

**Tamil Nadu Sustainably Harnessing Ocean Resources and Blue
Economy (TN-SHORE) (with the financial support from
the World Bank)**

Environment and Social Due Diligence Report

For

International Dugong Conservation Centre at Manora, Thanjavur, Tamil Nadu



MARCH 2024

**DFO, THANJAVUR
DEPARTMENT OF FORESTS
GOVERNMENT OF TAMIL NADU**

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ACRONYMS

EIA	Environmental Impact Assessment
ESDD	Environmental and Social Due Diligence
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
ESZ	Eco Sensitive Zone
GBV	Gender -Based Violence
GoI	Government of India
GRS	Grievance Redress Service
IUCN	International Union for Conservation of Nature
IA	Implementing Agency
LMP	Labour Management Plan
M&E	Monitoring and Evaluation
NPMU	National Project Management Unit
OHS	Occupational Health & Safety
PA	Protected Area
PD	Project Director
RCP	Resource Conservation Plan
RET	Rare Endangered Threatened
SC	Scheduled Caste
SEP	Stakeholder Engagement Plan
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
SPMU	State Project Management Unit
ST	Scheduled Tribe
T	Tribal Presence
TORs	Terms of Reference
WB	The World Bank

International Dugong Conservation Centre at Manora, Thanjavur, Tamil Nadu

Executive Summary

The Government of Tamil Nadu, supported by the World Bank, is establishing the International Dugong Conservation Centre (IDCC) at Manora, Thanjavur, as part of the TN-SHORE project to enhance coastal resilience and advance a sustainable blue economy. This Environment and Social Due Diligence Report (ESDDR) analyses the environmental and social impacts associated with constructing and operating the IDCC, designed to conserve the endangered Dugong and its habitat, promote eco-tourism, and engage the community.

The IDCC, spread over 24,350 sq m along Manora, is set to feature a Dugong-shaped main building, a museum, interactive displays, and incorporates eco-friendly elements such as solar power and water recycling systems. Located near critical Dugong habitats in Palk Bay, which houses significant seagrass beds essential for the species' survival, the project's proximity to sensitive ecological zones and cultural heritage sites like Manora Fort presents moderate environmental and social risks. These risks primarily involve potential impacts on local biodiversity and cultural assets.

A comprehensive Environmental and Social Management Plan (ESMP) has been developed to mitigate these risks, including adopting best construction practices to minimize ecological disruption and stringent waste management protocols. The plan also includes strategies to manage the influx of tourists and ensure the protection of natural resources. To ensure ongoing compliance and effective site management, capacity-building efforts are recommended, along with involving local stakeholders in conservation efforts and enhancing public awareness about Dugong conservation.

Extensive stakeholder consultations have revealed strong community support for the project, emphasizing the need for careful management of construction activities and tourist access to minimize disruption to local livelihoods and ecological integrity. The ESDDR ensures that potential adverse impacts are effectively managed, aligning the project with global conservation standards and local community interests, thus paving the way for its success.

1.0 INTRODUCTION

1.1 Project Overview

The TN-SHORE project, initiated by the Government of Tamil Nadu and supported by funding from the World Bank, is designed to enhance the resilience and sustainable utilization of coastal resources through a comprehensive, multi-sectoral approach. This initiative aims to promote resilient and circular blue economy, empower local livelihoods, and build capacities for a more sustainable future. To achieve these goals, the project has outlined five thematic investment areas prioritized for their strategic impact on coastal management and economic development:

Component 1: Strengthening Institutions for Integrated Coastal Management: This component is dedicated to enhancing institutional capabilities for holistic coastal zone management and governance. It aims to establish robust frameworks and systems for effective coordination and implementation of coastal management strategies.

Component 2: Shoreline Management and Coastal Protection: Focused on bolstering coastal resilience, this component invests in two critical areas: 1) Erosion Control and Management, aimed at mitigating shoreline erosion and preserving coastal integrity, and 2) Marine Biodiversity and Ecology Conservation, aimed at protecting and conserving marine ecosystems and biodiversity.

Component 3: Improving Livelihoods for Natural Resource-Dependent Communities: This component supports initiatives that promote alternative and sustainable livelihoods for communities reliant on coastal resources. Key activities include the development of nature tourism and the upgrading of fishing harbors and landing centres to enhance economic opportunities for local communities.

Component 4: Reducing Plastic Waste and Pollution through Enhanced Circularity: Addressing the issue of plastic pollution in coastal and marine environments, this component emphasizes the management and reduction of plastic waste through an ecosystem-centred approach. Activities include identifying plastic waste hotspots, investing in river system management, and establishing a digital waste exchange platform to promote plastic circularity.

Component 5: Project Management: This component covers the operational expenses of the project, including procurement, rental, and staffing, to ensure efficient and effective project implementation.

Component 6: Contingency Emergency Response Component (Zero Budget): This component is a provision for rapid response in the event of unforeseen emergencies, enabling swift action to mitigate impacts and ensure project continuity.

These components collectively aim to integrate environmental sustainability with economic development, creating a robust framework for the long-term preservation and enhancement of Tamil Nadu's coastal resources.

1.2 Sub-Project Description

The Sea Cow, or Dugong, is the sole existing species of herbivorous mammal inhabiting Indian sea waters. Classified as a protected species, the Dugong is found in the Gulf of Mannar, Palk Bay, Gulf of Kutch, and the Andaman and Nicobar Islands. However, the population and habitat of the Dugong are in a state of decline due to several factors such as loss of seagrass habitat, gill netting, disease, water pollutants, indigenous use, and poaching. In the Palk Bay region, critical habitat areas including Dhanushkodi, Rameshwaram, Devipattinam, and several other locations are not currently designated as Protected Areas, highlighting the urgent need for focused conservation efforts.

Palk Bay, renowned for its extensive seagrass beds which serve as the primary food source for the Dugong, is also a vital fishing area. Occasionally, Dugongs become entangled in fishing nets and are washed ashore, sometimes alive. When found alive, these Dugongs are rescued by local fishermen and released back into the sea. To raise awareness among the local communities, fishermen, and the general populace, the establishment of a Dugong Conservation Centre at Manora, Palk Bay, is proposed. This centre will focus on research and education concerning the Dugong and its habitat, and will feature exhibits on the importance of protecting both the Dugong and seagrass beds.

The proposed site at Manora is ideal due to its existing seagrass beds and frequent Dugong sightings, coupled with attractions like Manora Fort and local boating activities, which draw regular visitors from the surrounding areas. The main objective of this project is to create a lasting institutional framework for the management of a Dugong Conservation Reserve in Palk Bay, instilling conservation values for Dugongs as well as other endangered marine flora and fauna. The Conservation Centre is designed to promote awareness and facilitate research. Figure 1.1 illustrates the location of the project site as seen on Google Earth, while Figures 1.2 and 1.3 provides a more detailed view of the specific sub-project area, also via Google Earth imagery.

Table 1.1: Key Details of the International Dugong Conservation Centre	
Attribute	Details
State	Tamil Nadu
District	Thanjavur
Project	International Dugong Conservation Centre
Estimated Project Cost	Rs. 79 Crores
Location	Manora (Sarabendrarajapattinam), 20 km from Pattukkottai, 65 km from Thanjavur, on the shores of the Bay of Bengal
Proximity to Infrastructure	650 m from ECR Road, 44 km from Tiruchirapalli Airport
Tourism Connectivity	En-route to Velankanni church, attracting 15-20 million annual visitors from southern Tamil Nadu and Kerala
Geographic Coordinates	Latitude: 10° 15' 59" N, Longitude: 79° 18' 17" E
Coastal Regulation Zone (as per CRZ 2011/2019 notification)	CRZ III A (based on population density)
Tourist Features Nearby	Manora Fort (143 m away); Weekday visitors: 500; Weekend visitors: 2000-3000; Expected visitors in initial year: 10 lakhs
Site Area	24,350 sq m; flat terrain with a slight seaward slope; requires filling to mitigate seawater intrusion
On-site Facilities	Snacketeria, boat jetty, electrical line crossing, layered with field and tree layers
Building Design and Area	Public Zone, Semi-Public Zone, Private Zone; Total area: 4,145 sq m
Estimated Occupancy Load	2,027 people (1,351 males and 676 females), excluding cottages
Eco-friendly Design Features	Passive solar design, energy-efficient HVAC, natural daylighting, solar power generation, low-flow water fixtures, rainwater harvesting, smart irrigation, greywater management, sustainable material use, low-VOC emissions, waste management and recycling, permeable surfaces for water recharge, smart building technology
Disaster Resilience Features	Roof forms with minimal overhangs, curved building shapes for wind resistance, compliance with National Building Code for cyclone-prone areas
Scientific and Educational Attractions	Tunnel Aquarium, Seagrass Research Laboratory, Multi-Touch Interactive Displays, Digital Immersive Aquarium, 4D Theatre, Seagrass Cultivation Lab, Seagrass Experiment Lab with wave flume

Fig.1.1: Location of Project Site on Google Earth

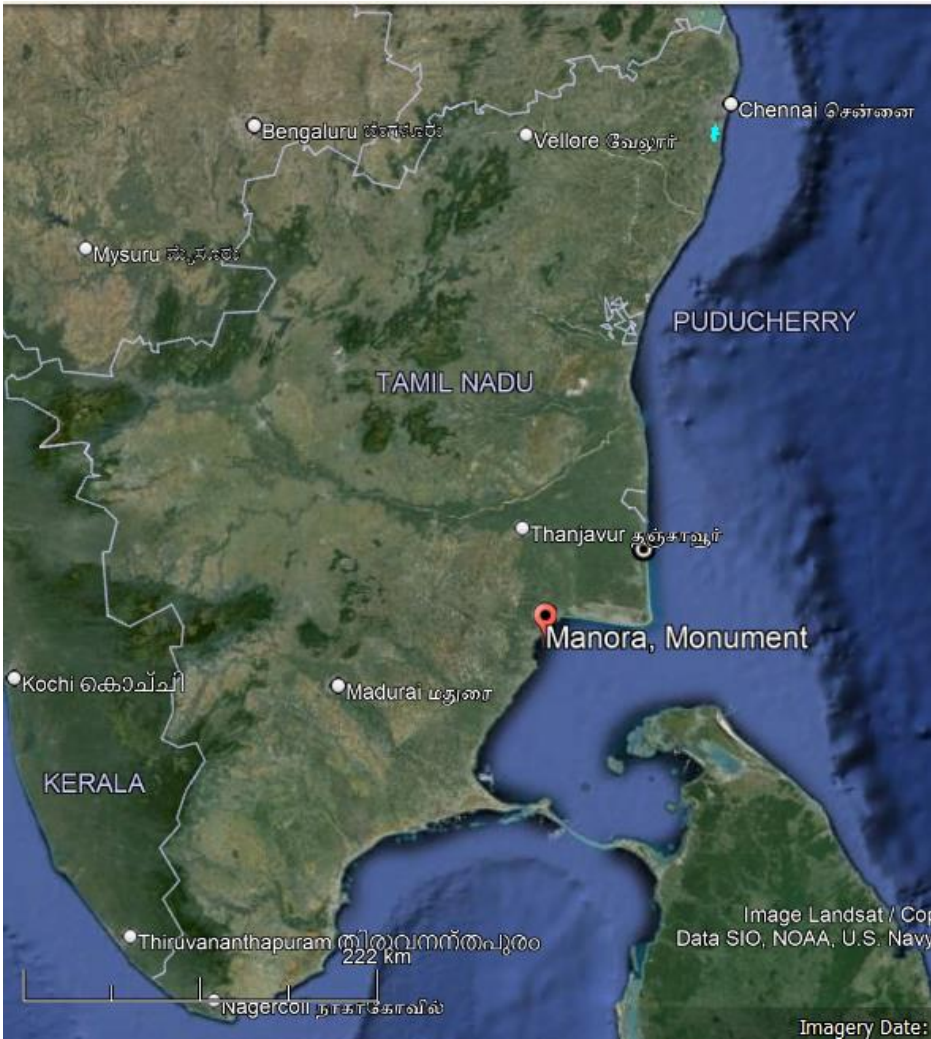


Fig.1.2: Detailed Aerial View of Project Site (Photo dated 29 Nov 2023)



Fig. 1.3: Close-up View of Project Site at Manora on Google Earth



1.3 Proposed Interventions/ Activities and Intended Outcomes

The strategic interventions and activities planned for the International Dugong Conservation Centre are outlined as follows, each designed to achieve specific conservation and educational outcomes:

A. Establishment of the International Dugong Conservation Centre:

- Public Zone:** The centrepiece is the Dugong-shaped main building (Figure 1.4), which houses display and office spaces, a Tunnel Aquarium, a 7D Theatre with digital immersive technology, a Museum, a 4D Theatre, a park, a cafeteria, an Open Air Theatre (OAT), parking facilities, a souvenir shop, selfie points, water points, washrooms, and a grand entrance plaza. This zone is intended to engage the public in interactive and educational experiences that promote awareness of marine conservation.
- Semi-Public Zone:** This area includes a training centre, a Dugong monitoring lab, and seagrass research laboratories. It serves as a hub for educational and research activities, facilitating both professional training and scientific study to support the conservation of the Dugong and its habitat.

- **Private Zone:** Comprising 26 cottages, staff accommodation, and service spaces, this zone is designed to support the needs of researchers and operational staff, ensuring that conservation and educational activities can be conducted efficiently and without interruption.

B. Mangrove Eco Walk Trails:

Accessible via a bridge across the existing stream of backwaters, this feature includes walking tracks, gazebos, a rope bridge, sea view decks, and the Eco Tower as a focal linear structure (Figures 1.5 and 1.6). These trails are aligned with the existing mangrove vegetation and are intended to provide visitors with a hands-on learning experience about mangrove ecosystems and their role in coastal ecology. The trails aim to enhance visitors' appreciation of these critical habitats and promote environmental stewardship. Each of these interventions is designed to integrate seamlessly with the natural and cultural landscape of the area, maximizing educational opportunities and encouraging community engagement in conservation efforts. The intended outcome is to establish a sustainable model for marine conservation education and to promote a deeper public understanding and commitment to protecting vulnerable marine species and their habitats.

Fig. 1.4: Architectural Design of the International Dugong Conservation Centre, Manora — Highlighting Key Zones and Layout.



Fig. 1.5: Integrated Design of the International Dugong Conservation Centre with Mangrove Eco Trails at Manora — Site Overview



Fig. 1.6: Aerial Drone View of the Dugong Conservation Centre and Adjacent Mangrove Eco Trails at Manora, captured on 11th August 2023 — Displaying the Interaction Between Built and Natural Environments.



1.4 Implementation Arrangements and Schedule

The implementation of the International Dugong Conservation Centre (IDCC) is entrusted to the Forest Department of Tamil Nadu, operating under the management of the District Forest Officer in Thanjavur. The project's execution timeline is set to span a total of 30 months commencing in June 2024. This structured timeline ensures that all phases of construction and development are aligned with our strategic goals for both environmental conservation and community engagement. The scheduling has been meticulously planned to accommodate the various complexities involved in establishing a state-of-the-art conservation facility, ensuring that all operational, educational, and research activities begin as projected without delay.

1.5. Purpose of ESDD

The Environment and Social Due Diligence (ESDD) for the TN-SHORE project, which aims to strengthen coastal resilience and the economy, is a critical component in managing the **Substantial Risks** identified under the World Bank's internal Environment and Social Risk Classification. The ESDD serves as a strategic tool for informed decision-making on the sub-project, adhering to the Environmental and Social Standards (ESS) of the Bank's Environmental and Social Framework (ESMF). The specific objectives of the ESDD are outlined as follows:

- a) **Risk Identification and Management:** Systematically identify, evaluate, and manage the environmental and social risks and impacts of the sub-project, ensuring alignment with the ESS of the Bank's ESMF.
- b) **Mitigation Hierarchy:** Employ a mitigation hierarchy approach to address the project's environmental and social risks and impacts. This involves:
 - Anticipating and avoiding risks and impacts where possible.
 - Minimizing or reducing risks and impacts to acceptable levels when avoidance is not feasible.
 - Mitigating impacts once they have been minimized or reduced.
 - Compensating for or offsetting significant residual impacts, where technically and financially feasible.
- c) **Equitable Impact Management:** Identify differentiated impacts on disadvantaged or vulnerable populations and devise specific measures to mitigate these impacts effectively.

- d) Institutional Relevance and Applicability:** Evaluate the relevance and applicability of environmental and social institutions, systems, laws, regulations, and procedures in the assessment, development, and implementation of the project, identifying any gaps and suggesting measures to address them.
- e) Capacity Assessment:** Analyse the borrower's existing capacities and identify gaps, subsequently outlining strategies for capacity enhancement to manage environmental and social risks effectively.
- f) Risk and Impact Categorization:** Determine the categorization of environmental and social risks and impacts for the Dugong sub-project. Based on this categorization, decide whether an Environmental and Social Impact Assessment (ESIA) conducted by an independent third-party is necessary, or if a generic Environmental and Social Management Plan (ESMP) can be adequately customized to mitigate the identified risks and impacts.

Through these objectives, the ESDD ensures that the TN-SHORE project adheres to international standards while promoting sustainable and equitable development outcomes.

1.6. Approach and Methodology of ESDD

The ESDD for the TN-SHORE project employs a structured and systematic approach to ensure thorough evaluation and management of environmental and social risks. The methodology encompasses the following strategic steps:

- i. Detailed Project Analysis:** Examine all sub-project information, including proposed interventions, their scale, and geographic locations. Assess each intervention to gauge the magnitude of environmental and social (E&S) risks and impacts associated with them.
- ii. Regulatory Compliance Review:** Analyse the relevance and applicability of both national and state legal requirements alongside the World Bank's Environmental and Social Framework (ESF). Perform an initial assessment to determine how these legal and policy frameworks apply to the E&S aspects of the project.
- iii. Site Evaluation:** Conduct comprehensive site visits to directly observe the baseline environmental and social settings. This includes understanding the specifics of proposed activities, their settings, and any sensitive characteristics of the locations involved.

iv. Baseline Data Collection: Collect key baseline data critical for impact assessment, focusing on aspects such as land use, proximity to protected areas, and the presence of indigenous or vulnerable populations within the immediate vicinity of the project.

v. Institutional Capacity Assessment: Evaluate the existing capacities within relevant institutions and identify any gaps that could impede effective management of E&S risks and impacts. This assessment helps tailor capacity-building initiatives to bridge identified gaps.

vi. Stakeholder Consultations: Engage in preliminary consultations with potential stakeholders to disseminate information about the proposed interventions, gather feedback, identify concerns, and discuss suitable mechanisms for ongoing communication and engagement.

vii. Risk and Impact Screening: Perform a detailed, activity-wise environmental and social screening to identify specific risks and impacts. Classify the sub-project according to the risk level—low, moderate, substantial, or high—and propose corresponding mitigation plans or measures to address the identified risks and impacts appropriately.

This comprehensive methodology ensures that all environmental and social dimensions of the TN-SHORE project are meticulously assessed and managed, aligning with both local regulations and international standards to achieve sustainable development outcomes.

2.0 INSTITUTIONAL FRAMEWORK AND CAPACITY ASSESSMENT

2.1 Policy and Legal Framework

India boasts a comprehensive and well-defined environmental and social regulatory framework. The applicability of regulations depends on the nature of the work and its location. Legislation can broadly be categorized into four main areas: environmental, forests, wildlife conservation, and social issues. An analysis was conducted to determine how these regulations apply to the proposed project, including a review of the World Bank's Environmental and Social Framework (ESF), which consists of ten Environmental and Social Standards (ESSs) from ESS1 to ESS10. This analysis included a detailed comparison of national environmental and social regulations with the World Bank's ESS, accompanied by a gap analysis. Discussions on the applicability of Indian regulations, the World Bank's ESS, and the results of the gap analysis are included in the Environmental and Social Management Framework (ESMF).

The project aligns with various national and international policies and legislations. The National Environment Policy of 2006, for instance, aims to protect and conserve critical ecological systems and resources, along with natural and man-made heritages that are vital for life support, livelihoods, economic growth, and a broader conception of human well-being. Mangroves, significant ecosystems in their own right, are a focal point of this project, enhancing efforts to understand, conserve, and restore them.

India, a signatory to the Convention on Biological Diversity (CBD), has enacted several laws aimed at mitigating environmental damage, including the Wildlife Protection Act of 1972, the Environmental Protection Act of 1986, the CRZ Notification of 2019, the Forest Conservation Act of 1980, the Water Prevention and Control of Pollution Act of 1974, the Biological Diversity Act of 2002, and the National Green Tribunal Act of 2010. These laws are particularly pertinent to the project as it involves activities within sensitive ecosystems such as mangroves and Dugong conservation areas under CRZ IIIA. The project also encompasses labour activities, making the Equal Remuneration Act of 1976 and other labour laws applicable.

Dugongs are protected under Schedule 1 of the Indian Wildlife Act of 1972, which prohibits the killing and sale of Dugong meat. Additionally, the project's construction activities must comply with the Tamil Nadu Combined Development and Building Rules (TNCDBR) of 2019. The proximity of the project site to Manora Fort brings into relevance the Archaeological Monuments and Archaeological Sites and Remains Act of 1958. However, the management of Manora monument falls under the jurisdiction of the Tamil Nadu State Archaeological Department, not the Archaeological Survey of

India (ASI), which requires tailored considerations for compliance and preservation efforts.

2.2 Description of Institutional Framework

The organizational structure for the coordination, management, and monitoring of the TN-SHORE Project is detailed below.

Lead Implementation Agency:

The project will be spearheaded by the Department of Environment, Climate Change and Forests, Government of Tamil Nadu, ensuring alignment with state environmental policies and objectives, through a three-tier implementation structure:

1. **State Project Management Unit (SPMU):** Located within the Tamil Nadu Green Climate Company (TNGCC), which falls under the Department of Environment, Climate Change and Forests. This unit is the central operational hub for the project.
2. **District Project Management Units (DPMUs):** Established at the district levels to ensure localized management and oversight.
3. **District Project Executing Agencies (PEAs):** Also positioned at the district level to facilitate the direct execution of project activities.

The TNGCC, led by the Additional Chief Secretary of the Department of Environment, Climate Change and Forests, includes a Board of Directors composed of Secretaries from key line departments. TNGCC is already at the forefront of three significant government missions: the Tamil Nadu Climate Change Mission, the Green Tamil Nadu Mission, and the Tamil Nadu Wetland Mission. With the inclusion of TN-SHORE, TNGCC will also spearhead the "Tamil Nadu Coastal Restoration Mission" as its fourth major initiative, serving as the SPMU for TN-SHORE. The SPMU is managed by a Chief Mission Director and is supported by a dedicated team comprising internal staff from the Forest Department and a cadre of specialists in technical, environmental and social fields, finance, procurement, and project administration.

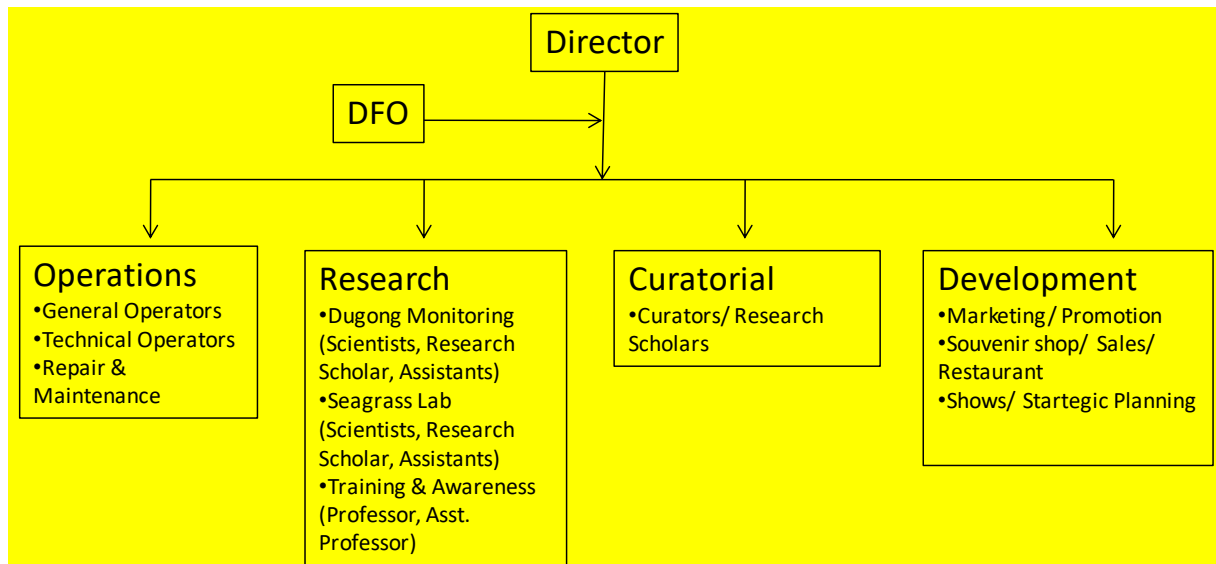
Institutional Arrangements for the Proposed Sub-Project:

Project Implementing Agency: District Forest Officer, Thanjavur, Forest Department, Government of Tamil Nadu.

Organizational Chart:

The organogram of the Project Implementing Agency has been given in Fig. 2.1 below.

Fig. 2.1: Organizational Chart of the IDCC



This chart illustrates the hierarchical structure and reporting lines within the project's implementing agency, aiding in the clear visualization of roles and responsibilities. This structured framework is designed to ensure efficient project delivery and effective integration of various administrative levels, enhancing the project's capacity to achieve its objectives of coastal resilience and environmental sustainability.

3.0.ASSESSMENT OF ENVIRONMENTAL AND SOCIAL CONDITIONS

An extensive assessment of the physical, ecological, and socio-economic conditions of the project area and its immediate surroundings has been conducted using secondary data sources and site observations, as outlined below.

3.1 Physical Environment

3.1.1 Land Use/Land Cover

The designated site for the International Dugong Conservation Centre, spanning 2.435 hectares, is situated at Manora beach and is categorized as coastal poramboke land. This parcel of land is presently vacant and under the jurisdiction of the Tamil Nadu Government. The District Collector has issued a recommendation to the Commissioner of Land Administration (CLA) for the transfer of this land to the Tamil Nadu Forest Department. CLA has, in turn, recommended the land transfer to the Government. The land use and land cover patterns in and around the project area have been analyzed using Google Earth satellite imagery, as depicted in Figure 3.1. The imagery indicates that the vicinity of the project site is a densely populated area with residential settlements and aquaculture farms. Additionally, there are clusters of mangroves along the beach area, which are critical to the local ecosystem.

Fig. 3.1: Land Use and Land Cover in and around Project Area (Google Earth Image)



3.1.2 Natural Hazards

The project site at Manora is located within Earthquake Hazard Zone II, which is classified as a Low Damage Risk Zone. Furthermore, the area is susceptible to tsunamis and falls within a High Wind Damage Risk Zone, including risks from cyclones, underscoring the need for robust disaster risk management measures.

Fig. 3.2: Wind and Storm Surge Hazard Map

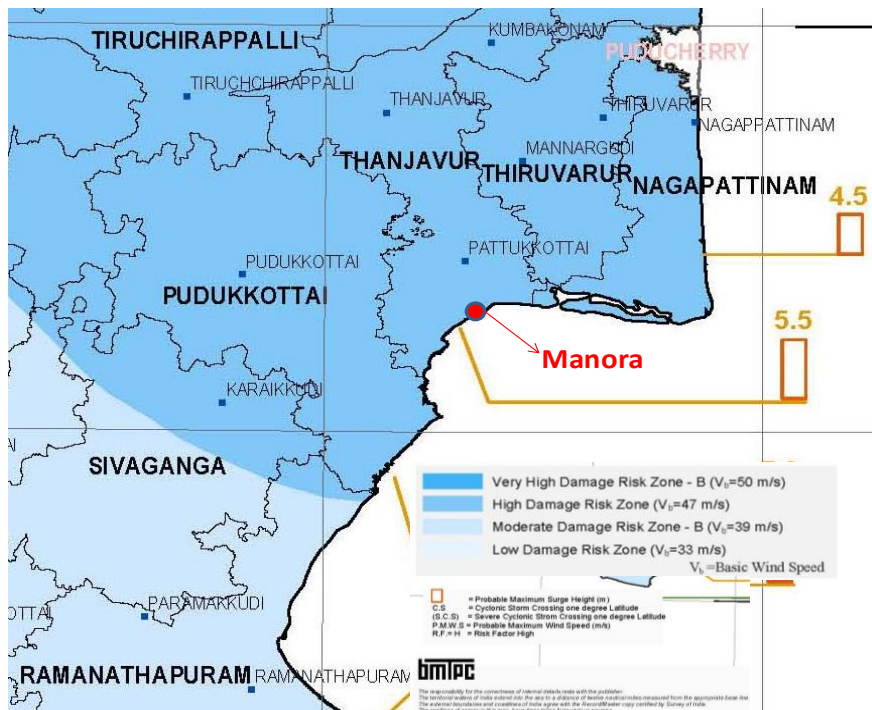
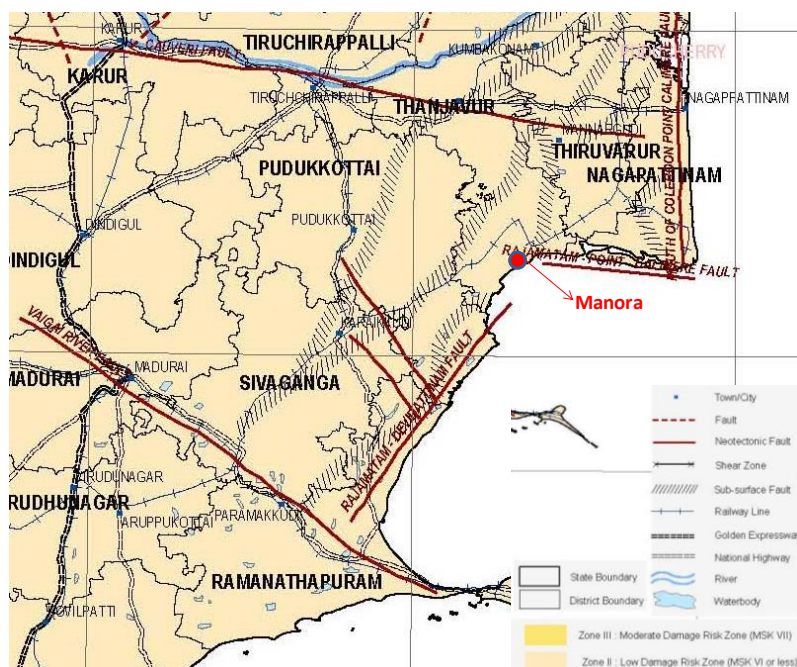


Fig. 3.3: Earthquake Hazard Map



These assessments provide essential insights into the environmental and physical challenges associated with the project location, forming the basis for planning and implementing mitigation strategies to minimize impacts on the local community and environment.

3.2 Protected Area

The designated project area is classified under CRZ IIIA as per the CRZ 2011 and 2019 notification, making it susceptible to tidal influences and marginal flooding during intense rainfall and storms. Approximately 50 meters east of the project site lies the Manora mangroves, separated from the site by a creek. This proximity underscores the ecological sensitivity of the area.

Palk Bay supports the population of the Dugong, a marine mammal listed under Schedule I of the Wildlife Protection Act, highlighting its critical conservation status. The sea adjacent to Manora beach are part of this vital Dugong habitat, reinforcing the importance of stringent environmental safeguards (Fig. 3.4).

Fig. 3.4: Dugong Habitats, Fishing Pressure and Location of Manora

(Source: Sivakumar, K. and Nair, A. (2013): *Dugong Distribution, Habitat and Risks...* Wildlife Institute of India – Technical Report.)

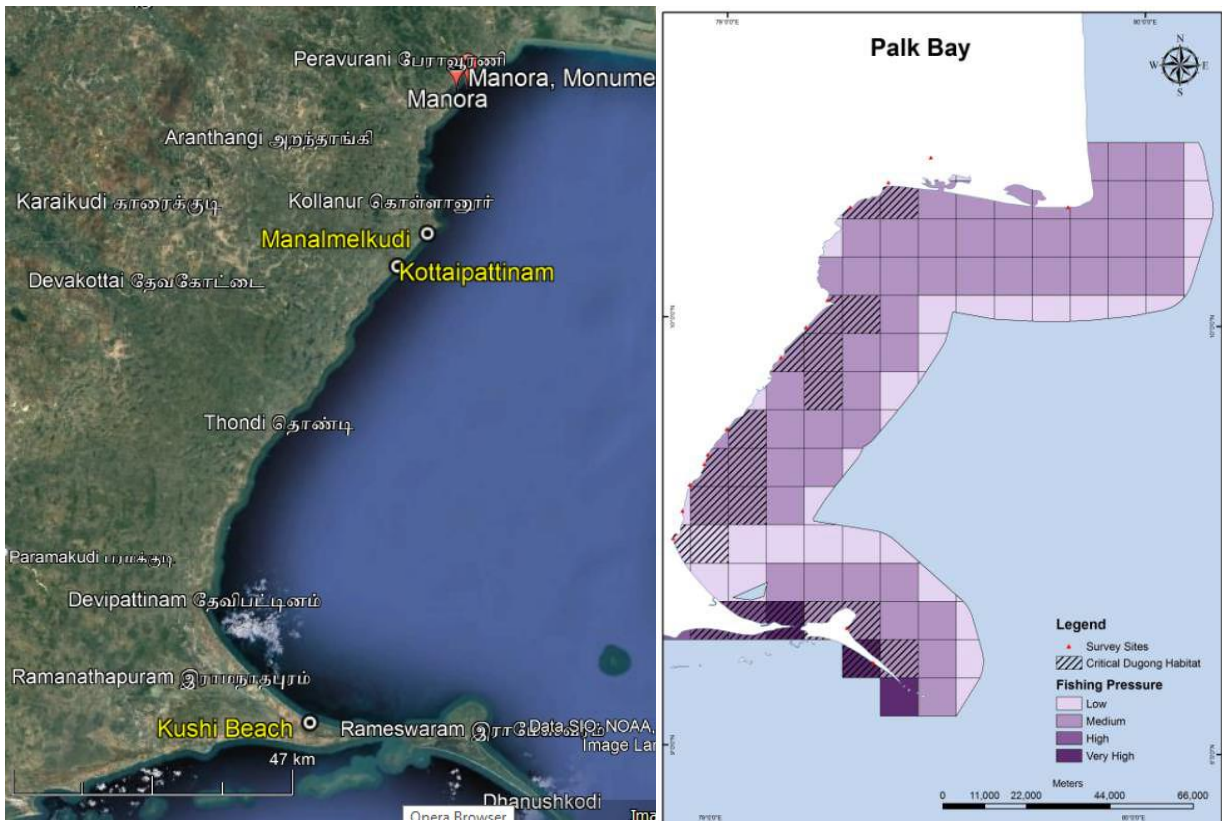
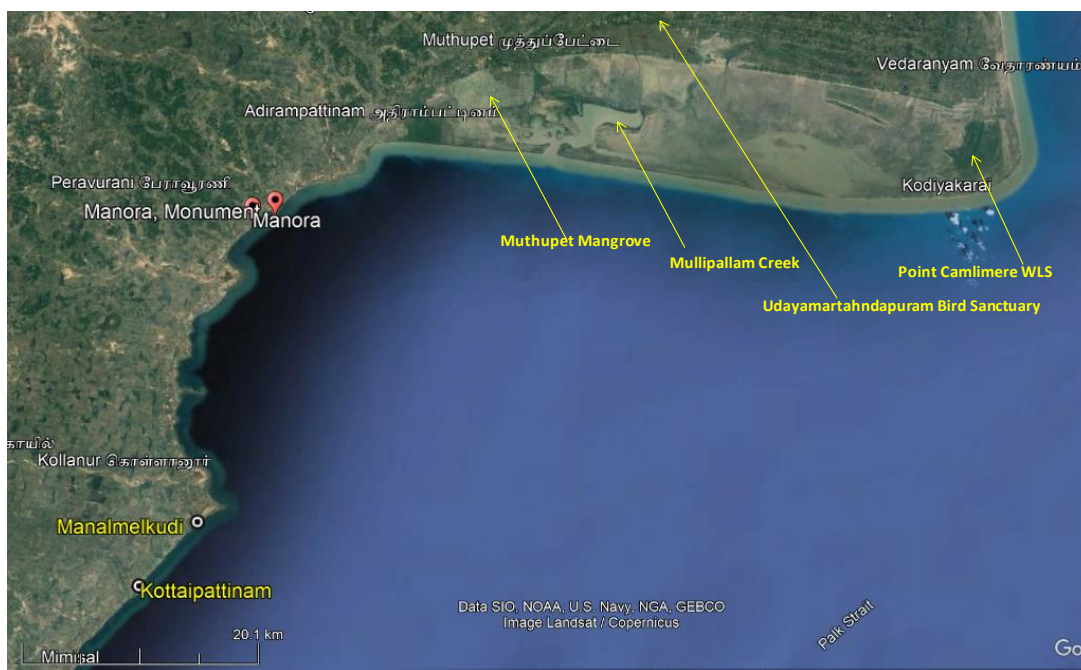


Fig. 3.5: Manora and Nearby Protected Areas



Additional protected areas in the vicinity include the Muthupet Mangrove Protected Area, located approximately 15 km to the northeast, and the Udayamarthandapuram Bird Sanctuary, situated beyond 40 km northeast. Further to the east-northeast, beyond 50 km, lies the Point Calimere Wildlife Sanctuary. These areas represent significant ecological assets that contribute to the biodiversity of the region and are integral to various conservation efforts.

This section of the ESDDR highlights the critical ecological characteristics of the project site and its surroundings, underscoring the need for careful management and mitigation strategies to preserve these vulnerable natural environments.

3.3 Social Environment

The proposed project sites are located within the Thanjavur district of Tamil Nadu. This section provides a comprehensive demographic profile of the district, as detailed in Table 3.2 below. The district is home to certain tribal communities, however there are no forest dwelling tribes. Specific data regarding the presence of these tribes in the Manora area is not currently available.

Table 3.2: Demographic Profile of Thanjavur District, Tamil Nadu

Description	Total	Male	Female
No. of Households	605,363	-	-
Population Growth (2001-11)	12.97%	-	-
Total Population	2,405,890	1,182,416	1,223,474
Population (0-6 age)	238,598	121,949	116,649
Sex Ratio	1,035	-	-
Sex Ratio (0-6)	957	-	-
Population (SC)	455,062	225,859	229,203
Population (ST)	3,561	1,739	1,822
Literates	1,790,998	944,264	846,734
Literacy Rate	82.64%	89.04%	76.5%
Total Workers	974,079	-	-
Cultivators	117,321	-	-
Agricultural Labourers	327,673	-	-
Household Industrial Workers	26,430	-	-
Other Workers	363,060	-	-
Main Workers	834,484	-	-
Marginal Workers	139,595	-	-
<i>Source: Census of India, 2011</i>			

Manora is situated 20 km from Pattukkottai and 65 km from the city of Thanjavur, in a locale known as Sarabendrarajanpattinam on the shores of the Bay of Bengal. It functions primarily as a fishing village, supported by a nearby small port used by fishing trawlers. This socio-economic setup highlights the community's reliance on marine resources, underscoring the importance of considering local livelihoods in project planning and execution.

3.4 Cultural Environment

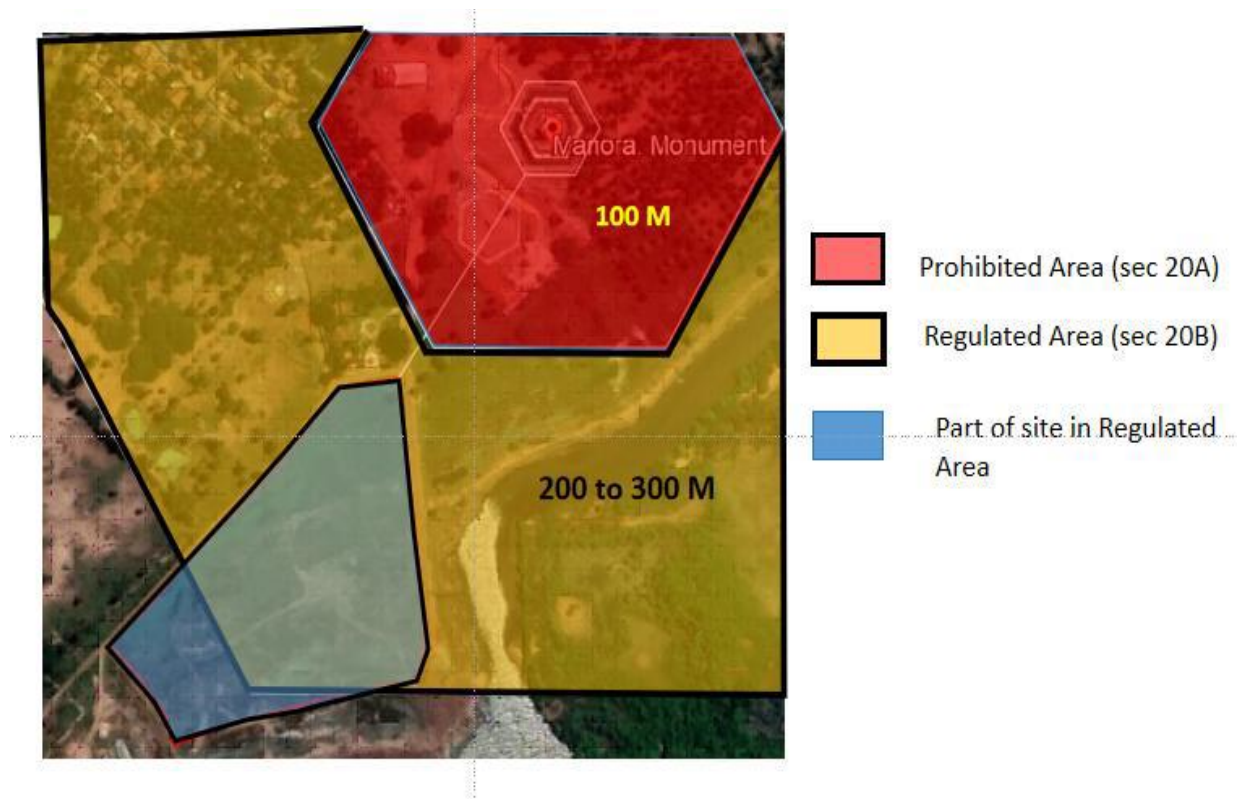
The project site is strategically positioned along the East Coast Road, which serves as a vital link connecting several significant religious and cultural sites. These include the Velankanni Church, located approximately 84 km

away, the Nagore Dargah at 97 km, and notable temples such as the Podhu Aavudayar Temple and Thillaivilagam Veerakothandaramar Temple at distances of 20 km and 38.4 km, respectively. This proximity underscores the site's cultural and spiritual significance, attracting numerous pilgrims and tourists year-round.

In close vicinity, approximately 143 meters from the project site, stands the historical Manora Fort. Constructed by Maratha ruler Serfoji II during 1814–1815, this fort commemorates the British victory over Napoleon Bonaparte. The structure is a prominent eight-storied, hexagonal tower, standing 23 meters high and providing panoramic views of the Bay of Bengal. The fort is a major cultural landmark, drawing approximately 800 daily visitors and annually attracting between 700,000 to 800,000 people.

Given its historical importance, Manora Fort is protected under the Ancient Monuments and Archaeological Sites and Remains Act of 1958 (Act No. 24 of 1958), further amended in 2010. This legislation imposes restrictions on the construction of structures exceeding 7 meters in height within a 100-meter radius of a heritage site (Figure 3.6) to ensure the preservation of its historical integrity

Fig. 3.6: The project site along with the heritage regulated zones around Manora Fort



The fort is managed by the state archaeological department, exempting it from certain provisions under Section 20B of the Archaeological Survey of India's regulations. Development proposals for the project site have been adjusted to comply with state regulations, ensuring that all new structures respect the cultural landscape and heritage conservation guidelines. This careful consideration highlights the project's commitment to preserving the rich cultural heritage of the region while advancing developmental objectives.

4.0 ACTIVITY WISE ENVIRONMENT AND SOCIAL SCREENING, RISK AND IMPACTS IDENTIFICATION

4.1 Sub-Project Screening

The sub-project screening process is conducted following a structured three-step methodology outlined in the Environmental and Social Management Framework (ESMF). This process facilitates a thorough identification and analysis of potential environmental and social (E&S) risks associated with the proposed interventions.

Step 1: Initial Risk and Impact Assessment (SF-1)

The initial screening employs the SF-1 format, which categorizes and assesses the potential E&S risks associated with each project activity. This screening involves evaluating potential impacts on:

- Land, Geology, and Soil (LGS)
- Water (W)
- General Ecology and Biodiversity (EB)
- Waste, Pollution, and Hazard (WPH)
- Protected Areas (PA)
- Land Acquisition and Encroachment (LA)
- Loss of Livelihood and Household (LL)
- Labour (L)
- Cultural/Heritage (CH)
- Tribal Presence (T)
- Gender-Based Violence Risks (G)

Step 2: Risk/Impact Intensity Assessment (SF-2)

Using the SF-2 format, this stage assesses the intensity of identified risks and impacts for each category. This assessment helps to classify each risk and impact according to its severity—ranging from Low, Moderate, and Substantial, to High. This critical analysis aids in understanding the potential scale and scope of impact that the project might have on the environment and local communities.

Step 3: Risk Summary and Categorization (SF-3)

In the final screening stage, SF-3 consolidates all identified risks and impacts into a comprehensive summary. This summary distils the complexities of the assessments into a coherent categorization, assigning the highest identified risk level as the overall risk category for the sub-project.

Based on the outcomes of these assessments, the ESDD report finalizes the risk category—whether Low, Moderate, Substantial, or High. It also specifies the necessary mitigation instruments that need to be prepared as part of the Environmental and Social Management Plan (ESMP), along with detailed responsibilities and timelines for implementation.

This systematic approach ensures that all potential environmental and social impacts are adequately identified, assessed, and managed, aligning with both national and international standards to mitigate risks effectively throughout the lifecycle of the project.

The outcomes of the three-stage screening exercise are detailed below:

Step I Screening (Form SF-1):

The proposed interventions for the IDCC include several key components:

- 1. Public Zone:** This area will feature a Dugong-shaped main building that houses display and office spaces, a Tunnel Aquarium, 7D Theatre with digital immersive technology, a museum, 4D Theatre, Park, Cafeteria, Open Air Theatre (OAT), Parking, Souvenir Shop, Selfie Points, Water Points, and Washrooms, along with a grand entrance Plaza.
- 2. Semi-Public Zone:** This zone includes a Training Centre, Dugong Monitoring Lab, and a Seagrass Research Laboratory.
- 3. Private Zone:** This area will be dedicated to housing with 26 cottages for staff accommodation and service spaces.
- 4. Mangrove Eco Walk Trails:** Accessible via a bridge over the existing stream of backwaters, this area includes walking tracks, gazebos, a rope bridge, sea view decks, and the Eco Tower as a focal linear structure, all designed to align with the existing Mangrove vegetation.

Given the proximity of these activities to sensitive ecosystems such as mangroves, CRZ areas, Dugong habitats, and heritage sites like Manora Fort, potential physical impacts are anticipated on water quality, waste management, pollution, ecology & biodiversity, protected areas, land & soils, and cultural & heritage sites. Since the land in question is under the control of the Tamil Nadu Government, and steps have been initiated to transfer it to the Forest Department, no land acquisition or eviction of encroachment is anticipated. However, the construction activities involved will require both skilled and unskilled labour, thus labour and gender-related impacts are expected.

The results of this screening are documented in Annexure I.

Step II Screening (Form SF-2):

Following the initial screening (SF-1), all activities identified as having potential risks or impacts are further evaluated through Step II screening using the SF-2 form. This step assesses the extent of risk associated with each sub-activity, categorizing the risk/impact intensity as Low (L), Moderate (M), Substantial (S), or High (H), based on specific criteria:

- **Low (L):** Localized, temporary, and negligible impacts.
- **Moderate (M):** Temporary or short-term impacts that are reversible with appropriate management.
- **Substantial (S):** Medium-term impacts covering a larger impact zone, partially reversible.
- **High (H):** Significant, long-term, non-reversible impacts that can only be contained or compensated.

Occupational Health and Safety (OHS): OHS is identified as a moderate risk activity and is integral to all project sizes and types. It is not specifically categorized under the screening criteria but is addressed as a critical element of the Contractor's ESMP.

The analysis of the risk and impact intensities for sub-activities has identified the project activities as predominantly 'Moderate' in risk. These activities are expected to have temporary, short-term, and localized impacts on the existing mangrove habitat and the fragile coastal ecosystem. Over the long term, the proposed interventions are anticipated to increase tourist footfall significantly—from the current 200,000 visitors per year to an expected 1,000,000 visitors annually at the outset. While this increase in visitors could

pose localized adverse impacts, it is also projected to have broader positive effects by promoting conservation awareness among a larger audience.

The results of this screening are documented in Annexure II. Based on the comprehensive evaluations conducted, the summary of risks is compiled in Table 4.1 (SF-3), providing a synthesized overview of the environmental and social risks associated with the project.

The Table 4.1 provides a comprehensive assessment of environmental and social risks associated with the project activities of the IDCC. For detailed activity descriptions, refer to Annexure 1, Section 1.

Table 4.1: Summary of Risk and Impacts (SF 3)

Project Activity For Details Refer Annexure 1 Section 1	Environment Risks					Social Risks					
	Land, Geology & Soil	Water	Biodiversity & Host Community	Waste, Pollution & Hazard	Protected Area (WLS, National Park etc.)	Land	Loss of Livelihood/ HH etc.	Labour	Cultural/ Heritage	Tribal	Gender
Establishment of IDCC with following components: - Public Zone: Main building, Tunnel Aquarium, Theatres, Museum, Park, Cafeteria, OAT, Parking, Shops, Selfie Points, Water Points, Washrooms, Plaza - Semi Public Zone: Training centre, Dugong monitoring lab and Seagrass research lab - Private zone: Cottages, staff accommodation and service spaces.	M	M	M	M	M	L	None	M	M	None	M
Mangrove Eco Walk Trails: includes Access Bridge, Walking tracks, gazebos, rope bridge and sea view decks.	M	M	M	M	M	None	None	M	M	None	M
Hence the overall Risk Classification of the sub-project may be inferred as Moderate											

The overall risk classification for the sub-project, considering the summarized risks and impacts across various environmental and social categories, is inferred as **Moderate**. This classification indicates that while risks exist, they are manageable with standard mitigation strategies and continuous monitoring.

This tabular summary enables project stakeholders to quickly identify and address potential risks associated with the project's implementation phases, ensuring that preventive and corrective measures are efficiently integrated into the project's environmental and social management plans.

4.2 Stakeholder Consultation

In November 2023, during a field visit, focused discussions were conducted with local stakeholders, including fishermen and community members, regarding the establishment of the IDCC. The feedback gathered revealed that while the fishermen are supportive of the new centre, they expressed a strong desire for assurances that the centre's operations will not interfere with their fishing activities. Similarly, the broader local community showed positive sentiment towards the establishment of the centre, appreciating its potential benefits and expressing enthusiasm about its development. These consultations are crucial in aligning the project's activities with the interests of local stakeholders and ensuring ongoing community support.

4.3 Descriptive Summary of Risks and Impacts from Activities Based on Screening

The screening analysis has provided a detailed evaluation of the potential environmental impacts and risks associated with the sub-project. Below is a summary of the key findings:

Environmental Impacts and Risks:

1. **Moderate Risk Classification:** The environmental risks and impacts associated with various construction-related activities under this sub-project are classified as **moderate**. This classification is due to the temporary, short-term nature of the impacts and their localized impact zones.
2. **Proximity to Sensitive Areas:** The construction activities are located near areas classified under CRZ IIIA, which includes mangrove habitats and Dugong habitats (listed under Schedule I species). Potential impacts

could include pollution and stress on natural resources. To mitigate these impacts, eco-friendly design concepts are recommended, including energy-efficient practices, water conservation measures, effective waste management strategies, the use of eco-friendly materials, and the integration of smart building technology.

3. **Construction Phase Impacts:** During the construction phase, the transportation of materials, machinery, and equipment is expected to have limited, localized, and temporary impacts on the local community and ecosystem. These impacts include noise and air pollution, as well as disruptions to road traffic, which are manageable with proper planning and mitigation strategies.
4. **Impact of Increased Tourism:** The anticipated increase in tourist footfall—from the current 200,000 visitors per year to an estimated 1,000,000 visitors annually at the project's outset—poses potential risks of waste generation and pollution impacts on the sensitive ecosystem. Despite these challenges, the project aims to leverage this increase in visitors as an opportunity to enhance awareness among tourists and the local community about the importance of conserving and protecting Dugongs, mangroves, and seagrass. This approach aligns with the project's ultimate objective of promoting environmental stewardship through education and engagement.

These summarized findings from the screening process underline the need for implementing robust environmental and social management strategies. By addressing these risks proactively, the project can ensure that its developmental benefits are realized without compromising the ecological integrity of the area or the well-being of the local community.

Social Impacts and Risks:

The following are the key social impacts and risks associated with the project, based on comprehensive assessments:

1. **Land Acquisition and Livelihoods:** The project site is designated as vacant land currently under the administration of the Tamil Nadu Government. As such, there are no anticipated impacts regarding land acquisition or loss of livelihood due to displacement.
2. **Cultural Heritage:** Moderate impacts are anticipated concerning cultural heritage due to the proximity of Manora Fort. The primary concern is traffic congestion on the roads leading to the IDCC, which could potentially

disrupt local fishermen's access to their boats. Measures to manage and mitigate traffic flow will be crucial to minimize these impacts.

3. **Employment and Community Engagement:** Construction activities will necessitate both skilled and unskilled labour, presenting risks related to labour and gender equality. However, these activities are also expected to create significant employment and alternative livelihood opportunities for the local community, both during the construction phase and in the long-term operation of the centre.
4. **Labour-Related Risks:** Potential safety issues such as injuries, accidents, and fatalities are concerns within the construction phase, posing serious risks to worker safety. To address these, strict adherence to Occupational Health and Safety (OHS) guidelines will be enforced. This will include regular safety drills, the provision of appropriate safety gear, and continuous monitoring to ensure a safe working environment for all personnel involved.

These identified social risks require diligent management and ongoing engagement with the community to ensure that the project not only minimizes negative impacts but also enhances the social fabric of the local area through positive contributions to local employment and the preservation of cultural heritage.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

5.1.1 Risk Classification

Through the comprehensive ESDD exercise, several risks and impacts have been identified that are associated with the project. These include risks to water quality, waste management, pollution, hazard mitigation, ecology, biodiversity, protected areas, land and soil quality, cultural heritage, labour, and gender dynamics. The project's proximity to sensitive areas such as mangrove forests and Dugong habitats elevates the importance of these considerations.

No issues related to land acquisition or eviction are anticipated, as the project site is owned by the Tamil Nadu Government. The primary activities involve construction, requiring both skilled and unskilled labor, which introduces moderate, temporary, and localized risks. These risks are manageable with the implementation of a robust Environmental and Social Management Plan (ESMP) that adheres to established guidelines.

Given the above assessments, the overall risk classification for this sub-project is categorized as **Moderate**. Occupational Health and Safety (OHS) are recognized as significant concerns and are being addressed through a dedicated OHS plan that aligns with the World Bank's Environmental, Health, and Safety Guidelines (WB ESHS).

This proactive approach ensures that all potential environmental and social impacts are adequately managed, maintaining compliance with national and international standards, and promoting sustainable project outcomes.

5.1.2 National Legislation and WB ESS Applicability Screening

The analysis of the applicability of the Government of India and State legal and regulatory frameworks reveals several legislations that the contractor must comply with to ensure environmental quality, occupational health and safety, and the protection of worker and employment terms.

The World Bank's Environmental and Social Framework (ESF) includes ten Environmental and Social Standards (ESS) that vary in applicability based on the nature of project activities. The specific applicability of these standards to

the project is detailed in Table 5.1 below, providing clear guidelines for compliance throughout the project's lifecycle.

Table 5.1: Applicability of Environmental and Social Standards (ESS) and Trigger Criteria

ESS Applicability & Triggers	
ESS	Relevancy with Reasons
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant: The project activities are in close proximity to sensitive ecosystems such as mangrove habitats and Dugong habitats, involving significant construction work.
ESS2: Labour and Working Conditions	Relevant: The project predominantly involves construction work, necessitating strict adherence to labor safety and working conditions.
ESS3: Resource Efficiency, Pollution Prevention and Management	Relevant: Construction activities occur within fragile ecosystems. The project also aims to manage the increased tourist footfall projected at approximately 1 million visitors initially.
ESS 4: Community Health and Safety	Relevant: Located in the densely populated coastal area of Sabendrarajanpattinam, the project could impact community health and safety through increased vehicle movement..
ESS 5: Land Acquisition, Restrictions on Land use and Involuntary Resettlement	Not Relevant: The project land is owned by the Government of Tamil Nadu, thus negating concerns over land acquisition.
ESS 6: Biodiversity conservation and Sustainable Management of Living Natural resources	Relevant: Construction work near CRZ III A zones, mangrove habitats, and Dugong habitats requires specialized attention for the conservation of these critical habitats.
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Tradition Local Communities	Not Relevant: No direct impact on indigenous or historically underserved communities is identified.
ESS 8: Cultural Heritage	Relevant: The project's proximity to Manora Fort, a regulated heritage site, necessitates careful planning to prevent adverse impacts on cultural heritage.
ESS 9: Financial Intermediaries	Not Relevant: No involvement of financial intermediaries in direct project financing.
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant: Planned community engagement strategies aim to enhance conservation impacts and ensure transparency and inclusivity in project communications.

This table serves as a strategic guide for ensuring that all relevant environmental and social standards are met, providing a foundation for responsible project execution and contributing to sustainable development outcomes.

5.2 Recommendations

5.2.1 Mitigation and Management of Risks and Impacts

Given that the identified risks and impacts fall within the low to moderate category, a standard ESMP tailored to the sub-project has been developed and is available as a separate document. However, considering the eco-sensitive nature of Palk Bay, which serves as a habitat for the Dugong, it is imperative that the contractor prepares a detailed Environmental and Social Impact Assessment (ESIA) and ESMP, utilizing the ESDDR and the standard ESMP as guiding documents. The contractor must also allocate a specific budget for the development of these assessments, which include field data collection.

The mitigation plans designed to meet the required standards are detailed with assigned responsibilities and timelines in Table 5.2 below:

Table 5.2: List of Mitigation Plans with Responsibility and Timelines

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	ESIA & ESMP	Contractor	Before commencement of work
ESS2: Labour and Working Conditions	- Labour Management Procedure (LMP) including OHS management plan. - GBV actions	Contractor	Before commencement of work
ESS3: Resource Efficiency, Pollution Prevention and Management	Pollution Prevention, Monitoring and Management Plan	Contractor	Before commencement of work

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
ESS 4: Community Health and Safety	- Community Health and Safety Plan - Traffic management strategies	Contractor and Project Executing Agency (DFO Thanjavur)	Before the commencement of work
ESS 6: Biodiversity conservation and Sustainable Management of Living Natural resources	Biodiversity Conservation Plan focusing on minimizing impacts during construction	Contractor and Project Executing Agency	Before the commencement of work
ESS 8: Cultural Heritage	Heritage Conservation Plan	Contractor and Project Executing Agency	Before the commencement of work
ESS 10: Stakeholder Engagement Plan	Stakeholder Engagement Plan (SEP)	Contractor and Project Executing Agency	Before the commencement of work

These mitigation strategies should be integrated into the regular ESMP to be prepared by the contractor, in line with the findings from the ESIA and the impacts analyzed by the ESDD. The TNGCC will ensure the disclosure of the finalized ESDD and ESMP on its website following formal approval from the World Bank. Additionally, the executive summary of the standard ESMP and ESDD will be translated into the local language and made available on the TNGCC website to ensure accessibility and transparency.

5.2.2 Institutional Management, Monitoring and Reporting

The monitoring and management will be coordinated by the Tamil Nadu Forest Department, specifically through the office of the DFO, Thanjavur. This arrangement ensures that the project aligns with the state environmental objectives while leveraging local expertise and institutional capacity.

The institutional management framework will include a dedicated PMU, tasked with the regular oversight and reporting of the project's progress against the established environmental and social management plans. This unit will be responsible for coordinating between the SPMU and local implementation bodies to ensure that all project activities are carried out in accordance with the stipulated guidelines and standards.

Reporting mechanisms will be established to ensure transparency and accountability, with regular updates provided to the World Bank and relevant stakeholders. These reports will include details on project activities, progress towards conservation goals, and compliance with environmental and social safeguards. The project will also involve local communities in the monitoring process, enabling them to report directly on project impacts and effectiveness, thereby fostering community engagement and ensuring that the project's benefits are widely distributed and aligned with local needs and priorities. This inclusive approach will not only enhance the project's effectiveness but also contribute to building local capacity for long-term environmental and social management.

Annexure-1: Form SF-1

Sl. No	Project Component	Likely Nature of Risk/Impact - Land, Geology & Soil (LGS) - Water Quality (WQ), - Ecology & Biodiversity (EB) - Waste, Pollution & Hazard (WPH) - Protected Area (PA), - Labour (L), - Culture/Heritage (CH), - Gender Based Violence Risks (G)
1	2	3
1.	Establishment of International Dugong Conservation Centre - Public Zone: Dugong shaped main building, Tunnel Aquarium, 7D Theatre with digital immersive technology, Museum, 4D Theatre, Park, Cafeteria, Open Air Theatre (OAT), Parking, Souvenir shop, Selfie Points, Water Points, Washrooms, and the grand entrance Plaza. - Semi Public Zone: Training centre, Dugong monitoring lab and Seagrass research lab - Private zone: Cottages (26 nos), staff accommodation and services spaces.	LGS, W, EB, WPH, PA, L, CH, G
2.	Mangrove Eco Walk Trails: Includes Access Bridge, Walking tracks, gazebos, rope bridge, and sea view decks	LGS, W, EB, WPH, PA, L, CH, G

This table provides a clear, structured overview of the potential risks and impacts associated with the different zones and elements of the project, helping stakeholders understand the environmental and social considerations needed for comprehensive project planning and risk management.

Annexure-2: Form SF-2

Sl. No	Project Component (As per SF-1)	Identified Risks (As per SF-1)	Description of Risks and Impacts	Risk/Impact intensity Low (L), Moderate (M), Substantial (S), High (H))
1	2	3	4	5
1	Establishment of International Dugong Conservation Centre - Public Zone: Dugong shaped main building, Tunnel Aquarium, 7D Theatre with digital immersive technology, Museum, 4D Theatre, Park, Cafeteria, Open Air Theatre (OAT), Parking, Souvenir shop, Selfie Points, Water Points, Washrooms, and the grand entrance Plaza. - Semi Public Zone: Training centre, Dugong monitoring lab and Seagrass research lab - Private zone: Cottages (26 nos), staff accommodation and services spaces.	LGS, W, EB WPH, PA L, CH, G	- Construction activities lead to waste generation and potential pollution. - Impacts critical habitats like mangrove and Dugong habitats. - Increases tourist flow, affecting local infrastructure, - Proximity to heritage site (Manora Fort) and - Density of the population in coastal area (CRZ III A).	LGS - M W - M EB - M WPH - M PA - M L - M CH - M G - M
2	Mangrove Eco Walk Trails: Includes Access Bridge, Walking tracks, gazebos, rope bridge, and sea view decks	LGS, W, EB WPH, PA L, CH, G	- Limited development activities occur within sensitive mangrove habitat. - Promotes increased tourist footfall, impacting local biodiversity and community.	LGS - M W - M EB - M WPH - M PA - M L - M CH - M G - M

Criteria for Risk Evaluation:

Low (L): Localized, temporary, and negligible impacts.

Moderate (M): Temporary or short-term impacts that are reversible under controlled conditions.

Substantial (S): Medium-term impacts covering larger impact zones, partially reversible.

High (H): Significant, non-reversible, long-term impacts that can only be contained or compensated.

Occupational Health and Safety (OHS): Rated as Moderate (M) by default, emphasizing that with stringent adherence to safety protocols, OHS risks can be effectively managed and minimized.