November and December 2023, is summarised and presented in this section.

Community level consultations included multiple stakeholders,

- (i) Past/Current Elected Representatives, village residents,
- (ii) Women's Village Organization, Self Help Groups,
- (iii) Forest Department and staff /Fisheries Department representative,
- (iv) Vulnerable Households,
- (v) Local vendors; existing road user groups/population and local representatives of etc.

A total number of 122 participants were addressed during the community level consultations at various districts as provided in the Table 9-1 below.

Table 9-1 The list of locations and participants in community consultations

Sl. No	Date	District	Location	Block/Taluk	No. of Participants	Male	Female
1	28.11.2023	North Chennai	Appar Street, Beach Road, Tiruvottriyur	Tiruvottriyur	10	2	8
2	02.12.2023	Ramanathapuram	Devipattinam	Ramanathapuram	15	11	4
3	02.12.2023	Ramanathapuram	Vedhalai village	Mandapam	18	12	6
4.	14.12.2023	Cuddalore	Kinjampettai Village	Vadalur	30	10	20
5.	15.12.2023	Cuddalore	T.S.Pettai Village,	Parangipettai	49	40	9
				Total	122	75	47

Table 9-2 Community consultations output

Location	Stakeholders Consulted	No.of Participants	Consultation Outcomes	Needs and suggestions	Action taken
Appar Street, Beach Road, Tiruvottriyur, North Chennai.	Residents of Tiruvottriyur ; Fishermen groups, Women self-help groups (SHG), Peoples from nearby settlements, Forest department officials.	10	• Women are involved in SHGs and run micro-finance for their tiny businesses. • Fishermen are supported with cash through schemes such as National marine Fishermen Saving cum Relief Scheme and during fishing ban period. • Common observations by the participants were – • High level of industrial pollution. • Climate change affecting fish catch. • Water quality changed to being more saline. • Decrease in income due to lessening of catch. • No awareness about Ecology/ Environmental sensitive areas and need for conservation. • After Tsunami in 2004, amount of fish catch reduced considerably. • After Covid huge loss of income and business. • They would welcome projects that will improve the condition of the society and improve of their livelihood and increase welfare.	• Cyclone intimation need to be more effective and robust. • Prior intimation is required on new govt. and private projects and people need to be consulted. • Would Expect jobs from the project ensuing as also from the nearby industries • Need Proper house to safeguard their assets during cyclone and other natural calamities • Embankments should be constructed to prevent land erosion and soil salinity. • Need more skill development programme to enrich the women's livelihood. • Drainage system should be provide to avoid damages due to flooding. • Need overhead water tanks for sweet water (OHT). • Ice plant, cold storages, fish processing units, warehouses for fish storage, modern fishing equipment, net mending sheds, etc. are highly required. • Playground, library facilities are necessary for children. • GPS equipment of tracing the location of boats is necessary. • Cyclone awareness programme and emergency	• The general recommendations are included in the ESMF like skill development, information disclosure, awareness programs on erosion control and women skill developments.

Environmental and Social Management Framework for Tamil Nadu Strengthening Coastal Resilience and the Economy Project

Location	Stakeholders Consulted	No.of Participants	Consultation Outcomes	Needs and suggestions	Action taken
			• Not interested for relocation. • No proper house to safeguard their assets during cyclone and other abnormal weather conditions. • Very much scare about Sea Erosion. • Expecting Government to provide/create livelihood source. • Expecting Women Small scale skill development programme.	preparedness training is necessary.	
Devipattina, Ramanathapuram	People of coastal area • Self-help groups (SHG), • Fishermen groups, • Ward members, • Forest department staffs.	15	• There are 3 active SHGs, involved in savings and providing finance to members in need. • Fishermen are supported with cash through schemes such as National marine Fishermen Saving cum Relief Scheme and during fishing ban period. • Observation by participants – • Climate change and resultant reduction in fish catch specifically after Tsunami. • Covid also impacted on their income and business negatively.	• More educational, vocational and training facilities are required. • For any new project, prior intimation should be given to the community so that positive impacts can be garnered by the people and provide support. by the government /private before doing any activities. • Need street lights and regularity in electricity supply. • Under-employment and un-employment are of big concern. • Livelihood opportunities need to be created through new projects. • Ice plant, fish processing unit, warehouse for fish storage, fishing equipment's, net	• The Suggestions from the consultations regarding training facilities, stakeholder information disclosure, employment generation, and women's Self-Help Group (SHG) development activities have been incorporated into the ESMF, SEP, and ESMP.

Location	Stakeholders Consulted	No.of Participants	Consultation Outcomes	Needs and suggestions	Action taken
			• Income has decreased over the years. • Primary catch is prawn, fish and crabs (seasonal), the quantity is reduced now. • Good communication between Forest Rangers and the people and sharing of forestry related information. • Fishermen practice conservation by not catching the small, embryonic and undeveloped fish.	- mending shed, etc., are required. • Playground, Library facilities are required for children. • Fish processing area, boat anchoring /parking (specifically during cyclones), market development, are necessary. • Boat parking space required specifically for cyclone period • Construction of embankments is required to reduce and mitigate soil erosion. • Skill development programme • GPS equipment of tracking the location of boats is necessary. • Good fish auction hall is very important. The existing one needs to be renovated. • Boat repairs centre to be initiated by the government/provide subsidy • People, especially, women are looking forward to small scale skill development programme like prawn processing, pickle making for value addition to fishing which would increase their income.	

During the consultation, discussion was also conducted on the preferred strategy for disclosure of information on project components and related interventions/activities. The participants suggested that

- Community meetings and focus group discussion would be the most effective ways to interact with the project communities including vulnerable group and other affected groups.
- Representatives of different government agencies involved in the project should also be present in order to provide detailed understanding on the project interventions and clarity on all activities. This will help in providing a platform to all these groups to express their views and opinions on the project and also provide local wisdom on various aspects.
- In addition to this the future meetings and Information Education Communication (IEC) activities should be ensured and augmented with presentations, posters, banners, leaflets, pamphlets, wall paintings, notice boards for clear and easy understanding of the project related activities and the importance of people's involvement in these. Summary of project stakeholder needs and methods, tools and techniques for stakeholder engagement.

A separate Stakeholder Engagement Plan (SEP) has been developed to outline a comprehensive approach for engaging stakeholders, including public information disclosure and consultation throughout the project's entire lifecycle. The plan includes the methodology, strategy, resources and responsibilities, Grievance Redress Mechanism (GRM), as well as monitoring and reporting measures to ensure effective project implementation.

Information Disclosure

Project related information shall be disclosed through public consultation and making relevant documents available in public locations. The PMU/PIU and other associated line departments shall provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected persons and other stakeholders. For illiterate people, other suitable communication methods will be used.

The ESMF report has to be discussed with the PMU before making it available at the offices of PMU. A concise summary of project and draft ESMF report (in Tamil (local language)), providing all necessary details of proposals, implementation arrangements, project locations, likely issues and mitigation, and monitoring measures and grievance redress mechanism, shall be made available to the stakeholders. This should also provide contact information of the PMU/PIU. This summary shall also be displayed at the notice boards of PMU, district level offices of the PIUs and related line departments, State and District Libraries, Local municipal and gram panchayat office and other public places. During project implementation, relevant information about any major changes to the project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

The following reports shall be made available at the offices of PMU, PIUs, State and District Libraries, Local municipal and gram panchayat office and other public places for public reference and shall also be uploaded on respective websites:

1. Summary of ESMF (in Tamil (vernacular language) and English)
2. Final ESMF Report (in English)

In addition, the following information shall also be displayed/disseminated, wherever applicable.

1. Project specific information needs to be made available at each contract site through public information kiosk
2. Project information brochures shall be made available at all the project sites as well as the office of PMU / PIU.
3. Reports and publications, as deemed fit, shall be expressly prepared for public dissemination e.g., English versions of the ESIA, ESMP and RAP and Executive Summary of ESIA, ESMP, and RAP in Tamil (vernacular language).
4. Wherever civil work will be carried out a board will be put up for public information which will disclose all desired information to the public, for greater social accountability.
5. All information will be translated into Tamil (vernacular language) and will be disclosed to the public through the Panchayat, District Magistrate's office, concerned project offices, websites of PMU.

10. PUBLIC CONSULTATION AND STAKEHOLDER PARTICIPATION

Public consultation shall be carried out at various stages of the project preparation. As part of the environment and social assessment, consultations will be carried out by using appropriate instruments including Focus Group Discussions (FGDs), stakeholder consultations, etc. Specific consultations will be held near the sites proposed to seek opinions/suggestions of the hosts and the communities involved. The outcome of consultations will be incorporated as appropriate in the designs and mitigation plans. As part of such consultations, the draft Mitigation Plans will also be presented and explained to the people on the content and process of the implementation of the plans. This would ensure 'buy in' for the projects by the host communities, project affected/involved communities, all line departments and other agencies concerned; and lead to foster project ownership by them, which is essential for the success of the subprojects. Public consultation requirements, process to be followed, reporting mechanism and other relevant details are provided in this ESMF. The PIUs shall also hold consultations at district, block and community level to facilitate involvement of stakeholders and solicit feedback on sub-project identification/selection, preparation/design, implementation plans and other such key elements of project delivery. Key stakeholders such as project affected persons, opinion makers, experts, and different department personnel shall be consulted. Stakeholder involvement mechanisms are/will be central to the design and implementation of the project and provide opportunities for information sharing, consultation, and collaboration measures. While consultations during the planning stage ensures participation in site selection and design, consultations during the implementation phase encourages community feedback for more participatory monitoring. Guidance for this purpose has been laid out in this SEP; to ensure proper consultation and involvement of key stakeholders during key stages of sub-project preparation and implementation.

ANNEXURES

11. ANNEXURE-1

Form SF-1 (Indicative form filled for Turtle Conservation Centre at Chennai, Tamil Nadu)

Sl. No	Project Component	Likely Nature of Risk/Impact Land, Geology & Soil (LGS); Water (W), Biodiversity (B); Waste, Pollution & Hazard (WPH); Protected Area (PA); Land Acquisition/ encroachment etc. (LA); Loss of Livelihood/ Household etc. (LL); Labour (L); Culture/Heritage (CH); Tribal Presence (T); GBV Risks (G). Sexual Exploitation and Abuse (SEA)/Sexual Exploitation, Abuse and Harassment (SEAH)
1	2	3
1.	Clearing of ground and translocation of a lone ash tree at the site which is in a protected area	LGS B WPH L
2.	Setting up a Turtle Conservation Center with movement of vehicles carrying construction materials, labour movement, placement of Exhibits and Displays, with facilities for Education and Programs, Audio-visual Presentations, Workshops and Events	LGS W B WPH L SEA/AH
3.	Construction of approach ways and parking area	LGS W B WPH L
4.	Operation and maintenance of the center	WPH

Form SF-2 (Indicative form filled for Turtle Conservation Centre at Chennai, Tamil Nadu)

Sl. No	Applicable Component/ Project Construction preparatory Work-related Sub activity (As per SF-1)	Nature of Risk (Conforming to Column 3 of SF-1)	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
1	2	3	4	5
1	Clearing of ground and translocation of a lone ash tree at the site which is in a protected area	LGS EB WPH L	The clearing and levelling area is around 3700 sq m and during the process, dust will be prevalent, and vegetative wastes will occur due to the removal of shrubs. The dust will be temporary and waste will be disposed of in the designated area. Further, the lone ash will be translocated to another area in the National Park. Only the soil fauna will be affected. However, their loss is temporary and due to the availability of large vegetative areas adjacent to the site, a new population of soil fauna will emerge over time.	LGS - L B - L WPH - L L - L
2	Setting up a Turtle Conservation Center with movement of vehicles carrying construction materials, labour movement, placement of Exhibits and Displays, with facilities for Education and Programs, Audio-visual Presentations, Workshops and Events	LGS W EB WPH L	Excavation of the earth for laying the foundation will generate dust and there will be a marginal loss of soil fauna due to the small area of the building (1500 sq m). Construction debris if any will be disposed as per the stipulated procedure. The movement of vehicles may create dust, damage to soil fauna, and congestion outside the project area. Being an isolated area, traffic congestion is unlikely inside the park. Faunal loss will be minimal. Movement of the labourers and placement of the material may have the risk of causing minor accidental injuries which may heal in a short time. There will be minor water spillage or washings during the rain which may contaminate the surrounding soil and water in the adjacent canals. However, the impacts are only during the construction phase. Possibility of Sexual Harassment and Abuse	LGS - M W - L B - M WPH - L L - M SEA/AH-L
3	Construction of approach ways and parking area	LGS W EB WPH L	Earth removal will create dust temporarily and excavation of earth also in low quantity due to the smaller area used for this purpose. Water spillage may contaminate the soil. These impacts will be for a short duration.	LGS-L W-L
4	Operation and maintenance of the center	WPH	Mostly generation of small quantities of solid waste and sewage from toilets. Solid waste	WPH - L

Sl. No	Applicable Component/ Project Construction preparatory Work-related Sub activity (As per SF-1)	Nature of Risk (Conforming to Column 3 of SF-1)	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L), Moderate (M), Substantial (S), High (H)
			will be disposed of as per stipulated procedures and sewage from toilets will be treated using a clarifier type of facility.	

SF 3 Form - Summary of Risk and Impacts

Project Activity For Details Refer Annexure 1 Section 1	Environment Risks					Social Risks					
	Land, Geology & Soil	Water	Biodiversity	Waste, Pollution & Hazard	Protected Area (WLS, National Park etc.)	Land	Loss of Livelihood/ HH etc.	Labour	Cultural/ Heritage	Tribal	SEA/SH
Clearing of ground and translocation of a lone ash tree at the site which is in a protected area	L	NA	L	L	NA	NA	NA	L	None	None	L
Setting up a Turtle Conservation Center with the movement of vehicles carrying construction materials, labour movement, placement of Exhibits and Displays, with facilities for Education and Programs, Audio-visual Presentations, Workshops and Events	M	L	M	L	NA	NA	NA	M	NA	NA	NA
Construction of approachways and parking area	L	L	NA	NA	NA	NA	NA	NA	NA	NA	NA
Operation and maintenance of the center	NA	NA	NA	L	NA	NA	NA	L	NA	NA	NA
Hence the overall Risk Classification of the sub-project may be inferred as Low to Moderate .											

Criteria for Risk Evaluation:

Low	Localized, temporary and Negligible
Moderate	Temporary, or short term and reversible under control
Substantial	Medium term, covering larger impact zone, partially reversible
High	Significant, non- reversible, long term and can only be contained/compensated
Occupational Health and safety	It will be treated as Moderate by default as OHS effect can be kept controlled and with negligible effect with adoption of defined guidelines.

Project Category	☐ Low risk, ☐ Moderate Risk, ☐ Substantial Risk, ☐ High Risk
Key Reasons	
ESS Instruments Required	• ESMP included within ESDD • Standard ESMP (standalone)

Status	Agency / Official	Name, Signature with Date and Seal
Prepared by	PIU	
	Environmental and Social Specialist	
Checked and categorised as (Low risk, Moderate risk, substantial risk, High risk)	PMU	
Reviewed and accepted by		

ESDDR FORMAT

Introduction

- 1.1 Project overview
- 1.2 Sub-project description
- 1.3 Proposed interventions/ activities and intended outcomes
- 1.4 Implementation arrangement and schedule
- 1.5 Purpose of ESDD
- 1.6 Approach and methodology of ESDD

Institutional Framework and Capacity Assessment

- 2.1 Policy and legal framework
- 2.2 Description of institutional framework

Assessment of Environmental and Social Conditions

- 3.1 Physical environment
- 3.2 Protected area
- 3.3 Social environment
- 3.4 Cultural environment

Activity Wise Environment & Social Screening, risk and impacts identification

- 4.1 Sub-project screening
- 4.2 Stakeholder consultation
- 4.3 Descriptive summary of risks & impacts from activities based on screening

Conclusion and Recommendations

- 5.1 Conclusions
 - 5.1.1 Risk classification
 - 5.1.2 National legislation and WB ESS applicability screening
- 5.2 Recommendations
 - 5.2.1 Mitigation and Management of Risks and Impacts
 - 5.2.2 Institutional Management, Monitoring and Reporting

12. ANNEXURE 2

Environmental and Social Management Plan (ESMP)

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency												
DESIGN / PRE-CONSTRUCTION STAGE																
1	Design to incorporate environmental sensitivities	Designs shall take into account topography / environmental and social sensitivities and regulations; especially National / State building rules and Fire Safety Codes Rainwater harvesting, topsoil preservation, and green measures shall be adopted														
2	Clearances, Approvals, Permits/NOCs etc. to be secured / complied with.	List of clearances required prior to start of construction activity	Pre-construction stage (Prior to initiation of any work) The time period suggested for getting permission is 2-3 months.	PMU/PIU/PMC & Contractor												
		<table><tr><th>Type of Clearance</th><th>Applicability</th></tr><tr><td>NOC and consent under Air, Water & Environment Act and noise rules from SPCB</td><td>For establishment of construction camp</td></tr><tr><td>NOC and consent under Air, Water & Environment Act and noise rules from SPCB</td><td>For operating construction plant, crusher, batching plant and others as applicable</td></tr><tr><td>Explosive license from Chief Controller of Explosives.</td><td>For storage of fuel oil, lubricants, diesel etc.</td></tr><tr><td>Permission for storage of hazardous chemicals from CPCB.</td><td>For storage and handling of Hazardous chemicals.</td></tr><tr><td>Borrow area approval from district collector, Consent letter, and lease agreement with the owner of land.</td><td>Borrow area for excavation of earth.</td></tr></table>			Type of Clearance	Applicability	NOC and consent under Air, Water & Environment Act and noise rules from SPCB	For establishment of construction camp	NOC and consent under Air, Water & Environment Act and noise rules from SPCB	For operating construction plant, crusher, batching plant and others as applicable	Explosive license from Chief Controller of Explosives.	For storage of fuel oil, lubricants, diesel etc.	Permission for storage of hazardous chemicals from CPCB.	For storage and handling of Hazardous chemicals.	Borrow area approval from district collector, Consent letter, and lease agreement with the owner of land.	Borrow area for excavation of earth.
		Type of Clearance			Applicability											
		NOC and consent under Air, Water & Environment Act and noise rules from SPCB			For establishment of construction camp											
		NOC and consent under Air, Water & Environment Act and noise rules from SPCB			For operating construction plant, crusher, batching plant and others as applicable											
		Explosive license from Chief Controller of Explosives.			For storage of fuel oil, lubricants, diesel etc.											
Permission for storage of hazardous chemicals from CPCB.	For storage and handling of Hazardous chemicals.															
Borrow area approval from district collector, Consent letter, and lease agreement with the owner of land.	Borrow area for excavation of earth.															

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications		Time frame	Regulation and coordinating agency
		Quarry Lease Deed and Quarry License from State Department of Mines and Geology.	Quarry operation (for new quarry).		
		Permission for Storage and Disposal of Silt / Muck/dredged material	Revenue Authority, Department of Geology (if applicable) and Local Bodies (for disposal if in waste disposal site).		
		Permission/NOC from State GroundWater Department	For extraction of groundwater.		
		Permission/NOC from State Irrigation department	For taking/using river, canal water.		
		Labor license from labor commissioner office.	Engagement of Labor		
		Provide a copy of all necessary clearances to the PMU/PIU/PMC • Adhere to all clearance terms and conditions • Obtain written permission from private landholders to use their land for support activities, prior to commencing any works			
3	Dismantling of structures	Land acquired: the compensation will be as per the RFCTLARR – or as per RP Dismantled public utilities & structures shall be planned to be reconstructed in discussion with stakeholders (as specified in RP)		Post design to Pre-construction.	PMU/PIU/PMC & Contractor
4	Relocation of Utilities	All underground and overhead utilities are to be shifted as per utility shifting plan, prior permission is to be obtained from regional offices of concerned departments like Electricity, Telecommunications, Waterworks etc. Relocated utilities shall be suitably placed considering the probable impacts due to climate change.		Post design to Pre-construction	PMU/PIU/PMC & Contractor

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
5	Clearing and Grubbing & Tree Felling	- Clearing and grubbing to be done only on the required surface & just before the start of the next activity on that section. In case of a time gap, water should be sprinkled regularly until the start of the next activity. - Avoid tree felling as much as possible. Follow national regulation / applicable procedures for the replanting of trees. Tree felling permission shall be obtained from the forest department / local body under applicable Acts. - Compensatory plantation shall be planned to be undertaken at prescribed rates. - Plan to use native species in consultation with the communities, Forest Department, Local Bodies.	Prior to the start of construction activity.	PMU/PIU/PMC & Contractor
6	Relocation of drinking Water sources	Alternate water supply arrangements, meeting required quality standards, shall be made to that affected people (people who lost opportunity to utilize the existing water sources due to pollution, decrease in capacity, lack of access, etc).	Prior to the start of construction activity.	PMU/PIU/PMC & Contractor
7	Sensitive Physical/Cultural Properties	- Construction activities shall be done in a manner to avoid damage to cultural properties. - In case of an impact on the cultural properties, location-based property preservation shall be done in consultation with the community as per the Physical Cultural Resources Management Plan.	Prior to start of construction activity.	PMU/PIU/PMC & Contractor
8	Environmental Management and Monitoring facility equipment for ESMP (meters, vehicle and Buildings)	Monitoring is to be carried out regularly as per the frequency and at locations specified as per the environmental monitoring plan.	Plan for monitoring shall be prepared during design itself; monitoring shall be for during and after construction (Five Years)	PMU/PIU/PMC & Contractor

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
AIR ENVIRONMENT- CONSTRUCTION PHASE				
1	Gaseous Emissions	Vehicles and machinery are to be maintained so that emission conforms to National Ambient air quality standards. All vehicles and machineries should obtain Pollution Under Control Certificates	Beginning with & throughout construction	PMU/PIU/PMC & Contractor
2	Dust Generation	▪ In the case of small road constructions, asphalt mixing plants should be sited over 1000 m from any community. ▪ Mixing equipment should be well sealed and be equipped with a dust-removal device. ▪ Operators should wear dust masks, ear protection and hard hats. ▪ Vehicles delivering materials should be covered to reduce spills and dust blowing off the load. ▪ Clearing and grubbing to be done, just before the start of the next activity on that site. In case of the time gap, water should be sprinkled regularly until the start of the next activity. ▪ Water to be sprayed during the construction phase, at mixing sites, approach road & temporary roads. ▪ Labor to be provided masks / PPEs. ▪ Embankment slopes to be covered with turfing/stone pitching immediately after completion Construction site prone to dust generation shall have fencing to arrest dust spreading into neighboring sensitive land uses	Beginning with & throughout construction until asphaltting / dust-generating activities are completed, and side slopes are covered.	PMU/PIU/PMC & Contractor
3	Equipment selection maintenance and operation	Construction plant and equipment will meet recognized international and national standards for emissions. And will be maintained and operated in a manner that ensures that relevant air, noise, and discharge regulations are met.	During construction	PMU/PIU/PMC & Contractor

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
LAND ENVIRONMENT – CONSTRUCTION PHASE				
4	Soil Erosion and sedimentation control	Plan the activities so that no bare/loose earth surface is left out before the onset of monsoon. For minimizing soil erosion, the following preventive measures are to be taken: ▪ Embankment slopes to be covered, soon after completion ▪ Next layer/activity to be planned, soon after completion of, clearing and grubbing, laying of embankment layer, sub-base layer, scarification etc. ▪ Topsoil from borrow area, debris disposal sites, construction site to be protected /covered for soil erosion. ▪ Debris due to excavation of foundation, dismantling of existing cross drainage structure will be removed from the watercourse immediately. ▪ Diversions for bridges will be removed from the watercourse before the onset of monsoon.	During construction Upon completion of construction activities at these sites.	PMU/PIU/PMC & Contractor
5	Loss of agricultural topsoil	All areas of cutting and all areas to be permanently covered will be stripped to a depth of 150mm and stored in stockpile. (Refer to ECoP on Top Soil Management) Topsoil shall be safeguarded from erosion and will be reused as follows: ▪ Covering all borrow areas after excavation is over. ▪ Dressing of slopes of embankment. ▪ Development of greenery.	During construction.	PMU/PIU/PMC & Contractor
6	Compaction of Soil and Damage to Vegetation/ Diversions	Construction vehicles should operate within the Corridor of Impact avoiding damage to soil and vegetation. ▪ Diversions, access roads used will be redeveloped by the contractor, to the satisfaction of the owner/ villagers.	During construction.	PMU/PIU/PMC & Contractor

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
7	Contamination of soil	Hazardous Waste Rules, 2016 will be complied with. - Crushing /Batching/ Hot Mix Plants if any required; to be setup 500m away from surface water bodies. - The oil interceptor will be installed at the planned site and Truck lay by. - Bio-toilets shall be provided (at construction site) for safe disposal of waste. - Scarified bituminous waste shall be reused for base course in crossroads and junction improvement of gravel roads.	During construction	PMU/PIU/PMC & Contractor
8	Borrow pits	No borrow pit will be opened without the permission of the supervision consultant. - Written approval from the owner to be submitted to PMU/PIU/PMC. - Borrow pits shall be identified outside the worksite. - Before opening additional borrow pits, operating pits shall be closed according to IRC specification.	During construction	PMU/PIU/PMC & Contractor
9	Quarrying and / or Sourcing of materials	- Quarrying will be carried out at approved and licensed quarries only. Copy of licenses to be submitted to the PMU/PIU/PMC. - The contractor will use materials from the approved sources.	During construction	PMU/PIU/PMC & Contractor
WATER ENVIRONMENT – CONSTRUCTION PHASE				
10	Loss of water bodies (surface/ ground)	- No excavation from the bund of the water bodies. No debris disposal near, any water body. - Water for construction activity shall be from the approved water bodies only. - Construction labor should be restricted from polluting the source or misusing the source. - Shifting of source to be completed prior to disruption of the actual source. - Alternate arrangements shall be made to all the water users prior to the construction activity for the identified	During construction	PMU/PIU/PMC & Contractor

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
		(during Design stage) water sources (surface and ground sources) that fall in the project site - To avoid any damage to the constructed areas, drainage to be provided along and across the with proper engineering structures. - Enhancement/de-silting of existing surface water bodies - Encourage rainwater harvesting		
11	Reduction in waterspread area	- Avoid infrastructure which reduces water spread area / alternate placement of facilities shall be preferred - De-silting of existing water bodies. - Prepare and follow Disaster Management Plan Watershed Management & Recharge		
12	Alternation of drainage	- Diversions should be constructed during dry season, with adequate drainage facility, and will be completely removed before the onset of monsoon. - Debris generated due to the excavation of foundation or due to the dismantling of the existing structure should be removed from the watercourse. - Silt fencing has to be provided on the mouth of discharge into natural streams. - Continuous drain (lined/unlined) is provided obstruction if any, to be removed immediately.	Whenever encountered during construction	PMU/PIU/PMC & Contractor
13	Runoff and drainage	- Throughout monsoon uninterrupted continuous drain to be functional. - Lined drain to be provided at build-up locations for quick drainage. - Increased runoff due to increased impervious surface is countered through increased pervious surface area through soak pits.	During Construction	PMU/PIU/PMC & Contractor
14	Water requirement for project	The contractor has to provide a list of sources (surface/ground) for approval from PEA.	During Construction	PMU/PIU/PMC & Contractor

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency															
		Prior to the use of the source, the contractor should obtain written permission from authority, to use the water in construction activity, and submit a copy to PEA.																	
15	Silting/sedimentation	- Measures suggested under ‘Soil Erosion and Sedimentation control’ has to be enforced. - Silt fencing to be provided in the following places: <table><tr><th>Sl.No</th><th>Location</th><th>Remarks</th></tr><tr><td>1.</td><td>Topsoil storage</td><td>Around the periphery of the storage yard</td></tr><tr><td>2.</td><td>Borrow area site</td><td>Along the length of the borrow area in the downslope direction</td></tr><tr><td>3.</td><td>Surface Water bodies</td><td>Equals to diameters/length or as instructed by PEA/Local Body.</td></tr><tr><td>4.</td><td>Plant sites</td><td>In down slop direction final material</td></tr></table> - Construction activities should be stopped near water bodies during monsoon.	Sl.No	Location	Remarks	1.	Topsoil storage	Around the periphery of the storage yard	2.	Borrow area site	Along the length of the borrow area in the downslope direction	3.	Surface Water bodies	Equals to diameters/length or as instructed by PEA/Local Body.	4.	Plant sites	In down slop direction final material	Throughout the construction period.	PMU/PIU/PMC & Contractor
Sl.No	Location	Remarks																	
1.	Topsoil storage	Around the periphery of the storage yard																	
2.	Borrow area site	Along the length of the borrow area in the downslope direction																	
3.	Surface Water bodies	Equals to diameters/length or as instructed by PEA/Local Body.																	
4.	Plant sites	In down slop direction final material																	
16	Contamination of water	- Measures suggested under the Contamination of soil’ have to be enforced. - Construction work close to water bodies should be avoided during monsoon. - Labor camps are to be located away from water bodies. - Car washing/workshops near water bodies are to be avoided.	Throughout the construction period.	PMU/PIU/PMC & Contractor															
NOISE ENVIRONMENT – CONSTRUCTION PHASE																			
17	Noise	- Noise standard at processing sites, e.g. aggregate crushing plants, batching plants, hot mix plants are to be strictly monitored to prevent exceeding GOI noise standards. - Workers in the vicinity of strong noise to wear protectors and	Beginning and throughout construction	PMU/PIU/PMC & Contractor															

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
		- their working - time should be limited as a safety measure. - In construction sites within 150 m of sensitive receptors and settlement areas construction to be stopped from 22:00 to 06:00. - Machinery and vehicles should be maintained to keep their noise to a minimum. - Noise barrier shall be constructed at all noise-sensitive locations. - HORN PROHIBITION signpost to be erected. - Rumble strips/speed breaker to be provided.		
FLORA & FAUNA – CONSTRUCTION PHASE				
18	Loss of trees and Avenue planting	- Trees felled should be cut in logs and stacked species wise as instructed by PMU. - Avenue plantation has to be taken up soon after the completion of civil works. - All the realignment sections are to be enhanced with landscaping and peripheral tree plantation. - Community structure has to be enhanced with plantation. - The contractor has to ensure that no trees/branches to be felled by laborer for fuel, warmth during winter. Enough provision of fuel to be ensured.	After completion of construction activities	PMU/PIU/PMC & Contractor
19	Vegetation clearance	- Clearing and grubbing should be avoided beyond that which is directly required for construction activities. - The next activity to be planned/started immediately, to avoid dust generation and soil erosion during monsoon. - Turfing/ re-vegetation to be started soon after completion of the embankment.	Cleaning operations as part of the construction stage	PMU/PIU/PMC & Contractor
20	Fauna	- Construction workers must protect natural resources. - The contractor shall allow suitable means to prevent	During construction	PMU/PIU/PMC & Contractor

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
		disturbance to birds/animals and their nests.		
SOCIO – ECONOMIC ENVIRONMENT-CONSTRUCTION PHASE				
21	General Issues – Related to Users		During Construction	PMU/PIU/PMC & Contractor
	Fear of uncertainties regarding future	Public participation sessions should be conducted in different stages of project construction.		
	Public Health and Safety	▪ Debris (C&D) will be disposed to the satisfaction of the Engineer. ▪ Monitoring of air, water, noise and land during construction and operation phase. ▪ Project interventions including civil works shall be planned to take into account climate change effects. (for example; buildings will be built above maximum probable tide levels, and designed to withstand high wind, storm surge and rising sea levels).		
	Loss of access	At all times, the Contractor shall provide safe and convenient passage for vehicles, pedestrians and livestock to and from side roads and property accesses connecting the project road. Work that affects the use of side road existing access shall not be undertaken without providing adequate provision to the prior satisfaction of the Engineer. The works shall not interfere unnecessarily or improperly with the convenience of public or the access to, use and occupation of public or private road, railways and any other access footpaths to or of properties whether public or private.		
	Traffic jams and Congestion	▪ Detailed Traffic Management Plans shall be prepared and submitted to the Engineer for approval 5 days prior to commencement of maintenance works on/near any section of the road. ▪ The traffic control plans shall contain details of temporary diversions, details of arrangements for construction under traffic and details of traffic		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
		arrangements after cession of work each day temporary diversion (including scheme of temporary and acquisition) will be constructed with the approval of the Engineer after due consideration to the local environment and economy . ▪ The temporary diversion shall not compromise on the issues of public safety. Special consideration shall be given in the preparation of the traffic control plan to the safety of pedestrians and workers at night ▪ The contractor shall ensure that the running surface is always properly maintained, particularly during the monsoon so that no disruption to the traffic flow occurs ▪ The temporary traffic detours in settlement areas shall be kept free of dust by frequent application of water.		
	Traffic control and safety	▪ The Contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required by the Engineer for the information and protection of traffic approaching or passing through the section of the highways under improvement. ▪ For roads, the provision of traffic safety measures shall be considered incidental to work as per the Ministry of Road Transport and Highways (MoRTH) specification and Indian Road Congress (IRC) guidelines. ▪ For roads, all signs, barricades, pavement markings shall be as per MoRTH specification.		
	General Issues- Related to Labours			
	Pressure on Existing Infrastructure due to labor camps.	▪ Contractors should recruit the local people as labourer at least for unskilled and semi-skilled jobs ▪ Basic facilities should be ensured at labour camp including first aid emergency medical response teams, Regular general health check-ups, canteen toilets with proper disposal facilitate education to the children by tying up with schools in the Neighborhood, to prevent the spread of		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
		disease and pressure on existing infrastructure. - Contractor is responsible for enforcing /adhering to the minimum requirements as per the bid document conditions. - Camps if any; shall be planned to take into account climate change effects to ensure the safety of workers housed. (for example; buildings will be built above maximum probable tide levels, and designed to withstand high wind, storm surge and rising sea levels).		
	Accidents and Safety	The contractor is responsible for enforcing /adhering to the minimum requirements given in bid documents w.r.t Workers safety during Construction Environment and Safety Manager will report, on the enforcement of the above at regular time intervals.		
	Payment of wages	This shall follow Social management Plan		
	Rehabilitation of labor and Construction camp	At the completion of construction, all construction camp facilities shall be dismantled and removed from the site. The site shall be restored to a condition in way inferior to the condition prior to commencement of the works. Various activities to be carried out for site rehabilitation include: the following aspects shall be included in the bid document as part of Contractor responsibility. - Oil and fuel contaminated soil shall be removed and transported and buried in waste disposal areas. In case transportation is not possible, the treatment of polluted areas has to be done. - Soak pits, septic tanks shall be covered and effectively sealed off. - Debris (rejected material) should be disposed off suitably. - Ramps created camp should be leveled. - Underground water tank in a barren/non-agricultural land, topsoil shall be taken for utilized for plantation. - Proper documentation of rehabilitation site is necessary. This shall include the following: - Photograph of rehabilitated site; - Landowner consent letter for satisfaction in measures taken for rehabilitation of site;		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
		- Undertaking from contractor; and Certification from Engineer in-charge		
22	Sensitive Community Structure	Any loss during construction will be the sole responsibility of the contractor and the damage will be repaired immediately up to the satisfaction of people at the contractor's own cost.	During construction	PMU/PIU/PMC & Contractor
23	Roadside amenities	- Bus shelter if affected shall be provided as required. - Pedestrian crossing is provided at major settlement locations, providing zebra crossing, signposts and speed breakers. However, this should be properly planned. - Landscaping at junctions. - Hedging at boundary with non-palatable shrubs, all along the non-urban stretch.	During construction Plantations (Herbs/shrubs), immediately after completion of construction	PMU/PIU/PMC & Contractor
24	Construction & Demolition waste management	Construction & Demolition Wastes shall be covered and stocked within clearly demarcated areas, transported in covered vehicles, and disposed as suggested by PEA/local body after requisite permissions.	During Construction	PMU/PIU/PMC & Contractor
ROAD SAFETY – CONSTRUCTION PHASE				
24	Accident with hazardous materials	Compliance with Environmental (Protection) Act, 1986, including: - For the delivery of hazardous substances, three certificates issued by the transportation department are required permit license, driving license and guarding license. - Vehicle delivering hazardous substances will be printed with standard signs. Persons operating the vehicles should be trained personnel and should carry Material Safety Data sheets. - These vehicles can only be parked at designated parking lots. - The list of hazardous materials for construction activity has to be identified in advance and the same has to be informed to the PEA. Accident Management shall be the responsibility of the Contractor and the Regulating Agencies.	During Construction	PMU/PIU/PMC & Contractor

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
		In case of a spill of hazardous materials, relevant departments will be informed at once & dealt with it in accordance with the spill contingency plan.		
OPERATION PHASE				
AIR ENVIRONMENT-OPERATION PHASE				
1	Dust Generation	- Dust Generation due to vehicle wheel will be reduced due to increased/widened paved surface. - Avenue plantation and other plantations will include species having dust and pollutant absorption characteristics. - Community properties and realignment locations will have peripheral plantation and landscaping. - Maintenance of roads/paths to be ensured.	After completion of construction activity	PMU/PIU/Local Authority
2	Air pollution	- With the reduction in journey time and idle engine running time air pollution will reduce. - Avenue plantation is proposed throughout the corridor. - Avenue plantation includes species having air-purifying characteristics. - Enforce Pollution Under Control (PUC) programs. - The public will be informed about the regulations on air pollution of vehicles. - The air pollution monitoring program has been devised for checking pollution levels and suggesting remedial measures.	After completion of construction activity	PMU/PIU /Local Authority
LAND ENVIRONMENT – OPERATION PHASE				
3	Temporary land acquisition	- Borrow area redevelopment plan to be completed/ enforced. - All temporary acquired land for construction of diversion, transportation of material, etc., should be redeveloped as	After completion of construction	PMU/PIU /Local Authority

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
		- per standard specifications. - Affected productive area to be rehabilitated with topsoil.		
4	Soil erosion	- Embankment slopes to be re-vegetated - Residual spoils to be disposed of properly in compliance with construction and Demolition Waste Management Rules, 2016.	After completion of construction	PMU/PIU /Local Authority
5	Soil Contamination	- The public should be informed about the regulations on land pollution. - Compliance with Construction and Demolition Waste Management Rules, 2016. - Monitoring of soil quality to be done regularly as per frequency and location mentioned in the Environment Monitoring Plan.	After completion of construction	PMU/PIU /Local Authority
WATER ENVIRONMENT – OPERATION PHASE				
6	Sitting / sedimentation	- Measures suggested under 'soil erosion' to be enforced. - De-silting of existing water bodies. - Silt fencing to be provided.	After completion of construction	PMU/PIU /Local Authority
7	Decreased waterspread area	- De-silting of water bodies to ensure more water retention. - Prepare and follow Disaster Management Plan - Follow Watershed management approaches and effective recharge & drainage practices		
8	Contamination of water	- The public to be informed about the regulations on water pollution. - Monitoring of water pollution to be done regularly as per the frequency and location mentioned in the EMP.	After completion of construction	PMU/PIU /Local Authority
9	Maintenance of Storm Water Drainage System	- The urban drainage systems should be maintained to accommodate storm water flow. - Cleaning/ removing spoils should be ensured before/during the monsoon rains.	Especially at the start & end of rains	PMU/PIU /Local Authority

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
NOISE ENVIRONMENT- OPERATION PHASE				
10	Noise	▪ 'Horn Prohibited' signpost will be enforced. ▪ Maintenance of noise barriers. ▪ Discouraging the establishment of sensitive receptors near the road. ▪ The public to be informed about the regulations on noise pollution.	After completion of construction	PMU/PIU /Local Authority
FLORA & FAUNA – OPERATION PHASE				
11	Loss of trees and Avenue Planting	▪ The avenue plantation should be properly maintained preferably through Communities, NGOs or CSR of corporate groups ▪ Discourage cutting trees/ branches. ▪ Educate people about the usefulness of trees	After completion of construction	PMU/PIU /Local Authority
SOCIO-ECONOMIC ENVIRONMENT – OPERATION PHASE				
12	General Issues	▪ Public consultation to be organized after completion of construction to assess the people's opinion/ grievance from the project intervention. ▪ Remedial measures to mitigate the impact due to project intervention to be incorporated in the operation phase.	Operation phase	PMU/PIU /Local Authority
ROAD SAFETY ENVIRONMENT – OPERATION PHASE				
13	Protection of high road embankments	▪ Stabilization of altered (especially high) embankments. ▪ Although stone pitching is provided, vigilance to be maintained.	Immediately after construction	PMU/PIU /Local Authority
14	Safety and noise disturbance	▪ Further construction near infrastructure provided shall be as per the zoning regulations as well as the Environmental guidelines.	Before and after project Development period	PMU/PIU /Local Authority

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

Sl. No.	Environmental Issues	Specifications	Time frame	Regulation and coordinating agency
15	Ensure Safe Traffic	▪ Road surface if affected, to be maintained and proper road markings to be provided, pot holes to be filled immediately. ▪ Regular maintenance of sign post, painting/removal of bills. ▪ Traffic rules / safety awareness to people ▪ Speed limit & speed breakers / traffic calming to be enforced at sensitive locations. ▪ Lighting of major junctions ▪ Intimation to communities including sensitive land uses (like Hospitals, Schools etc.) regarding works	During Operational stage	PMU/PIU /Local Authority

ESMP for Material collection facilities MRFs

SI No	E&S issues	Mitigation Measures	Planning / Implementation Responsibility	Monitoring Responsibility
A		Planning and Pre-Construction Stage		
1	<i>Planning for MRF</i>			
1	Site Access Closure	- Stop all other activities on site before commencement of any civil works. - Prohibit all public access to the site, including waste pickers and scavengers vide adequate fencing/compound wall, manned security, and signage which prohibit public access completely, to avoid risk to the public. - Close site fully and display appropriate signage at the site entrance to indicate that the waste dump has been closed from the operation. - Provide compound wall as per contour of the ground.to avoid land disturbance and movement, the fence/compound wall shall - Perform grading shall be performed where necessary to provide a neat appearance	ULB	SPMU
3	Absence / Delay in Permissions for Developing the MRF and associated works as per National regulations	Obtain required permissions for undertaking MRF and assessments conducted for undertaking these as per existing Laws, Regulations; including for associated infrastructure, DG Sets, Consent to Establish; and other licenses including those as per Labor Laws, before the start of works on site	Contractor, ULB	SPMU
4	Dust impacts due to Site Preparation <i>(Air Pollution) and Visual Blight due to excavation</i>	- Provide temporary high screen, buffers around the site before the start of work to curtail dust emissions - Arrange a green belt as early as possible on the area of the site with no / less dump. (preferably fast-growing thick canopies of indigenous trees, shrubs in layers)	Contractor	SPMU

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures	Planning / Implementation Responsibility	Monitoring Responsibility
5	Material sourcing, transport, and stacking of construction materials <i>(Occupational Health and Safety issues and Air noise pollution)</i>	- Provide prior intimation to neighbors on proposed construction activities, timings, emergency contacts, grievance mechanism to register grievances, if any - Provide prior intimation to nearby Health Centre on work activities need for medical support, emergency support needs, type of laborers on-site and labor camp if any - Source materials only from approved quarries - Transport material only in closed trucks with PUC certificates, with water sprinkling if required to curtail dust emissions. - Ensure driver has valid license and follow speed regulations - Ensure materials transported preferably through well-surfaced roads. If road is kuccha, water sprinkling shall be done to prevent dust emission before and after truck passes - Ensure material transportation and unloading activities should not result in noise disturbance to locals and should be during day time - Ensure materials are properly stored/stacked following good housekeeping practices (labeling, properly arranged); in covered sheds to prevent loss of strength and loss of material. Material storage shall not result in any harm to workers or visitors. - Provide vehicle wheel wash area on site - Provide workers to be provided with Personnel Protection Equipment (PPE) including safety boots, jackets, earmuffs, gloves. - Proper rest area on site shall be provided with water, first aid, toilets.	Contractor	SPMU
6	The layout of Labour camp <i>(Impacts on Air, Water, Land, Fauna/Flora, Socio-economic)</i>	- In case a labour camp is required, the Labour camp layout, design and material/fire safety plan shall be approved by site engineer before start of construction of the camp - Inform nearby health center about the labor camp and have a tie up for any treatment/ checkup/tests - Ensure safety of materials used for the camp (from corrosion, fire/flood/other manmade and natural disasters) - Ensure camp is not set up on waste dumping yard or similar areas or in an area prone to Hazards - Ensure camp is located at higher plinth levels to prevent water intrusion.	Contractor	SPMU, Labour Commissioner, TNPCB.

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures	Planning / Implementation Responsibility	Monitoring Responsibility
		- Ensure rooms shall be of appropriate sizes with adequate ventilation and livable temperature/other conditions and facilities like proper beds, storage areas, common kitchen when the wood is not used as a fuel (better to use LPG) - Provide proper facilities at the camp including food and common entertainment facilities, crèche, toilets with proper septic tanks, washing area, wastewater, and waste collection/management systems, etc - Maintain camp in good clean hygienic conditions and shall have outdoor seating areas, greenery, security		
7	Nearness/disturbance to sensitive areas such as forests, wildlife habitations, etc. especially in case of providing support facilities <i>(Impacts on Fauna / Flora)</i>	- Ensure site selection for support facilities or activities based on the screening checklist and the master plan of the region, to avoid sensitive areas. Follow mitigation hierarchy – Avoid, Minimize, Mitigate, and Reduce. Obtain requisite permissions from respective authorities such as Department of Environment and Forests, Pollution Control Board, SCZMA - Covered and well-marked storage area for excavated wastes and washing, segregation of the same are to be arranged	Local Body	SPMU
9	Nuisance hazards to neighboring areas	- Ensure proper design and adequate compound wall; high screen during construction, buffer zones and thick green belt to comply with SWM Rules, 2016 and other PCB requirements - In case of waste mound and site, edges are sliding or unsafe; provide engineered retention walls.	Contractor	SPMU, TNPCB
B	Construction / Implementation stage			
1	Impact due to the vehicular movement <i>(Air and noise environment)</i>	- Maintain vehicles and machinery so that emission conforms to National Ambient air quality standards. - Obtain Pollution Under Control Certificates for all vehicles and machinery should obtain - Erect HORN PROHIBITION sign post. - Rumble strips/speed breaker to be provided.	Contractor	SPMU

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures	Planning / Implementation Responsibility	Monitoring Responsibility
2	Impact due to the use of construction equipment (Air and Noise)	- Mixing equipment should be well sealed and be equipped with a dust-removal device. - Ensure Operators should wear dust masks, ear protection, and hard hats. - Cover vehicles delivering materials to reduce spills and dust blowing off the load. - Provide labor with masks / PPEs. - Fence construction site that are prone to dust generation shall have fencing to arrest dust spreading into neighbouring sensitive land uses - Ensure strict monitoring of Noise standards at construction machines to prevent exceeding of GOI noise standards. - Workers in the vicinity of strong noise to wear protectors and their working time should be limited as a safety measure. - Ensure that in construction sites within 150 m of sensitive receptors and settlement areas construction to be stopped from 22:00 to 06:00 hrs. - Machinery and vehicles should be maintained to keep their noise to a minimum. - Construct Noise barriers at all noise-sensitive locations.	Contractor	SPMU
3	Impact during the construction activities (water environment)	- Avoid construction work close to water bodies during monsoon. - Site Labour camps away from water bodies. - Vehicle washing or maintenance near water bodies are to be avoided. - Contaminated water from construction activities carrying soil, cement wash, etc shall not be allowed to flow out of the site. It shall be contained and treated on site. - Contractor should not discharge construction waste water directly onto ground or to nearest drain. It shall be routed through an appropriate silt pit to trap all particles & clean water may be allowed to drain. Material in the pit may be disposed without harm to environment or people. The silt trap shall be used as fire water / drainage silt containment during O&M phase. When the solid particles settles down, the clear water can be reused for curing or any other construction purposes. When the solid particles settles down, the clear water can be reused for curing or any other construction purposes	Contractor	SPMU

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures	Planning / Implementation Responsibility	Monitoring Responsibility
7	Transportation of wastes or retrieved or other material in overloaded and open vehicles <i>(Air, Odour nuisances; spills and littering impacts on Air, Water, Land)</i>	- Ensure all vehicles shall carry only approved load of weight as per SOP - Ensure regular cleaning of roads & drains and removal of spills if any. - All Transport vehicles shall be covered - Ensure provisions of SWM Rules 2016 for all waste / retrieved material Transportation activities	Contractor	SPMU
9	Occupational health and safety impacts of the workers during the construction of support facilities: - Health impacts of exposure to a variety of harmful materials of waste-related pollutants. - Accidental spillage by moving vehicles. - Cut & Bruises during handling of materials/rejects - Allergies from pathogen and airborne dust <i>(Air environment, Health impacts)</i>	- Provide First Aid and other related activities at appropriate locations - Prepare emergency preparedness plans and implement for all manpower working centers and its field extension centers. - Prepare an Environment Health & Safety policy shall be prepared and implemented throughout the activities area. - Establish a labor grievance mechanism for addressing issues, complaints and grievances of workers - Provide workers with PPE such as face mask, gloves, shoes, nose masks & goggles - Provide non-slippery work areas - Proper training will be provided regarding the maintenance of Health - Provide workers with rest areas, toilet facilities (with septic tanks), food, and water in a hygienic environment (with proper handwash). Provide clean eating areas where workers are not exposed to hazardous or noxious substances; - Ensure First aid facilities are available at accessible places. More than one first aid station if the site is large - Tie-up with the local hospital / Health Centre to provide an ambulance to handle emergency cases if required and for regular health checkups. Arrange daily health checkup for workers working on waste heaps - Carry out routine inspections, housekeeping, and maintenance at regular intervals. - Adopt measures such as deferred timings and stretch break, where necessary	Facility operator	SPMU

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures	Planning / Implementation Responsibility	Monitoring Responsibility
		▪ Secure all installations from unauthorized intrusion and accident risks; ▪ Provide Health and Safety orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; ▪ Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas if any, unescorted ▪ Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; ▪ Ensure moving equipment is outfitted with audible back -up alarms; ▪ Mark and provide signboards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall follow international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; ▪ Disallow worker exposure to noise level greater than 85 dBA for more than 8 hours a day without hearing protection ▪ Register all workers shall be registered as per prevalent labor laws (including a workforce of subcontractors) and provided insurance cover ▪ Workers and their kith and kin shall be suitably informed about the registration, other details of workers, and insurance details and provide contact details of contractors person/insurance agent ▪ Inform workers on possible dangers while using heavy machinery like JCB, cranes, etc and prevent going near operating / movement areas. Flagmen should be arranged on-site with a whistle. ▪ inform communities to prevent children and others from going near operating / movement areas While using heavy machinery like JCB, cranes, etc,. ▪ Flagmen shall be arranged if work is near schools, hospitals, major roads, and traffic control is required with the support of police. ▪ Implement a work permit system for all works related to working at heights (typically when working over 2m and above) and for hot jobs; ▪ All works related to working at heights will be undertaken only during the daytime when sufficient sunlight is available;		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures			Planning / Implementation Responsibility	Monitoring Responsibility
		- Deploy temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as handrails and toe boards to prevent materials from being dislodged will be done; - Ensure critical controls for all High Energy Hazards & Other Hazards shall be in place				
		Welding activities and Concreting activities	Visual Impacts can occur during construction phase	a) The project area/Site area to be enclosed and to avoid public access b) Display board containing information like project details, name and mobile number of Engineer at RWS and name and mobile number of Contractors for public awareness that construction is on-going in the facility		
		Operation of DG sets during Construction activities	Release of air pollutants such as NOx, CO and PM10	Type approved DG sets with adequate stack height shall be provided. as per permit conditions.		
		OHS during construction - Demolition, Civil Works - Masonry, welding activities..etc.-	•Working at height without proper PPE •Handling of cement, paint and other chemicals	· A work permit system will be implemented for all works related to all high energy hazards including work at heights, work in enclosed spaces, work in areas frequented by reptiles / pests, hot jobs, and other activities		

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SI No	E&S issues	Mitigation Measures			Planning / Implementation Responsibility	Monitoring Responsibility
			•Accidental spillage by moving vehicles. •Cut & Bruises during handling of materials/rejects •Unauthorized entry to site premises •Working without permit system •Use of faulty welding machine grinding machine etc. •Smoking in site premises •Absence of first aid box •Over speeding of trucks or any vehicles or not following traffic rules. •Non informing or damaging any artefacts ,objects or anything of historical are found	where leachate, wastes etc. may be encountered All noisy activities shall be restricted during daytime between 9 AM to 6 PM. Noise enclosures shall be arranged in case of any activity that produces more than permissible noise levels All works related to working at heights will be undertaken only during the daytime when sufficient sunlight is available; Use of temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as handrails and toe boards to prevent materials from being dislodged will be done; To manage pests if encountered during works, use approved insecticides and suitable snake repellents in the facility, and avoid any insecticides containing materials banned as per WHO, and / or National / State regulations. However, no material that would harm the		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures			Planning / Implementation Responsibility	Monitoring Responsibility
			unexpectedly while excavating •Fire incidents during welding •Accidents during construction	environment or people shall be used. The most appropriate mechanism would be to follow integrated pest management, guided by experts in the field Not to overload ladders Not to overreach on ladders or stepladders Not to rest a ladder against weak upper surfaces, for example glazing or plastic gutters Do not use ladders or stepladders for strenuous or heavy tasks, only use them for light work of short duration (a maximum of 30 minutes at a time). To Provide, protective clothing, respirator when handling cement or dry materials No over loading to be allowed in vehicles, the primary reason for spillage is over loading .The vehicle should be properly washed and serviced at regular intervals		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures			Planning / Implementation Responsibility	Monitoring Responsibility
				Use cut resistant gloves while handling sharp edged materials Site access to be restricted (site entry and exit to be guarded) Material storage to be away from access and it should be clearly marked and barricaded Open pits or floor opening to be put up with barricade or safe tops Tool box and permit system to be made mandatory in day today operation Welding machines to be provided with flash back arrester and grinding machines to be provided with guards No smoking signage to be displayed at site All sites shall have full-fledged First Aid Kits with all required medicines & tools for immediate action.		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures			Planning / Implementation Responsibility	Monitoring Responsibility
				First Aid Kits shall not be used for storing any other material than medicines and required tools for medical aid. Workers, Supervisors shall be appropriately educated on the availability & use of kits. All tippers/heavy vehicles to be fitted with speed governors and drivers should have valid licences and trainings All work areas & signages shall be well lit at all times		
12	Pest / Vermin Control (Odor, flies, rodent / other pest menaces)	▪ Regular cleaning and approved pest control measures to be adopted ▪ Bio pesticides / biological control or Integrated Pest Management also using locally effective techniques shall be followed. ▪ Banned pesticides/insecticides shall not be used. ▪ Workers shall be made aware of storage and use of pest control measures and PPEs to be used			Contractor	SPMU
C	Operation& Maintenance Phase					
1	Impacts due to vehicle movement for new activities (Air, water environment, a nuisance to communities, Health impacts)	▪ The movement route shall be scheduled for each vehicle. ▪ Enforce speed limits applicable and make drivers aware of this ▪ Vehicles movement shall be tracked by Health Supervisors to ensure keeping up to schedule; preferably using GPS ▪ Clean fuel shall be used in vehicles. Any adulterated fuel shall be avoided. There shall be periodic emission tests for vehicles ▪ Provision of Personal Protective Equipment such as face mask, gloves, nose masks & goggles to all workers in C&T vehicles, Maintenance yards ▪ Proper lubrication shall be provided to minimize squeaking noise due to friction			Facility operator	SPMU

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures	Planning / Implementation Responsibility	Monitoring Responsibility
		- Honking shall be minimized to eliminate any possible discomfort to the nearby people. - The most optimum route is planned with minimum no. of vehicles with the help of GIS mapping and apps for the general public - Traffic will be managed at the site by providing adequate space for parking of vehicles - Timely transfer and disposal of retrieved material shall be carried out by vehicles and should transfer materials only to designated areas as per design - No waste or material shall be disposed in any place other than the designated area; including water bodies, coasts/forests, or sensitive areas.		
2	Exhaust emissions (Air impacts)	- No idling of vehicles on site. - Regular maintenance of heavy equipment used at the site and waste hauling vehicles to ensure their exhaust emissions meet the emissions standards prescribed	Facility operator	SPMU
3	Plying of vehicles through kutcha / unsurfaced roads and idling (Air pollution: SPM, CO, CO2)	- Improve Kucha roads to topped ones suitable for movement of vehicles - Vehicle movement shall be well planned – through topped roads. In case of necessity to move through Kutcha roads, ensure sprinkling of water to suppress dust before and after the movement of the vehicle	Facility operator, Panchayat	SPMU
4	Odor (Nuisance, Air)	- Waste with a strong odor to be covered immediately they are emptied from delivery vehicles; - Control and manage leachate treatment plant to minimize odor. - Adhere to air quality regulations with quarterly air quality monitoring - Maintenance of the buffer zone and protective berms - Provide buffers screens to curtail odor from reaching surrounding communities	Facility operator	SPMU
5	Impact on the ambient noise quality during the operations	- Strictly adhering to designated working hours (day time); Sensitizing construction truck drivers and equipment operators to switch off idle engines; - Using modern, well-maintained and regularly serviced vehicles;	Facility operator	SPMU

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures	Planning / Implementation Responsibility	Monitoring Responsibility
	<i>(Noise, nuisance to sensitive receptors, health impacts)</i>	- Ensuring that all generators and heavy-duty equipment be insulated or placed in enclosures to minimize ambient noise levels. - Provision of earmuffs and ear protection to workers and employees in high noise areas		
6	Occupational health and safety impacts of the workers: - Health impacts of exposure to a variety of harmful materials of waste-related pollutants. - Accidental spillage by moving vehicles. - Cut & Bruises during handling of materials/rejects - Allergies from pathogen and airborne dust <i>(Air environment, Health impacts)</i>	- All centers of labor contact points shall be provided with First Aid and other related activities. - Emergency Preparedness plans shall be prepared and implemented for all manpower working centers and its field extension centers. - An Environment Health & Safety policy shall be prepared and implemented throughout the activities area. - Establish a labor grievance mechanism for addressing issues, complaints and grievances of workers Workers will be provided with PPE such as face mask, gloves, shoes, nose masks & goggles - Provide non-slippery work areas - Proper training will be provided regarding the maintenance of Health - Workers shall be provided with rest areas, toilet facilities (with septic tanks), food, and water in a hygienic environment (with proper hand wash). Provide clean eating areas where workers are not exposed to hazardous or noxious substances; - First aid facilities will be available at accessible places. More than one first aid station if the site is large - Tie-up with the local hospital / Health Centre will be arranged to provide an ambulance to handle emergency cases if required and for regular health checkups. Arrange daily health checkup for workers working on waste heaps - Routine inspections, housekeeping, and maintenance will be carried out at regular intervals	Facility operator	SPMU

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures	Planning / Implementation Responsibility	Monitoring Responsibility
		▪ Measures such as deferred timings and stretch break to be adopted ▪ Secure all installations from unauthorized intrusion and accident risks; ▪ Provide H and S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; ▪ Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted ▪ Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; ▪ Ensure moving equipment is outfitted with audible back -up alarms; ▪ Mark and provide signboards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall follow international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; ▪ Disallow worker exposure to noise level greater than 85 dBA for more than 8 hours a day without hearing protection ▪ All workers shall be registered as per prevalent labor laws (including a workforce of subcontractors) and provided insurance cover ▪ Workers and their kith and kin shall be suitably informed about the registration, other details of workers, and insurance details and provide contact details of contractors person/insurance agent ▪ While using heavy machinery or those that rotates / moves, inform workers on possible dangers and prevent going near operating / movement areas. Flagmen should be arranged on-site with a whistle. ▪ While using heavy machinery or those that rotates, moves, inform communities to prevent children and others from going near operating / movement areas. ▪ Flagmen shall be arranged if work is near schools, hospitals, major roads, and traffic control is required with the support of police. Critical Controls for all High Energy Hazards & Other Hazards shall be in place		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures		Planning / Implementation Responsibility	Monitoring Responsibility
		Dust emission ,Noise impacts due to Waste sorting, dedusting and baling activities of MRF	Placement of equipment's shall be in a manner as to create safe work flow, minimizing dust & noise impacts on the workers & nearby landuses. Appropriate shrubbery (of shrubs / herbs at different height layers) shall be provided around the facility. All staff inside the RRF facilities to be provided with masks, hand gloves. But as precautionary measure it is advisable to wear ear plugs during the operation of these machineries.		
		Fire hazards, Pest menaces, Community opposition, Visual blight and exhausts space available for further receipt of NBDW Waste stacking for long period	Longer period of storage in RRF not to be allowed. suitable arrangements for lifting the RDF and inert material at short intervals shall be made.		
			Baled and shredded NBDW shall be handed over to agency for further processing.		
			Inerts and material for RDF to be shifted to designated storage space.		
			Processed waste or incoming waste to be properly stacked away from all access way and firefighting devices. All fire extinguishers should be placed free of obstructions.		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures		Planning / Implementation Responsibility	Monitoring Responsibility
		The water may percolate through the waste during the rainy season and then this water may enter nearby streams or groundwater in course of time due to Waste stacking in MRF surroundings, outside the designated Shed	Waste stacking should be done inside the RRF shed/facility. Waste should not be stacked outside the premises. Inerts and RDF materials to be shifted to the assigned storage facility in the centralised Solid waste management facility on a daily basis		
		Spillage during the handling of oil or other lubricants can damage the land /soil properties of the area	Oil /grease required for the day today use should be stored in the facility. Facility cannot store large quantity of oil/grease/paint as there is no separate chemical storage shed available. The empty paint cans, oil drums to be disposed as per Hazardous Waste Management Rules 2016 The required oil/grease/paint to be stored away from waste and machineries and to be kept in a shed with concrete flooring. MSDS to be displayed near to the chemicals and suitable fire extinguisher to be placed near to the storage		
		Non arrangement of waste and over stacking of waste will affect the visual blight of the area affecting the well- being	Material (Waste) stacking to be proper inside the RRF and waste stacking outside the RRF shed not to be allowed.		

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR TAMIL NADU STRENGTHENING COASTAL RESILIENCE AND THE ECONOMY PROJECT

SI No	E&S issues	Mitigation Measures		Planning / Implementation Responsibility	Monitoring Responsibility
		and values of surrounding neighborhood			
		The capacity of MRF may be exhausted and it may affect further collection of materials from MRFs	Removal of waste in timely manner to be practised. ULB shall explore the demand of waste dry materials by recyclers too. If required collection frequency to be decreased.		
		Rapid fire and destruction of entire facility. Injury to the workforce	Provision of appropriate firefighting equipment, tanks, separation of stacks, storage in bunkers, etc. All workers shall be trained on Fire Fighting, emergency response measures & safe work practices.		
			Overhead fire pipeline is laid in the facility with hose with reels and nozzles.		
			Wiring of the facility should adhere to Industrial standards		
			Machineries to be serviced at proper intervals and do not use machineries with any leakage		

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SI No	E&S issues	Mitigation Measures			Planning / Implementation Responsibility	Monitoring Responsibility
		Vehicular accidents, Spillage of oil/leak from machineries, Workers exposed to dust and high noise levels during the operation of machineries such as deduster, shredding, baling etc. accidents due to faulty wiring and damaged switch boards.	Competent drivers to be appointed, adequate maneuverability space are provide for safe operations of vehicle. And in case of limited space, crowded or congested area vehicle should be reversed with support of a flag man. Vehicle should have audible reverse alarm.	No over stacking to be allowed. No stacking near to machineries or in access way or outside the facility. there shall be adequate separation between stockpiles and boundary walls		
			Ensure sanitary workers are wearing gloves, mask and gum boots during the handling and processing of NBDW.			
			Use face shield and mask when putting and removing waste from deduster.			
			Provide a separation of machinery from common work area by using cone and warning tape.			
7	Pest / Vermin Control (Odour, flies, rodent / other pest menaces)	- Regular cleaning and approved pest control measures to be adopted - Biopesticides / biological control shall be followed. - Banned pesticides/insecticides shall not be used. - Workers shall be made aware of storage and use of pest control measures and PPEs to be used			Contractor	SPMU

Environmental Monitoring Plan

Sl. no.	Type	Locations	Parameters	Period and frequency	Responsibility
Construction Phase					
1	Ambient Air Quality	10 locations as selected during the baseline study	PM10, PM2.5, Sulfur dioxide (SO ₂), Oxides of nitrogen (NO ₂), Carbon monoxide (CO), Hydrocarbon (HC), Volatile Organic Compound (VOC's)	24-hr (8hr for CO) Average samples every quarter	Contractor/ PMU/PIU through NABL accredited laboratory
2	Ground Water	10 locations as selected during the baseline study	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coliforms / MPN (No. of coliforms/ 100ml), Heavy Metals	Quarterly	Contractor/ PMU/PIU through NABL accredited laboratory
3.	Surface water	10 locations as selected during the baseline study	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coliforms / MPN (No. of coliforms/ 100ml), Heavy Metals	Quarterly	Contractor/ PMU/PIU through NABL accredited laboratory
4.	Noise	10 locations as selected during the baseline study	24hrly Day and Night time Leg level	Quarterly	Contractor/ PMU/PIU through NABL accredited laboratory
5.	Soil	10 locations as selected during the baseline study.	Organic matter, C,H,N, Alkalinity, Acidity, heavy metals and trace metal, Alkalinity, Acidity	Quarterly	Contractor/ PMU/PIU through NABL accredited laboratory
Operation Phase					
1.	Ambient Air Quality	10 to be selected after consultation with PCB	PM10, PM2.5, Sulfur dioxide (SO ₂), Oxides of nitrogen (NO ₂), Carbon monoxide (CO), Hydrocarbon (HC), Volatile Organic Compound (VOC's)	24-hr (8hr for CO) Average samples every quarter	PMU/PIU /Local Authority NABL accredited laboratory
2.	Ground Water	10 to be selected after consultation with PCB	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coliforms / MPN (No. of coliforms/ 100ml), Heavy Metals	Quarterly	PMU/PIU /Local Authority NABL accredited laboratory
3.	Surface water	10 to be selected after consultation with PCB	pH, TSS, TDS, DO, BOD, Salinity, Total Hardness, Fluoride, Chloride and MPN (No. of coliforms / MPN (No. of coliforms/ 100ml), Heavy Metals	Quarterly	PMU/PIU /Local Authority NABL accredited laboratory

Sl. no.	Type	Locations	Parameters	Period and frequency	Responsibility
4.	Noise	10 locations covering the project site and in the surrounding to be identified in consultation with PCB	24hrly Day and Night time Leq level	Quarterly	PMU/PIU /Local Authority accredited laboratory NABL
5.	Soil	10 to be selected after consultation with PCB.	Organic matter, C, H, N, Alkalinity, Acidity, heavy metals and trace metal, Alkalinity, Acidity	Quarterly	PMU/PIU /Local Authority through NABL accredited laboratory

Social Management Plan

Sl. No.	Activities	Target	Timeline	Means of verification	Responsibility
1	To complete the registration by the Principal Employer, the ULB, as per the provisions of the Contract Labour (Regulation & Abolition) Act 1970 (CL Act), Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979 (ISML Act) and The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 (BOCW Act) and procure certificate to that effect.	Three Registration Certificates to be procured by the ULB under CL Act, ISML Act and BOCW Act respectively.	Before Awarding works	Registration Certificate issued by District Labor Officer	SPMU

Sl. No.	Activities	Target	Timeline	Means of verification	Responsibility
2	To Procure license under CL Act, ISML Act and registration under BOCW Act by the Contractor	Two Licenses and One registration under CL Act, ISML Act and BOCW Act respectively.	Before commencing the work at site	License and registration certificate issued by the competent Authority.	Contractor
3	To procure Workmen Compensation insurance policy proportionate to the number of labour force deployed. (By the Contractor)	One insurance policy.	Before commencing work at site	Copy of insurance policy	Contractor
4	To display a copy of the certificate of registration at the conspicuous place on the premises where the building and other construction work is being carried on.	One notice board	As soon as the work is started.	Photographs of the notice board where the license is displayed.	Contractor
5	To establish a labour information signboard at camp site by including following details like, date of payment of wages, working hours, holidays, wages rates for different categories of laborer's and name and contact details of local labour inspector and his/her office and emergency contact numbers.				
6	To conduct pre-employment medical examination (as per the provisions of BOCW Act)- to	All workers must be examined	No of workers employed by the Contractor	Pre-Medical Examination certificate issues as per Rule 223© of BOCW Act (Form No. IX) by the Registered	Contractor

Sl. No.	Activities	Target	Timeline	Means of verification	Responsibility
	ensure medical fitness of the employee.			Medical Practitioner.	
7	To conduct Periodical Medical Check-ups (once in every six months)	All workers must be examined.	No of workers employed by the Contractor	Medical Examination certificate issued by a registered medical practitioner.	Contractor
8	To provide safe drinking water. The Contractor must provide safe drinking water at worksite as well as camp site* (Guideline is provided along with this document)	As per requirement	During the entire contract period	Photographs of supply of potable water, Bill of water purchase.	Contractor
9	To arrange first Aid facility at work site as well as camp site (Specifications and items to be maintained in the box is mentioned in this document)	As per requirement	During the entire contract period	First Aid Register, Bill of purchase, photographs of First Aid kit	Contractor
10	To arrange separate First Aid room at work site	Allot one specified room	To be made available during the construction period	Photographs of the facility	Contractor
11	To provide first Aid training to selected labourers or staff members through an authorised agency.	One training with authorized agency	Within one month of commencement of the work	Training records & Photographs	Contractor
13	To establish rest room at work site or camp site		Before commencement of the work	Photographs of the rest room	Contractor

Sl. No.	Activities	Target	Timeline	Means of verification	Responsibility
14	To establish, Appropriate place for rest / eating & wash areas to be provided		before the commencement of the work	Photographs of the facility, canteen register etc	Contractor
15	To maintain essential registers and records like Form A (Registration of employees), Attendance Register, Wages Register, and other registers like incidents registers including Accident register, Harassment complaints, recovery register, Maternity leave, Termination etc.		As and when the work starts	Copy of registers.	Contractor
16	Constitute GRC for laborer's (maximum members to be six. Number of members from employer and employee to be equal. Female members should be minimum 50%.)		As and when work starts	Copy of register and minutes of meeting. Complaint box etc	Contractor
17	Constitution of ICC (minimum members to be four. The presiding member should be a senior female employee) and provide orientation to all workers		As and when work starts	Copy of register and minutes of meeting. Complaint box etc	Contractor

Sl. No.	Activities	Target	Timeline	Means of verification	Responsibility
19	Ensure all workers sign the code of conduct on GBV and provide induction trainings		As and when new employees are joined	Training reports and other documents	Contractor
20	Conduct HIV/AIDS awareness programmes	As per requirement	Once in six months	Reports, photographs etc	Contractor
21	All the vehicles involved in the project shall be insured to cover the third-party risk	Vehicle must be allowed to be plied in the project only after procurement of third- party insurance to the vehicle	As and when vehicles are plied in the project	Photocopy of insurance is to be collected	SPMU

13. ANNEXURE 3

LABOUR MANAGEMENT PROCEDURE

Introduction

The Labour Management Procedures (LMP) sets out the way in which project workers would be managed, in accordance with the requirements of National and State's regulations along with World Bank's Environmental & Social Standards. Accordingly, LMP for the TN-SHORE has been developed in adherence to applicable National/State regulations and World Bank's Environmental & Social Standard (ESS - 2):

Objectives of LMP

The prime objectives of the LMP includes:

- To promote safety and health at work.
- To promote the fair treatment, non-discrimination and equal opportunity of project workers.
- To protect project workers, including vulnerable workers such as women, persons with disabilities, migrant workers, contracted workers and primary supply workers, as appropriate.
- To prevent the use of all forms of forced labor and child labor.
- To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law.
- To provide project workers with accessible means to raise workplace concerns.

Applicability

The present LMP would be applicable to all the "project worker/ labours" working for subproject in the TN-SHORE which includes:

- **Direct Workers:** People employed or engaged directly including contractual staffs to work in the subprojects of TN-SHORE
- **Contracted Workers:** People employed or engaged through third parties (which may include contractors and sub-contractors, etc) to perform work related to core functions (i.e. for specific project activities without which project cannot continue)
- **Primary Supply Workers:** Primary suppliers are those who on an ongoing basis, provide directly to the project goods or materials essential for the core functions of the TN-SHORE.
- **Community Workers:** Community workers are included in the project in a number of different circumstances, including where labor is provided by the community as a contribution to the project, or where projects are designed and conducted for the purpose of fostering community-driven development.

The table below provides an estimate of project workers

Table 13-1 Estimation of Project Workers

S. No.	Type of Project Workers	Requirement in Numbers
1	Direct Workers with PMU (TNGCC), 14 DPMUs, All PIAs	
1.1	State PMU	10
1.2	14 DPMUs	100
1.3	All PEAs	30
	Sub-Total	155
2	Contracted Workers	
2.1	Works at various work site – infrastructure and Environment friendly interventions	5000
2.2	Personnel of various consultancy firms contracted for undertaking studies	100
2.3	Communication agency	15
2.4	Workers at various MRF, other recovery facilities	500
	Sub-Total	5600
3	Primary supply workers	200
3.1	Agencies supply goods such as yellow bags, safety equipment	2000
	Sub-Total	2200
4	Community Workers	
4.1	Workers engaged as mangrove workers	5000
	Sub-Total	5000
	TOTAL	11000

The present LMP also set out mechanism to implement the various provisions for fair treatment, non-discrimination and equal opportunity, occupational health and safety to all project worker as defined above. It also provides grievance mechanism for all direct workers and contracted workers to raise work place concern.

Assessment of Key Potential labour Risk

Potential risks that may arise from the nature of activities to be undertaken include:

- Employment practice that are not compliant with either labor law or ESS 2. For example, not providing written documents of assignments, wages not proportionate with tasks performed, excess workload without provision of adequate rests and leisure, lack of hygiene facilities, discrimination towards women and labor with disability, unlawful termination and withholding of benefit, etc.
- Lack of Occupational Health and Safety (OHS) practice and procedures during construction and operation resulting in unsafe work environment.
- Short and long-term effects on health due to over exposure to dust, noise levels, and exposure to chemicals /hazardous wastes.
- Absence or inadequate or non-responsive emergency response mechanism for rescue of workforce, during natural calamities like cloud bursts, landslides, disasters due to earthquake/floods/fire outbreak, etc. at work/subproject sites.
- Lack of adequate sanitation and health facilities at the work/ subproject sites.
- Community health and safety issues, especially rise of communicable diseases, including Malaria and Cholera to the workforce, and staff.
- The conduct of hazardous work, such as working at heights or in confined spaces, use of heavy machinery, or use of hazardous materials.
- Generation of solid, liquid and fecal wastes, especially around labor camps and toilet area.

- (i) Rise of incidence of Gender-Based Violence GBV (Sexual Harassment, Sexual Exploitation, and Abuse, Rape and Discrimination) emanating from the labors.
- (j) Increased competition over resources due to influx of labor; labor conflicts and work conditions.
- (k) Other project related risk may include of child and forced labor by primary suppliers and use of unscrupulous labor practice, and denial for workers' rights to form workers organizations, etc. (particularly for unskilled construction workers/labor), etc.

Overview of labour Legislation

The prime applicable National and State legislations which regulate the terms and conditions of employment in the project workers/ labours includes, (i) The Industrial Employment (Standing Order) Act 1946, (ii) Factories Act, 1948, (iii) Payment of Wages Act, 1936, (iv) The Minimum Wages Act, 1948, (v) Child and Adolescent Labour (Prohibition and Regulation) Act 1986, (vi) Employee Compensation Act, 1923, (vii) Contract Labour (Regulation and Abolition) Act, 1970, (viii) Equal Remuneration Act, 1976, (ix) Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.

The World Bank's Environmental & Social Standard ESS2 on Labor and working condition requires promoting worker-management healthy relationship, developing strategies to improve working condition like fair treatment of workers and vulnerable groups that are involved in the project and preventing all forms of forced and child labors. This standard helps to monitor health of the worker, working condition, hours of work and other necessary requirements including grievance mechanism and measures related to Occupational Health and Safety and shall be complied in accordance with ESS.

Labour and Working Conditions

The LMP have been evolved in accordance with requirements of national regulations as well as ESS 2. The key elements of LMP includes

Terms and Conditions of Employment

- Project Workers/ labours will be provided with information and documentation that is clear and understandable regarding their terms and conditions of employment including their rights related to hours of work, wages, overtime, compensation and other benefits at beginning of the working relationship.
- Project worker will be paid on regular basis as per the contract daily/weekly/monthly.
- Deduction from payment of wages will only be made as per employment terms and conditions with written information to concerned project workers.
- Where required Project worker/labours will get written notice of termination of employment.
- All wages that have been earned, social security benefits, pension contributions and any other entitlement will be paid on or before termination of working relationship with project workers.

Non-discrimination and Equal Opportunity

- Project Workers/ labours will be employed only based on the principle of equal opportunity and fair treatment and there will be no discrimination with respect to any aspects of employment relationship.
- Measures to prevent and address harassment, intimidation and/or exploitation would be taken as per applicable national regulations.
- Measures will be provided to address the vulnerability of specific groups of project workers such as women, people with disabilities, migrant worker.

Worker's Organisations

- The national law recognizes workers' rights to form and to join workers' organisations to bargain collectively.

- The role of legally established workers' organisations and legitimate workers' representative will be respected, and they will be provided with information needed for meaningful negotiation in timely manner.

Child Labour and Forced Labour

- No child labour is proposed to be involved in proposed project considering the nature of work and activities under various components of Project.
- No forced labour i.e. bonded labour, indentured labour, etc are proposed to be employed in connection with proposed project.

Contractors will keep records in accordance with specifications set out in this LMP. The PMU may at any time require records to ensure that labour working conditions are met. The PIU/PMC will review records against actual at a minimum on a monthly basis and can require immediate remedial actions if warranted. A summary of issues and remedial actions will be included in quarterly reports to the World Bank.

The code of conduct of workforce serves to establish the broad framework within which an action, or default by work force may be judged. Any action, or default, which conflicts with the code, is unacceptable. The description incorporates the necessary skills of labor worker as well as general labor duties and responsibilities specifically to avoid conflicts with the local population, transmission of diseases including Covid-19, any form of sexual harassment and violence, Personal Integrity and Discrimination. The major duties and responsibilities that workforce should strictly follow in their work place includes:

- (a) **Prevention of Labour Conflicts with the Local Community.** To prevent labor conflicts with local communities, the labors to follow the code of conduct listed below
 - The workers shouldn't allow themselves to be influenced in the execution of their duties by any consideration other than the legitimate and reasonable interests of the respective labors.
 - The workers are advised to refrain from unnecessary interactions with the local population. They are also advised to avoid conflicts and altercations with the locals at any cost.
 - The workers should spend more time either at work place or their company provided residences, if any.
 - The workers should show respect towards local languages, culture and traditions and shouldn't make any derogatory remarks towards them either by words or actions even unintentionally.
 - The workers show respect towards the local womenfolk.
 - Restriction in use of local resources.
- (b) **Prevention of Transmission of Diseases.** To prevent significant risk of transmission of any serious disease, it is duty of the labor to follow the code of conduct listed below
 - The Workers should disclose complete information about their existing health conditions including any ailment prior to joining.
 - The workers should inform the project manager to get their health checked as soon as possible if he/she witnesses any symptom of communicable disease and start treatment as soon as possible to avoid transmission to others.
 - It is the duty of the worker to avoid being exposed to any communicable diseases wherever possible by taking care not to be in contact with affected people.
 - The transient workers should adhere to national requirements and guidelines with respect to COVID-19.
 - Labors need to comply with any reasonable instruction and cooperate with any reasonable policy or procedure relating to health and safety at the workplace.
 - The workers must avoid promiscuous behaviour as this may expose them to serious communicable diseases such as HIV-AIDS. Adequate safety measures such as restriction on outsiders' entry into labor camp particularly in night be imposed

- (c) **Prevention of Sexual Harassment and Violence.** Prevention of harassment and violence in the workplace it is duty of the project workers to follow the code of conduct listed below:
- All supervisor and workers must understand their responsibility towards provide a safe work environment. It must be understood by the workers that sexual harassment doesn't only violates company's charter but also prohibited under applicable National Regulations
 - No worker should indulge in sexual harassment of other workers either by actions or by words.
 - The workers should avoid videos, films or books with objectionable content.
 - Any worker who is subject to sexual harassment either by actions or words must immediately bring the matter to the attention of his supervisor/manager as well as project manager.
- (d) **Personal Integrity.** Maintaining highest degree of integrity both in personal and professional conduct by each member of work force is a primary requirement for ensuring a conducive work environment. Accordingly, the workers must ensure the followings
- Utmost honesty in both personal and professional dealings.
 - Refrain from fraudulent behavior in both personal as well as professional matters
 - Refrain from stealing and other nefarious activities.
 - Non-disclosure of Company's confidential information.
 - The workers shouldn't accept any gifts, favors or other considerations of anything more than token value, from any other party.
- (e) **Discrimination.** Discrimination in any form will not be tolerated. All workers should be aware of:
- No worker should discriminate against other workers on any basis including that of Religion, Caste, Language, Nationality, Ethnicity etc.
 - Nobody should refer to others' Religious, National, Ethnic and caste/language-based identities in derogatory language/terms.
 - Nobody should pass comments/jokes etc on others' Religious/ National/ Ethnic/ Racial/ Caste/ Language based identities.

Occupational Health and Safety Plan

The Occupational Health & Safety (OHS) plan have been formulated in compliance with national and state regulations as well as World Bank's ESS 2. The prime objectives of OHS Plan includes increased safety consciousness and awareness among PMU/PIU/PMC, contractors and sub-contractors by uplifting the safety standards and setting the trend in safety excellence through established goals and objectives, training programs, audits and motivations.

PMU/DPMU/PEA/ shall be responsible for planning, reporting, implementing and monitoring all OHS requirements and compliance of all laws and statutory requirements. The Contractor shall also ensure that the OHS requirements are clearly understood and faithfully implemented at all levels at site. The OHS Plan includes following:

- All contractors/sub-contractors shall ensure that OHS standards & procedures requirements shall be strictly adhered.
- All Contractors/Subcontractors must ensure that their employees are competent and qualified to carry out their specific tasks.
- All necessary PPE's shall be provided by the contractors/sub-contractors.
- Contractors/sub-contractors should deploy a qualified/experienced safety officer/supervisor at site who will work in close co-ordination with PIU/PMC E&S specialist and will be responsible for implementation of safety norms at site. The credentials of the safety Officer/Supervisors must be submitted to the PIU/PMC for approval.
- All contractors/sub-contractors should ensure that their workers have been given safety Induction by their Safety officer.
- All contractors/sub-contractors should ensure that the non-conformities observed during the site inspection by the PIU/PMC are closed within the stipulated period.
- All contractors/sub-contractors should arrange for all site facilities of their workers viz. First Aid, drinking water, toilets, waste bins on suitable location at the site.

- Contractors/sub-contractors should ensure that all the equipment's and tools and tackles (Crane, Hydra, slings, shackles etc.) being used at site is duly certified by competent authorities. A copy of these certificates should be submitted to PIU/PMC for verification, approval and record.
- All contractors/sub-contractors should follow any other guidelines given by PIU/PMC as per site specific requirements.

Addressing Worker's Grievances

Contractors of ongoing civil works have established and functioning internal HR/Admin systems that look into grievances of employees and these shall continue. Contractor of respective construction packages (each contract) will be obligated to set up/continue a GRM, especially to redress complaints relating to workers deployed for construction works. The GRM will have due representation PIU, Contractor, Workers and women (either from PMU office/contractor/workers) and function under PMU office. The mandate for PMU, Institutional arrangements, procedure for receiving complaints, time limits for redressal of complaints and escalation level for unresolved cases and resolution thereof will be finalized during the approval of C-ESMP by PMU office. TNGCC through the DPMUs and PEAs will have an oversight of this labour GRM. The GRM for the Workers will be set up during mobilization phase of the contractor. The GRM will also be designed to address labor related SEA/SH.

Policies and Procedures

Policies and Procedures are listed under the following sub-headings: i) Incidents and Accident related; ii) Labour influx and GBV/SEAH related;

Incidents and Accident Notifications

The contractor will promptly notify to the PIU within 24 hours any incident or accident related or having an impact on the Project which has, or is likely to have, a significant adverse effect on the environment, tangible cultural heritage, the affected communities, the public or workers. They will provide sufficient detail regarding the incident or accident, indicating immediate measures taken to address it, and including information provided by any contractor and supervising entity. Further, the PIU will appraise this to PMU and the World Bank.

Labour Influx and GBV/ SEAH

Project interventions related to construction/upgradation works will involve construction contracts, which will be for a medium duration (say 18 to 24 months) while nature based solutions may at best involve 2-3 months followed by periodic maintenance. Project will be utilizing largely contracted workers who will be employed through local contractors. Hence the labour risks associated with the contract work is expected to moderate.\

Contractors will maintain the information of all workers Further, contractors will lay down a Code of Conduct (CoC) for the workers to adhere in order to maintain harmonious relations with local communities. The CoC commits all persons engaged by the contractor, including sub-contractors and suppliers, to acceptable standards of behaviour. A model Code of Conduct has been provided in Annexes2 and 33, respectively for workers and the contractor's firm. The CoC will include sanctions for non-compliance, including non-compliance with specific policies related to gender-based violence, sexual exploitation and sexual harassment (e.g., termination). The CoC will be written in plain language and signed by each worker to indicate that they have:

- Received a copy of the CoC as part of their contract;
- CoC has been explained to them as part of induction process;
- acknowledged that adherence to CoC is a mandatory condition of employment;
- Understood that violations of the CoC can result in serious consequences, up to and including dismissal, or referral to legal authorities.

Primary Suppliers

The project will engage primary suppliers for procurement of emergency kits under disaster management works. The list of equipment to be procured is given in chapter 4 Where there is a significant risk of serious safety issues related to primary supply workers, the PMU will require the relevant primary supplier to introduce procedures and mitigation measures to address such safety

issues. Such procedures and mitigation measures will be reviewed periodically to ascertain their effectiveness.

Community Workers

Community workers will be engaged for activities such as blue flag beaches and beach management committees. The engagement letter of the community workers as volunteers and CQRT are given in Annexure 5-5 respectively.

Age of Employment

Direct Workers: The Direct workers will be technically qualified, with ages ranging between a minimum of 18 years and a maximum of 60 years. The direct workers drafted to TNGCC, PEAs and DPMUs will be regular or contractual employees, whose credentials would be duly verified by GoTN, at the time of recruitment itself.

Contract Workers: The age of the technically qualified and or skilled contract workers can range from a minimum of 18 years to a maximum of 60 years, whereas the age of unskilled workers can range between 18 to 50 years and in no case, it can be expected to exceed 60 years.

Age of the personnel deployed by TNGCC could be verified by PMU through valid documents like AADHAR Card /Voter Card/Passport/Valid Driving License.

The age of the skilled and unskilled personnel deployed by Contractor could be verified by PIUs through valid documents like AADHAR Card/Voter Card/Passport/Valid Driving License. In exceptional cases, where the unskilled worker(s) are unable to produce valid age proof documents for whatsoever reason, the age could be ascertained through medical examination by competent medical authority at Government hospital at the expense of Contractor.

Under no circumstance, children less than 14 years of age will be engaged in any kind of work and is a prohibited activity as per Gol and state government norms, including World Bank's ESF. The same is in accordance with the Child Labour Prohibition Act, 1986 and Child Labour (Prohibition and Regulation) Amendment Rules framed there under. In case, it is detected by PIU/ Concerned Department / PMTC officials, contractor will be immediately issued show cause notice for termination of contract and matter will be duly reported to the district labour office. The contractor needs to collect Aadhar Card details of each worker employed and these details need to be submitted to the PIU and Labour Commissioner on a monthly basis. Based on the Aadhar Card details, the PIU/ labour commissioner will identify persons under the age of 18. The PIU will report to labour commissioner, if there is any child labour. Under the Child Labour Tracking System of the Ministry of Labour, each Labour Commissioner has formed Flying Squads with Police, Labour Officers and NGOs as members. These Flying Squads would conduct surprise inspections to all labour licensee sites and will identify child labour, if any. The rescued children will be sent for rehabilitation. A case will be booked on the contractor for further prosecution and legal action.

Primary Supply Workers: In case of primary suppliers for construction materials, TNGCC shall be required to carry out due diligence procedure to identify if there are significant risks that the vendors/suppliers are exploiting child or forced labour or exposing workers (14-18 years) to serious safety issues as well as to introduce provisions of relevant acts in the bid and contract documents. If there are any risks related to child and forced labour, and safety identified, the TNGCC will notify PMU/PIUs and will address these risks and may avoid such suppliers, where possible. In case, any lapses in the implementation of this LMP are detected by PIU/ Concerned Department officials, contractor will be immediately issued show cause notice for termination of contract and matter will be duly reported to the district labour office.

Community Workers: For the community workers, the minimum age is 18 years. The community workers will be engaged by DPMU/PIAs, whose credentials would be duly verified by PIU, at the time of recruitment itself.

Terms and Conditions

Specific Wages

Direct Workers: The Direct workers engaged for K SHORE are government officers, whose salary and other emoluments will be in conformity to the Rules and Regulations as issued by the Department of Human Resources Management, GoTN.

Contracted Workers: The wages of consultants/personnel deployed by the PMU and PIUs, through PMTC, or other consultancy firms for various studies, are contracted services and determined through two-stage competitive bidding (technical and financial) procedure and determined by prevalent market rates and normally expected to be higher than state government wages.

The wages of technically qualified, skilled, unskilled workers, to be engaged by the Contractor are determined by the Department of Labour and Employment, subject to the provisions of Minimum Wages Act, 1948. There will not be any discrimination of wages paid to male and female workers and same wages will be paid for equivalent work to all workers in conformity with the provisions of the Equal Remuneration Act, 1976.

Community Workers. The community workers will be paid outcome aligned incentives. Community Workers collecting data will be doing so on voluntary basis.

Work Hours and Maximum Number of Work Hours

The Direct workers at the PMU, PIU and concerned Department will work as per State Government Rules, which will be in compliance with the relevant notification by the Department of Human Resources Management, GoTN. The work hours for contracted workers will not be more than 8 hours per day 48 hours per week with 2nd and 4th Saturdays as official holiday.

Specific Terms and Conditions

The following terms and conditions will need to be added to the contracts issued by contractors to the workers.

- No contracted worker will be required or allowed to work continuously for more than five hours unless he had an interval of rest of not less than half an hour.
- The working day of contracted workers will be so arranged that inclusive of the intervals of rest, if any will not spread over more than twelve hours on any day Subject to provisions of Building and Other Construction Workers (Regulation of Employment and Conditions of Services), every worker will be allowed a day rest every week, which will ordinarily be Sunday, but the contractor will fix any other day of week as the rest day
- No worker will be made to work on any day, which has been notified by Central or State Government in the official Gazette as a Gazetted holiday or any day, which is declared as National Holiday.
- All categories of contract workers particularly unskilled workers can be directly engaged by the contractor or sourced through labour contractors. In such cases, the labour contractor shall have valid registration and licence with the competent authority in Tamil Nadu
- All wages to contracted workers, especially for unskilled workers are to be paid directly by the Contractor, even if the unskilled workers are engaged through labour contractors or any sub-contractors. All payments to the labourers will be done directly by the main contractors instead of routing through labour contractors. If not, the main Contractor confirms to the PIUs, on a periodic basis, that payments have been in time to all workers and keeps payslips for monitoring purposes.
- Any denial in and/or untimely payment of wages to workers will render the contractor liable to an action before the relevant Labour court/Industrial Tribunals under the Legislations mentioned above.
- Conditions of employment for skilled and unskilled workers will conform to Building and Other Construction Workers (Regulation of Employment and Conditions of Services)
- Under no circumstances, child labour or forced labour (in any form) shall be engaged, as these are prohibited under National and State Government Norms.
- Contractor will also be liable to be prosecuted in his personal capacity under the provisions of Indian Penal Code 1860 and other Penal legislations before criminal courts in case of gross

negligence and dereliction of duty or contraventions of any such statute resulting in death or injury of the workers.

Grievance Mechanism

Typical workplace grievances include demand for employment opportunities; labor wages rates and delays of payment; disagreement over working conditions; and health and safety concerns in the work environment. It requires establishment of a separate grievance mechanism for project workers (direct workers, and contract workers), as required in ESS-2 and which will also address labor-related SEA. Handling of grievances will be objective, prompt, and responsive to the needs and concerns of the aggrieved workers. Different ways for workers to submit their grievances will be made available, such as submissions in person, by phone, by email or by complaint registers. The grievance raised will be recorded and the timeframe for redress will depend on the nature of the grievance, health and safety concerns in work environment. The grievance mechanism for workers are as follows:

Direct Workers: The PD and CPD of TNGCC, will be responsible for providing guidance and advice on all worker related grievances and their redressal, in line with the State Government, Government of India Rules and Regulations.

Contract Workers: The contractor of respective construction packages will be obligated to set up a GRM, especially to redress complaints relating to workers deployed for construction works. The official designated by the PIU and TNGCC is also responsible for overseeing the GRM. The mechanism will function under the respective PIU. The mandate for GRM, institutional arrangements, procedure for receiving complaints, time limits for redressal of complaints and escalation level for unresolved cases and resolution thereof will be finalized during the approval of C-ESMP by PIUs and the concerned Department. The GRM for the workers will be set up during mobilization phase of the contractor. The contractor will also be responsible for tracking and resolving workers grievances and maintain records about grievances/complaints received, minutes of discussions, recommendations and resolutions made thereof and intimation of resolution of grievance to the complainant.

The consultancy agencies that have been contracted by PMU will ensure that they have established/ functioning GRMs to address respective workers' concerns. Also for primary suppliers, the respective vendors will be furnish details of GRM that addresses workers grievances, to PMU, DPMUs and PEA shall periodically seek such information/confirmation from them.

Community Workers: The Executive Engineer, PEAs, will be responsible for providing guidance and advice on all worker related grievances and their redressal, in line with the State Government, Government of India Rules and Regulations. For the community workers, the community level GRM at the field level at the respective division will be applicable. This will be mentioned in the engagement letter as an annexure.

Workers will also be able to submit their grievances through the district Labour Department, whose address and contact telephone numbers will be prominently displayed by contractors for the visibility of all workers at all worksites.

Dissemination of information on GRM: Information relating to the availability of GRM without any retribution, its institutional set up, timings and procedure for receiving complaints, mechanism of handling complaints, maximum time limits for redressal of complaints and escalation level for unresolved cases and resolution thereof will be disseminated to the workers on a regular basis. Some of the GRM dissemination avenues are:

- During Induction training for new workers
- During Toolbox meet/briefings by work supervisors
- During periodic tail gate sessions, to review and refresh site protocols on safety procedures at work
- Through pictorial illustrations and posters in local language installed at prominent places like entry/exit points, canteen, entertainment areas, health camp sites etc
- During awareness campaigns for safety at work and response to Emergency Response Plans
- Awareness and briefing on community safety, while at work.

Annexure 3-1: List of Information to be maintained by Contractors

The information database on contracted workers to be maintained by the contractor will include not limited to the following¹⁰

- Name and Age (to be supported by AADHAR /Voter Card)
- Father's Name and Permanent Address
- Marital Status and Name of the Spouse (if married)
- Number of Children with Gender (as applicable)
- Place of Stay of Spouse and Children during work engagement
- Address and Contact Number (in case of any emergency)
- Key Skills and Years of Experience
- Work activities, Schedule, Duration of Engagement
- Duration of Contract and Rotation Arrangements
- Facilities Arranged by Contractor including health check-ups prior to engagement, accommodation (onsite workforce camps, with local community, transportation to work site and other facilities (to be specified by Contractor)
- Pre-Employment Check-ups, Fitness Tests and Health Awareness Campaign for workers.

¹⁰as per ESF/Safeguards Interim Note: COVID-19 considerations in construction/civil works projects dated April 7, 2020

Annexure 3-2: Model Code of Conduct for Contractor's Personnel

We are the Contractor, [enter name of Contractor]. We have signed a contract with [enter name of Employer] for [enter description of the Works]. These Works will be carried out at [enter the Site and other locations where the Works will be carried out]. Our contract requires us to implement measures to address environmental and social risks related to the Works, including the risks of sexual exploitation, sexual abuse and sexual harassment.

This Code of Conduct is part of our measures to deal with environmental and social risks related to the Works. It applies to all our staff, laborers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as **"Contractor's Personnel"** and are subject to this Code of Conduct.

This Code of Conduct identifies the behaviour that we require from all Contractor's Personnel.

Our workplace is an environment where unsafe, offensive, abusive or violent behaviour will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

REQUIRED CONDUCT

Contractor's Personnel shall:

1. carry out his/her duties competently and diligently;
2. comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person;
3. maintain a safe working environment by:
 - a. ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;
 - b. wearing required personal protective equipment;
 - c. using appropriate measures relating to chemical, physical and biological substances and agents; and
 - d. following applicable emergency operating procedures.
4. report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health;
5. Treat women, children (persons under the age of 18), and men with respect regardless of race; colour; language; religion; political or other opinion; national, ethnic or social origin; sexual orientation or gender identity; disability; birth or other status.
6. Not use language or behaviour towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
7. Not engage in Sexual Harassment, which means unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature with other Contractor's or Employer's Personnel;
8. Not engage in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another;
9. Not engage in Sexual Abuse, which means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions;
10. Complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, and Sexual Exploitation, Abuse and Harassment (SEAH);
11. Report violations of this Code of Conduct; and
12. Not retaliate against any person who reports violations of this Code of Conduct, whether to us or the Employer, or who makes use of the grievance mechanism for Contractor's Personnel or the project's Grievance Redress Mechanism.

RAISING CONCERNS

If any person observes behaviour that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done in either of the following ways:

1. Contact [*enter name of the Contractor's Social Expert with relevant experience in handling gender-based violence, or if such person is not required under the Contract, another individual designated by the Contractor to handle these matters*] in writing at this address [] or by telephone at [] or in person at []; or
2. Call [] to reach the Contractor's hotline (*if any*) and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take seriously all reports of possible misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this Code of Conduct, I can contact [*enter name of Contractor's contact person with relevant experience*] requesting an explanation.

Name of Contractor's Personnel: [insert name]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

Annexure 3-3: Code of Conduct for Company (Contractor)

This Code of Conduct is part of our measures to deal with environmental and social risks related to the Works. *This company-level code of conduct should be **signed by the Project Manager**, and shared throughout the company.*

[Company] is committed to creating and maintaining an environment in which gender-based violence (GBV) has no place, and in which it will not be tolerated by any employee, associate, or representative of the company. Therefore, in order to ensure that all employees, associates, and representatives of [Company] are aware of this commitment, and in order to prevent, identify, and respond to any allegations of GBV, the following core principles and minimum standards of behaviour will apply to all company employees, associates, and representatives without exception:

1. [Company] will comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Personnel and any other person.
2. [Company]—and therefore all employees, associates, and representatives—commit to treating women, children (persons under the age of 18), and men with respect, regardless of race; color; language; religion; political or other opinion; national, ethnic or social origin; sexual orientation or gender identity; disability; birth or other status. GBV is in violation of this commitment.
3. In the eyes of [Company], GBV constitutes acts of gross misconduct and is therefore grounds for sanction, which may include penalties and/or termination of employment. All forms of GBV are unacceptable, regardless of whether they take place on the worksite, the worksite surroundings, at workers' camps, or off-site (i.e. involving individuals not employed by the company). In addition to the potential sanctions listed above, legal prosecution will be pursued, if appropriate, for any employees, associates, and representatives alleged to have committed GBV.
4. Demeaning, threatening, harassing, abusive, or sexually provocative language and behaviour are prohibited among all company employees, associates, and representatives.
5. Sexual favours—for instance, making promises or favourable treatment dependent on sexual acts—are prohibited.
6. All employees, including volunteers and sub-contractors are expected to report suspected or actual GBV by a fellow worker, whether in the same company or not. Reports must be made in accordance with GBV allegation procedures.
7. All employees are required to be trained on joining work to ensure they are familiar with the GBV Code of Conduct.
8. All employees will be required to sign a code of conduct for Contractor's Personnel confirming their agreement to comply to the same.

I do hereby acknowledge that I have read the foregoing Code of Conduct, and on behalf of the company agree to comply with the standards contained therein. I understand my role and responsibilities to prevent and respond to my employees' grievances. I understand that any action inconsistent with this Code of Conduct or failure to take action mandated by this Code of Conduct may result in disciplinary action.

Signature: _____

Name of Project Manager: _____

Company Name: _____

Date: _____

Annexure 3-4: Monitoring Checklist for Construction Sites

Questions		Answers	
General			
1.	Name of the work awarded		
2.	Details of the Executing Agency – Name and Address		
3.	Time Frame of the Work		
4.	How many labor camps are set up by the contractor		
Workers terms and conditions			
5.	Total No. of Worker/Laborers at worksite :-	Male	Female
6.	Total number of skilled, semi-skilled and unskilled workers		
7.	Total number of local and migrant workers.		
8.	Source of workers i.e. where does the contractor source required workers?		
9.	Are the ages of workers confirmed to be at least 18 years of age or above?		
10.	If so, what is the document used for age verification (Aadhar card, driving license etc.)		
11.	Are all workers provided with written contracts?		
12.	Does the contract document clearly lay terms and conditions of work, including OHS aspects? E.g. nature of work, payment, the timeline of payment, deductions, leave and other benefits (EPF/medical), penalties, etc. <i>(please provide sample copy)</i>		
13.	Are all informal workers provided with contracts? <i>(please provide a sample copy)</i>		
14.	What is the rate paid for semi-skilled and unskilled workers?		
15.	Are these rates displayed on a notice board?		
16.	Are migrant workers treated fairly and do they benefit from conditions of work that are no less favourable than those available to locally-recruited workers?		
17.	Do females get the same wages as males for the same type of work? <i>(please provide copy of the payslip)</i>		
Work location and access			
18.	Can everyone reach the work area safely? (Yes/ No)		
19.	If no, give reasons, what is the constraint?		
20.	If so, what is the mode of transport?		
21.	Are all access routes throughout the site in good condition And in easily understood language		
Workplace facilities			
22.	What is the source of water for workers?		

23.	Whether Sufficient, safe drinking water and mobile toilets are available at the worksite.	
24.	How many toilets are there at camp – separately for males and females?	
25.	How frequently are these toilets cleaned?	
26.	If yes, at what locations (provide photo)	
27.	Have all the workers been explained the Code of conduct and signed it?	
28.	Are sanitizers provided to workers?	
29.	Are all workers provided with PPE (gumboots, helmet, gloves, etc.) as necessary?	
30.	Are there first aid kits available at the site?	
31.	Are there condom boxes at camp at discreet locations?	
32.	Does the contractor have a tie-up with local hospitals?	
33.	Are all workers vaccinated?	
34.	If so, how many workers have received both doses?	
35.	Is there a mechanism for workers to raise workplace grievances? If so what?	
36.	Does the camp have a grievance register?	
37.	Is the register being used?	
38.	If so, how many grievances and what is the nature of grievances	
39.	Are there GBV awareness posters at worksites?	
40.	Does the contractor firm have an Internal Complaints Committee to deal with SE/SH issues?	
Workplace procedures and related issues		
41.	Whether Proper tools are provided to the workers to conduct their work.	
42.	Safety equipment/gears are being used where appropriate?	
43.	Workers had been given instructions and guidance regarding their work/job tasks.	
44.	Whether community access to facilities, services, or resources hampered?	
45.	Whether construction/upgradation of embankment/revetment is hampering the business activity of locals? <i>(provide details on the number of locals, type of business, and measure adopted)</i>	
46.	If yes, then what are the measures that have been taken up by the contractor?	
47.	Whether construction activity affecting the adjoining private property?	
48.	If yes, then what are the measures that have been taken up by the contractor?	
Feedback from Workers		
49.	Workers reported contracts have been provided	

50.	Workers/laborers reported that they received the correct and timely wages	
51.	Workers reported that they have/retain their original identification documents.	
52.	Workers reported on drinking water	
53.	Workers reported clean toilet facilities	
54.	Workers reported on medical facilities	
55.	Workers reported on covid vaccination status	
56.	Workers reported on the presence/effectiveness of GRM for raising workplace grievances	
57.	Has any worker reported having been sexually harassed by anyone on the site?	
58.	If yes, explain	
59.	Did the contractor take proper action if the incident of sexual harassment occurred?	
60.	If yes, explain	
61.	Worker report having been abused or experience violence by anyone on the site.	
62.	If yes, explain	
63.	Did the contractor take proper action of incidents if incidents of violence by anyone onsite?	
64.	If no, explain	
65.	Female worker reported they had been given same opportunities as men to participate in training.	

Annexure 3-5: Engagement Letter for Community Workers (as Volunteer)

Date:

[Name & Address of Community Volunteer]

We are pleased to inform that..... [Name of Community volunteer] with
Aadhar Card No./ Voter ID. _____ is hereby engaged as.....
[Designation] with[Name of employer (organisation/ company)]. He/She
will work as a volunteer who will be responsible for

The engagement details are as below.

Designation

Date of joining

Place of posting

Brief scope of
work

During your engagement, you will be provided with the following:

- i. Personal Protection Equipment (PPE) kits
- ii. Work/ domain related training including usage of PPE kits and OHS aspects
- iii. Medical care and quarantine facility, in case tested positive for COVID-19

you are directed to follow the guidelines of Occupational Health & Safety and use PPE kits diligently.

Add a sentence on who they will raise grievances with?

Please confirm your acceptance of this offer, by signing and returning a copy of this Engagement Letter to the undersigned.

Thanking you,

Name & Designation of employer: _____

Office Address: _____

Date: _____

I have hereby read and understood the terms and conditions laid in this Engagement Letter, and accept the offer thereof.

Signature of Community volunteer

Annexure 3-6: Engagement Letter for Community Worker

Date:

[Name & Address of Community Worker]

We are pleased to inform that..... [Name of Worker] with Aadhar Card No. /Voter ID. _____ is hereby engaged as..... [Designation] with [Name of employer (organisation/ company)]. The employer will pay Rs. X /- as incentives (maximum ceiling).

The engagement details are as below.

Designation

Date of joining

Activity based Monthly Incentive (Max.)

Place of posting

Brief scope of work

During your engagement as members, you will be provided with the following:

- i. Work/ domain related training
- ii. Personal Protection Equipment (PPE) kits
- iii. Medical care and quarantine facility, in case tested positive for COVID-19

Also, during your tenure of service you are directed to follow the guidelines of Occupational Health & Safety.

Please confirm your acceptance of this offer, by signing and returning a copy of this Engagement Letter to the undersigned.

Thanking you,

Name & Designation of employer: _____

Office Address: _____

Date: _____

I have hereby read and understood the terms and conditions laid in this Engagement Letter, and accept the offer thereof.

Signature of Worker

14. ANNEXURE 4

Resettlement Policy Framework (RPF)

Introduction

TN-SHORE involves multiple sub-projects whose design are not known at this stage and will be known only during project implementation. Hence a Resettlement Policy Framework (RPF) is prepared that deals with project related land acquisition and restriction on land use resulting in adverse impacts to communities and persons, Physical or economic displacement (relocation, loss of residential land or loss of shelter, loss of income) and so on. To mitigate the IR impacts a resettlement policy which includes the entitlements to the impacted is detailed out in this section. This RPF guides for development of appropriate mitigation and compensation measures, for land acquisition, resettlement and rehabilitation, permanent and temporary impacts caused by project activities whose exact locations are not known.

Project impacts

The TN-SHORE is likely to have the following types of involuntary resettlement impacts that are eligible for compensation and mitigation measures: (i) loss of assets, including land and structures; (ii) loss of income or livelihood; and, (iii) collective impacts on groups, such as loss of common property resources and loss of access or limited access to such resources.

As seen from interventions listed in chapter 3 or 4, the land requirement will be small quantum in almost all cases with the maximum land taking required for MRF or Turtle, Dugong rehabilitation centre (upto 3-4 acres).

Every effort will be made during the preparation of detailed design to minimize acquisition of land and other assets and to reduce any involuntary resettlement impacts. Hence TNGCC will aim to totally avoid private land for any project/sub-project requirements. However, there are chances of encroachment and informal occupation on public land as well as temporary, minor impacts such as on access or other temporary disruptions to livelihoods. Displacement under the subprojects will be limited to the area required for the subprojects and their safety zones, referred to as the direct impact zone. Only structures and other encumbrances within this zone will be affected. Every effort will be made during the preparation of the detailed design to minimize acquisition of land and other assets and to reduce negative socio-economic impact. The structures and assets falling outside the direct impact zone will be left undisturbed. Impacts, unforeseen to the structures or assets outside will also be compensated in accordance to the principles of this resettlement framework.

Approach to land taking

TNGCC, PEAs will prioritize government land or based on screening alternative lands i.e. effectively change the design or location of the sub-project, wherever possible, to avoid any impact on private land. Very often, the land belonging to other landowning departments are required to be used for various facilities to be proposed. Generally, necessary permissions and approvals for land alienation take a long time. In case of all Government land, obtaining necessary "No Objection Certificate" from land owning agencies or other authorities concerned, prior to contract award is a pre-requisite and the land alienation must be completed as soon as possible and prior to commencement of construction in those respective facilities/sites.

However, if there are cases, where no government or community lands are available and private land taking cannot be avoided, in that case TNGCC shall acquire such private land using "Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 (RFCTLARR 2013) and state amendment and rules

Principles

The following resettlement principles are adopted for this program: (i) Screening of the project to identify involuntary resettlement impacts and risks. Minimizing and avoiding land acquisition and resettlement impacts of each subproject by exploring all viable alternative designs; (ii) where unavoidable, time-bound resettlement plans will be prepared and affected persons will be assisted in improving or at least regaining their pre-program standard of living; (iii) full information and close consultations with affected persons including consultation with affected persons on compensation, disclosure of resettlement information to affected persons, and participation of affected persons in planning and implementing subprojects will be ensured; Disclose a draft resettlement plan, including documentation of the consultation process in a timely manner to affected persons and other stakeholders. Disclose the final resettlement plan and other documents such as the monitoring reports to affected persons and other stakeholders; (iv) Where the resettlement impacts are unavoidable, the displaced persons should be assisted in improving or at least regaining their standard of living; (v) Vulnerable groups comprising below poverty line households, including female-headed households, disabled persons, elderly, children, landless, non-titled households with no tenure security, and schedule castes and scheduled tribe households will be given special assistance; (vi) payment of compensation to affected persons including non-titled persons (e.g., informal dwellers/squatters, and encroachers) for acquired assets at replacement cost; (vii) payment of compensation and resettlement assistance prior to the contractor taking physical acquisition of the land and prior to the commencement of any construction activities; (viii) provision of income restoration and rehabilitation; and (ix) establishment of appropriate GRMs.

Entitlements

The TN-SHORE will recognize three types of physically displaced persons like (i) persons with formal legal rights to land lost in its entirety or in part; (ii) persons who lost the land they occupy in its entirety or in part who have no formal legal rights to such land, but who have claims to such lands that are recognized or recognizable under national laws; and (iii) persons who lost the land they occupy in its entirety or in part who have neither formal legal rights nor recognized or recognizable claims to such land. The involuntary resettlement requirements apply to all three types of physically displaced persons. It also applies to all types of economically displaced persons – those facing permanent income loss as well as those facing temporary income loss. In accordance with the involuntary resettlement principles of this Resettlement Framework, all affected persons will be entitled to compensation/resettlement assistance. Compensation and assistance will be based on the nature of ownership rights on lost assets and the impacts, including vulnerability status of the affected persons.

A detailed description of each compensation measure and assistance is provided in the entitlement matrix. The matrix has special provisions for non-titled persons, affected persons/displaced persons will be entitled to a combination of compensation measures and resettlement assistance, depending on the nature of ownership rights of lost assets and scope of the impact, including social and economic vulnerability of the affected persons.

Definitions:

For purposes of this framework, the following definitions will be applicable:

- **Affected area:** means such area as may be notified by the appropriate Government for the purposes of land acquisition and which land will be acquired under RTFCTLARR Act, 2013 through declaration by Notification in the Official Gazette by the appropriate Government or for which land belonging to the Government will be cleared from obstructions;
- **Agricultural land:** Means land used for the purpose of: (i) agriculture or horticulture; (ii) dairy farming, poultry farming, pisciculture, sericulture, seed farming breeding of livestock or nursery growing medicinal herbs; (iii) raising of crops, trees, grass or garden produce; and

(iv) land used for the grazing of cattle;

- **Below poverty line (BPL) or BPL family:** means below poverty line families as defined by the Planning Commission of India, from time to time and those included in the BPL list for the time-being in force;
- **Building:** Means a house, out house or other roofed structure whether masonry, brick, wood, mud, metal or any other material whatsoever but does not include a tent or other portable and temporary shelter;
- **Corridor of impact (COI):** Refers to the minimum land width required for construction including embankments, facilities and features such as approach roads, drains, utility ducts and lines, fences, green belts, safety zone, working spaces etc. Additional land width would be acquired/purchased or taken on temporary lease if the Corridor of Impact extends beyond the available Right of Way;
- **Cut-off date:** In the cases of land acquisition affecting land holders the cut-off date would be the last date of publishing Notification for land acquisition u/s 11 (1) of RTFCTLARR Act, 2013 in the local newspaper. Those without any valid pass, the cut-off date would be the start date of the Census and Socio-Economic survey.
- **Encroacher:** A person who has extended their building, agricultural lands, business premises or work places into public/government land without authority;
- **Income:** Income of the PAP shall mean the amount prior to the cut-off date from all occupations taken together calculated by an objective assessment;
- **Land:** "land" includes benefits to arise out of land, and things attached to the earth or permanently fastened to anything attached to the earth
- **Land acquisition" or "acquisition of land":** means acquisition of land under the RTFCTLARR, 2013.
- **Non-agricultural labourer:** means a person who is not an agricultural labourer but is primarily residing in the affected area for a period of not less than five years immediately before the declaration of the affected area and who does not hold any land under the affected area but who earns his livelihood mainly by manual labour or as a rural artisan immediately before such declaration and who has been deprived of earning his livelihood mainly by manual labour or as such artisan in the affected area;
- **Notification:** means a notification issued from time to time by appropriate government for land acquisition under the provisions of RTFCTLARR, 2013.
- **Project Affected Family (as defined in RTFCTLARR Act 2013):** It includes -
 - i. A family whose land or other immovable property has been acquired;
 - ii. A family which does not own any land but a member or members of such family may be agricultural labourers, tenants including any form of tenancy or holding of usufruct right, share-croppers or artisans or who may be working in the affected area for three years prior to the acquisition of the land, whose primary source of livelihood stand affected by the acquisition of land;
 - iii. The Scheduled Tribes and other traditional forest dwellers who have lost any of their forest rights recognised under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 due to acquisition of land
 - iv. Family whose primary source of livelihood for three years prior to the acquisition of the land is dependent on forests or water bodies and includes gatherers of forest produce, hunters, fisher folk and boatmen and such livelihood is affected due to acquisition of land;
 - v. A member of the family who has been assigned land by the State Government or the Central Government under any of its schemes and such land is under acquisition;
 - vi. A family residing on any land in the urban areas for preceding three years or more prior

to the acquisition of the land or whose primary source of livelihood for three years prior to the acquisition of the land is affected by the acquisition of such land.

- **Project Affected Person (PAP):** Any person affected either directly or indirectly by the project and/or project related activity, irrespective of the legal status and would include:
 - a. Patta/Title holders,
 - b. Encroachers,
 - c. Squatters,
 - d. Tenants, Leaseholders, Sharecroppers,
 - e. Employees, Landless labourers,
- **Project Affected Household (PAH):** A social unit consisting of a family and/or non-family members living together, and is affected by the project negatively and/or positively;
- **Rent:** Means whatever is lawfully payable in cash or in kind, partly in cash and partly in kind, whether as a fixed quantity of produce or as a share of the produce, on account of the use or occupation of land or on account of any right in land but shall not include land revenue;
- **Potential Temporary Economic Impacts:** The potential temporary economic impacts will be largely small business enterprises (for eg, hawkers, mobile vendors, road side shops etc) fouling with project pipeline alignment. These impacts will be identified as part of social baseline survey and necessary compensation as per entitlement matrix to be worked out and include the same in the ESIA/RP, as applicable.
- **Replacement Cost:** A replacement cost/value of any land or other asset is the cost/value equivalent to or sufficient to replace/purchase the same land or other asset and other applicable taxes to be incurred by the affected person. The depreciation and salvage value will not be subtracted in determining the structure cost.
- **Shop:** Means any premises where any trade or business is carried on and where services are rendered to customers;
- **Squatter:** A person who has settled on public/government land, land belonging to institutions, trust, etc and or someone else's land illegally for residential, business and or other purposes and/or has been occupying land and building/asset without authority;
- **Temporary Impact:** Impact expected during implementation of the project in the form of earth spoil, tremors and vibrations, etc. affecting land and structures.
- **Tenant:** A person who holds/occupies land-/structure of another person and (but for a special contract) would be liable to pay rent for that land/structure. This arrangement includes the predecessor and successor-in-interest of the tenant but does not include mortgage of the rights of a landowner or a person to whom holding has been transferred; or an estate/holding has been let in farm for the recovery of an arrear of land revenue; or of a sum recoverable as such an arrear or a person who takes from Government a lease of unoccupied land for the purpose of subletting it.
- **Vulnerable Households (Vulnerable PAPs):** Vulnerable PAPs are those living below poverty line, SC / ST families and women headed households, Widows, Physically Challenged persons; Elderly persons above the age of 60 years among the affected families.
- **Wage earner:** Wage earners are those whose livelihood would be affected due to the displacement of the employer. The person must be in continuous employment for at least six months prior to the cut-off date with the said employer and must have reliable documentary evidence to prove his/her employment.

Compensation for Land and Related R&R.

Wherever Land Acquisition is involved in the projects, compensation for the land and related R&R to the PAPs will be made as per the provisions of the RTFCTLARR 2013 and WB ESS 5. The District Administration / concerned authorities will carry out private land acquisition and R&R implementation

based on the provisions of RTFCTLARR Act, 2013 and WB ESS 5. The project affected assigned landowners will be treated similar to the project affected land owners.

The need for resettlement and rehabilitation arises when the land which is acquired or alienated or transferred results in involuntary displacement and/or loss of livelihood, sources of income and access to common properties/resources on which people depend for economic, social and cultural needs irrespective of their legal status. Though the squatters and encroachers are not entitled to legal compensation for land that they have occupied, this policy will provide for resettlement and rehabilitation of such persons with the aim of improving their standard of living. This policy will also be applicable to those landowners from whom land would be acquired. In case of those affected families living in the lands reserved under Development Plans with or without approval of construction of structures will also be assisted for resettlement and rehabilitation as per the Entitlement Framework in this ESMF,

Entitlement for PAPs. The entitlement for different categories of impacts is explained in the following entitlement matrix. The principles of the entitlement matrix are in accordance with the RTFCTLARR, 2013 and World Bank ESF -ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.

Table 14-1 Entitlement Matrix

Sl. no.	Application	Definition of Entitled Unit	Entitlement	Details
A. Loss of Private Agricultural, Home-Stead & Commercial Land¹¹				
1	Land for the Project	Titleholder family and families with traditional land Right	Compensation at Market value, Resettlement and Rehabilitation	a) Land for land, if available. Or, Cash compensation for the land at replacement value, which will be determined as provided under section 26 of the RFCTLARR Act 2013. b) The land if allotted will be in the name of both husband and wife. c) If post-acquisition, residual land is economically unviable, the land owner will have the choice of either retaining or sell off the rest of the land. d) Refund of stamp duty and registration charges incurred for replacement land to be paid by the project; replacement land must be bought within a year from the date of payment of compensation to project affected persons. e) Subsistence allowance of Rs. 36000 as one-time grant f) One-time grant of Rs. 500,000 or annuity g) Compensation at market value for loss of crops if any
	Residual land	Titleholder family and families with traditional land Right	Compensation at replacement value, Resettlement and Rehabilitation	In case residual land is found to be economically unviable, PAPs have the choice of: a) selling off the residual land at the market value to the project

¹¹ One USD is equivalent to INR 83.20 as on January 01, 2024

Sl. no.	Application	Definition of Entitled Unit	Entitlement	Details
				b) take 25% of the compensation value and retain the land parcel.
B. Loss of Private Structures (Residential/Commercial)				
2	Loss of Structure	Title Holder/ Owner	Compensation at Market value, Resettlement & Rehabilitation Assistance	a) Cash compensation for the structure at the Market value which would be determined as per as per section 29 of the RFCTLARR Act 2013. House under Indira Awas Yojana in rural area or Rs 50,000 in lieu off and house under RAY in urban area or Rs 100,000 in lieu off. The house if allotted will be in the name of both husband and wife. b) Right to salvage material from the demolished structures. c) Three months' notice to vacate structures. d) Refund of stamp duty and registration charges for purchase of new alternative houses/shops at prevailing rates on the market value as determined in (a) above. Alternative houses/shops must be bought within a year from the date of payment of compensation. e) In the case of partially affected structures and the remaining structure remains viable, an additional 10% to restore the structure. In the case of partially affected structures and the remaining structure becomes an unviable additional 25% of the compensation amount as severance allowance. f) Subsistence allowance equivalent to Rs. 36,000 as a one-time grant. g) Each affected family getting displaced shall get a one-time financial assistance of Rs 50,000 as a shifting allowance. h) Each affected family that is displaced and has cattle, shall get financial assistance of Rs 25,000/- for construction of cattle shed. i) One-time grant of Rs. 50,000 as resettlement assistance j) Each affected person who is a rural artisan, small trader or self-employed person and who has been displaced (in this project owner of any residential-cum commercial structure) shall get a one-time financial assistance of Rs 25,000/-for construction of working shed or shop. k) One-time grant of Rs. 500,000

Sl. no.	Application	Definition of Entitled Unit	Entitlement	Details
3	Structure	Tenants/ Lease Holders	Resettlement & Rehabilitation Assistance	a) Registered lessees will be entitled to an apportionment of the compensation payable to structure owner in case the lessee has erected any art of1 the structure as per applicable local laws. b) In the case of tenants, three months written notice will be provided along with Rs 50,000 towards shifting allowance.
C. Loss of Trees and Crops				
4	Standing Trees, Crops	Owners and beneficiaries (Registered/ Un-registered tenants, contract cultivators, leaseholders & sharecroppers)	Compensation at market value	a) Three months advance notice to project affected persons to harvest fruits, standing crops and removal of trees. b) Compensation to be paid at the rate estimated by: i) The Forest Department for timber trees ii) The State Agriculture Extension Department for crops iii) The Horticulture Department for fruit/flower bearing trees. c) Registered tenants, contract cultivators & leaseholders & sharecroppers will be eligible for compensation for trees and crops as per the agreement document between the owner and the beneficiaries. d) Un-registered tenants, contract cultivators, leaseholders & sharecroppers will be eligible for compensation for trees and crops as per mutual understanding between the owner and the beneficiaries.
D. Loss of Residential/ Commercial Structures to Non-Titled Holders				
5	Structures on Government land	Owners of Structures or Occupants of structures identified as per Project Census Survey	Resettlement & Rehabilitation Assistance	a) Non-vulnerable encroachers shall be given three months' notice to vacate occupied land b) Vulnerable encroachers¹² will be provided cash assistance at replacement cost for loss of structures as described in section 29 of the RFCTLARR Act 2013. c) Any encroacher identified as non-vulnerable but losing more than 25% of the structure used will be paid cash assistance at replacement cost for loss of

¹² Vulnerable encroachers will include those who (i) are either below poverty line; or (ii) women headed households; or (iii) belongs to scheduled community as caste or tribe; or (iv) elderly or disabled

Sl. no.	Application	Definition of Entitled Unit	Entitlement	Details
				structures. The amount will be determined as per section 29 of the RFCTLARR Act 2013. d) All squatters to be paid cash assistance for their structures at replacement costs which will be determined as mentioned in section 29 of the RFCTLARR Act 2013. e) All squatters (other than kiosks) will be eligible for a one-time grant of Rs 36,000 as a subsistence allowance. f) All squatters other than Kiosks will be given a shifting allowance of Rs 50,000 per family as a one-time grant for a permanent structure and Rs. 30,000 for a semi-permanent structure and Rs. 10,000 for a temporary structure. g) Each affected person who is a rural artisan, small trader or self-employed person assistance' of Rs 25,000/- for construction of working shed or shop. h) In the case of Kiosks, only Rs 5000 will be paid as a one-time grant.
E. Loss of Livelihood				
6	Families living within the project area	Title Holders/ Non-Title holders/fishermen, boat operators sharecroppers, agricultural labourers and employees	Resettlement & Rehabilitation Assistance	a) Subsistence allowance of Rs. 36,000 as a one-time grant. (PAPs covered under 1(f), 2 (f) and 5 (e) above would not be eligible for this assistance). b) Training Assistance of Rs 10,000/- for income generation per family. c) Temporary employment in the project construction work to project affected persons with particular attention to vulnerable groups by the project contractor during construction, to the extent possible and preference in the employment of semi-skilled and unskilled jobs in the project with adequate training for the job.
F. Additional Support to Vulnerable Families				
7	Families within the project area	As per the definition of vulnerable	Resettlement & Rehabilitation Assistance	One-time additional financial assistance of Rs. 50,000. Squatters and encroachers already covered under clause 5 are not eligible for this assistance.
G. Loss of Community Infrastructure/Common Property Resources				
8	Structures & other resources (e.g. land,	Affected communities and groups	Reconstruction of community structure and common property resources	Reconstruction of community structure and Common property resources in consultation with the community.

Sl. no.	Application	Definition of Entitled Unit	Entitlement	Details
	water, access to structures, etc.) within the project area			
H. Temporary Impact During Construction				
9	Land & assets temporarily impacted during construction	Owners of land & Assets	Compensation for temporary impact during construction e.g. damage to the adjacent parcel of land/assets due to the movement of vehicles for transportation of equipment, machinery and construction activities for infrastructure development.	Compensation to be paid by the contractor for loss of assets, crops and any other damage as per prior agreement between the 'Contractor' and the 'Affected Party'.
I. Resettlement Site				
10	Loss of residential structures	Displaced titleholders and non-titleholders	Provision of resettlement site/ vendor market	Resettlement sites will be developed as part of the project if a minimum of 25 project displaced families opt for assisted resettlement. Vulnerable PAPs will be given preference in allotment of plots/flats at the resettlement site. Plot size will be equivalent to size lost subject to a maximum of provision given in the RFCTLARR Act 2013. Basic facilities shall be provided by the project at the resettlement site as per the provisions given in the Third Schedule of RFCTLARR Act 2013. Similarly, if at least 25 displaced commercial establishments (small business enterprises) opt for shopping units, the Project Authority will develop the vendor market at a suitable location in the nearby area in consultation with displaced persons. Basic facilities such as approach road, electricity connection, water, and sanitation facility, will be provided in the vendor market by the project. Vulnerable PAPs will be given preference in allotment, of shops in the vendor market. One displaced family will be eligible for only one land plot at the resettlement site or shop in the vendor market.
J. Land on lease				
11	Titleholders	Land Owners/ Titleholders	Annual Lease rental for use of land	a) Annual Lease Rent as per pre-agreed rate with the land owners

Sl. no.	Application	Definition of Entitled Unit	Entitlement	Details
				giving consent for sparing their land for the project b) Provisions regarding the increase in lease rent on predetermined rates and timeframe c) Provisions related to loss of structure/ trees/ crops as per the provisions of Clause 2 and 4 respectively
12	Agricultural Labor	Non-Title holders/ sharecroppers, agricultural labourers and employees		As per Clause 6 above

If payments are made after year 2024, then the CPI of that year, during which payment is made, will be used for calculation of inflation rate. The unit rates will revise every year prior to month of March. Illustrative table with assistance amounts adjusted to inflation are presented below for the period ending November 2022.

Table 14-2 Unit rates and revised as of November 2022

No	Entitlement	Unit rates as of January 2014 (in INR)	Revised as of November 2022 (latest available)
1	Livelihood assistance (Lumpsum)	5,00,000	7,74,509
2	Livelihood assistance (Annuity)	2,000/per month for 12 months x 20 years	2,000/per month for 12 months x 20 years (to be adjusted every year as per CPI index)
3	One-time assistance for loss of Cattle shed/petty shop	25,000	38,725
4	One-time assistance for displaced artisan/small traders/small shops	25,000	38,725
5	Cash in lieu of house, if opted (as per indexed and updated figures at time of payment)		
	Rural	1.3lakhs	Amounts to be updated as per PMAY guidelines as prevalent at the time of implementation.
	Urban	1.5lakhs	
6	Transportation/ Shifting assistance for Displaced	50,000	77,450
7	Subsistence allowance for displaced @INR 3000 per month for 1 year	36,000	55,764
8	One-time Resettlement Allowance	50,000	77,450

Coordination with Civil Works

The land acquisition and resettlement implementation will be co-coordinated with the timing of procurement and commencement of civil works. The required co-ordination has

contractual implications, and will be linked to procurement and bidding schedules, award of contracts, and release of cleared sections to the contractors. The project will provide adequate notification, counselling, and assistance to affected people so that they are able to move or give up their assets without undue hardship before commencement of civil works and after receiving the compensation. The bid documents will specify the extent of unencumbered land to be handed over at the time of commencement of works and subsequent milestones. This will be strictly followed to ensure that land is provided on a timely basis to the contractors and plan implementation of land acquisition and resettlement in line with procurement and civil works schedule.

The below table lists the actions to be completed by different stages:

Table 14-3 List of actions linked to civil works implementation

Stage of civil works	Activities
Before Issuance of civil work bids	Preparation of Land Acquisition Plan and Strip Plan
	Preparation, approval and disclosure of RAP based on Social Impact Assessment comprising Census & Socio Economic survey of affected persons and its disclosure
	List of encumbrances free stretches available for construction
	Issuance of draft Notification 11 of the Land Acquisition
	Appointment of Arbitrator
	Formation of District Level Land Purchase Committee
Before Award of civil works contract	Appointment of RAP implementation agency/NGO
	Private Negotiations with Titleholders by District Level Land Purchase Committee & Award
	Identification & Verification of PAPs by NGO
	Valuation of structures
	Preparation of Micro Plans for Rehabilitation & Resettlement by the NGO
	Issuance of ID Cards
	Update draft Resettlement plan to reflect surveys, consultations, design changes, and due diligence results
	Consultations disclosure & awareness generation
	Compensation Award for Titleholders R&R for Non-Titleholders
	Preparation and Approval of Micro Plans
	Disbursement of Compensation and R&R assistance amounts
Before Handover of land to contractor	List of encumbrances free stretches available for construction by first & second milestone dates. For the remaining milestones the required encumbrance free stretches should be made ready before start of work on that particular milestone
	Handover of land to contractors first & second milestone
	Payment of compensation and Resettlement assistance before handing over of land to contractor
	Notice period for vacating sites as per prescribed time frame

15. GRIEVANCE REDRESSAL MECHANISM

See Stakeholder Engagement Plan for GRM for details on processes for registration and resolution.

Resettlement Budget and Funding

The resettlement budget will comprise itemized estimate of compensation for land, structures, trees, crops, various resettlement assistances, rehabilitation, or replacement of CPRs including land, if government land is not available, institutional cost, contingency, additional studies if required, cost towards implementation, engagement of RAP implementation agency, evaluation consultants, etc. Based on the initial estimates provided by the RAP preparation consultants and later by the RAP implementation agency, the PMU shall update and prepare final estimates for compensation and assistances payable. They shall jointly review the compensation for land with the Revenue department and with Public Works Department for cost of structures and CPRs. Based on these estimates, the PMU shall prepare a request for funds and submit the same to the Government of Tamil Nadu for release of funds for disbursement. The funds will be transferred to TNGCC from the GoTN, and from there will be released to Deputy Commissioners of the concerned districts.

The cost of LA and R&R has been budgeted as part of the overall project costs and shall be met with Government of TN funds and included in the counterpart funds. The funds as estimated in the budget for the financial year and additional fund as required based on the revised estimates, shall be available at the disposal of TNGCC. TNGCC being PMU of the project will provide necessary funds for compensation of land and structure and cost of resettlement assistance in a timely manner to the jurisdiction of the respective Deputy Commissioners. The World Bank's loan will be available for costs purchase of goods and NGO consultancy, M&E services, if required following the applicable procurement guidelines.

Consultation & Disclosure

Consultations with various stakeholders will be carried out throughout the project cycle, i.e., preparation, implementation and post implementation, in accordance with the Project's overall Stakeholder Engagement Plan. Consultations will be held with special emphasis on vulnerable groups. Encouraging public participation in consultations informs the public of the project and serves as a venue for the public to express their opinion on priorities which the project should address.

The PMU and PIUs will ensure that PAPs and other stakeholders are informed and consulted about the project sites, its impact, their entitlements and options, and allowed to participate actively in the development of the sub-project. Stakeholder consultations were organized for comments/ feedback on the draft ESMF instruments (ESMF, RPF, IPPF, LMP and SEP). The feedback received from the consultation was incorporated in the revised documents. The outcomes of the consultation and information disclosure are summarized in the Stakeholder Engagement Plan.

As per Access to Information Policy of the WB, this RPF will be made available at the World Bank Portal. This RPF will be kept in TNGCC portals and their District offices.

RAP Implementation Monitoring

The RAP implementation monitoring at the site level will be the responsibility of the concerned PIUs. This internal monitoring will include:

- (i) Administrative monitoring: Daily planning, implementation, feedback and troubleshoot, individual PAP file maintenance, and progress reports, etc.
- (ii) Socio-economic monitoring: Baseline information for comparing PAP's socio-

- economic conditions, disbursement of compensation and R&R assistance, community relationships, dates for consultations, etc.
- (iii) Monitoring and evaluation reports documenting progress on resettlement implementation, and RAP completion reports based on the data captured will be provided by the KERS to World Bank for review.

Internal Monitoring:

Tables below provides indicative monitoring Indicators for Physical & financial Progress and grievances. These indicators would be finalized during implementation.

Table 15-1 Indicative monitoring Indicators for Physical Progress

Monitoring Indicators	Implementation Target	Revised Implementation Target	Progress this Month	% against Revised Implementation Target
Preparation and dissemination of leaflets to various stakeholders				
Compensation for Structures, other assets (cattle sheds)				
Preparation and approval of micro-Plans				
Number of joint bank accounts opened				
Issuance of identity cards				
Submission of monthly progress reports				
Onetime rehabilitation grant provided				
Livelihood Restoration Allowance for affected Categories				
Allowances paid to Vulnerable groups				
Community Assets rehabilitated/ Restored				
No. of PAPs who have received training for livelihood restoration/enhancement				
PAP untraceable				

Table 15-2 Indicative monitoring indicators for financial Progress

Category	Estimated Cost (INR)	Progress this month
R&R Assistance		
RAP Implementation NGO		
M&E Services		

Table 15-3 Monitoring of Grievances received and redressed

Particulars	Quarters				Cumulative Total
	Q1	Q2	Q3	Q4	
No. of cases referred to GRC					
No. of cases settled by GRC					
No. of cases pending with GRC					
a. Project Level					
b. District Level					
c. PMU Level					
Average time taken for settlement of					
No. of GRC meetings					
No. of PAPs moved Court					
No. of pending cases with the court					
No. of cases settled by the court					

External Audit

TNGCC should engage the services of an independent agency not associated with project implementation to undertake concurrent monitoring quarterly and evaluation twice – at mid and at end term. The external agency, with previous experience in resettlement activities and familiarity with Government and World Bank, will be engaged to monitor and verify RAP implementation to determine whether resettlement goals have been achieved, livelihood and living standards have been restored, and provide recommendations for improvement. The external agency will undertake impact evaluation on a sample basis during mid-term and project completion. It will record PAPs views on resettlement issues; PAPs understanding of entitlement policies, options, and alternatives; site conditions; compensation valuation and disbursement; grievance redress procedures; and staff competencies. The agency will also evaluate the performance of the PMU related to resettlement issues.

Table 15-4 Indicative Impact Evaluation Indicators

Parameter	Breakup of parameter	Baseline (%)	Mid-Term (%)	End-Term (%)
Occupation of HH*	Agriculture			
	Trade/Business			
	Petty shopkeeping			
	Agri labour			
	Non-Agri labour			
	Service			
Average Annual Income*	<Rs 75000			
	Rs 75001–1lakh			
	Rs 1lakh–2.5lakh			
	Rs 2.5lakh–5lakh			
	Below Poverty Line			
Possession of Assets*	TV			
	Fridge			
	Cycle			
	Motorcycle			
	Car			
Housing Conditions	Pucca house (RCC Roof, Brick Walls, Cement Flooring)			
	Semi-Pucca House (Bamboo, Sheet Roof, Mud/Brick Walls, Mud/cement flooring)			
	Kutcha House (Thatched Roof, Mud Wall, Mud Flooring)			
Land Assets	Marginal Farmers			
	Small Farmers			

Updating of Resettlement Policy Framework

This RPF will be an “up-to-date” or a “live document” enabling revision, when and where necessary. Since the more sub-basin/sites can be taken up and any unexpected situations and/or changes in the project or subcomponent design would therefore be assessed and appropriate management measures will be incorporated by updating the Resettlement Policy Framework to meet the requirements of country’s legislations and Bank ESF. Such revisions will also cover and update any changes/modifications introduced in the legal/regulatory regime of the country/ state. Also, based on the experience of application and implementation of this framework, the provisions and procedures would be updated, as appropriate in consultation with stakeholders and PAPs and approved by TNGCC and redisclosed.

Indicative Contents of a Resettlement Action Plan

- A. Description of the project. General description of the project and identification of the project area.
- B. Potential impacts. Identification of:
 - a) the project components or activities that give rise to displacement, explaining why the selected land must be acquired for use within the timeframe of the project;
 - b) the zone of impact of such components or activities;
 - c) the scope and scale of land acquisition and impacts on structures and other fixed assets;
 - d) any project-imposed restrictions on use of, or access to, land or natural resources;
 - e) alternatives considered to avoid or minimize displacement and why those were rejected; and
 - f) the mechanisms established to minimize displacement, to the extent possible, during project implementation
- C. Objectives. The main objectives of the resettlement program.
- D. Census survey and baseline socioeconomic studies.

The findings of a household-level census identifying and enumerating affected persons, and, with the involvement of affected persons, surveying land, structures and other fixed assets to be affected by the project. The census survey also serves other essential functions:

- Identifying characteristics of displaced households, including a description of production systems, labor, and household organization; and baseline information on livelihoods (including, as relevant, production levels and
 - Income derived from both formal and informal economic activities) and standards of living (including health status) of the displaced population;
 - Information on vulnerable groups or persons for whom special provisions may have to be made;
 - Identifying public or community infrastructure, property or services that may be affected;
 - Providing a basis for the design of, and budgeting for, the resettlement program;
 - In conjunction with establishment of a cutoff date, providing a basis for excluding ineligible people from compensation and resettlement assistance; and
 - Establishing baseline conditions for monitoring and evaluation purposes.
- E. Eligibility. Definition of displaced persons and criteria for determining their eligibility for compensation and other resettlement assistance, including relevant cutoff dates.
 - F. Valuation of and compensation for losses. The methodology to be used in valuing losses to determine their replacement cost; and a description of the proposed types and levels of compensation for land, natural resources and other assets under local law and such supplementary measures as are necessary to achieve replacement cost for them.

- G. Community participation. Involvement of displaced persons (including host communities, where relevant)
- H. Implementation schedule. An implementation schedule providing anticipated dates for displacement, and estimated initiation and completion dates for all resettlement plan activities. The schedule should indicate how the resettlement activities are linked to the implementation of the overall project.
- I. Costs and budget. Tables showing categorized cost estimates for all resettlement activities, including allowances for inflation, population growth, and other contingencies; timetables for expenditures; sources of funds; and arrangements for timely flow of funds, and funding for resettlement, if any, in areas outside the jurisdiction of the implementing agencies.
- J. Grievance redress mechanism. The plan describes affordable and accessible procedures for third-party settlement of disputes arising from displacement or resettlement; such grievance mechanisms should take into account the availability of judicial recourse and community and traditional dispute settlement mechanisms.
- K. Monitoring and evaluation. Arrangements for monitoring of displacement and resettlement activities
by the implementing agency, supplemented by third-party monitors as considered appropriate by the Bank, to ensure complete and objective information; performance monitoring indicators to measure inputs, outputs, and outcomes for resettlement activities; involvement of the displaced persons in the monitoring process; evaluation of results for a reasonable period after all resettlement activities have been completed; using the results of resettlement monitoring to guide subsequent implementation.

16. ANNEXURE 5

Tribal Development Framework

Tribal context in TN SHORE

Tamil Nadu has a total Scheduled Tribe (ST) population of 0.79 million which constitute about 1.1 % of the total population of the state. There are 36 sub-group of Tribes in the State. The main tribes among them are Malayali, Toda, Kurumbas, Paniyan, Irular, Kattunayakan, Kanikkar, Palliyan, Kadar, etc. Of which Toda, Kota, Kurumbas, Kattunayakan, Paniyan and Irular have been designated as 'Primitive Tribes'. There are pockets of tribal habitations especially concentrated in the Hills.

The total scheduled tribes' population in the coastal districts is 1,97,763 which constitutes approximately 0.56 % of the state's coastal population (males, numbering 99,093 and females numbering 98,670). Out of 14 coastal districts of Tamil Nadu state where the project will be implemented, Kalrayan Hills in Villupuram district comes under Integrated Tribal Development Programme (ITDP). The urban and rural areas of all 14 coastal districts of Tamil Nadu have tribal population. Schedule Tribe Population in coastal districts is described below:

Table 16-1 Schedule Tribe Population in coastal TN

Sr. No.	Coastal District of Tamil Nadu	Schedule Tribe Population		
		Rural	Urban	Total
1.	Thiruvallur	35044	12199	47243
2.	Chennai	0	10061	10061
3.	Chengalpattu			3028
4.	Villupuram	71370	3489	74859
5.	Cuddalore	9923	5779	15702
6.	Mayildathurai			486
7.	Nagapattinam	2210	1546	3756
8.	Tiruvarur	939	2095	3034
9.	Thanjavur	1340	2221	3561
10.	Pudukottai	835	448	1283
11.	Ramanathapuram	501	604	1105
12.	Thoothukudi	1264	3647	4911
13.	Tirunelveli	3822	6448	10270
14.	Kanyakumari	3741	3541	7282

Note:

- i. Chengalpattu district came into existence on 29 November 2019 after bifurcation of Kanchipuram district.
- ii. Mayiladuthurai was bifurcated on 28-12-2020 from Nagapattinam district

Legal and Regulatory Framework

Constitutional Safeguards

The constitutional safeguards related to tribal's are: (i) Article 14, related to Equal rights and opportunities; (ii) Article 15, prohibits discrimination on grounds of sex, religion, race, caste etc; (iii) Article 15 (4), enjoins upon state to make special provisions for the tribals; (iv) Article 16 (3), empowers state to make special provisions for reservation in appointments or posts in favour of Scheduled Tribes; (v) Article 46, enjoins upon State to promote with special care educational and economic interests of tribal people, protection from social injustice and exploitation; (vi) Article 243D related to the reservation of seats for Scheduled Tribes in Panchayats & Municipalities (vii) Article 275 (1), Grant-in-aid for promoting the welfare of Scheduled Tribes; (viii) Article 330, 332, 335, related to the reservation of seats for Scheduled Tribes in Lok Sabha, State Assemblies and official positions in central & state

governments; and (ix) Article 339, 340, related to Control of the Union over the Welfare of tribal and powers to investigations thereof.

The World Bank's Environment and Social Standards 7 (ESS-7)

The objectives of this ESS are as follows:

1. To ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods.
2. To avoid adverse impacts of projects or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts.
3. To promote sustainable development benefits and opportunities in a manner that is accessible, culturally appropriate and inclusive.
4. To improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation throughout the project's life-cycle.
5. To obtain Free, Prior, and Informed Consent (FPIC) in the following three circumstances
 - a. Adverse impacts on land and natural resources subject to traditional ownership or underuse or occupation.
 - b. Cause physical relocation of tribal communities from their land and natural resources subject to traditional ownership or under customary use or occupation; or
 - c. Significant impacts on the cultural, spiritual, natural and or religious heritage of the tribal communities;
6. To recognize, respect and preserve the culture, knowledge, and practices, and to provide them with an opportunity to adapt to changing conditions in a manner and in a time-frame acceptable to them.

The ESS-7 aims to ensure that the Scheduled Tribe Communities present in, or with collective attachment to, the project area are fully consulted about, and have opportunities to actively participate in, project design and the determination of project implementation arrangements. The scope and scale of consultation, as well as subsequent project planning and documentation processes, will be proportionate to the scope and scale of potential project risks and impacts as they may affect the Tribal Communities present in the project area. Potential Impacts due to project interventions.

In ESS 7, the term "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities" (or Scheduled Tribes) refer exclusively to a distinct social and cultural group possessing the following characteristics in varying degrees:

- i. Self-identification as members of a distinct indigenous social and cultural group and recognition of this identity by others; and
- ii. Collective attachment to geographically distinct habitats, ancestral territories, or areas of seasonal use or occupation, as well as to the natural resources in these areas; and
- iii. Customary cultural, economic, social, or political institutions that are distinct or separate from those of the mainstream society or culture; and
- iv. A distinct language or dialect, often different from the official language or languages of the country or region in which they reside.

The possible impacts due to project interventions are as follows:

Tribal Development Framework

The main features of TDF are:

- i. Provide guidance and establish requirements for screening, consultations, preparation

- of TDPs.
- ii. Provide guidance on avoiding or minimizing and/or mitigating any potential adverse impacts on tribal households and their livelihoods.
 - iii. ensure that the project obtains Free, Prior and Informed Consent (FPIC) with tribal people in the entire process of planning, implementation and monitoring of project;
 - iv. ensure that project benefits are accessible to the tribal communities living in the project area;
 - v. Establish appropriate strategies for information sharing, communication and capacity building of tribal stakeholders at all stages of the project and proposes additional interventions/ investments that may be required to enhance project benefits and their outreach/ access to the tribal communities.
 - vi. Ensure that a grievance mechanism is established as described in Stakeholder Engagement Plan for this project and that it is culturally appropriate and accessible to affected tribal groups and takes into account the availability of judicial recourse and customary dispute settlement mechanisms such tribal groups.

Screening

The project will undertake a screening for tribal populations with the help of tribal community leaders and local leaders. Screening Format is given in Annexure 1. The screening will check for the following:

- 1) Confirm the presence of tribal population in the project area which exhibit the characteristics as outlined in section 3.5
- 2) Names of tribal groups in the project influence area
- 3) Total number of tribal groups in the project influence area
- 4) Percentage of tribal population in project influence area versus total population
- 5) Number and percentage of tribal households to be affected/ benefitted in the project influence area
- 6) Vulnerability of the tribal groups in the project influence area
- 7) Clarifies if any project activities will trigger adverse impacts on tribal groups
- 8) If the project activities solely benefit tribal groups

The vulnerability of especially Tribal Groups and their existing socio-economic conditions that may further deteriorate due to project impacts are assessed. As per the requirements of the ESS-7, if such especially vulnerable groups among the Scheduled Tribal community are identified within the project area, the project will take appropriate measures to recognize, respect and protect their land and territories, environment, health and culture, as well as measures to avoid all undesired contact with them as a consequence of the project.

Framework for Meaningful Consultations, and Free, Prior and Informed Consent (FPIC)

TN SHORE requires obtaining Free, Prior and Informed Consent (FPIC) for any project interventions that are likely to cause:

- Adverse impacts on land and natural resources subject to traditional ownership or under customary use or occupation;
- Cause physical relocation of tribal communities from their land and natural resources subject to traditional ownership under customary use or occupation; or
- Significant impacts on the cultural, spiritual, natural and/ or religious heritage of the tribal communities;

No activity that does not receive FPIC will be taken up under the project. The consultations involving FPIC is required when the subproject causes a) adverse impacts on land and natural resources subject to traditional ownership or under customary use or occupation, b) relocation of Tribal from land and natural resources subject to traditional ownership or under

customary use or occupation; or c) significant impacts on Tribals' cultural heritage that is material to the identity and/or cultural, ceremonial, or spiritual aspects of the affected Tribals' lives. In case such FPIC is not obtained then the proposed sub-project activity will not be taken up.

For this purpose, the implementing agencies (TNGCC and relevant PIUs) will undertake a participatory process in conducting meaningful consultations and will involve: Gram Panchayats; community leaders, community groups, fishing community, village headman, and which will ensure the active inclusion of tribal communities, including their farmers and leaders and other disadvantaged groups. Tribal communities will be involved in the planning, implementation and monitoring process. Identification of these stakeholders will be undertaken in accordance with the Stakeholder Engagement Plan based on the type and nature of project intervention. The consultations document the feedback, concerns, and needs of these tribal groups which will be incorporated into the project activities.

A Stakeholder Engagement Plan (SEP) has been prepared with the objectives of i) systematic approach to stakeholder engagement and information disclosure; ii) maintenance of positive relationships with them; iii) monitoring of stakeholder interests and feedback. The Stakeholder Engagement Plan (SEP) – to be included in the ESMP of each project will ensure that the tribal groups are able to engage with the project in socially and culturally meaningful way/language on queries, information disclosure, and grievances. Other project-related information will be shared with the primary stakeholders in Tamil language, where necessary.

Mitigation measures to address project impacts

Table 16-2 Mitigation measures which apply to the tribal groups

S.No.	Mitigation Measure	Responsibility
1	Screening of Subprojects	PIU with support from TNGCC
2	FPIC wherever, there are adverse impacts on tribals	PIU with support from TNGCC
3	Capacity Building of tribals including vulnerabletribals such as women, persons with disabilities, gender minorities, etc.	PIU with support from TNGCC
4	R&R entitlements; wherever R&R is involved, Free Prior Informed Consultations will be conducted with Tribals wherever there are adverse impacts on them	PIU with support from TNGCC
5	Coverage under household census/socio-economic surveys	PIU with support from TNGCC
6	Monitoring and evaluation of implementation ofthese special provisions, etc.	PIU with support from TNGCC
7	Grievance Redress Mechanism: In projects where Tribal presence is there, the Grievance Redress Committees at the project level will have membership from the tribal communities.	PIU with support from TNGCC
8	The project development benefits and opportunities will be informed to the tribal groups on regular basis and they will be assisted in reaping those benefits, viz., employment opportunities in the contract works.	PIU with support from TNGCC

Table 16-3 Application of Tribal Development Framework to sub-projects

Stage	Actions for Social Assessment, Meaningful Consultations and Tribal Development Plan
Preparation stage	▪ Screen for presence of tribal communities in project village (using screening checklist) /ascertain if the project site is located that is being used for commercial or residential purposes ◆ Name(s) of IP community group(s) in the area; ◆ Total number of IP community groups in the area; ◆ Percentage of IP community population in the area compared with the total population; and ◆ Number and percentage of IP households to be affected by the sub-project ▪ List nature of potential activities and related interventions likely to be undertaken in presence and/or tribal groups ▪ List the nature of tribal groups present or likely to be affected by the interventions ▪ Conclude on the need for: ◆ A Tribal Development Plan and its likely content depending on whether it is only for: ◆ for obtaining FPIC (indicate type of impact i.e., on land, requiring relocation, cultural heritage) The scope and scale of consultation, as well as subsequent planning /documentation and TDP preparation processes, will be proportionate to the scope and scale of potential project risks and impacts as they may affect such tribal groups ▪ Identify stakeholder–tribal groups, areas and households ▪ Engage Social experts to support the PMU with relevant knowledge of the area Capacity building of SDS and other PIU personnel on TDF; ▪ Develop culturally appropriate IEC materials for dissemination in the project areas with ST population ▪ Orient tribal communities on project objectives, interventions and implementation processes through use of culturally appropriate IEC materials; ▪ Disclose of interventions and approach under TDF ▪ Mobilize tribal households for proposed interventions ▪ Prepare of socio-economic baseline of the tribal groups including profiling of tribal communities in GPs; ▪ Hold Gram Sabha meetings ensuring representation of the tribal households on project interventions. Send letters of intimation to Gaon Sabha, PRI Members, local Civil Society Organizations about the meetings/ consultations in advance say at least 10 days before. Along with the intimation send project activity related details and agenda. Ensure that there is participation from all sections of tribals including females and more than two thirds participation. Record the meeting discussions and issue minutes/ proceedings and maintain records. Take consent of the Gaon Sabha for any project activity. ▪ Hold regular, periodic consultations with affected and benefitted tribal communities during planning by involving: ◆ Representative bodies and organizations other community members; ◆ Provide sufficient time for decision-making processes; and ◆ Allow for effective participation in the design of project activities or mitigation measures that could potentially affect them either positively or negatively. ▪ Identify existing Grievance resolution mechanisms and processes respected and used by the locals

Stage	Actions for Social Assessment, Meaningful Consultations and Tribal Development Plan
	- Identify schemes that promote social and economic empowerment of tribal communities with which project activities can be converged - Hold consultations with other departments and facilitate convergence of other existing government schemes through support from the project.
Preparation of TDP (within DPR or ESMP)	- KERS /PIUs will take all necessary measures to screen and identify such locations and avoid any additional land procuring through design interventions without jeopardizing the safety standards to be followed. - The IPPF provides for rehabilitation/reconstruction of any damaged/ impacted community assets through community participation - In case encroachments are found, these will be dealt with as per the Resettlement Policy Framework (RPF) for this project Depending on the presence of tribal people and their socio economic vulnerability and cultural distinctiveness the, prepare sub-project specific TDPs as part of DPR per outline presented below - A summary of Targeted Social Assessment, including the applicable legal and institutional framework; - Baseline seriocomic data that profiles occupations, landholdings, household incomes, existing customary usufruct rights over forest resources, participation in project operations as well as community institutions to assess impact - A summary of the results of the meaningful consultation; and FPIC where necessary formal, written community endorsement/sign off of the subproject/activity(locations, design, etc.) by elected representatives and customary tribal leaders; - Specific Measures to avoid, minimize, mitigate, or compensate for any potential adverse impacts identified. - Specific Measures for ensuring culturally appropriate social and economic benefits for tribal communities; e.g., preference in provision of benefits from tourism development, water recreation activities, etc. In case of flood shelters FPIC will be taken during the onsite social screening also collective resolution of all the stakeholders may be documented for further legitimacy. In case of FPIC is unsuccessful, then record the proceedings about the same in the records - Details of cost estimates, financing plan, schedule, and implementation arrangements; - Accessible and culturally appropriate grievance redressal procedures - Project Monitoring and Evaluation arrangements including monitoring indicators and evaluation parameters - Disclosure arrangements

Stage	Actions for Social Assessment, Meaningful Consultations and Tribal Development Plan
Implementation	▪ Continue holding consultations as per TDP and SEP using IEC materials developed ▪ Administer and monitor mitigation measures stated in the TDP. Key monitoring indicators would be ◆ Coverage of tribal households in different activities implemented under the project ◆ Benefits rendered to and accessed by the tribal households ◆ Number of tribal families selected under capacity building activities ◆ Number of tribal family members having engaged in civil work, ▪ Liaise with other relevant departments involved in convergence ▪ Progress Reporting including reporting on functioning of grievance redressal

Implementation arrangements of TDP

The TDP implementation responsibility will be in sync with the overall implementation strategy of the project. The Social Specialist at the PMU – KERS being responsible for its implementation under the overall guidance provided by the Head of the IA, Project Director. The Social Specialists will also be responsible for coordinating with other line departments, provide requisite support for organizing community consultations, data collection and provide oversight on the process of preparation and quality of the TDF. The role and responsibilities of the Social Specialists are as follows:

1. Support the implementing entities in preparation and finalization of tribal plans for their greater inclusion.
2. Overall planning, designing, guiding, implementing and coordinating institutional development and capacity building strategies proposed for tribal's and institutions existing in scheduled areas.
3. Identifying stakeholders and ensuring their participation;
4. Monitoring implementation of the framework by different implementing entities as per TDF;
5. Designing the community manual and guidelines for the support organization and developing training modules/ manuals/ IEC materials;
6. Monitoring the activities of the unit;
7. Ensuring timely implementation of capacity building measures, taking into account specific needs of the tribals.

The Social Specialists will be the responsible person to guide the overall process related to tribal inclusion and their greater participation in the development process. She/he will monitor the processes followed in execution of the planned activities and realization of the tribal inclusion parameters. In addition, an external consultant will be hired for preparation of the tribal development plans.

Implementation Costs and budget: Implementation of the TDP would need to factor in the following and will be reflected in the SEP.

Table 16-4 Budget table for implementing the TDP (Indicative)

Items (indicative)	Unit	Rate	No.	Amount
Additional resource persons (Tribal experts etc.)				
Conducting FPICs (vehicle, fuel, photography, videography)				
Training				
IEC materials develop and dissemination				
Budget for any identified special community needs				

Monitoring arrangements of TDP

Throughout the implementation of the project, the Social Development Specialist of PMU KERS and concerned PIUs and will monitor the project compliance with TDP. The Social Development Specialist will visit the project sites at least on a quarterly basis since the planning until three months and meet the tribal communities and their leaders. The Specialist will also monitor activities to ensure adequate participation and inclusion of ST persons in availing benefits under the project. Upon the completion of the sub-component and implementation of IPDP, the Social Specialist will carry out an IPDP completion assessment to confirm that all measures under this TDP have been fully implemented.

- Conduct periodic monitoring and audit of TDP implementation to provide early alert to redress any potential problems; and,
- Conduct mid-term, annual and end term monitoring and audit to assess target achievements and slippages with respect to implementation of IPDP.
- Grievance redressal mechanism – monitors and audits its functioning and processes

along with complaints received and resolved shall be monitored and audited.

The results of this monitoring and audit shall be summarized in reports which will be submitted to the KERS on a regular basis. Provision will be made for participatory monitoring involving the PAPs. The summarized reports of this monitoring and audit should be sent to the World Bank on quarterly basis.

17. ANNEXURE 6

GENDER and GBV ACTION PLAN

Gender Equity

TN-SHORE project emphasizes inclusive community development through a number of integrated interventions, especially taking into consideration the vulnerable coastal communities – sustaining by traditional means of utilizing coastal and marine resources. In order to make the project more inclusive and participatory, it is required that women associate themselves in different activities which they find feasible. This approach of inclusion and equity, specifically involvement and engagement of women will be helpful to attain social justice and reduce marginalization of women and empower them to avail maximum benefit from the project.

Thus, incorporating gender and other social issues in the development projects helps to improve project performance and facilitate the achievement of the Bank's goal of poverty reduction. A gender approach in the overall project framework takes care of key gender issues and brings in parity in association and participation of women and minimises the gap between males and females at the project level. A gender approach is also a way to comprehend the impacts on the women beneficiaries and ensures equality in project induced wellbeing.

During the environmental and social assessment, consultations will be organised with different stakeholders to understand gender issues and possible measures that can help women in ensuring their participation in the overall process. The assessment helped to identify certain key issues pertaining to women and their involvement in different livelihood activities as well as other activities which will directly or indirectly impact their lives.

Policy Provision

Directions in Constitution

The constitution of India provides provisions to secure equality in general and gender equality in particular. Various articles in the Constitution safeguard women's rights by putting them at par with men socially, politically and economically. The Preamble, the Fundamental Rights, Directive Principles of State Policies (DPSPs) and other constitutional provisions provide several general and special safeguards to secure women's human rights. The Preamble to the Constitution of India assures justice, social, economic and political; equality of status and opportunity and dignity to the individual. Thus, it treats both men and women equal.

The policy of women empowerment is well entrenched in the Fundamental Rights enshrined in our Constitution. For instance:

1. Article 14 ensures to women the right to equality;
2. Article 15(1) specifically prohibits discrimination on the basis of sex;
3. Article 15(3) empowers the State to take affirmative actions in favour of women;
4. Article 16 provides for equality of opportunity for all citizens in matters relating to employment or appointment to any office. These rights being fundamental rights are justifiable in court and the Government is obliged to follow the same.

Directive principles of State Policy also contains important provisions regarding women empowerment, and it is the duty of the government to apply these principles while making laws or formulating any policy. Though these are not justifiable in the Court but these are essential for governance nonetheless. Some of them are:

1. Article 39 (a) provides that the State to direct its policy towards securing for men and women equally the right to an adequate means of livelihood.
2. Article 39 (d) mandates equal pay for equal work for both men and women.
3. Article 42 provides that the State to make provision for securing just and humane conditions of work and for maternity relief.

Fundamental Duties

Fundamental duties are enshrined in Part IV-A of the Constitution and are positive duties for the people of India to follow. It also contains a duty related to women's rights. Article 51 (A) (e) expects from the citizen of the country to promote harmony and the spirit of common brotherhood amongst all the people of India and to renounce practices derogatory to the dignity of women.

Other Constitutional Provisions

Through the 73rd and 74th Constitutional Amendment of 1993, a very important political right has been given to women which is a landmark in the direction of women empowerment in India. With this amendment, women were given 33.33 percent reservation in seats at different levels of elections in local governance i.e. at Panchayat, Block and Municipality elections. Thus, it can be seen that these Constitutional provisions are very empowering for women and the State is duty bound to apply these principles in taking policy decisions as well as in enacting laws.

Specific Laws for Women

Some specific laws, which were enacted by the Parliament in order to fulfil the Constitutional obligation of women empowerment are;

1. The Equal Remuneration Act, 1976.
2. The Dowry Prohibition Act, 1961.
3. The Immoral Traffic (Prevention) Act, 1956.
4. The Maternity Benefit Act, 1961.
5. The Medical termination of Pregnancy Act, 1971.
6. The Commission of Sati (Prevention) Act, 1987.
7. The Protection of Women from Domestic Violence Act, 2005
8. The Prohibition of Child Marriage Act, 2006.
9. The Pre-Conception & Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994.
10. The Sexual Harassment of Women at Work Place (Prevention, Protection and) Act, 2013.

Above mentioned and several other laws are there which not only provide specific legal rights to women but also give them a sense of security and empowerment.

International Commitments

India is a part of various International conventions and treaties which are committed to secure equal rights of women. One of the most important among them is the Convention on Elimination of All Forms of Discrimination against Women (CEDAW), ratified by India in 1993. Other important International instruments for women empowerment are: The Mexico Plan of Action (1975), the Nairobi Forward Looking Strategies (1985), the Beijing Declaration as well as the Platform for Action (1995) and the Outcome Document adopted by the UNGA Session on Gender Equality and Development & Peace for the 21st century, titled "Further actions and initiatives to implement the Beijing Declaration and the Platform for Action". All these have been whole-heartedly endorsed by India for appropriate follow up.

National Policy for Woman

In the year 2001, the Government of India launched a National Policy for Empowerment of Women which was revised in the year 2016. The National Policy for Women, 2016 (draft) having the vision of "A society in which, women attain their full potential and are able to participate as equal partners in all spheres of life and influence the process of social change". The objectives of the policy are

1. Creating a conducive socio-cultural, economic and political environment to enable women enjoy de jure and de facto fundamental rights and realize their full potential;
2. Mainstreaming gender in all-round development processes/programmes/projects/ actions;
3. A holistic and life-cycle approach to women's health for appropriate, affordable and quality health care;
4. Improving and incentivizing access of women/ girls to universal and quality education;
5. Increasing and incentivizing work force participation of women in the economy;

6. Equal participation in the social, political and economic spheres including the institutions of governance and decision making;
7. Transforming discriminatory societal attitudes, mind-sets with community involvement and engagement of men and boys;
8. Developing a gender sensitive legal-judicial system;
9. Elimination of all forms of violence against women through strengthening of policies, legislations, programmes, institutions and community engagement;
10. Development and empowerment of women belonging to the vulnerable and marginalized groups;
11. Building and strengthening stakeholder participation and partnerships for women empowerment;
12. Strengthen monitoring, evaluation, audit and data systems to bridge gender gaps.

World Bank's Approach

The World Bank's approach to promoting gender equality makes all staff responsible for ensuring that the Bank's work is responsive to the differing needs, constraints, and interests of males and females in client countries. Gender equality is now a core element of the Bank's strategy to reduce poverty. There is a clear understanding that until women and men have equal capacities, opportunities and voice, the ambitious poverty-reduction agenda set out in the Sustainable Development Goals will be difficult to achieve.

Issues of Significance

Mainstreaming gender equity and empowerment is already a focus area in TN-SHORE. In the sub projects, activities related to diversification of livelihood, improvement of basic services and protection of coastal and marine resources will address women's needs. At the sub project level, gender analysis will be part of the social assessment and the analysis will be based on findings from gender specific queries during the primary data collection process and available secondary data. The quantitative and qualitative analysis will bring out sex disaggregated data and issues related to gender disparity, needs, constraints, and priorities; as well as understanding whether there is a potential for gender based inequitable risks, benefits and opportunities. Based on the analysis, the specific interventions will be designed and if required Gender Action Plan (GAP) will be prepared.

The participation of beneficiaries and focus on poverty reduction are two other key determinants of the effectiveness and sustainability of any project. Any project must address the constraints on women's participation in project design, construction, and monitoring and evaluation (M & E). The project must also focus on the linkage between gender and poverty, by identifying, for example, relation between the household income and occupation of the women of the fisherman community. An adaptive, learning and process-oriented approach works better than a blue print approach; continuous dialogue between the PMU/PIU through engaging the Gram Sabha in case of rural areas and local urban bodies in case of urban areas, and the beneficiaries / PAPs is therefore important. Project beneficiaries are likely to have a stronger sense of ownership when the project gives them enough time, design flexibility, and authority to take corrective action. In this way, they find it easier to incorporate their earlier learning and negotiate with project staff and service providers. Therefore, a mechanism must be built into the project to allow such reciprocal interactions between the beneficiaries and the service providers.

Three major tools are used to identify and deal with gender issues in the project cycle: gender analysis, project design, and policy dialogue.

1. Gender analysis should be an integral part of the environmental and social assessment at the screening stage itself. The issues identified can be scaled up during the feasibility and detailed analysis can be carried out during the project preparation stage.
2. The project designs should be gender responsive based on gender analysis and should be included in the ESIA document. The findings and recommendations from the gender analysis during project planning and feedback from beneficiaries during implementation must be discussed thoroughly to determine the need for further action.

3. Consultations will be organised with different stakeholders to understand gender issues and possible measures that can help women in ensuring their participation in the overall process. The consultations helped to identify certain key issues pertaining to women and their involvement in the proposed interventions.

Significant Gender Issues

The following are the major common gender issues applicable to most of the interventions.

1. Lack of options of occupation for the women of the fisherman community. Absence of diversity of work other than helping with the catch at the landing sites affects the income of household especially for the small traditional fishing communities during the lean period.
2. Exclusion of women in fisheries related activities such as community mariculture.
3. Low land holding of traditional dual farming and hence low production and insecure livelihood
4. Women earn less wage for the same duration of work, especially in informal/private sector;
5. Occupational health issues due to prolonged duration of engagement during small community based fisheries related activities or farming.
6. Drudgery of women in agricultural activities due to less usable agricultural equipment;
7. Limited access to technical equipment, capital, and training for developing alternative livelihood options.
8. Few women holding productive resources such as land, animals, and machinery.
9. Negligible role of women in the decision-making process of the community for conservation of resources (such as mangroves or turtles) or disaster management.
10. Lack of proper solid waste or sewage management leading to serious health hazards.
11. Active participation in community institutions is limited to a few women and large section either do not participate or remain passive;
12. Lack of awareness in coastal communities and poverty lead to a higher rate of school drop-outs and child marriage.

Key Actions

a. General Check list

1. Identify key gender and women's participation issues.
2. Identify the role of gender in the project objectives.
3. Prepare terms of reference (TOR) for the gender specialist or social development specialist of the PMU/PIU
4. Conduct gender analysis as part of the overall Social Assessment.
5. Draw up a socioeconomic profile of key stakeholder groups in the target population and disaggregate data by gender.
6. Examine gender differences in knowledge, attitudes, practices, roles, status, wellbeing, constraints, needs, and priorities, and the factors that affect those differences.
7. Assess men's and women's capacity to participate and the factors affecting that capacity.
8. Assess the potential gender-differentiated impact of the project and options to maximize benefits and minimize adverse effects.
9. Identify government agencies and nongovernmental organizations (NGOs), community-based organizations (CBOs), and women's groups that can be used during project implementation. Assess their capacity.
10. Review the gender related policies and laws, as necessary.
11. Identify information gaps related to the above issues.
12. Involve men and women in project design.
13. Incorporate gender findings into the project design.
14. Ensure that gender concerns are addressed in the relevant sections (including project objectives, scope, poverty and social measures, cost estimates, and institutional arrangements).
15. List out major gender actions.
16. Develop gender-disaggregated indicators and monitoring plan.

b. Core Requirement for Mainstreaming Gender

1. All data should be disaggregated by gender, caste, ethnicity, location, and age
2. Issues of division of labour, access to resources and decision-making power (who is doing what, who has access to what, who makes the ultimate decision) have to be assessed for their gender differential impact on women and men of different social identity groups.
3. Assessment of policies, programs, institutional arrangements, human resources issues, and M&E system has to be done from a gender perspective of the project, project authorities and community groups.

c. Steps of Gender Mainstreaming

Three major tools will be used to identify and deal with gender issues in the project cycle: initial gender assessment, gender action plan, and policy note. The initial gender assessment should be an integral part of the environmental and social assessment at the screening stage. The issues identified can be scaled up during the feasibility study and detailed analysis can be carried out during the detailed project report stage. The project design should be gender responsive based on gender analysis and should be included in the detailed project report in the form of a gender action plan. The findings and recommendations from the gender analysis during project planning and feedback from beneficiaries during implementation must be discussed thoroughly to determine the need for further action.

Table 17-1 Steps of Gender Mainstreaming

Focus of Intervention	Inputs and Process Indicators	Data Source
Policy checklist	i. What are the requirements of the national gender equality policy, if any, and the executive support provided to it? ii. Which ministry focal point or unit is responsible for advocacy and gender inclusion at the policy and project level? iii. Are women and men civil society stakeholders consulted on policies and programs; included in teams analyzing policy and strategy; included in decision making? iv. Is there a system for monitoring the implementation of gender and other components of sector policies and strategies? v. Sex disaggregation of beneficiary data and key gender indicators outreach and capacity building on gender and other social dimensions grants for addressing gender issues? vi. Are there training sessions on gender including gender-sensitive planning? vii. Is stakeholder consultation facilitated? viii. Is there participation in implementing agencies or community organizations? ix. How many women are represented on gender boards and in works prioritization and decision-making forums related to the planning, implementation, monitoring, and evaluation of sub projects?	Contract documents; the Ministry of Women and Child Development; Society For Poor People Development (SPPD)
Project cycle: Project identification, preparation, and design	i. Conduct a rapid assessment to identify and quantify potential gender-related issues and impacts affecting access, risks, benefits, and participation ii. Identify disadvantaged or vulnerable groups, including who they are, where they live, and their socioeconomic characteristics (scheduled castes, women-headed households, widows, disabled) iii. Examine the impacts of the subproject on these groups iv. Identify the gender-specific implications of land acquisition and resettlement	Stakeholder and beneficiary assessments: user satisfaction survey, project concept note, social assessments (household surveys and focus group discussions in project influence area), mid-

Focus of Intervention	Inputs and Process Indicators	Data Source
	v. Identify gender-specific implications of employment opportunities to be created under the project vi. Identify gender-specific constraints in receiving information and providing feedback and complaints on the project vii. Discuss identified gender and other social issues in the project viii. Include both females and males affected by the project in stakeholder consultations ix. Use separate focus groups to enable women to voice their views separately from men x. Analyze the data collected to highlight gender differences in uses and the underlying causes of women's and men's project related problems xi. Examine relevant inter-sectoral linkages, such as access to health services, HIV/AIDS prevention, and access to markets and schools xii. Ensure that analysis of gender differences in needs, use, constraints, and access are included in the terms of reference for the social assessment xiii. Identify the gender-related issues that need to be addressed to ensure the effectiveness and sustainability of the project xiv. Develop approaches for addressing the gender-related issues identified and creating opportunities for equal access to project benefits for men and women, including training, organizational capacity building, grants programs, targets for women's participation xv. Develop indicators for measuring progress on gender-related issues within the relevant project components (e.g. construction works, institutional arrangements, land acquisition, and resettlement benefits, privatization, livelihood restoration, awareness building, consultations, complaint handling)	term and end term evaluation surveys
Project cycle: Methodology	i. Desk review (secondary literature) ii. Review available information (e.g. statistics, gender analysis etc.) in the project area and the socioeconomic profile of the target population iii. Review the relevant legal framework (e.g. inheritance law), policy framework (e.g. resettlement and rehabilitation), and institutional framework (e.g. current administrative system for land acquisition, compensation disbursement, grievance handling, awareness creation) and their gender implications iv. Review government programs for encouraging equal opportunities and participation of women in the project influence area v. Household surveys (primary survey) vi. Draw up gender- disaggregated socioeconomic and cultural profiles and identify the problems faced by and needs of the target population vii. Conduct group discussions, random interviews, and transect walks to study the activity pattern viii. Collect quantitative information ix. Participatory methodologies (e.g. participatory rapid appraisal) x. Collect qualitative information that cannot be collected through surveys (socio cultural norms, behavioral questions)	Other projects in the country/state and gender policy documents, household surveys, national sample survey, latest census data, participatory rapid appraisal of target area, focus group discussions, consultations with beneficiaries

Focus of Intervention	Inputs and Process Indicators	Data Source
	xi. Define ways in which men and women beneficiaries and other stakeholders, especially poor women, can equally participate in the project xii. Map out the target areas and assess which are the most disadvantaged areas and sections of society (widows, female-headed households, disabled men and women) in terms of access to services and poverty level xiii. Identify major stakeholder groups and their positions xiv. Staffing xv. Ensure adequate gender balance in field teams xvi. Select field team members with gender awareness, local knowledge, cultural understanding, and willingness to listen	
Project cycle: Data collection	i. Socioeconomic profile: Gender-disaggregated data ii. Demographic: Gender, sex ratio, caste, marriageable age, female-headed households, migration trend, household size iii. Economic: Income level and source, expenditure pattern and decision making, access to land and resources iv. Health: Population growth rate, infant and adult mortality rate, availability of medical facility, reproduction-related decision making, HIV/AIDS awareness v. Education: Literacy, school enrolment and dropout ratio, child labor vi. Status of women: Political representation and awareness, socio cultural perceptions and practices of men and women, domestic violence, trafficking, gender-discriminatory policies and laws, gender roles, responsibilities and gender division of labor in productive areas (e.g. agriculture, income-generating activities) and reproductive areas (e.g. household chores, child care), and time allocation for each responsibility vii. Availability, quantity, and quality of fuel and fodder, who collects fuel, fodder, and water for the family, sources of drinking and agricultural water, how men and women store and use water collected, dry season management, how far away these resources are located, time spent on collection of the resources, mode of transport used to collect the resources, availability of sanitation service (chargeable or not, who runs it) viii. Access, control, constraints ix. How men and women differ in their access to and control of land, agricultural inputs, extension, markets, employment opportunities, and credit x. Whether external assistance is provided to improve access and control, and by whom xi. Participation xii. Factors affecting the level of participation of men vs. women, incentives and constraints, means of information dissemination about the project preferred by men vs. women, labor demand for men vs. women, which modes of participation men and women favor (e.g. decision making in planning, cash contribution, labor contribution for construction, training, financial management, organizational management) xiii. Perception of benefits and impacts xiv. Men's and women's perceptions of positive and negative impacts of the project, how negative effects can be mitigated	District, block, and village census data, national sample survey data, health survey data, household surveys, focus group discussions, behavioral surveys, observation

Focus of Intervention	Inputs and Process Indicators	Data Source
Project implementation: Gender action plan	i. Prepare a gender action plan. Under this: ii. Undertake quality social and gender analyses. Identify constraints to participating and benefiting men and women; develop strategies for each component to ensure that men and women participate and benefit equally iii. Revisit gender design strategies at inception to develop a detailed gender action plan. The plan needs to be tested and reviewed early in implementation; identify detailed activities, targets, resources, and responsibilities for implementation iv. Citizen Engagement Framework: The gender action plan must be fully owned and understood by the PMU/PIU. Use a participatory and flexible approach to developing the plan; a strong rationale that is directly linked to overall project objectives is needed for targeting and working with women v. Identify realistic targets linked to loan objectives. Targets and strategies should enable step-by-step progress, bringing incremental changes and challenging culture without threatening it; linking targets to loan objectives helps all stakeholders to understand the rationale for focusing on women and helps monitoring of participation and benefits. vi. Include gender capacity building in the gender action plan. Both formal training and ongoing support and mentoring are needed for developing skills, ownership, and commitment. vii. Provide adequate skills and resources for the implementation of the gender action plan. Long-term gender specialists in the PMU/PIU or project team and adequate resources for implementation of actions; nongovernmental organizations and other agencies contracted to implement project activities should have a demonstrated gender capacity. viii. Monitor and follow up gender-related targets and activities. Systematic follow-up to ensure that policy reforms and gender actions are implemented; routine monitoring and reporting; gender-sensitive indicators and gender-related risks must be included in project logical frameworks.	Gender expertise, Discussion, and participation with beneficiaries, separate focus group discussions with men and women, government departments, labor and employment laws, provisions in project and budget, learning approaches from good practice cases
Project implementation: Participation strategy	i. Develop a participation strategy for men and women during project implementation and monitoring and evaluation: ii. Avoid overly high expectation of women's participation and develop a practical schedule for participation iii. Planning. Conduct women-specific consultation to take their views and suggestions on the design. Any mechanism established during the project design, such as grievance mechanisms, should have adequate representation of women iv. Construction. Ensure work conditions that are conducive to women's participation (e.g. gender-equal wage rates, construction season, toilet and child care facilities) v. Training options. Identify ways to link up with income generation, literacy, and other activities to support an integrated approach to poverty reduction and women's empowerment vi. Staffing, scheduling, procurement, and budgeting. Hire female project staff	Gender expertise, Discussion, and participation with beneficiaries, separate focus group discussions with men and women, government departments, labor and employment laws, provisions in project and budget, learning approaches from good practice cases

Focus of Intervention	Inputs and Process Indicators	Data Source
	vii. Consider seasonal labor demand in scheduling civil works viii. If appropriate, set a minimum percentage of female labourers and prohibit the use of child labourers in the civil works contract ix. Ensure adequate and flexible budgeting to allow a learning approach (e.g. training budget, consulting service budget for women's organizations)	
Project cycle: Impact	i. Establish whether men and women perceive positive and negative impacts of the project differently, and assess how the negative effects can be mitigated ii. Consider whether the benefits are likely to be distributed equitably iii. For disadvantaged or vulnerable groups, find out who they are, where they live, what are their socioeconomic characteristics (scheduled castes, women-headed households, widows, disabled), and how the project will affect them iv. Assess the gender-specific implications of the following: • Land acquisition and resettlement: extent of land being acquired • Utility relocation: what and where • Tree cutting: how many and local dependence • Diversion of forest land: how much and local dependence	Project monitoring reports, audits, group discussions, household survey, land tenure details
Monitoring and Evaluation: Feedback mechanism	i. Develop a feedback mechanism in which both males and females have a voice ii. Disaggregate all relevant indicators by gender, such as the number of women gaining access to credit, increase in women's income, and career prospects for project-trained women iii. Integrate sex-disaggregated beneficiary data and relevant measures of gender equality into the baselines and other routine monitoring and evaluation processes iv. Measure the impacts of the project components on women and men v. Assess the value added by women's participation in the project	Focus group discussions, project monitoring reports
Monitoring and Evaluation: Gender-informed indicators	i. Develop gender-informed results indicators for monitoring. These include: ii. Increased income, employment, and entrepreneurship. iii. Time saving and increased productivity. Reduced women's and men's time for domestic work (collection of water, fuel wood, food crop collection, fodder, etc.); increased productive time used for economic activities. iv. Improved affordability. Percentage increase of income among women and men; increased participation in decision making; number of women and men participating in community decision meetings; reduced incidence of harassment, crime, and human trafficking; increased awareness of HIV/AIDS transmission and prevention; number of women and men leading committees; number of women and men managers in agencies; women control their income and establish bank accounts in their names; increased recognition of women's contributions to the household and community	Review of gender-informed results indicators

Key Activities in Project Cycle

The involvement of women groups in the identification of impacts and opportunities through project activities shall form the basis for the preparation of gender sensitive project activities.

The procedure to be followed and process and outcome are presented in the following matrix.

Table 17-2 Opportunities for Involvement of Women during Project stages

Project Stages	Key Activities	Responsibility
Planning Stage	- Identify gender concerns/issues related to the project with due consultation with women group - Organize women stakeholders' meetings to inform about the project activities, its benefits and key expectations from the project. - Sensitize and discuss the project and its components. - Sensitize other stakeholders on gender concerns/issues; - Identify key areas of constraints that may be improved through the project; - Prepare project component wise activity plan where women can be engaged in different project activities.	Social Development Specialist, Gram Panchayats/ Urban Local Bodies, PMU/ PIU
Implementation Stage	- Implementation of provisions of project activity specific plan addressing gender concerns as per the GAP; - Monitoring engagement of women in different project activities, skilled and unskilled works; - Monitor safety and security measures of women in work and camp sites; - Monitor women specific provisions and facilities created in the project site and camps. - Supervising adherence to wage payment norms	Social Development Specialist, PMU/ PIU, External M&E Agency
Post-Implementation Stage	- Continuation of activities initiated under the project; - Monitoring sustenance of project inputs and its benefits accessed by women	Social Development Specialist, PMU/PIU

Monitoring Gender Action Plan

The indicators, frequency, and agency recommended for monitoring are presented in the table as follows;

Table 17-3 Monitoring Indicators for Gender Action Plan

Aspects	Monitoring Indicators (Process and Outcome)	Frequency	Monitoring Responsibility
Economic	- No. of women engaged in different activities and their proportion to the total workforce; - Days of engagement of women in different wage / non-wage activities and proportional days of engagement in comparison to their male counterpart; - Growth in income of women due to such engagements; - Reduction in no. of days of migration (if migrating earlier); - No. of women having additional/new market oriented employable skills for self-engagement; - No. of women accessed different govt. schemes/provisions including beneficial enrolment in agricultural interventions; - Improvement in asset holding of women (productive and household assets).	- Planning Stage: for the baseline data - Half yearly Monitoring - Mid Term Review (MTR) - Final Impact Assessment	PMU/PIU Third party Monitor along with PMU/PIU

Aspects	Monitoring Indicators (Process and Outcome)	Frequency	Monitoring Responsibility
Social	Improvement of association of women in local institutional and decision-making process (membership, management position, etc.);	- Planning Stage: for the base line data - Half yearly Monitoring - Mid Term Review (MTR) - Final Impact Assessment	PMU/PIU Third party Monitor along with PMU/PIU

18. ANNEXURE 7

GBV Risk mitigation Framework

Understanding GBV & SEA

Gender-based violence (GBV) is violence directed against a person on the basis of gender. It constitutes a breach of the fundamental right to life, liberty, security, dignity, equality between women and men, non-discrimination, and physical and mental integrity that, non-discrimination, and physical and mental integrity. Sexual Exploitation and Abuse (SEA) is a form of GBV, defined as any actual or attempted abuse of a position of vulnerability, differential power, or trust for sexual purposes, including, but not limited to, profiting monetarily, socially, or politically from the sexual exploitation of another. Acts of SEA may involve actual or threatened violence or inducements such as protection, food, shelter, or the like, in exchange for sex.

The Context

Global Context: Violence against women and children takes many forms, including sexual, physical, emotional and economic abuse. It occurs in the home and on the streets and in times of peace and in conflict and crisis. Recent estimates by the World Health Organization indicate that 35 percent, or one in three women worldwide, have experienced some form of physical or sexual assault. GBV is an expression of gender inequality that prevents women and their families from escaping poverty drains public resources and impedes human development and economic productivity.

National Context: Women and girls in India today continue to experience multiple forms of violence, across multiple intersections, including of religion, caste, class, abilities and sexual orientation. In India, the global data on gender violence is complemented by the recently concluded NFHS-4 data (2015-2016) at the national level which shows that 30 percent of women have experienced physical violence since age 15, and 6 percent have ever experienced sexual violence in their lifetime. 33 percent of ever-married women have experienced physical, sexual, or emotional spousal violence. Despite this, only 14 percent of women who have experienced physical or sexual violence by anyone have sought help to stop the violence.

GBV in Infrastructure Projects

Civil works, which include construction, maintenance and/or upgrading of infrastructure, can exacerbate the risk of GBV in both public and private spaces by a range of perpetrators in a number of ways, for example:

1. Projects create changes in the communities in which they operate and can cause shifts in power dynamics between community members and within households. Male jealousy, a key driver of GBV, can be triggered by labour influx on a project when workers are believed to be interacting with community women. Hence, abusive behaviour can occur not only between project-related staff and those living in and around the project site, but also within the homes of those affected by the project.
2. Construction workers are predominantly younger males. Those who are away from home on the construction job are typically separated from their family and their normal sphere of social control. This can result in inappropriate behaviour, such as sexual harassment of women and girls and illicit sexual relations with minors from the local community.
3. When land redistribution occurs—for example due to resettlement for civil works—women may be extremely vulnerable to GBV. This is particularly true in countries where the legal systems preclude women from holding land titles.
4. Projects with a large influx of workers may increase the demand for sex work—even increase the risk for trafficking of women for the purposes of sex work—or the risk of forced early marriage in a community where marriage to an employed man is seen as the best livelihood strategy for an adolescent girl. Furthermore, higher wages for workers in a community can lead to an increase in transactional sex. The risk of

incidents of sex between laborers and minors, even when it is not transactional, can also increase.

5. Women and girls' job opportunities are limited due to a lack of appropriate transportation options. When creating job opportunities for women within projects, teams should be aware that traveling to and from work in some settings can force women and girls to use unsafe, poorly lit commuter routes, or unsafe public transport. Increased risk of violence is experienced when women are confronted with traveling long distances to access work opportunities or forced to travel at night.
6. Increased interactions between the incoming workforce and the local community may result in increasing rates of communicable diseases, including sexually transmitted diseases and HIV/AIDS.

Legal and Policy Environment for Women's Safety

International Instruments: The international legal and policy framework establishes standards for action by countries to meet their legal obligations and policy commitments to address violence against women. Some of the key International instruments⁶ for the protection of women include:

- **United Nations General Assembly, Convention on the Elimination of All Forms of Discrimination against Women (CEDAW):** Under CEDAW, States ensure through competent national tribunals and other public institutions the effective protection of women against any act of discrimination and refrain from engaging in any practice of discrimination against women and to ensure that public authorities and institutions shall act in conformity with this obligation.
- **Fourth World Conference on Women, Beijing Declaration and Platform for Action:** The Platform for Action states that 'women may be vulnerable to violence perpetrated by persons in positions of authority in both conflict and non-conflict situations. Training of all officials in humanitarian and human rights law and the punishment of the perpetrators of violent acts against women would help to ensure that such violence does not take place at the hands of the public officials in whom women should be able to place trust, including police and prison officials and the security forces' (Para. 121).

United Nations General Assembly, Resolution 52/86 on Crime Prevention and Criminal Justice Measures to Eliminate Violence Against Women

- World Bank's Guidance note on **Management of Labour Influx, 2016**. The document Provides guidelines to address issues and risks arising from influx of migrant labour leading to gender-based violence, forced labour etc.

National Instruments

- India has signed and ratified **Convention on Elimination of Discrimination against Women (CEDAW)**. Since then, the national policy for Women 2016 and other policies and amendments on acts has been reflecting the principles highlighted in the related international conventions. The goal of this Policy is to bring about the advancement, development and empowerment of women.
- **The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013**, aims to prevent and provide redressal of complaints of sexual harassment. One of the main provisions in this act is that it calls for constituting an Internal Complaints Committee at each office or branch with 10 or more employees/workers.

One Stop Centres

Ministry of Women and Child Development (MWCD) has formulated a Centrally Sponsored Scheme for setting up One Stop Centres, a sub-scheme under the umbrella scheme for National Mission for Empowerment of Women including Indira Gandhi Matritrav Sahyaog Yojana. In line with the national guidelines, these Centres are established across the state to

provide integrated support and assistance under one roof to women affected by violence, both in private and public spaces.

¹⁰ https://wcd.nic.in/sites/default/files/OSC%20Directory_0.pdf

¹¹ Box (SHe-Box) is an effort of MWCD, GoI to provide a single window access to every woman, irrespective of her work status, whether working in organised or unorganised, private or public sector, to facilitate the registration of complaint related to sexual harassment. Any woman facing sexual harassment at workplace can register their complaint through this portal. Once a complaint is submitted to the 'SHe-Box', it will be directly sent to the concerned authority having jurisdiction to take action into the matter.

World Bank Good Practice Note

The World Bank Good Practice Note (GPN) provides a comprehensive understanding of the nature and kinds of GBV. The GPN establishes an approach to identifying risks of GBV, in particular sexual exploitation and abuse and sexual harassment that can emerge in major infrastructure projects with civil works contracts. The GPN builds on World Bank experience and good international industry practices, including those of other development partners.

The GPN is guided by several key principles reflected in the 2017 GBV Task Force Report:

- 1) **Be survivor-centered:** Approach considerations related to GBV prevention, mitigation and response through a survivor-centered lens, protecting the confidentiality of survivors, recognizing them as principle decision-makers in their own care and treating them with agency, dignity and respect for their needs and wishes.
- 2) **Emphasize prevention:** Adopt risk-based approaches that aim to identify key risks of GBV and to undertake measures to prevent or minimize harm.
- 3) **Build on existing local knowledge:** Engage community partners—local leaders, civil society organizations, and gender and child advocates— as resources for knowledge on local level risks, effective protective factors and mechanisms for support throughout the project cycle.
- 4) **Be evidenced-based:** Build on existing global research and knowledge on how to address GBV effectively.
- 5) **Be adaptable:** Operational guidance presented in this note provides the foundation for an effective GBV risk management approach; adapt and adjust mitigation measures to respond to the unique drivers and context in any given setting.
- 6) **Enable continuous monitoring and learning:** Ensure operations integrate mechanisms for regular monitoring and feedback to track effectiveness and to build internal knowledge of what works to prevent, mitigate and respond to GBV.

The GPN outlines the three Steps that need to be undertaken during project preparation and implementation as described below.

1. **Identify and assess** the risks of GBV during social assessments and include measures for their mitigation in project design. Ideally, this is done during project preparation, with the understanding that GBV risk assessment is a continuous process and should take place throughout the project life cycle as GBV can occur at any moment.
2. **Address** the risks during project implementation by identifying and implementing appropriate GBV risk mitigation and monitoring measures – that are commensurate to the risk level, on an ongoing basis
3. **Respond** to any identified GBV incidents, whether related to the project or not, ensuring that effective monitoring and evaluation mechanisms are in place to report on such incidents and to monitor follow up.

¹¹ http://www.shebox.nic.in/user/about_shebox

Assessment of GBV Risks

As per the SEA/SH risk assessment tool for projects involving major civils works and the social protection tool, the risk is assessed to be Moderate. The work will be carried out in rural areas, and only local labourers will be involved. Although project involves civil works and social works tools, the scale will be small, and the project will support income generating activities that will be in a group and in presence. The IAs are required to implement “The Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, 2013 (POSH Act 2013)” as part of the Government of India requirement. Existing reports and research materials at national and state level were reviewed for the assessment of area of impact and GBV risks. The assessment of GBV risks vis-à-vis the area of impact is shown in the table below:

Table 18-1 GBV and risk assessment

SN	Area of Impact	Risk Assessment
1.	Women Workers at Construction sites and activities	As TN-SHORE project intervention is expected to spread over a span of 5 years, the migrant workforce is required to stay for long durations. It is likely that the workers will come in contact with the local community and vice-versa. With varied cultural and economic backgrounds, the likely interactions between communities and workers may lead to potential GBV risks: ▪ Cultural insensitivity towards women and the stigma associated with GBV, makes women silent and/or are skeptical about a sincere and unbiased redressal, ▪ Lack of adequate and safe means of commuting to the project site and back. The risks are augmented significantly if travel is required at night, ▪ There is lack of awareness of compliance to PoSH Act, ▪ Women staff are often not aware of the escalation matrix (within the organization) for such violations, ▪ Absence of separate toilets for women at construction sites.
2.	Labor Camps	Labour camps at TNSHORE may sometimes negligent in following national labour laws with regards to safety and security provisions for women labourers. The key reasons that lead to incidents of GBV within the labour camps are: ▪ Absence of adequate provisions for sanitation and water, ▪ Same toilets and bathing areas for men and women, ▪ No doors or broken locks on toilets doors, ▪ Absence of creche and lack of privacy for lactating mothers for feeding their children, ▪ Inadequate accommodation for women workers; women workers having to sleep in the open in the same area as men. ▪ Inadequate lighting in the camps and the toilets, ▪ Absence of adequate security personnel in the camp, ▪ Lack of knowledge of an escalation matrix and coupled with the skepticism of a fair redressal.
3.	Community women and girls in close vicinity to the project sites	▪ Increased interaction between the staff/workers and the communities can cause inappropriate behaviour, such as sexual harassment of women and girls and illicit sexual relations with minors from the local community. ▪ It may also increase rates of communicable diseases, including sexually transmitted diseases and HIV/AIDS. ▪ The movement of transport vehicles through the residential areas in the villages and towns could make the public places (like markets, schools, playgrounds, access roads etc.) unsafe for women, adolescent girls and children.

SN	Area of Impact	Risk Assessment
4.	Involvement Women in Strengthening Plastic Circularity	Girls and Women in strengthening plastic circularity are susceptible to the risks of GBV perpetrated by fishermen and tourist population on the beaches.
5.	Temporary displacement of vendor stalls, small businesses, and informal establishments	Under the TN-SHORE project, temporary displacement of vendor stalls, small businesses, and informal establishments (e.g., fisherman huts and fish landing sites) may negatively impact access, livelihoods, and security, potentially raising the risk of GBV/SEA/SH of women owning vender stall, small businesses, etc.
6.	Livelihood opportunities under project component	TN-SHORE project will focus on enhancing livelihood and employment opportunities, which could potentially lead to sexual exploitation and abuse of women to be involve in livelihood program.
7.	Development of Tourism through Biodiversity Conservation Park, International Dugong Conservation Centre	TN-SHORE envisages developing of tourism through biodiversity conservation park, International Dugong conservation centre, etc. This may implications on GBV/ SEA/SH risks on the one hand on local women, adolescent girls and children and women employed in these places on the other.

With reference to the World Bank's SEA/SH Risk Assessment Tool, the risk score is calculated on a scale of 0 to 25: projects that score 0-12.25 are considered "Low" risk; 12.5-16 "Moderate" risk; 16.25-18 a "Substantial" risk, and 18-25 "High" risk. Based on the internal risk assessment tool, the GBV risk rating for the project is considered **Moderate**.

GBV Action Framework

As a part of the ESMF preparation process and based on consultations with stakeholders including women's groups, civil society organizations, administrative/field officials, the GBV risk rating for TN-SHORE at appraisal stage is observed to be '**Moderate**'. The ESMF notes that the TNGCC and other stakeholders are well-equipped to address GBV related risks in the context of proposed subproject interventions.

Subproject interventions involve civil works, albeit not on a large scale and likewise Environment friendly interventions such as mangrove afforestation too are on moderate scale. Such construction/upgradation activities will be utilizing largely contract workers who will be employed through small, local contractors, including migrant labors. However, the scale of these activities and the associated impacts is likely to be localized and hence GBV risk mitigation measures are built-into the occupational health and safety aspects of labor management and sensitization of communities.

To mitigate potential risks related to on-site safety and GBV, the TNGCC (PMU) will ensure that PEA with support from DPMUs will undertake the following steps and measures

Table 18-2 GBV action framework

Action to Address GBV Risks	Detail	By Whom	By When
Hiring of GBV Service Provider on need basis	SPMU will hire a GBV Service Provider after a Capacity Assessment of its abilities to provide quality survivor centred services including security, legal, health care, safe space, case management and also providing referral services to link to other services not provided by it.	SPMU, TNGCC	At project initiation

Action to Address GBV Risks	Detail	By Whom	By When
Identification of project's GBV Risks	Mapping of TN-SHORE components specific GBV Risks.	Social Specialist at SPMU, TNGCC	Once before mobilization of Contractor/s; Ongoing throughout the life of the Project.
Updation of Project Safeguard Documents	Have GBV risks adequately reflected in all safeguard instruments (i.e., Project ESMP). Include the GBV mapping in these instruments.	Social Specialist at SPMU, TNGCC	Once before mobilization of Contractor/s; Ongoing throughout the life of the Project
	Have the GBV Risk reflect in the Contractor's C-ESMP which is derived from the ESMP.	Social Specialist at SPMU, TNGCC	Once before hiring workforce; Ongoing throughout the life of the project.
Accountability and Response Framework	Develop a GBV Action plan including the Accountability and Response Framework as part of the ESMP.	Social Specialist at SPMU, TNGCC	Once before hiring workforce; Ongoing throughout the life of the project.
	Contractor's response to the Accountability and Response Framework in the ESMP, will be made in C-ESMP. C-ESMP will be evaluated at the time of bidding, to evaluate contractor's capacity to address the GBV risks of the project.	Contractor	Once before hiring workforce; Ongoing throughout the life of the project.
Capacity Assessment	Assessment of the local capacity of the GBV Service Provider to prevent and respond to GBV, including the availability of safe and ethical service provision for survivors.	Social Specialist at SPMU, TNGCC	Once before hiring the GBV Service Provider/s; Ongoing throughout the life of the project
Monitoring and implementation of Stakeholder Engagement Plan	As part of the project's stakeholder consultations, those affected by the project should be properly informed of GBV risks and project activities to get their feedback on project design and safeguard issues. Consultations need to engage with a variety of stakeholders (political, cultural or religious leaders, health teams, local councils, social workers, women's organizations and groups working with children).	Social Specialist at SPMU, TNGCC	Once before Contract mobilisation; Consultations need to occur continuously throughout the life of the project.
	The Stakeholder Engagement Plan of the project, which will be implemented over the life of the project will create awareness in the local communities and other stakeholders about the project's activities, to specifically address GBV related issues.	Social Specialist at SPMU, TNGCC	Once before Contract mobilization; Consultations need to occur continuously throughout the life of the project.

Action to Address GBV Risks	Detail	By Whom	By When
Institutionalizing and monitoring a GRM	Make certain the availability of an effective grievance redress mechanism (GRM) with multiple channels to initiate a complaint. It will have specific procedures for safe and ethical documenting of GBV cases. GBV GRM outside of the project GRM to ensure the requirement for confidentiality and delicate handling.	Social Specialist at SPMU, TNGCC	Once before hiring the GBV Service Provider/s; Ongoing throughout the life of the project.
Review GRM	Review that the GRM receives and processes complaints to ensure that the protocols are being followed in a timely manner, referring complaints to an established mechanism to review and address GBV complaints	Social Specialist at SPMU, TNGCC	Ongoing throughout the life of the project.
Code of Conduct Implementation Strategy	The implementation strategy for CoC for GBV risks covers the following: - Codes of Conduct to be created to cover the specific GBV Risks of the project. - Ensure requirements in CoCs are clearly understood by those signing. - Have CoCs signed by all those with a physical presence at the project site. - Train project-related staff on the behaviour obligations under the CoCs. - Disseminate CoCs and discuss with employees and surrounding communities	Social Specialist at SPMU. TNGCC and Contractors	CoC to be created by SPMU prior to mobilization of contractor/s. All CoC implementation activities are ongoing throughout the life of the project.
Training plan for SEA and SH	Have project workers and local community undergo mandatory training on SEA and SH. The training curriculum and schedule to be finalized before civil work begins. Orientation on SH/SEA to be included in Safety Induction, Tool Box Talk and task Briefing/Training's for new labour etc	Social Specialist at SPMU. TNGCC	Curriculum and training schedule to be fixed before mobilization of Contractor. Training ongoing throughout the life of the project.
Evaluation and Monitoring of Proper Residential and Working Conditions	Proper residential and work conditions can help reduce GBV Risks. Evaluation and monitoring of the working conditions to be in line with what is proposed as the GVP Action Framework, Labour laws of India and ESS of WB. Reporting and follow-up for deviations found in the facility.	Social Specialist at SPMU, TNGCC	Once before mobilization of Contractor/s; Ongoing throughout the life of the Project.
Signage	Adequate signages and posters are required to be placed in strategic places in the labour camp, dept and construction site. They will carry the message (in Tamil language) of "Zero Tolerance" to SEA and	Social Specialist at SPMU, TNGCC	Once before mobilization of Contractor/s; Ongoing throughout the life of the Project.

Action to Address GBV Risks	Detail	By Whom	By When
	SH. The IEC material will also have information of access points for reporting GBV.		
Reporting	QPRs will report various parameters of the implemented GBV Action Framework. They will be circulated in the SPMU.	Social Specialist at SPMU, TNGCC	Quarterly; Ongoing throughout the life of the project.
Supervision & Oversight	The performance of the GBV Action Framework will be will discussed in review meetings for supervision.	Social Specialist at SPMU, TNGCC	Bi-annually; Ongoing throughout the life of the project

Detailed Mitigation Plan For Moderate GBV and SEA/SH Risk in TN - SHORE

Mitigation measures for a moderate SEA/SH risk in TN-SHORE has been developed in accordance with Good Practice Note¹³ and is presented in the following table:

Table 18-3 Mitigation Plan for Moderate GBV and SEA/SH Risk

Sr No.	Mitigation Measures	Responsibility	Supervision
1.	Compliance with applicable National and Company laws, policies, rules, and regulations (including policy on sexual harassment).	Implementing Agencies	TNGCC
2.	Compliance with applicable health and safety requirements to protect the Local Community (including vulnerable and disadvantaged groups), the Employer's Personnel, and the Contractor's Personnel (including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment).	Implementing Agencies	TNGCC
3.	No discrimination in dealing with the local community and all co-workers. Treat women, children (persons under the age of 18), and men with respect regardless of race, colour, language, religion, political or other opinions, national, ethnic or social origin, property, disability, birth or other status.	Contractors and Implementing Agencies	TNGCC
4.	Not indulge in Sexual Harassment (for example prohibition of the use of language or behaviour, particularly towards women and/or children, that is inappropriate, abusive, sexually provocative, demeaning or culturally inappropriate).	Contractor and Implementing Agencies	TNGCC
5.	No Violence, including sexual and/or gender-based violence (for example acts that inflict physical, mental or sexual harm or suffering, threats of such acts, coercion, and deprivation of liberties).	Contractor and Implementing Agencies with support from the GBV service provider agency	TNGCC
6.	No Exploitation including sexual exploitation and abuse (for example the prohibition of the exchange of money, employment, goods or services for sex, including sexual favours or other forms of humiliation, degrading behaviour, exploitative behaviour, and abuse of power).	Contractor and Implementing Agencies	TNGCC
7.	Will not mix/ interact with children including sexual activity or abuse, or otherwise unacceptable behaviour towards children or women, and ensure their safety in the project areas.	Contractor and Implementing Agencies	TNGCC
8.	Sanitation requirements (for example, to ensure female workers use specified sanitary facilities provided by their employer).	Contractor and Implementing Agencies	TNGCC
9.	Avoid conflict of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favours, are not provided	Contractor and Implementing Agencies	TNGCC

¹³ Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Investment Project Financing involving Major Civil Works

Sr No.	Mitigation Measures	Responsibility	Supervision
	to any person with whom there is a financial, family, or personal connection).		
10.	Respect reasonable work instructions (including environmental and social norms).	Contractor and Implementing Agencies	TNGCC
11.	All staff must report suspected or actual violations by a fellow worker, whether in the same contracting firm or not. Reports must be made through the GRM setup for this purpose.	Contractor and Implementing Agencies	TNGCC
12.	Sanctions may be applied if an employee is confirmed to be a gender-based violence perpetrator. The sanctions will be proportional to the transgression and in accordance with applicable laws and policies.	Contractor and Implementing Agencies	TNGCC
13.	Non- retaliation against workers who report violations, if that report is made in good faith.	Contractor and Implementing Agencies	TNGCC
14.	Popularise and communicate about the Internal Committee (IC) as per provisions contained in Section 4 of the Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal) Act 2013 along with ToR of the Committee at head-quarters as well as division/ district offices. Additionally, information on Sexual Harassment electronic Box (SHe-Box) an online portal by MWCD, GoI will be provided. If any GBV/ SEA/ SH related grievances are received by the GRCs, the same will be forwarded to the respective ICs.	Contractor and Implementing Agencies	TNGCC
15.	Include Self-help groups, particularly those led by women, might serve as effective channels for conducting SEA/SH awareness programs.	Contractor and Implementing Agencies	TNGCC
16.	Train project personnel on GBV/ SEA/ SH/ VAC and redressal / referral mechanism/including GRM personnel. Training of project personnel on GBV/ SEA and grievance redressal/ referral mechanism, including GRM committee members and personnel Awareness programs and FGDs will be conducted with STs, SCs, OBCs communities on SEA/SH and grievance redressal/ referral mechanism.	Contractor and Implementing Agencies	TNGCC
17.	Inform and consult those affected by the project, of the SEA/SH risks and project activities	Contractor and Implementing Agencies	TNGCC
18.	Develop IEC materials for awareness on GBV risks and measures to mitigate or respond including information on SHe-Box Online Complaint Management System http://www.shebox.nic.in/	Implementing Agencies	TNGCC
19.	Address SEA/ SH issues in regular meetings to keep the local communities and other stakeholders informed about project activities	Contractor and Implementing Agencies	TNGCC
20.	Ensure Codes of Conduct (CoC) are clearly understood and signed by Contractors/ staff/ officials; Train staff/ officials on CoC	Contractor and Implementing Agencies	TNGCC

Sr No.	Mitigation Measures	Responsibility	Supervision
21.	Implement appropriate project-level activities such as: • Separate, safe and easily accessible facilities for women and men in the place of work and the labour camps. (e.g. toilets should be located in separate areas, well-lit) • Display signs that the project site is an area where SEA/SH is prohibited.	Contractor and Implementing Agencies	TNGCC
22	Designate Social Expert in TNGCC to supervise all SEA/SH actions during preparation and implementation	throughout project implementation	TNGCC
23	Evaluate Contractor's SEA/SH accountability and response framework	Before contract signing	TNGCC with support from WB
24	Review C-ESMP, where applicable	Before commencement of activity	TNGCC with support from WB
25	Report in the quarterly progress report and also during Bank's Implementation Support Mission	All phases	TNGCC

19. ANNEXURE 8

The baseline studies are required for any development/ project that has the potential to impact the existing environment or if the environment has the potential to affect the sensitive development. The baseline in the ESMF can use as an example and guide for the baseline preparation of other subprojects that require ESIA (Substantial risk subproject).

Annexure 9-1 Baseline Air Environment Results

Air Environment

Ambient air quality of has been studied for the area of Thazankuppam in Chennai, Nagapattinam, Manavalakurichi in Kanniyakumari. The monthly trend of PM₁₀, PM_{2.5} Nitrogen Dioxide (NO₂) & Sulphur Dioxide (SO₂) was found within permissible limit of CPCB standard. Overall the project area maintains good constant air quality and satisfactory category.

Table 19-1 Ambient Air Quality monitoring locations

Location Code	Locations	Latitude	Longitude
AAQ1	Thazankuppam, Ennore, Chennai	13°13'48.08"N	80°19'42.17"E
AAQ2	Nagapattinam	10°45'52.24"N	79°50'35.75"E
AAQ3	Manavalakurichi, Kanniyakumari	8° 8'52.97"N	77°18'2.66"E

Table 19-2 Analysis of Ambient Air Quality Parameters (NAAQS)

S.No	Parameters	NAAQ standards: 2009	
1	Sulphur Dioxide (SO ₂), µg/m ³	50 (Annual)	80 (24 Hours)
2	Nitrogen Dioxide(NO ₂), µg/m ³	40 (Annual)	80 (24 Hours)
3	Particulate Matter (PM _{2.5}), µg/m ³	40(Annual)	60 (24hours)
4	Particulate Matter (PM ₁₀), µg/m ³	60 (Annual)	100 (24 hours)
5	CO, mg/m ³	2 (8 hours)	4 (1hour)
6	Pb, µg/m ³	0.5 (Annual)	1(24 hours)
7	O ₃ , µg/m ³	100 (8hours)	180 (1hour)
8	NH ₃ , µg/m ³	100 (Annual)	400 (24 hours)
9	Benzene, µg/m ³	5 (Annual)	5 (Annual)
10	Benzo (a) pyrene, ng/m ³	1 (Annual)	1 (Annual)
11	Arsenic, ng/ m ³	6 (Annual)	6 (Annual)
12	Nickel, ng/ m ³	20 (Annual)	20 (Annual)

Table 19-3 Summary of Ambient Air Quality

Code	Location	PM _{2.5} (µg/m ³)				PM ₁₀ (µg/m ³)				SO ₂ (µg/m ³)				NO ₂ (µg/m ³)				CO (mg/m ³)			
		Min	Max	Mean	98%	Min	Max	Mean	98%	Min	Max	Mean	98%	Min	Max	Mean	98%	Min	Max	Mean	98%
AAQ1	Thazankuppam	21	27	23.50	26.86	43	56	49	55.58	7.9	9.8	8.89	9.77	15.4	18.2	16.89	18.19	0.11	0.21	0.16	0.21
AAQ2	Nagapattinam	23	30	26.25	29.72	48	63	56	62.58	7.80	10.4	9.25	10.36	16.9	20.3	18.63	20.23	0.13	0.23	0.18	0.23
AAQ3	Manavalakurichi	19	25	22.25	24.86	39	53	47	52.86	5.40	7.10	6.20	7.06	13.6	16.7	15.06	16.67	0.12	0.26	0.18	0.25
Industrial/Residential /Rural and other Area (CPCB)		60				100				80				80				2			

Code	Location	NH ₃				O ₃				Lead				Benzene				Bap			
		Min	Max	Mean	98%	Min	Max	Mean	98%	Min	Max	Mean	98%	Min	Max	Mean	98%	Min	Max	Mean	98%
AAQ1	Thazankuppam	BDL(<5)				12.8	14.9	13.64	14.82	BDL(<0.1)				BDL(<0.1)				BDL(<0.01)			
AAQ2	Nagapattinam	BDL(<5)				12.90	15.20	13.91	15.10	BDL(<0.1)				BDL(<0.1)				BDL(<0.01)			
AAQ3	Manavalakurichi	BDL(<5)				11.70	13.60	12.61	13.56	BDL(<0.1)				BDL(<0.1)				BDL(<0.01)			
Industrial/Residential /Rural and other Area (CPCB)		400				100				1				5				1			

Summary

The study area for the PM₁₀, PM_{2.5}, Nitrogen dioxide (NO₂) and Sulphur dioxide (SO₂) was found within permissible limit of CPCB standard.

Annexure 9-2: Baseline Noise Environment Result

Noise environment

The main objective of monitoring of ambient noise levels was to establish the baseline noise levels in the surrounding areas and to assess the total noise level in the environment of the study area.

Table 19-4 Noise Quality Monitoring Locations

Sampling Location Code & Name	Location	Zone	Coordinates	
			Latitude	Longitude
N1	Thazankuppam, Ennore	Residential Area	13°13'48.08"N	80°19'42.17"E
N2	Nagapattinam	Residential Area	10°45'52.24"N	79°50'35.75"E
N3	Manavalakurichi	Residential Area	8° 8'52.97"N	77°18'2.66"E

Table 19-5 Ambient Noise Level

S. No.	Location code	Location	Zone	LIMIT (as per CPCB Guidelines)Leq dB(A)		Observed value		
				DAY*	NIGHT**	DAY* Lday [dB(A)]	NIGHT** L night [dB(A)]	Leq [dB(A)]
1	N1	Thazankuppam, Ennore	Residential	55	45	54.7	43.1	53.2
2	N2	Nagapattinam	Residential	55	45	54.3	44.5	55.8
3	N3	Manavalakurichi	Residential	55	45	53.6	44.2	52.1

Note: *Daytime shall mean from 6.00 a.m. to 10.00 p.m.

**Night time shall mean from 10.00 p.m. to 6.00 a.m.

Summary

The study area for the project was found within permissible limit.

Annexure 9-3: Baseline Soil Environment Results

Soil Characteristics

It is essential to determine the potential of soil in the area and identify the current impacts of urbanization on soil quality and also predict impacts, which may arise due to the project. Accordingly, a study of assessment of the baseline soil quality has been carried out.

Table 19-6 Details of Soil Sampling Locations

CodeNo	Location	Latitude	Longitude
S1	Thazankuppam, Ennore	13°13'48.08N	80°19'42.17"E
S2	Nagapattinam	10°45'52.24"N	79°50'35.75"E
S3	Manavalakurichi	8° 8'52.97"N	77°18'2.66"E

Table 19-7 Details of Soil Results

S.No	Parameters	Unit	Test Methods	S1	S2	S3
1	pH	-	IS-2720(Part 26) 1987(RA 2011)	7.91	8.27	7.11
2	Bulk Density	g/cc	FAO Chapter 3, ABCTL/SOIL/SOP 1	1.46	1.26	1.48
3	Electrical Conductivity	ms/cm	IS-14767:2000 (RA 2010)	0.569	0.478	0.296
4	Total Nitrogen as N	kg/ha	IS-14684:1999, Reaff:2008	66	154	48
5	Available Phosphorous as P	kg/ha	FAO Chapter 3, ABCTL/SOIL/SOP 2	32.8	52.3	25.8
6	Available Potassium as K	kg/ha	FAO Chapter 3, ABCTL/SOIL/SOP 7	374	314	374
7	Exchangeable Calcium as Ca	m.eq/100g	FAO Chapter 3, ABCTL/SOIL/SOP 4	16.2	21.4	14.1
8	Exchangeable Magnesium as Mg	m.eq/100g	FAO Chapter 3, ABCTL/SOIL/SOP 5	5.96	6.78	3.98
9	Exchangeable Sodium as Na	m.eq/100g	FAO Chapter 3, ABCTL/SOIL/SOP 6	2.31	1.48	1.81
10	Organic matter	%	IS 2720 (Part 22):1972, Reaff:2010	0.61	0.96	0.58
11	Texture Classification	-	Robinson Pipette Method	Loamy Sand	Clay	Loamy Sand
12	Sand	%		88.4	25.6	78.5
13	Clay	%		9.1	61.3	0.9
14	Silt	%		2.5	13.1	20.6

Result

The study are for the project was found within permissible limit and suitable for plantations.

Annexure 9-4: Baseline Water Environment Results

(Groundwater, Surface Water, Marine Water & Marine Sediments)

Water Quality

Selected water quality parameters of ground water resources and surface water resources within 10-km radius of the study area has been studied for assessing the water environment and to evaluate anticipated impact of the project. The purpose of this study is to: Assess the water quality characteristics for critical parameters;

- Evaluate the impacts on agricultural productivity, habitat conditions, recreational resources and aesthetics in the vicinity; and
- Predict impact on water quality by this project and related activities.
- The information required has been collected through primary surveys and secondary sources.

Table 19-8 Water Sampling Locations

Location Code	Locations	Latitude	Longitude
Ground water			
GW1	Thazankuppam, Ennore	13°13'48.08"N	80°19'42.17"E
GW2	Nagapattinam	10°45'52.24"N	79°50'35.75"E
GW3	Manavalakurichi	8° 8'52.97"N	77°18'2.66"E
Surface water			
SW1	Madhavaram Lake	13°12'9.78"N	80°15'9.66"E
SW2	Kaduvaiyar (Vadavoor)	10°42'53.89"N	79°48'46.39"E
SW3	Valliyaru	8°10'55.59"N	77°19'5.75"E

Table 19-9 Presentation of Groundwater Results

S. No	Parameters	Unit	Limits as per IS 10500:2012		GW1	GW2	GW3
			Acceptable	Permissible			
1	Colour	Hazen	5	15	<1	2	<1
2	Odour	-	Agreeable	Agreeable	No Odour Observed		
3	Turbidity	NTU	1	5	BDL(<0.5)	1	BDL(<0.5)
4	pH at 25 °C	-	6.5-8.5	No Relaxation	7.96	8.14	7.64
5	Electrical Conductivity @25°C	µS/cm	Not Specified	Not Specified	2230	3060	1310
6	Total dissolved solids	mg/l	500	2000	1296	1812	788
7	Total Suspended solids	mg/l	Not Specified	Not Specified	<2		
8	Total Alkalinity as CaCO ₃	mg/l	200	600	370	480	280
9	Total Hardness as CaCO ₃	mg/l	200	600	650	672	330
10	Calcium as Ca	mg/l	75	200	134	142	77
11	Magnesium as Mg	mg/l	30	100	76	84	33
12	Chloride as Cl ⁻	mg/l	250	1000	411	687	224
13	Sulphate as SO ₄	mg/l	200	400	138	158	92
14	Nitrate as NO ₃	mg/l	45	No Relaxation	11		3
15	Iron as Fe	mg/l	0.3	No Relaxation	0.15	0.16	0.05
16	Manganese as Mn	mg/l	0.1	0.3	BDL(<0.01)		
17	Fluoride as F	mg/l	1	1.5	0.33	0.41	0.36
18	Sodium as Na	mg/l	Not Specified	Not Specified	256	420	180
19	Potassium as K	mg/l	Not Specified	Not Specified	6	4.8	3.5
20	Barium as Ba	mg/l	0.7	No Relaxation	BDL(<0.1)		
21	Residual free Chlorine as Cl ₂	mg/l	0.2	1	BDL(<0.1)		
22	Aluminum as Al	mg/l	0.03	0.2	BDL(<0.03)		
23	Cadmium as Cd	mg/l	0.003	No Relaxation	BDL(<0.003)		

S. No	Parameters	Unit	Limits as per IS 10500:2012		GW1	GW2	GW3
			Acceptable	Permissible			
24	Lead as Pb	mg/l	0.01	No Relaxation	BDL(<0.01)		
25	Copper as Cu	mg/l	0.05	1.5	BDL(<0.03)		
26	Zinc as Zn	mg/l	5	15	0.06	0.11	0.05
27	Total Chromium as Cr	mg/l	0.05	No Relaxation	BDL(<0.03)		
28	Arsenic as	mg/l	0.01	0.05	BDL(<0.01)		
29	Cyanide as CN	mg/l	0.05	No Relaxation	BDL(<0.05)		
30	Selenium as Se	mg/l	0.01	No Relaxation	BDL(<0.01)		
31	Mercury as Hg	mg/l	0.001	No Relaxation	BDL(<0.001)		
32	Anionic Surfactants as MBAS	mg/l	0.2	1	BDL(<0.025)		
33	Phenolic Compounds as Phenol	mg/l	0.001	0.002	BDL(<0.001)		
34	Pesticides	mg/l	Absent	Absent	Absent		
35	Total Coliforms	MPN/100ml	Absent/100 ml	Absent/100 ml	<2		
36	E.Coli	MPN/100ml	Absent/100 ml	Absent/100 ml	<2		

BDL: Below detection limit

Table 19-10 Details of Surface Water Results

S. No.	Parameters	Unit	SW1	SW2	SW3
1.	Temperature	°C	26.6	25.6	29.9
2.	Colour	Hazen	15	15	10
3.	Odour	-	No Odour Observed		
4.	pH at 25°C	-	7.94	7.84	7.94
5.	Electrical Conductivity	µS/cm	468	574	705
6.	Turbidity	NTU	8.6	6.6	3.3
7.	Total Dissolved Solids	mg/l	256	332	398
8.	Total Hardness as CaCO ₃	mg/l	98	160	150
9.	Total Alkalinity as CaCO ₃	mg/l	110	142	144
10.	Chloride as Cl	mg/l	71	84	123
11.	Sulphate as SO ₄	mg/l	17	32	32
12.	Fluoride as F	mg/l	0.14	0.11	0.16
13.	Nitrate as NO ₃	mg/l	3	12	11
14.	Ammonia as NH ₃	mg/l	0.22	0.14	0.24
15.	Phosphate as PO ₄	mg/l	0.41	0.26	0.58
16.	Sodium as Na	mg/l	50	58	29.9
17.	Potassium as K	mg/l	5.6	3.5	4.5
18.	Calcium as Ca	mg/l	27	48	41
19.	Magnesium as Mg	mg/l	7.4	10	12
20.	Iron as Fe	mg/l	0.21	0.14	0.23
21.	Manganese as Mn	mg/l	0.02	0.04	BDL(<0.01)
22.	Anionic Surfactants as MBAS	mg/l	BDL(<0.025)		
23.	Total Suspended Solids	mg/l	8	5	2
24.	Dissolved Oxygen as O ₂	mg/l	6.5	5.6	6
25.	Chemical Oxygen Demand	mg/l	18	20	18

S. No.	Parameters	Unit	SW1	SW2	SW3
26.	Bio-Chemical Oxygen Demand @ 27°C for 3 days	mg/l	2.2	2.6	2
27.	Phenolic compounds as C ₆ H ₅ OH	mg/l	BDL(<0.001)		
28.	Copper as Cu	mg/l	BDL(<0.03)		
29.	Mercury as Hg	mg/l	BDL(<0.001)		
30.	Cadmium as Cd	mg/l	BDL(<0.003)		
31.	Selenium as Se	mg/l	BDL(<0.01)		
32.	Total Arsenic as As	mg/l	BDL(<0.01)		
33.	Cyanide as CN	mg/l	BDL(<0.02)		
34.	Lead as Pb	mg/l	BDL(<0.01)		
35.	Zinc as Zn	mg/l	0.10	0.10	0.03
36.	Total Chromium as Cr	mg/l	BDL(<0.03)		
37.	Nickel as Ni	mg/l	BDL(<0.02)		
38.	Oil & Grease	mg/l	BDL(<1)		
39.	Total Coliform	MPN/ 100ml	>1600		
40.	Faecal Coliform	MPN/ 100ml	>1600		350

BDL: Below detection limit

Marine Water

One-time marine water monitoring was conducted by qualified Marine Expert of ABC Techno Labs India Pvt Ltd, Chennai. Samples of marine water for analysis were collected at three (3) selected locations using a 5L Van Dorn Water Sampler (PARTEX make) for analyzing major physio-chemical and biological parameters.

Table 19-11 Marine Water Sampling Location

Monitoring location Code	Latitude	Longitude	Water Depth
MW1	13°13'46.96"N	80°22'57.20"E	Surface
MW2	10°44'30.52"N	79°51'31.31"E	Surface
MW3	8° 7'27.70"N	77°19'0.75"E	Surface

Table 19-12 Marine Water Results

S.No	Parameter	Unit	Test Method	MW1 Surface	MW2 Surface	MW3 Surface
1	Temperature	°C	APHA 23rd EDITION	26.8	27.1	28.1
2	Phosphate as PO ₄	mg/l	IS:3025:Part-31:1988 (Reaff:2019)	0.10	0.12	0.11
3	Turbidity	NTU	IS : 3025 Part 10-1987 (Reaff: 2017)	3.7	3.9	2.8
4	pH at 25 °C	-	IS : 3025 Part 11- 1987 (Reaff: 2017)	8.17	8.11	8.19
5	Salinity	0‰	APHA 22 nd EDITION-2520B	33.1	29.6	34
6	Nitrate as NO ₃	mg/l	APHA 23rd EDN -4500- NO ₃ -B	3	2.4	2.4
7	Iron as Fe	mg/l	IS : 3025 Part 53-1987 (Reaff:2019)	BDL(<0.05)		
8	Manganese as Mn	mg/l	APHA 23rd EDN -3500-Mn D	BDL(<0.02)		
9	Nickel as Ni	mg/l	APHA 23rd EDN -3111 B	BDL (<0.02)		
11	Cadmium as Cd	mg/l	APHA 23rd EDN -3111 B	BDL(<0.01)		
12	Lead as Pb	mg/l	IS:3025 Part 47-1987 (Reaff:2019)	BDL(<0.01)		

S.No	Parameter	Unit	Test Method	MW1 Surface	MW2 Surface	MW3 Surface
13	Copper as Cu	mg/l	APHA 23rd EDN -3111 B	BDL(<0.03)		
14	Zinc as Zn	mg/l	IS:3025 Part:49-1987 (Reaff:2019)	0.08	0.10	0.06
15	Total Chromium as Cr	mg/l	APHA 23rd EDN -3111 B	BDL(<0.03)		
16	Arsenic as As	mg/l	IS:3025 Part:37-1987 (Reaff:2019)	BDL(<0.01)		
17	Mercury as Hg	mg/l	IS:3025 Part 48-1987 (Reaff:2019)	BDL(<0.001)		
18	Total Nitrogen as N	mg/l	IS 3025 Part 34 (Reaff:2019)	4	4	2.9
19	Dissolved Oxygen as O ₂	mg/l	IS 3025 Part 38 (Reaff:2019)	6.5	6.8	6.4
20	Biochemical Oxygen Demand @ 27 for 3 days	mg/l	IS 3025 Part 44 (Reaff:2019)	<2		
21	Total Suspended Solids	mg/l	IS : 3025 Part 17-1984	4	5	3
22	Nitrite as NO ₂	mg/l	APHA 22 nd EDN-4500- NO ₂ ⁻ B	0.03	0.09	0.05
23	Total Petroleum Hydrocarbon	mg/l	ABCTL/INS/SOP/31	BDL(<0.001)		

Marine Sediment

Geochemical and texture analysis were carried out for understanding the characteristics of sediments. Metals such as Cadmium (Cd), Copper (Cu), Chromium (Cr), Iron (Fe), Manganese (Mn), Nickel (Ni), Zinc (Zn), Lead (Pb) were estimated from all the stations. Grain size analyses were accomplished to determine the contribution of various sediment components such as sand, silt and clay. In addition, samples of benthos from the sediments were also collected. Marine sediment quality monitoring was carried out at 3 (Three) locations in the study area to understand the physical and chemical characteristics of the sediments.

Table 19-13 Marine Sediment sampling locations

Location Code	Latitude	Longitude
MS1	13°13'46.96"N	80°22'57.20"E
MS2	10°44'30.52"N	79°51'31.31"E
MS3	8° 7'27.70"N	77°19'0.75"E

Table 19-14 Marine Sediment Results

Sl. No	Parameter	Test Method	Unit	S1	S2	S3
1.	pH	IS -2720(Part 26) 1987(RA 2016)	-	7.86	7.71	7.68
2.	Total Organic Carbon as C	IS 2720 (Part 22):1972 (RA 2015)	%	2.01	1.96	2.86
3.	Phosphorous as P	EPA 3050 B & FAO Chapter 3/ ABCTL/SOIL SOP02	mg/kg	91	108	148
4	Zinc as Zn	EPA3050 B & 7000 B	mg/kg	83	77	74
5.	Cadmium as Cd	EPA3050 B & 7000 B	mg/kg	BDL(<2)		
6.	Copper as Cu	EPA3050 B & 7000 B	mg/kg	32.8	32.8	23.6
7.	Lead as Pb	EPA3050 B & 7000 B	mg/kg	8.78	8.71	4.96
8.	Mercury as Hg	EPA3050 B & 7000 B	mg/kg	BDL(<1)		
9.	Chromium as Cr	EPA3050 B & 7000 B	mg/kg	31.7	21.3	17.3
10.	Iron as Fe	EPA3050 B & 7000 B	mg/kg	471	474	348
11.	Arsenis as As	EPA3050 B & 7000 B	mg/kg	BDL(<2)		
12.	Manganese as Mn	EPA3050 B & 7000 B	mg/kg	124	112	96
13.	Nickel as Ni	EPA3050 B & 7000 B	mg/kg	BDL(<2)		
14.	Total Petroleum Hydrocarbon	ABCTL/INS/SOP/31	mg/kg	BDL (<0.05)		

BDL: Below detection limit