

ENVIRONMENTAL IMPACT ASSESSMENT – EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1.1. GENERAL

The Fisheries Department is one of the core line departments of Government of Tamilnadu principally to address the welfare of fishermen community of the state and intended to establish necessary infrastructures required for their safe berthing and hygienic fishing activities. The DoF is committed to have annual budget from Government of Tamilnadu to enhance the contribution of the fishery sector to the food security of the people of Tamilnadu and establish harbor infrastructure facilities at par with International Standard practices for ensuring constant growth in fish catches and its hygienic handling. It also gives top priorities for shore protection and erosion control activities to protect coastal villages from continuous threat from the high waves and cyclones. It works to attract more people into fishing activities; creating more job opportunity among fishery youths; exploring the opportunities in deep sea fishing; doubling the fish production and also to meet the export demands for enhancing the socio-economic status of the fishermen community.

Tamilnadu has about **1076 km** of coastal line that passes through 14 out of 38 districts that consists of four coastal zones viz., Coromandel Coast, Palk Bay, Gulf of Mannar and West Coast. There are **608** coastal fishermen villages having more than **1.9 Sq.Km** of Exclusive Economic Zone (EEZ) with **41,412 Sq.Km** (Inshore area-16,058 Sq.km., off-shore area-7,197 Sq.km and deep sea-18,157 Sq. km) of continental shelf under their activities.

The fishing community population is around **1.1 million in Tamilnadu** (2015) and ranks FIFTH in total fish production of the country and the total fish production of the State during **2014-15 is 6.97 lakh tons**. (From marine resources-4.57 lakh tons, Freshwater and brackish water resources - 2.40 lakh tons). Tamilnadu is one among the leading exporters of seafood with the export of marine products of 93,477 MT and earned a foreign exchange of INR 5,308.17 Crores during 2014-15. The fisheries sector has contributed **0.7 percent of the total Gross State Domestic Product (GSDP)** of the State.

The Kaluveli back waters is a natural estuary of the Kaluveli Tank and their system tanks, near Marakkanam Town. Kaluveli Waters is the district boundary for both Villupuram and Chengalpattu Districts. Being the back waters, it has very good tranquility and very safe for berthing the boats.

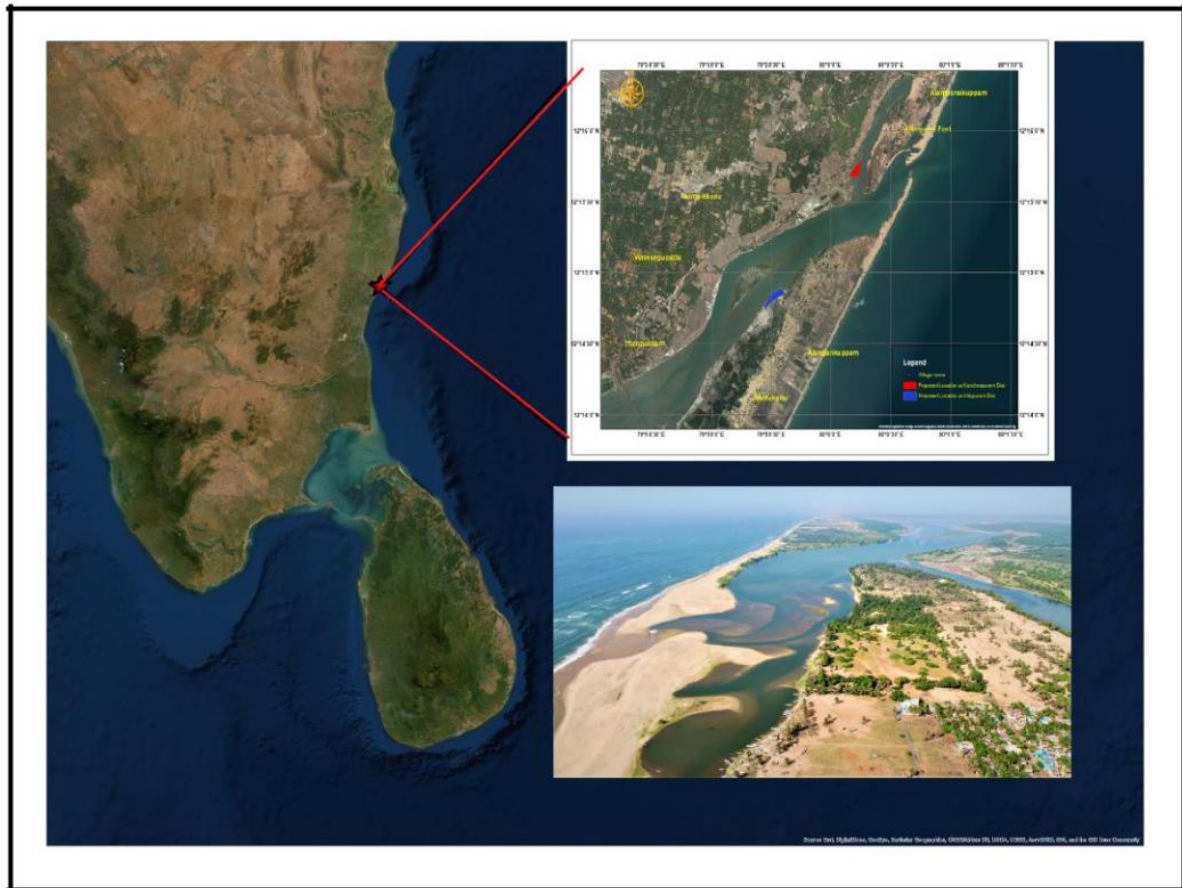
The Villupuram district has 19 coastal fishing villages with 14935 fishermen population, having 20 mechanised fishing boats, 1209 motorized crafts and 202 traditional fishing crafts. The Chengalpattu district has 44 coastal fishing villages with 29745 fishermen population, having 12 mechanised fishing boats and over 2000 motorised and traditional fishing crafts. The fishermen from Villupuram and Chengalpattu are operating their Mechanised Fishing Vessels (MFVs) from either Chennai Fishing Harbour or Puducherry/Cuddalore Fishing Harbours, due to absence of fishing harbour in these districts, which creates congestion and frequent boat accidents. The fishermen from Villupuram and Chengalpattu made frequent representation to the Government and accordingly, administrative sanction for Construction of Fishing Harbours in Kaluveli Waters at Azhaganuppam in Villupuram District and Alamparaikuppam in Chengalpattu District.

The proposed fishing harbours will help to reduce the overcrowding of fishing boats berthed in Chennai/Puducherry/Cuddalore Fishing Harbours and will also be used as an alternative facility for

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them. These Fishing Harbours have been designed to operate about 220 MFV and 600 FRP fishing vessels with all fish handling, auctioning, net mending and required rest rooms etc.

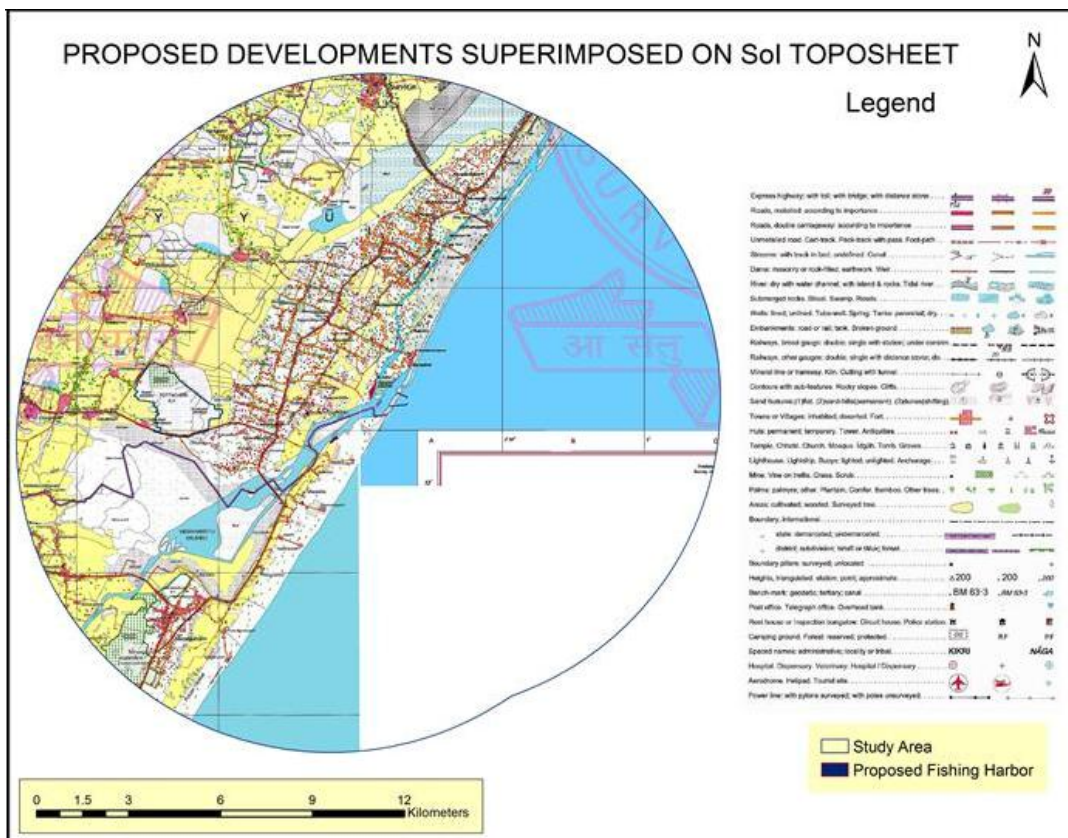
The sites for the proposed fishing harbour at Azhagankuppam, Village of Villupuram Dist., and Alamparaikuppam Village of Chengalpattu Dist. are located at $12^{\circ}14'50.66''$ N & $79^{\circ}59'31.97''$ E in Survey No-23/1 & 23/2 and $12^{\circ}15'40.40''$ N & $80^{\circ}0'10.37''$ E in Survey No-49/2, respectively.



M/s DHI Water Environments Pvt. Ltd, New Delhi has prepared the Detailed Project Report and M/s Cholamandalam MS Risk Services Limited, Chennai, has done the Rapid EIA Studies and obtained CRZ clearances from the District and State Level Authorities. The SEAC has given the Terms of reference (ToR). As per the EIA Notification 2006, it is mandatory to study the environment conditions around the 10 Km radius of the project site boundary. Areas that are ecologically sensitive near the project site are mangroves along the banks of Kaluveli Waters (Backwaters) near the ECR bridge. Alamparai Fort, Department of Archeology, Government of Tamilnadu notified monument, is present at an aerial distance of 750m away from the proposed Fishing Harbour at Alamparaikuppam. The marine water present in the study area is Bay of Bengal. The nearest railway station is Acharapakkam at an aerial distance of 25.5 Km from the project site. The nearest airport is Chennai International Airport about 80 km aerial distance and Puducherry Airport 42 Km aerial distance from the project site.

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The project sites are located at about 89 km from Chennai and 44 km from Puducherry. The project site can be identified from the Survey of India (SoI) toposheets no D44U3, D44T16 & D44T15 prepared by Survey of India and the location map of the proposed project site is shown below



2. PROJECT

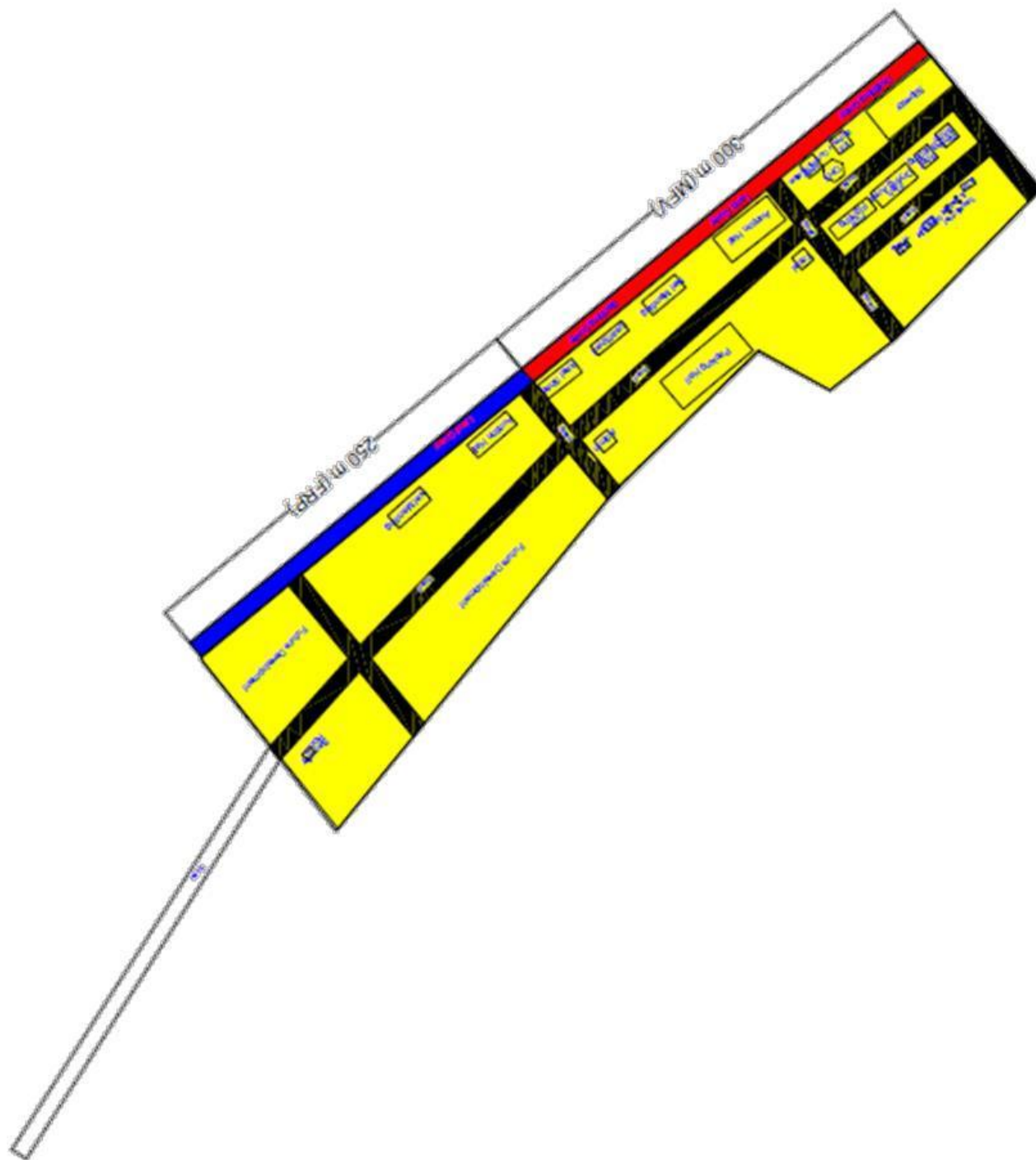
The proposed fishing harbors at Azhagankuppam is in Survey No 23/1 and 23/2 of Marakkanam revenue village in Marakkanamtaluk of Viluppuram district and the Alamparaikuppam is in Survey No 49/2 of Alamparaikuppam in Cheyyur Taluk of Chengalpattu district. The proposed fishing harbor at Azhagankuppam will spread over the 6 Ha land and Alamparaikuppam spreads over 5 Ha land, both the lands belonging to the Fisheries Department, which includes intertidal area. The project does not involve acquisition of land or resettlement of people. The nearest town to the project site is Edaikazhinadu which lies at a distance of 5.6 km and 3 km from Azhagankuppam and Alamparaikuppam respectively.

Both fishing harbors have been proposed to handle an annual fish catch of 12,000 Tonnes. To accommodate the said quantity, land side infrastructure facilities such as auction hall, net mending shed, gear room, power room, sloping yard, administration building, fresh water sump, electrical control room & electrical generator room, water supply and drainage, overhead tank of capacity 50,000 litres, Sewage treatment plant of capacity 15 KLD, solid waste collection area, parking area, security room, toilet blocks, ice plant and cold storage rooms, radio/ telephone communication, two lane internal roads of 1.5 Km length with walkway on either side and compound wall around the periphery are proposed. Water front infrastructure facilities such as

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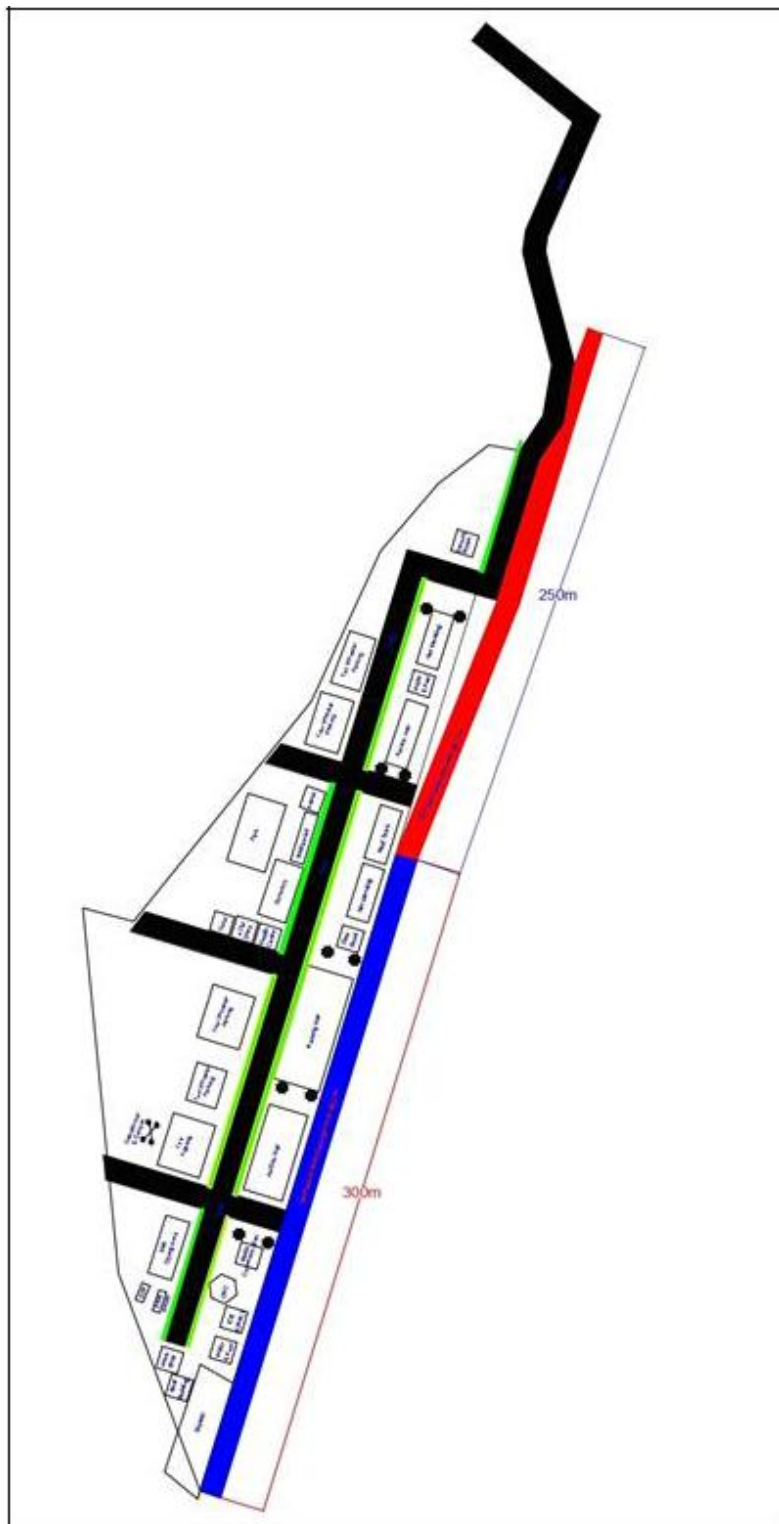
diaphragm wall, training wall, slipway, capital dredging and reclamation are proposed as part of the developments.

Proposed Layout of the Fishing Harbour at Azhagankuppam in Villupuram District



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Proposed Layout of the Fishing Harbour at Alamparaikuppam in Chengalpattu District



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2.1 Infrastructural Requirements

The two fishing harbours proposed at Azhagankuppam and Alamparaikuppam have been designed with similar infrastructures with only a few minor variations in dimensions and utilities. The following sub-sections details on the infrastructural development in the proposed harbours will make them as a fully functional fishing harbours.

The proposed project does not involve development of any external roads. However, internal roads are proposed as part of the harbor development to aid smooth flow of traffic within the harbor.

2.1. Site Connectivity

Although the proposed project is a Greenfield development, the project site is easily accessible by road. The detailed connectivity to the site is discussed in the following sections.

2.2 Road Connectivity

Azhagankuppam: A two lane road along the eastern side of the estuary is proposed to connect the project site to Thazhangadu Village, which is further connected to the East Coast Road (SH-49).

Alamparaikuppam: An existing single lane road (Canal Bank road) connects the project site to Kadapakkam, a residential area. However, the single lane road would be widened as a two lane road for a stretch of 215 m until Kadapakkam; the village road from Kadapakkam further connected to the East Coast Road (SH-49).

The SH-49 connects the project site to Chennai via Kalpakkam, Mahabalipuram and Kovalam. The site is connected to Puducherry by SH-49 via Marakkanam, Koonimedu and Bommayarpalayam.

2.3 Rail Connectivity

The nearest railway station to either locations is Acharapakkam located at a distance of 25.5 Km, which is connected to Melmaruvathur and Tindivanam, the major towns in Villupuram district.

2.4 Land Requirement

The proposed fishing harbors will be developed by reclaiming the existing intertidal area which is currently occupied by salt affected land. Filling for reclamation will be met from the dredged

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materials that is proposed as part of the development. The land on which the two harbours have been proposed is owned by Government of Tamil Nadu and being handed over to the Department of Fisheries. And therefore, no acquisition of land is required for the current proposals.

Azhagankuppam: The fishing harbour proposed at Azhagankuppam will be developed in the 6 Ha land owned by the Department of Fisheries.

Alamparaikuppam: The fishing harbour proposed at Alamparaikuppam will be developed in the 5 Ha land owned by the Department of Fisheries.

2.5 Proposed Infrastructural Developments

To address the need of handling 12,000 TPA of fish catch at either fishing harbours, basic developmental activities such as dredging to facilitate the berthing and safe navigation of fishing vessels and supporting infrastructure facilities such as internal roads, various types of building blocks and drainage facilities are proposed. The following subsections would detail the activities to be undertaken and the proposed developments.

2.6 Navigation Channel

As the two proposed fishing harbours would be developed in the backwaters of Kaluveli, a permanent approach channel for the vessel navigation, the clearing of the sand bar between the Kaluveli Waters and the sea is proposed by dredging. An area of 5 Ha of the sandbar would be dredged to maintain a water depth of -2.5m from CD. It is estimated that a volume of 0.4 M.Cum of dredge sediment would be generated during the development of the navigation channel.

2.7 Navigation Basin

Besides the development of navigation channel into Kaluveli Waters, the development of the navigation basin within Kaluveli Waters is also proposed in order to facilitate the navigation of vessels to the fishing harbours at Azhagankuppam and Alamparaikuppam. This would require capital dredging to maintain a water depth of -2.5 m from CD for berthing and safe navigation of fishing vessels. To attain such depth, it is expected that 0.4 M.Cu.m of dredge sediment would be generated for each fishing harbour accounting to a total volume of 0.8 M.Cum of dredge sediment.

2.8 Training Wall

To prevent the sedimentation of the Navigation channel, two training walls have been proposed on the northern and southern side of the channel. The length of the training wall on the northern side of the channel is 400m and the one to the southern side is 600m.

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2.9 Diaphragm Wall

Diaphragm wall along the harbor boundary will be constructed retain the soil from shearing and to provide a structural platform for docking of fishing vessel. At either harbours a diaphragm wall of length 550m has been proposed, of which 300m of the wall would be used to dock mechanized boats and 250m for motorized boats.

2.10 Reclamation

The dredged sediment would be utilized to reclaim the intertidal area and rising of low areas. The dredged sediments will be screened and tested for suitability for filling. An area of 3.23 ha and 3.43 of intertidal area at Azhagankuppam and Alamparaikuppam, respectively, would be reclaimed at both sites for the development purpose.

2.11 Internal Roads

It is proposed to develop several segments of two-lane internal roads of total length 1.5 Km within the two harbor facilities to aid free movement of vehicles. The proposed road width would be 10 m with sidewalk on the either sides for person on foot.

2.12 Associated Facilities

For supporting the efficient handling of fish catch, associated facilities such as auction hall, Ice plant and cold storage rooms, net mending shed, gear room, radio/telephone communication, power room, sloping yard, administration and bank building, electrical control room with generators, security room, compound wall around the periphery and parking area are proposed at both fishing harbours.

2.13 Greenbelt Development

Greeneries and landscaping in front of the main gate and other areas are proposed as part the development. The total area that is designated for greenbelt development is 0.1 Ha. The greenbelt

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would be developed in consultation with the forest department and priority would be given to species native to the region.

2.14 Utilities

Utilities refer to the electricity power and the water required by the harbor for its operation along with the waste management measures.

2.15 Sewage Treatment Plant & Drainage

A modular Sewage Treatment Plant of 15 KLD capacity that functions on activated sludge process is proposed at both harbours. The STP would treat the waste water generated from the handling of daily fish catches. Sewage from various units, including standalone toilets, will be routed to the STP by dedicated drains. Storm water drains will be developed within both the harbor facility to collect the rain water and route them to a collection tank and routed to the STP as well.

2.16 Water Requirement

An overhead tank of capacity 50KL is proposed for the two harbours, to meet the fresh water requirement within the harbours. The water would be sourced from approved sources and be treated in a water treatment plant whose operating capacity would be 1000 litre/hour. A water sump of capacity 50KL is also proposed as part of the development to store treated fresh water.

2.17 Proposed Landside facilities

The land side facilities recommended for the proposed Fishing Harbors at Azhagankuppam and Alamparaikuppam are:

1. Auction hall
2. Net mending shed
3. Gear room
4. Power room/Electrical/ Utility Room
5. Sloping Hard
6. Admin. & Bank Building
7. Fresh water Sump
8. Electrical control Room and Genset
9. Water supply and drainage
10. OHT – 50,000 Litres capacity
11. Sewage Treatment Plant (STP) – 15 KLD
12. Solid waste collection area
13. Parking area
14. Security Room
15. Gents Toilet
16. Ladies Toilet
17. Ice plant and Cold storage rooms
18. Radio / Telephone communication
19. Compound wall & Gate

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20. Internal Roads.
21. Electrification –including Transformers
22. Site Development works such as water supply green belt, shore protection

2.18 Proposed waterside facilities

The proposed sea side activities are:

1. Diaphragm wall
2. Dredging
3. Reclamation and Levelling with Dredged Materials
4. Training wall
5. Slipway

3 EIA CONSULTANTS

M/s DHI Water Environments Pvt. Ltd contracted M/s Cholamandalam MS Risk Services Limited, a NABET accredited EIA consultant organization (accredited to undertake EIA studies for Ports and Harbors as per the NABET accreditation scheme), to undertake the Environmental Impact Assessment (EIA) study. The EIA study for the proposed project was carried out based on the standard ToR issued by SEAC, the baseline environmental monitoring was conducted. The baseline study was done from 18th October 2019 to 11th November 2019.

The monitoring studies in the study area were conducted to assess the baseline environmental conditions with respect to quality of air, soil, noise, groundwater, surface water and marine waters, sediment etc. Sampling and Analysis studies were undertaken by NABL accredited laboratory. The primary data obtained from the laboratory were validated with the secondary data collected for the study area from the authentic sources.

As a part of the EIA study, the anticipated positive and the negative impacts on the environment due to the proposed project activities have been assessed and their corresponding Environment Management Plan (EMP) is developed to reduce the magnitude of impacts.

3.1 EIA FRAME WORK

EIA study has been completed with **Environmental survey** in the project area, considering **10 km radius from the location as Impact area**, for evaluating the **Due-diligence** of the Environmental status. The Survey for field observations was run to generate primary data on **Micrometeorology, Air Quality, Water, Noise, Soil/sediment, Socio Economics and Terrestrial & Marine Biology** (Flora, Fauna and Biota)

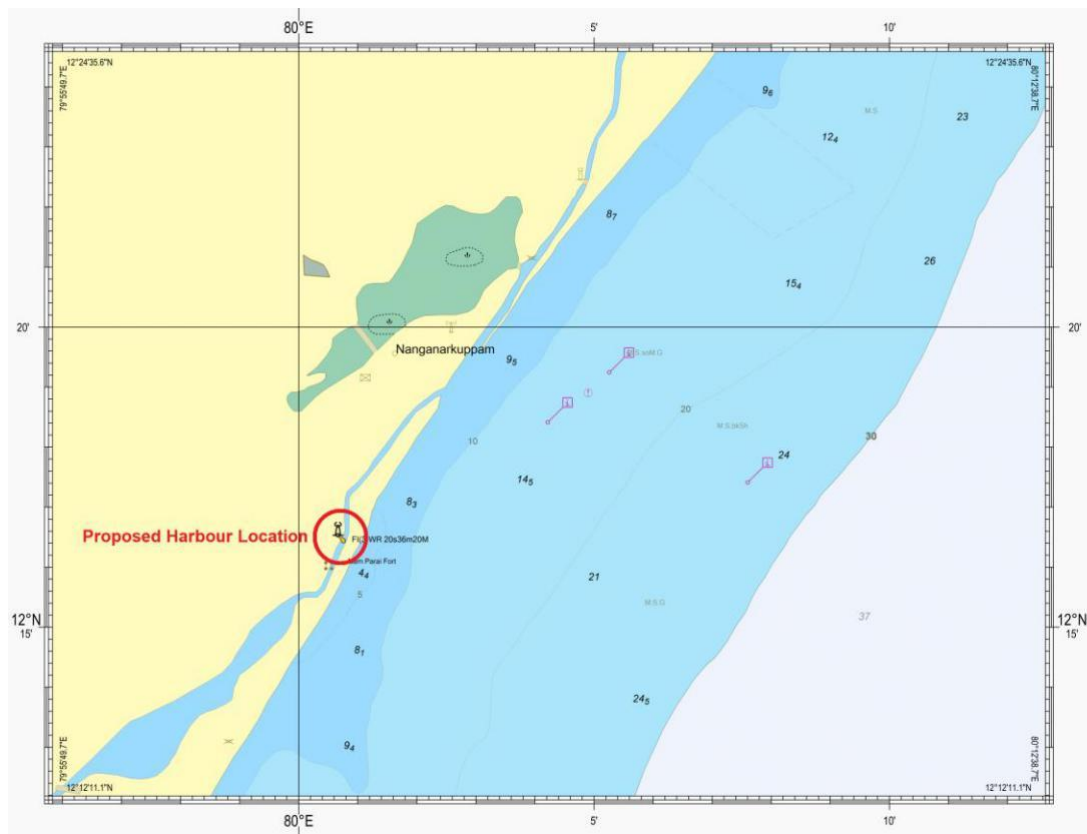
The hydrodynamic survey was conducted and Mathematical Models were run using Delft Modeling Tools for the evaluation of coastal dynamics of the project location and to draw the process dynamics for the design of structural components of the Harbor.

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A Comprehensive **Environmental Management Plan** is devised and provided for implementation in all three phases of the project viz., Planning & Designing, Construction and Operation & Maintenance phase.

4. The Shoreline

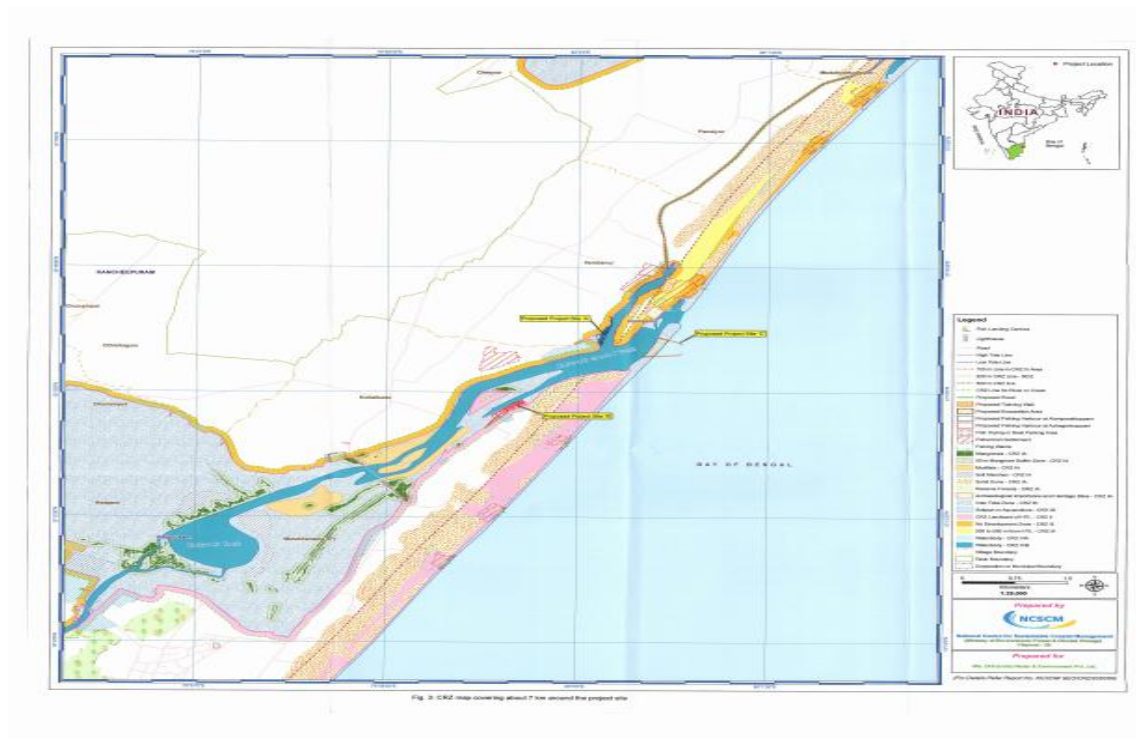
Bathymetry of the region was analysed using the data extracted from C-Map. C-Map is DHI's in-house tool providing digitised Naval Hydrographic Charts ([Figure 3-2](#)) The coastal orientation in this region is nearly N 30° E direction. It is observed that the seabed is steep with 10m water depth can be reached in 2.0 km from the shore. Further offshore, the slope of the seabed is also steep, with 20m water depth is available within 7 km from the coast. At 50 m & 100 m depth contour the seabed becomes again steep occurring at 22 km and 40 km from the coast. The proposed Harbor location is near the ruins of Alampara Fort (also called Alampara) which lie near Kadappakkam, a village 50 km from Mamallapuram on the land overlooking the sea. It can be reached on driving down the East Coast Road, about 100 km from Chennai, 5 km from Vedal and 50 km from Puducherry.



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5. CRZ Mapping

CRZ mapping for the 7 Km study area was done by National Centre for Sustainable Coastal Management (NCSCM), Chennai, which is one of the MoEF&CC authorized CRZ mapping agency. According to CRZ notification 2011, CRZ zonation, HTL/LTL lines and sensitive areas (if any) identified within the study area were superimposed on CRZ maps of scale 1:4000 and 1:25000.



6. Environmental Studies

1. Ambient Air Quality

The background ambient air quality of the study area has been analyzed by collecting 8 samples in various locations within the study area and the collected samples were analyzed for various parameters which were then compared with NAAQ standards

The background ambient air quality (PM10, PM2.5, SO2, NO2, ozone, ammonia etc) of the study area are collected from these locations as per CPCB guidelines, NAAQ of 2009. The collected samples were sent to NABL accredited laboratory on periodic basis for analysis. Noise monitoring will be done during the upcoming stages of the baseline monitoring period, with monitoring stations locations same as AAQ stations.

2. Noise Environment

The noise level varies in different ambience and location, as residential area would have lower noise levels when compared to an industrial area. The government has set noise level standards for various areas during both day and night times. AAQ and Noise were monitored in the same locations.

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3. Marine Water Sampling

Assessment of marine water quality was made by collecting marine water samples (both at surface and bottom) from 8 locations within the 10Km study area around the project site. The collected marine water was securely stored and assessed in the lab for various parameters.

4. Marine Surface Water Quality

The pH of all the collected marine samples was found to be varying from 7.2-8. Total suspended solids ranged from 4-21 mg/L with location MS 5 and MS 6 having the highest and lowest concentration respectively. The temperature of all the sampling locations was found to be ranging from 27.4-28.4°C.

5. Marine Bottom Water Quality

The pH of all the collected marine samples was found to be varying from 6.9-7.9. Total suspended solids ranged from 4-466 mg/L with location MS 1 and MS 6 having the highest and lowest concentration respectively. The temperature of all the sampling locations was found to be ranging from 27.6-28.6°C.

6. Marine Sediment Quality

Marine Sediments were collected in the same locations where a water sample was collected. The sediments were neutral to mild basic in nature with pH values ranging between 7.6 and 8.5.

7. Ecology and Biodiversity

Ecological studies give humans a deep insight into the principles of life; its forms and levels of existence and immortality on earth.

8. The following surveys were carried out in the site location

- i) Flora survey
- ii) Faunal assessment
- iii) Quantitative analysis of the vegetation

A detailed survey and the mitigation measures due to the developmental activities have been suggested appropriately

9. Socioeconomic Profile of Study Area

The demographic and stakeholders of the proposed project activities were surveyed and studied for their response to the proposed project of Fishing Harbor. A field survey clearly indicated that the local peoples are in favor of the project and also there are repeated representations to Government of Tamil Nadu for this project implementation.

10. ENVIRONMENTAL MANAGEMENT PLAN

This section presents the plan to manage the environment for effective sustenance of the environment from any potential impacts that may hamper the ambient condition of that environment due to the proposed development of the fishing harbours at Azhagankuppam, Villupuram District and Alamparaikuppam, Chengalpattu District. The effectiveness of Environment Management Plan (EMP) shall be assessed by developing a post project monitoring

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program (PPMP). Upon successful implementation of EMP and by adopting good engineering and operational practices during the construction and operation phases of the fishing harbor, there will be only a minimal impact on the environment, which can otherwise be considered as insignificant. The objectives of the Environmental Management Plan are as below.

- To identify key environmental issues envisaged to be encountered during construction and operation phases of the project
- To provide guidelines for appropriate mitigation measures
- To establish systems and procedures for implementing mitigation measures
- To ensure the mitigation measures are implemented
- To monitor the effectiveness of mitigation measures

The following studies will be conducted and necessary Management Plans will be evolved for better maintenance of existing environments in the site and near by localities.

- Dredging/Excavation and Reclamation Processes
- Vehicle movement and Civil Construction Works
- Air Quality Management Plan – Operation Phase
- Noise Quality Management Plan – Construction Phase
- Noise Quality Management Plan – Operation Phase
- Water Quality Management Plan – Construction Phase
- Water Quality Management Plan – Operation Phase
- Soil Quality Management Plan – Construction Phase
- Soil Quality Management Plan – Operation Phase
- Construction and Demolition Waste Management Plan
- Hazardous Waste Management
- Solid Waste Management Plan
- Stormwater Management Plan
- Wastewater and Sewage Management Plan
- Oil spill Management Plan
- Mangrove afforestation Management Plan
- Turtle Movement Management Plan
- Wetland Management Plan

11. RISK AND DISASTER MANAGEMENT PLAN

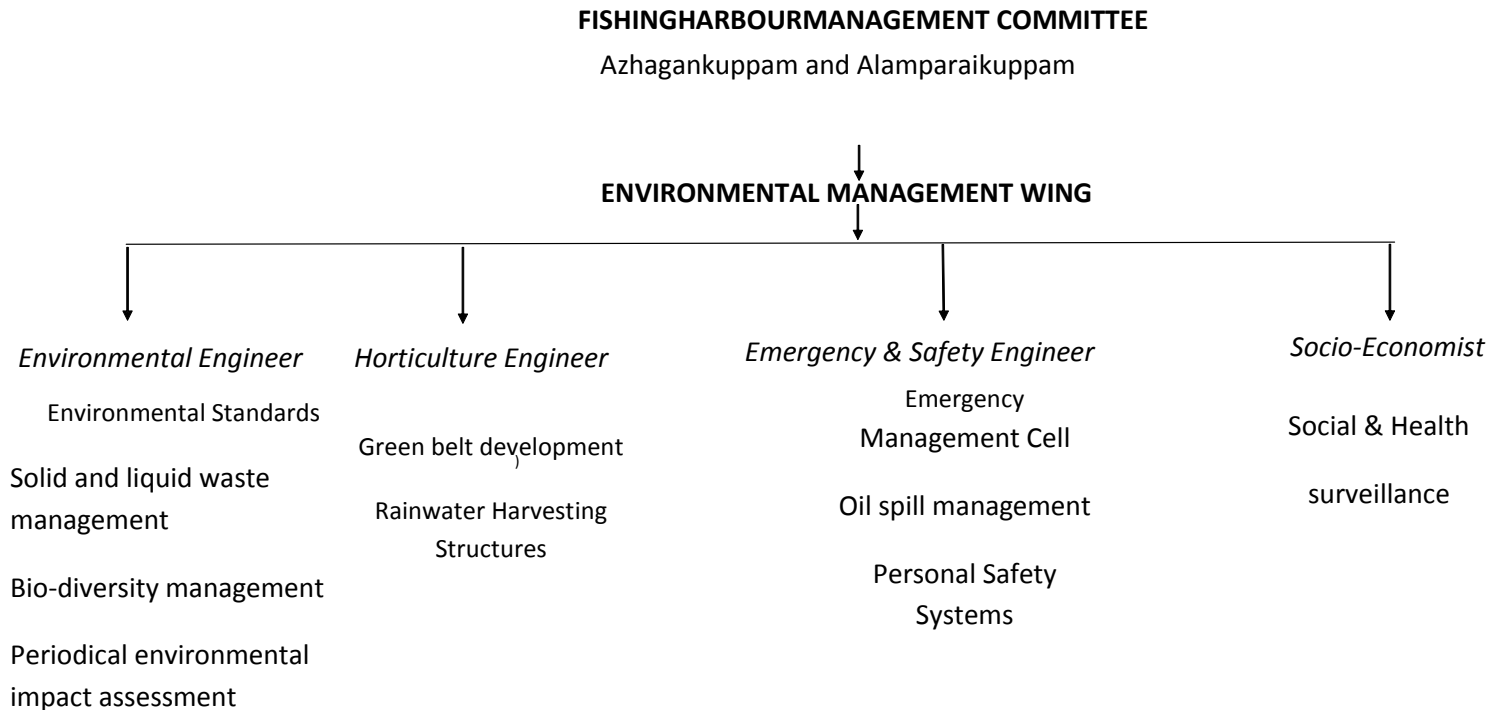
The fish handling and management are the prime activity of the Fishing Harbour hence there is no hazardous chemicals involved and environmentally threat effluent generated from these harbours.

On completion of these harbours, a Harbour Management Committee will be formed for each Harbour, headed by the Director of Fisheries and members from each Village Fishermen Panchayats from all the villages of the District and the concerned Assistant Director of Fisheries will be the Member Secretary.

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An exclusive team of managers with required number of skilled and trained man power will be formed to implement and monitor the Environmental Management Plan. The Cell shall have financial allocation from the regular annual budget of the Harbor administration.

Experts having very good tract records will be appointed as team leaders and well experienced and skilled sufficient supporting staff will be appointed by the Management Committee for day to day maintenance of the Harbours. The schematic diagram showing the details of Environmental and Emergency Safety Wing is given below.



12. BENEFITS OF THE PROJECT

The proposed site is rated environmentally compatible for the promotion of the proposed Fishing Harbours in Kaluveli Waters at Azhagankuppam Village in Villupuram District and Alamparaikuppam Village in Chengalpattu District. This project is highly cost effective, as two fishing harbours are being created in back water, where very less amount is being spent for forming wave tranquility. All the fishermen villages of the district will benefit from these fishing harbours. The operating congestion in Chennai and Puducherry/Cuddalore Fishing Harbours will get reduced. Most of the fishermen will upgrade their OBMS into MFVs. It will attract more people into fishing activities; creating more job opportunity among fishery youths; exploring the opportunities in deep sea fishing; doubling the fish production and also to meet the export demands for enhancing the socio-economic status of the fishermen community.