

# **Project Information Memorandum**

## **Selection of a Private Port Developer for Development, Marketing, Operation and Maintenance of Cuddalore Minor Port**

**Tamil Nadu Maritime Board**  
**Government of Tamil Nadu**  
No.171, South Kesavaperumal Puram,  
Off Greenways Road, Raja Annamalaipuram,  
Chennai – 600 028

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## 1. Project Background

Cuddalore Minor Port under the administrative control of Tamil Nadu Maritime Board (TNMB), Government of Tamil Nadu is an Open Roadstead (Anchorage) Port situated at the confluence of rivers Uppanar and Paravanar along the Bay of Bengal and is about 180 Kms south of Chennai. Larger vessels could not be docked at the Port and were usually anchored at the open sea and the loading and unloading of cargo takes place by means of Lighters/Steel Barges.

The existing breakwater was rehabilitated during the year 2007-09 up to a depth of 2m. The same got damaged over time due to the prevailing current and wave actions resulting in the choking of the Port entrance by sand bar formation. This has further led to reduction in the depth of approach channel.

To avoid the river mouth portion getting silted up and to prevent the port activities coming to a grinding halt affecting the fishermen and the cargo operators, TNMB has undertaken the development of the following infrastructure works at a cost of Rs. 159.45 Crore by availing financial assistance from the State Budget and Sagarmala / Coastal Berth Scheme of Ministry of Ports, Shipping and Waterways, GoI:

1. Extension of North and South Breakwater
2. Construction of wharf 1 & 2 (240 metres in length)
3. Dredging of approach channel (- 9 m)

The works have now been completed and TNMB now intends to select a Port Developer for the following:

- i. Development, Marketing, Operation, and Maintenance of the the Brownfield Port to achieve maximum cargo throughput.
- ii. Development, Marketing, Operation, and Maintenance of Greenfield Port.

## 2. Project Scoping

### **Brownfield Port Facilities**

The Detailed Project Report prepared by the Department of Ocean Engineering, Indian Institute of Technology, Madras recommended the following development works to operationalize the port:

S.No.	Capacity Expansion Project Components	
1.	Berth - 2 Nos.	
	Length	120 m
	Width	21 m
	Depth at berthing pocket	(-) 10 m
2.	Turning circle	
	Diameter	300 m
	Depth	(-) 10 m CD
	Approach Channel length	1,500 m
	Approach Channel width	60 m
	Approach Channel dredge depth	(-) 9 m CD
	Channel slope	1V:5H
3.	Capital dredging in cum	18,73,476m <sup>3</sup>
4.	Breakwater extension using armour stones & tetrapod	
	Extension of North breakwater	215 m
	Extension of South breakwater	420 m

Accordingly, the development works were undertaken by TNMB and completed.

TNMB will give a license to use the project facilities along with land to an extent of 111.72 acres for a period of 50 years extendable up to 99 years based on mutually agreed terms. The selected Port Developer has to create the support infrastructures and undertake the Development, Marketing, Operation, and Maintenance of the port.

### **Greenfield Port Facilities**

The selected Port Developer shall be given the license to use the waterfront of 3.60 km stretch from the South breakwater for a period of 50 years extendable up to 99 years on mutually agreed terms.

The Government Poromboke Land of 47.14 acres adjoining the waterfront of 3.60 km shall also be given as part of the Concession. The selected Port Developer has to develop additional

berths to handle higher capacity vessels by acquiring required back up lands and undertake Development, Marketing, Operation, and Maintenance of the port.

### **3. Market assessment**

Seaports play a crucial role in facilitating trade & economic development and serve as an indispensable link between a country and the world. Seaports are the gateway to a country and are the critical junction between various modes of transport. About 95% of India's trade by volume and 68% by value is transported by sea.

#### **Tamil Nadu ports profile**

Tamil Nadu has the second longest coastline (1076 Kilometres) with 3 major ports and about 17 non-major ports. Of the 3 major ports, 2 major Ports, Chennai & Kamarajar Port are located at the Northern extremity of the State and the 3rd major Port, V.O. Chidambaranar (formally Tuticorin) Port is located at the Southern extremity of the State.

Apart from this, the State has declared about 17 non-major Ports which are administered and controlled by the erstwhile Tamil Nadu Port Department which was converted into Tamil Nadu Maritime Board under the Tamil Nadu Maritime Board Act, 1995 (Tamil Nadu Act 4/96) with effect from 18.03.1997.

#### **Trends in cargo traffic**

During 2020-21, Major and Non-major Ports in India have accomplished a total cargo throughput of 1251.38 million tonnes, and non-major ports in Tamil Nadu collectively handled 9.13 million tonnes of cargo.

In view of the expected growth in the Indian economy and the fact that Tamil Nadu is one of the forerunners in the industrial and economic development in India, the growth of EXIM trade from Tamil Nadu is expected to be significant in the next decade.

#### **The rationale for developing a port facility**

- Import of coal for thermal power plants at Mettur, Cuddalore, and other manufacturing industries with cogeneration power plants in central and western Tamil Nadu offers good potential for the port. For instance, the railway distance to Mettur Thermal Power Station from Ennore Port, through which coal is currently handled, is about 400 km.
- Import of Clinker, Finished Cement, Edible oil, Sugar, and fertilizers & FRM will also contribute to the traffic.

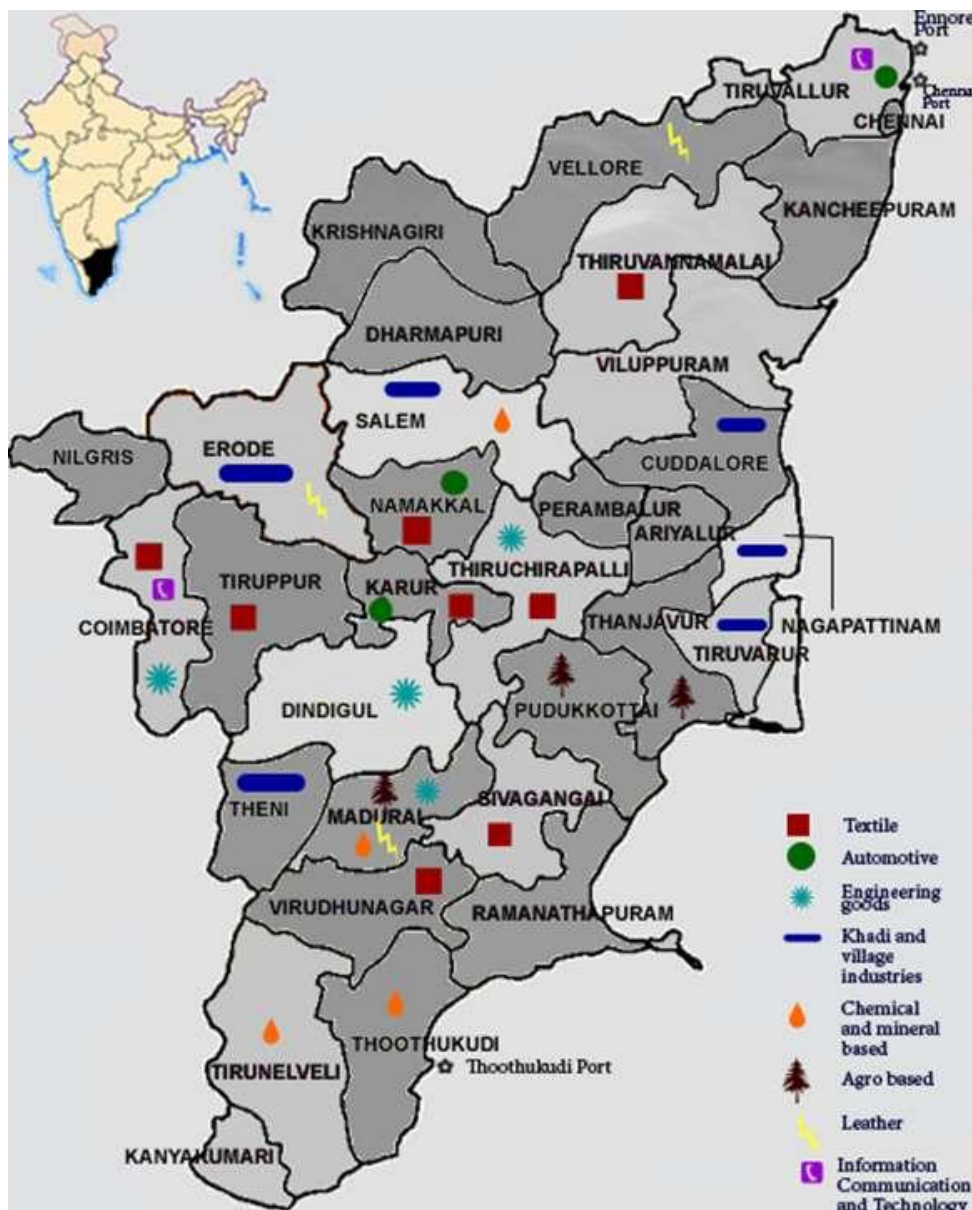


Of all the declared non-major Ports, few Ports are under the direct control of the Tamil Nadu Maritime Board and few of the Port development permissions have been accorded to private players who intend to develop a Port-based captive industry.

### Tamil Nadu Industrial Regions

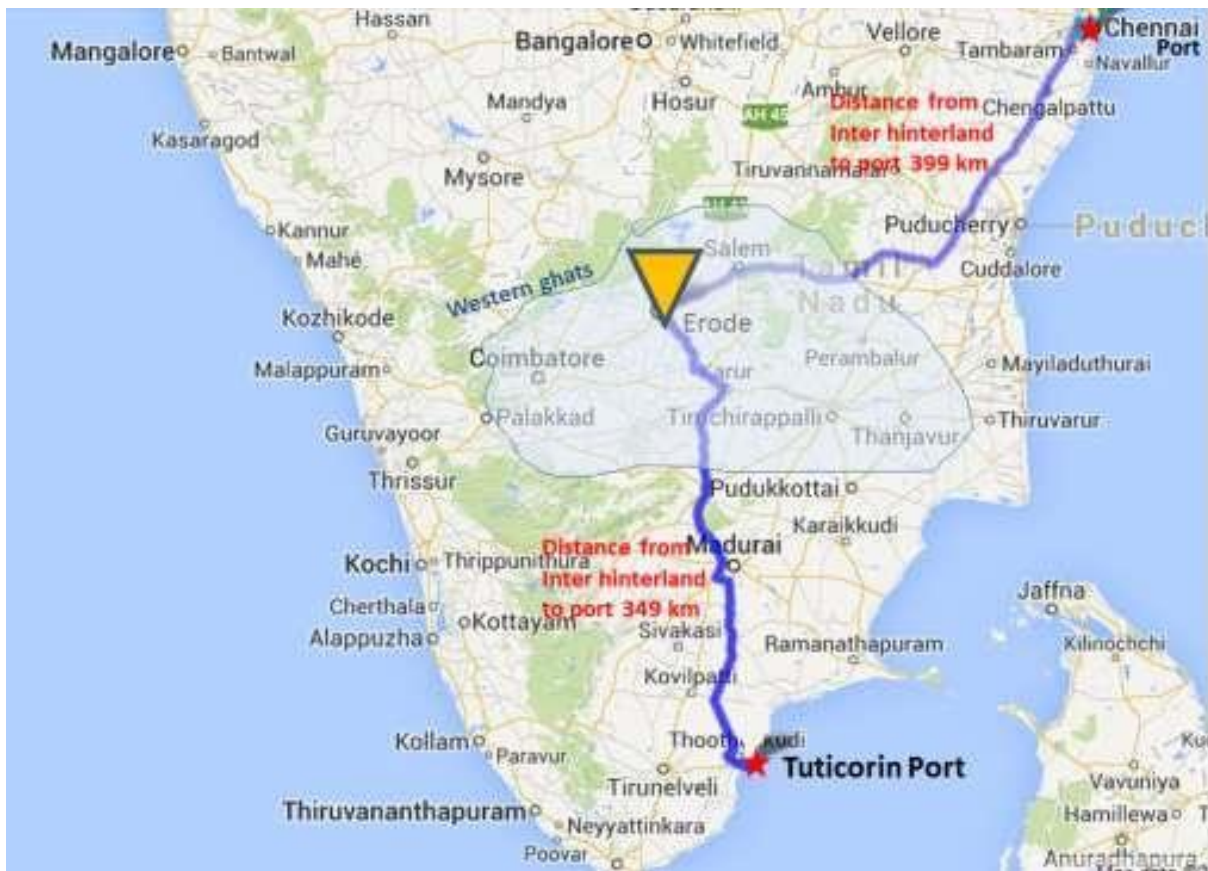
The State has a total of 38 districts with the key industrial districts located in the central & interior regions.

#### Districts and Key Industries in the District





In the Google map below, a representation of the distance of the interior region to the closest major Port has also been shown which is in excess of 300 kilometres:



**Tentative Distance Indicator of interior TN region to the major ports of Chennai & Tuticorin**

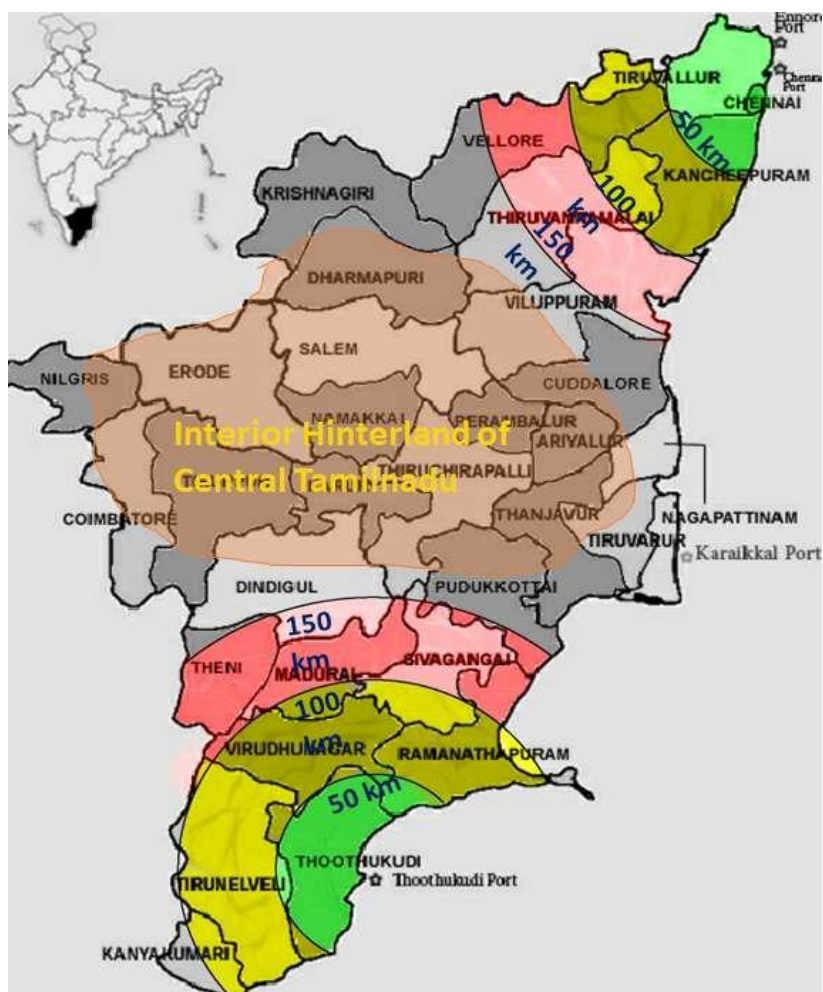
As can be seen from the image above the Central Tamil Nadu Region is located over 300 kilometres away from any major Port. The roadways connecting these regions to the major Ports are not conducive to handling heavy load cargo. The major cargo centres for central TN are detailed in the table below.

**District-wise major industries in Tamil Nadu**

Cargo Centre	Industry
Puducherry	Chemical, food products, metal, leather, printing, auto components
Nagapattinam	Power Plant, Agro Industries
Tiruvallur	Textile, Engineering, Food Industry
Pudukottai	Cashew, Agro Products
Karur	Paper, Textile

Namakkal	Truck body building
Perambalur	Cement
Ariyalur	Cement, Sugar
Thanjavur	Agro Industries, Sugar, Palm Oil
Trichy	Steel, Engineering, Textile, Cement
Cuddalore	Power Plants
Villupuram	Sugar, Rice
Salem	Steel, Mineral Industries, Dairy
Erode	Sugar, Leather, Textile
Tirupur	Textile

A detailed examination of potential cargo traffic originating/culminating within the various industries in Tamil Nadu Districts located in the land-locked and coastal districts of Tamil Nadu which are not easily accessible from the Chennai / Kamarajar Ports located in the northern part of Tamil Nadu and the V.O.C. Chidambaranar Port (formally Tuticorin Port) located in the southern part of Tamil Nadu as shown in image below:



## Trends in cargo traffic

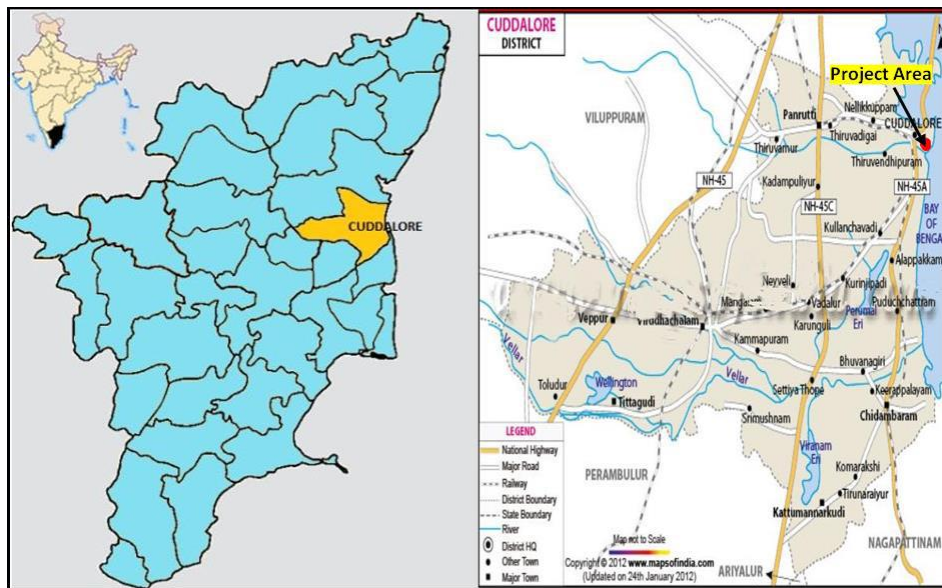
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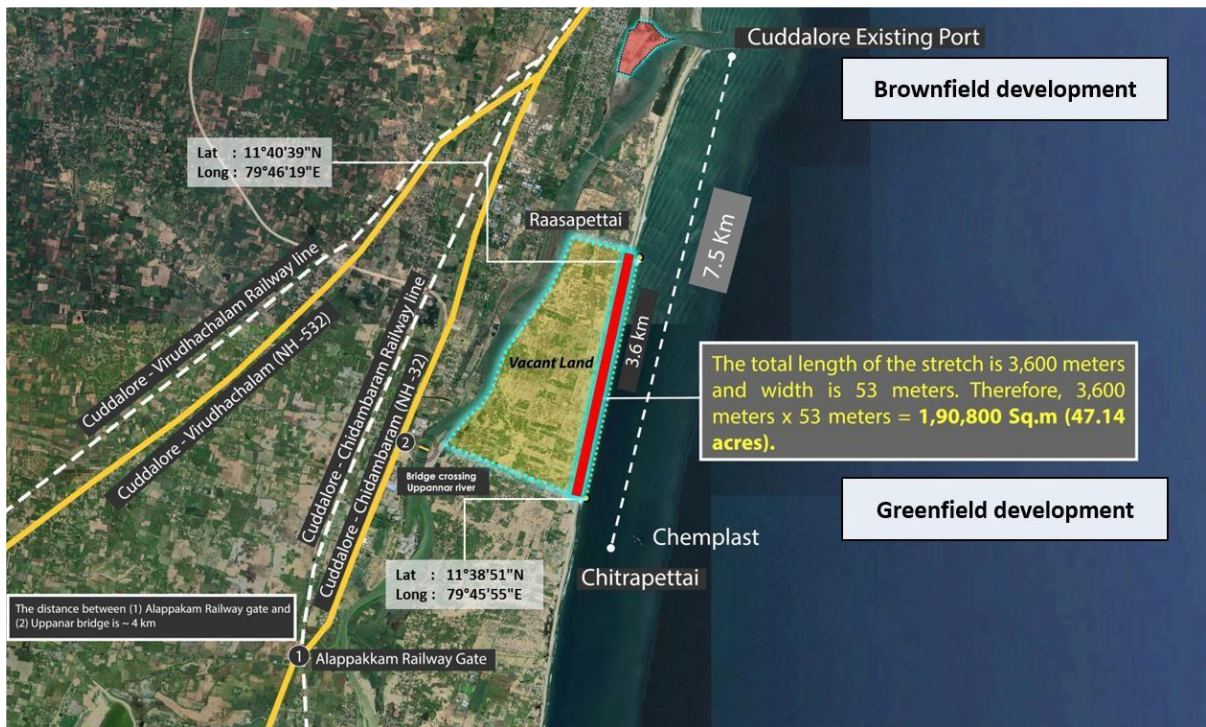
## 4. Project site

The project is located at the mouth of rivers Uppanar and Paravanar along Bay of Bengal. Cuddalore port is primarily an anchorage port, ships arrive and stay at anchorage about 2 kms from the port estuary.

Map 1:



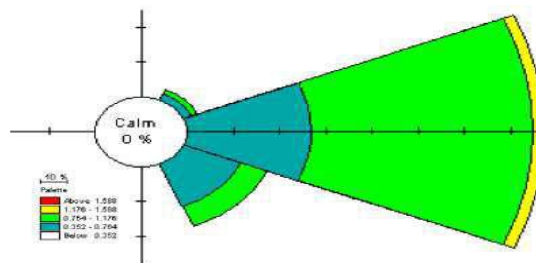
Map 2:



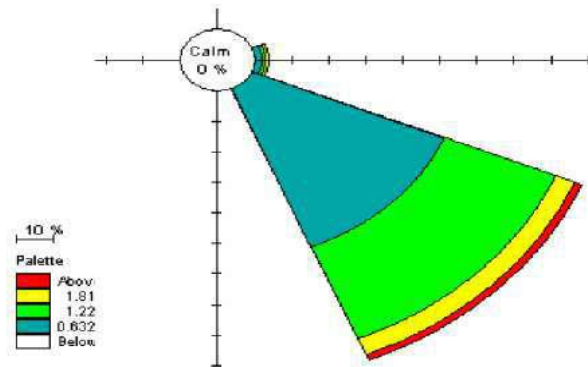
## 5. Meteorological Data

### Climate

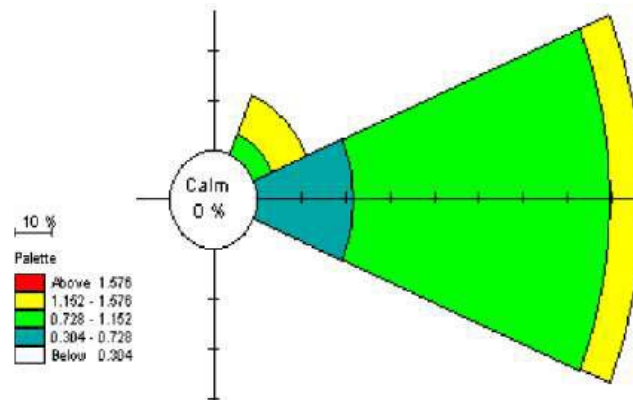
The climate of the region is characterized by two seasonal monsoons viz. north-east and southwest. North-East monsoon occurs between November and South-west monsoon extends from June up to September and is characterized by occurrence of rain. The waves approach the coast from North East, East and South West directions. The wave climate will be presented in the form of Rose diagrams. The prevailing wave climate for non-monsoon (January-May), south west monsoon (June-September) and north east monsoon (October-December) are indicated as below:



Wave rose for Non monsoon



Wave rose for south west monsoon



Wave rose for north east monsoon

## Temperature

The mean daily maximum temperature varies from 28°C and 37°C with the highest occurring in June. Mean daily minimum temperature varies between 23°C and 27°C, with the lowest occurring in December / January.

## Relative humidity

Relative humidity is fairly high and uniform round the year. The mean relative humidity varies between 71% and 73%.

## Rainfall

The average annual rainfall is 1337 mm. The average number of rainy days is 53 per year. October to December is the wettest months of the year with an average rainfall in excess of 200 mm per month, with a maximum of 458 mm in November. February and March are dry months with average rainfall below 25 mm per month.

## Cyclone

East Coast is prone to cyclonic storms round the year but mostly these occur prior to south-west monsoon i.e., in May and after south-west monsoon i.e. in October and November. Around 18 depressions are formed annually in the Bay of Bengal of which 6 turn out to be cyclonic storms on an average. The coast of Cuddalore is a cyclone prone one. The Thane cyclone 2011 is the one of the very severe one which has crossed the Cuddalore coast resulting in heavy damages.

## Visibility

Throughout the year, visibility is good as the fog is infrequent at sea during all seasons.

## 6. Oceanographic Data

### Sea water Temperature

Sea water temperature varies from a mean of 25°C in January and a mean of 29°C in October.

### Wind

The maximum cyclonic and non-cyclonic wind speed during the last 10-years is 26 m/s and 14-16 m/s respectively. The annual average wind climate exhibits two distinct peaks in its directional distribution, centered approximately on south-west and north-east. Examination of the seasonal climate tables shows that these correspond to the (south-west) monsoon period and the post-monsoon (also referred to as north-east monsoon) period, respectively.

### Wave climate

The wave characteristics play a vital role in the design and operation of the open sea marine terminal. It also governs the orientation of the unloading pier to obtain number of operable

days in a year.

The deep-water wave climate is dominated by north-easterly and south-westerly conditions associated with the (south-westerly) monsoon and the post-monsoon respectively. As the waves travel into progressively shallower water, they are modified by depth-refraction and their crests become progressively more aligned with the bed contours. This causes a reduction in the spread of wave directions in the wave climate with reduction in water depth. Moving into depths of 10m and below, the height of the largest waves is reduced due to the combined effects of refractions and wave breaking. The average wave height prevailing is 1.40 m with periods varying from 7 to 10 sec.

### Currents

The current speed and direction recorded at 20 minutes interval for 15 days at the 6 locations which are given below:

- C<sub>1</sub> - 0.18 m/s,
- C<sub>2</sub> - 0.24 m/s
- C<sub>3</sub> - 0.35 m/s,
- C<sub>4</sub> - 0.22 m/s,
- C<sub>5</sub> - 0.26 m/s and
- C<sub>6</sub> - 0.24 m/s.

In general currents appeared to be more dominated by tides than the influence of wind and general circulation in the area. The above current details are taken from the Bathymetric Oceanographic survey final report carried out by Indomer Coastal Hydraulics (P) Ltd (September 2008).

### Bathymetry Details

The coastline is inclined at an angle 65° w.r.t north. Most of the waves approach the coast from south east direction. The coast has a bay like formation. The beach slope in this stretches up to 10 m depth is nearly 1:200.

## 7. Geotechnical Data

### Geotechnical investigations conducted at site

Geotechnical Investigations consisted of three boreholes was carried out. While carrying out borehole investigations, Standard Penetration Tests(SPTs) were also carried out at every 1.50

m depth intervals.

#### Assessment of Geotechnical conditions at site

At that time of soil investigation, the ground water table was encountered at 1.30 m below existing ground level. Three numbers of standard oil investigation boreholes of 150 mm diameter were taken at specified locations. Investigations were conducted up to 30.0 m. SPTs were conducted at every 1.5 m depth intervals and samples were collected for identification and testing.

#### Subsoil conditions at Location of Marine facilities

Based on visual identification of soil samples and test results (of both field and laboratory tests), the soil profiles have been arrived. Subsoil is made up of four distinctive layers and is as mentioned below:

1. Silty Sand 0.0 m to (-) 11.60 m below G.L. with SPT's N = 24
2. Medium stiff clay (-) 11.60 m to (-) 24.80 with SPT's N=7
3. Silty Sand (-) 24.80 m to (-) 50.00 m with SPT's N=50

## 8. Handling Capacity

### Brownfield Port Facilities

Parcel size of vessel	:	6000 T
Handling rate	:	1100 TPH (@100% efficiency)
No. of mobile harbor crane to be considered	:	2 Nos.
Capacity of 1 No. of mobile harbor crane	:	550 TPH
Capacity of 2 Nos. of mobile harbor crane	:	1100 TPH
No. of hours for coal handling	:	$6000/1100 = 5.45$ Hrs = 6 Hrs
No. of hours for berthing and un-berthing	:	6 Hrs
Duration for handling 1 vessel	:	12 Hrs (0.5 days)
No. of days berth available per year	:	(364 days @ 65%) = 236.60 days



Volume of coal that could be handled in 236 days	:	$236.60/0.5 = 473.2$ ships x 6000 T = 2.84 MTPA
Handling capacity of 1 berth	:	2.84 MTPA
Handling capacity of 2 berths	:	5.68 MTPA

For the Greenfield Port development, the selected Port Developer shall create additional wharf / other facilities such as ship repairs etc. at his cost based on market demand.

## 9. Layout of berth



The berths and berthing basins have been located in areas which are best protected from wind and wave disturbance and away from the disturbance incident upon the harbour entrance and resonance. The turning circle has been located at the head of approach channel.

Further, the selected Port Developer shall submit the master plan for all the port related infrastructure facilities proposed to be developed during the concession period. The Port Developer will be permitted to develop port related infrastructure / facilities within the project site. The infrastructure / facilities proposed to be developed should be included in the master plan along with timeline for implementation and operationalization of each facility.

### Berth Structure

The berth has been designed to handle 5.68 MTPA to export/import cargoes and the berth location is considered along the embankment west of River Paravandar as shown in the figure below, which offers sufficient space for providing suitable access channel, relatively lesser dredging volumes, offers better land accessibility and better ease of vessel operations.



The location and form for berths have been decided by the following general consideration:

- Maximum ease of entering and leaving berth and
- Isolation requirements and safety regulations

## 10. Cost of the Project

The cost of the project for the development of the Port facilities was ₹159.45 crores. In addition to the above, the selected private operator has to invest about ₹80 crores for establishing the following facilities to operate and maintain the Port:

### Mandatory Facilities

- Desalination plant
- Effluent Treatment plant

### Optional Facilities

- Stocking yard
- Warehouse
- Administrative Building
- Toilets and Bathroom

- Internal Road
- High mast Lights
- Boundary wall with barbed wire
- ISPS equipment
- Tug
- Patrol / Pilot / Mooring Launch

The above facilities are only indicative. Any other facilities that may be required to comply with the regulations will be the responsibility of the selected Port Developer.

### 11. Concession Period

The Concession period is considered at 50 years extendible up to a period of 99 years and the Selected Port Developer has to achieve the following minimum throughput during the Concession period:

Years	Minimum Guaranteed Throughput (Tonnes)	Years	Minimum Guaranteed Throughput (Tonnes)
1	3.00 lakh	26	35.00 lakh
2	4.50 lakh	27	35.00 lakh
3	6.75 lakh	28	35.00 lakh
4	10.13 lakh	29	35.00 lakh
5	15.19 lakh	30	35.00 lakh
6	22.78 lakh	31	35.00 lakh
7	35.00 lakh	32	35.00 lakh
8	35.00 lakh	33	35.00 lakh
9	35.00 lakh	34	35.00 lakh
10	35.00 lakh	35	35.00 lakh
11	35.00 lakh	36	35.00 lakh
12	35.00 lakh	37	35.00 lakh
13	35.00 lakh	38	35.00 lakh
14	35.00 lakh	39	35.00 lakh
15	35.00 lakh	40	35.00 lakh
16	35.00 lakh	41	35.00 lakh
17	35.00 lakh	42	35.00 lakh
18	35.00 lakh	43	35.00 lakh
19	35.00 lakh	44	35.00 lakh

20	35.00 lakh	45	35.00 lakh
21	35.00 lakh	46	35.00 lakh
22	35.00 lakh	47	35.00 lakh
23	35.00 lakh	48	35.00 lakh
24	35.00 lakh	49	35.00 lakh
25	35.00 lakh	50	35.00 lakh

The payment has to be made for the actual throughput achieved or MGT whichever is higher.

### Minimum Cargo charges

The charges payable for Development, Marketing, Operation and Maintenance of Brownfield Port Facilities is fixed at Rs. 55/- per MT of Cargo handled with a cumulative increase of 15% in every 3 years. This is based on the guidelines being followed by TNMB for fixation of tariff, facilities created by TNMB in the Port and additional facilities to be created by the Selected Port Developer.

#### Greenfield Port

A mobilization period of 8 years from the date of signing of Concession agreement shall be permitted to develop and mobilize the resources for commercial operation of the Greenfield Port facilities. During the mobilization period, the selected Port Developer shall not be liable to pay the TNMB any amount.

The selected Port Developer shall pay the Concessions Authority on monthly basis of A% of the Gross Revenue generated from the Greenfield Port facilities to be developed by the Concessionaire. The revenue share percentage shall be discovered through tender process. The Revenue share table will be as below:

Upto 15 years	_____% of the gross revenue ----> (A)
16-30	1.5 X A
31 - 50	2 X A

## 12. Bid Variable

Bid variable - The bidder who is quoting a higher percentage of revenue sharing on Gross Revenue from Greenfield Port Facilities over and above the base value of 3% will be awarded contract.

### **Brownfield Port**

The Port Developer shall pay TNMB on monthly basis the amount whichever is higher among the following:

- Cargo handled per month X Approved cargo charges
- (MGT / 12 ) X Approved cargo charges

An escalation of 15% on the cargo charges will be considered after completion of every three financial years.

### **Greenfield Port**

The Port Developer shall pay TNMB on monthly basis the percentage of revenue sharing on Gross Revenue discovered through tender process.

License fee for land - The Port Developer shall pay TNMB the license fee for land as below:

Timeline (A)	Brownfield	Greenfield
At the time of signing of Concession Agreement (A)	₹4 crores	₹2.75 crores
A + 12 months	₹1.71 crores	₹0.72 crores
A + 24 months	₹1.71 crores	₹0.72 crores
A + 36 months	₹1.71 crores	₹0.72 crores
A + 48 months	₹1.71 crores	₹0.72 crores
A + 60 months	₹1.71 crores	₹0.72 crores
A + 72 months	₹1.71 crores	₹0.72 crores
A + 84 months	₹1.71 crores	₹0.72 crores
A + 96 months	₹1.71 crores	₹0.72 crores
A + 108 months	₹1.71 crores	₹0.72 crores
A + 120 months	₹1.71 crores	₹0.72 crores
A + 132 months	₹1.71 crores	₹0.72 crores
A + 144 months	₹1.71 crores	₹0.72 crores
A + 156 months	₹1.71 crores	₹0.72 crores
A + 168 months	₹1.71 crores	₹0.72 crores
A + 180 months	₹1.71 crores	₹0.72 crores
A + 192 months	₹1.71 crores	₹0.72 crores
A + 204 months	₹1.71 crores	₹0.72 crores
A + 216 months	₹1.71 crores	₹0.72 crores
A + 228 months	₹1.71 crores	₹0.72 crores
A + 240 months	₹1.71 crores	₹0.72 crores

### 13. Terms of Contract

- Development, Operation & Maintenance of the Project Facilities for a period of 50 years, extendible up to a maximum period of 99 years including repairs, maintenance and replacement if any.
- Installation of desalination plant, ETP and other equipment as may be required for the regular operations of the port at the cost of Port Developer. At the end of the Concession period, the Port Developer shall have the option of taking back the equipment's or transfer to TNMB at the value fixed by TNMB.
- Creation of Additional wharf / Godown / Office Space / other facilities at the cost of Port Developer with prior approval of TNMB.
- After completion of the concession period, the Port Developer should hand over the entire port with infrastructure and installations thereon to TNMB without any financial or other consideration.

### 14. Site Photos

#### NORTH BREAKWATER



## SOUTH BREAKWATER



## CUDDALORE PORT - SHIP BERTHING JETTY

