

4.7.4 TERMINAL AT KALINGNAGAR

Kalinganagar is a small town in Jajpur district of coastal Odisha. It is rich in iron ore. Recently, because of high global demand for steel, Kalinganagar is becoming a major global hub in steel and ancillary products. A large number of steel plants including projects by Tata Steel are in various stages of implementation. As a known fact, logistics plays a vital role in any steel production unit and more so in a new mega steel plant project like the one at Kalinganagar, in Jajpur Odisha. Iron ore, coal and imported limestone being the prime inputs for the steel plant it is an advantage that the iron ore mines and the upcoming port at Dhamra is barely 100 km from the plant site.

Traffic:

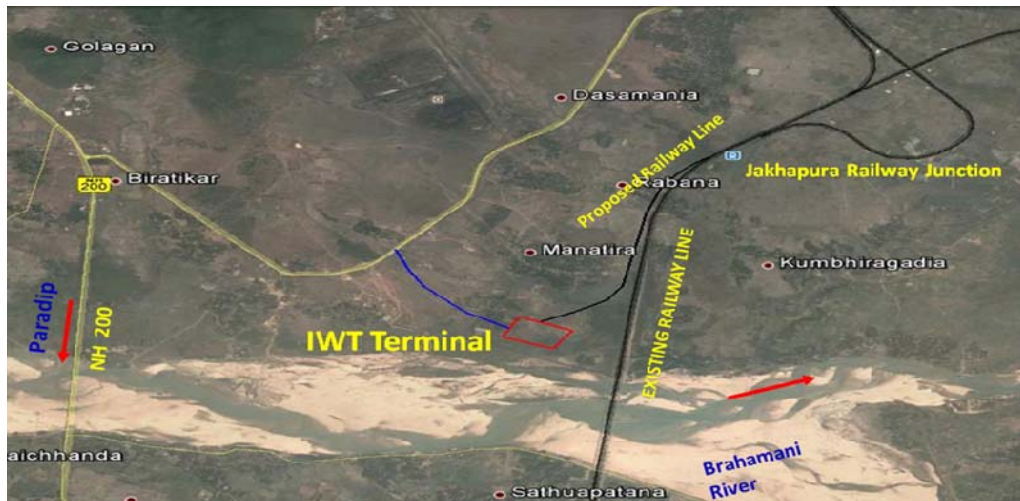
Projected divertible traffic through Kalinganagar Terminal

Kalinganagar Total Traffic (MT)	
Year	Total
2011-12	1.12
2018-19	2.34
2031-32	4.89
Important Commodity: Iron ore and Coal	

Road Connectivity:

The Kalinganagar industrial area is well connected by road. The Plant site is flanked by Daitari - Paradip expressway, which got converted to NH-200 recently, and on the eastern side there is the state highway leading to the Sukinda Mines. In addition a comprehensive road transport network has been planned for the proposed plant. It is expected that the ore from mines are transported through waterways to the Dhamra/ Paradip ports.

To connect the proposed terminal with the National Highway, a stretch of 1.6 km road is required which requires 11m wide road to bear the heavy vehicle movement. The cost of road connectivity is worked out as Rs.12.61crores. (i.e.,Rs 3.81 crores for additional land width requirement and Rs.8.80 crores towards development cost. The proposed road connectivity is depicted in the satellite imagery below:



Legend	Length (Km)	Existing / Available Width (m)	Addl land width reqd (m)	Ownership of land	Develop ment Cost (Cr)	Land cost (Cr)	Total Cost (Cr)
	1.60	New road	20	Private	8.80	3.81	12.61

Rail Connectivity: Kalinganagar is well connected with the rail network. It is expected to connect the IWT Terminal also to facilitate coal, core movement through rail network. The rail connectivity from the nearest rail head is found feasible and also inside the boundary of IWT Terminal. For the terminal, since the traffic forecast is not attractive enough to provide exclusive rail corridor, it is not considered for rail connectivity.

Total Development Cost:

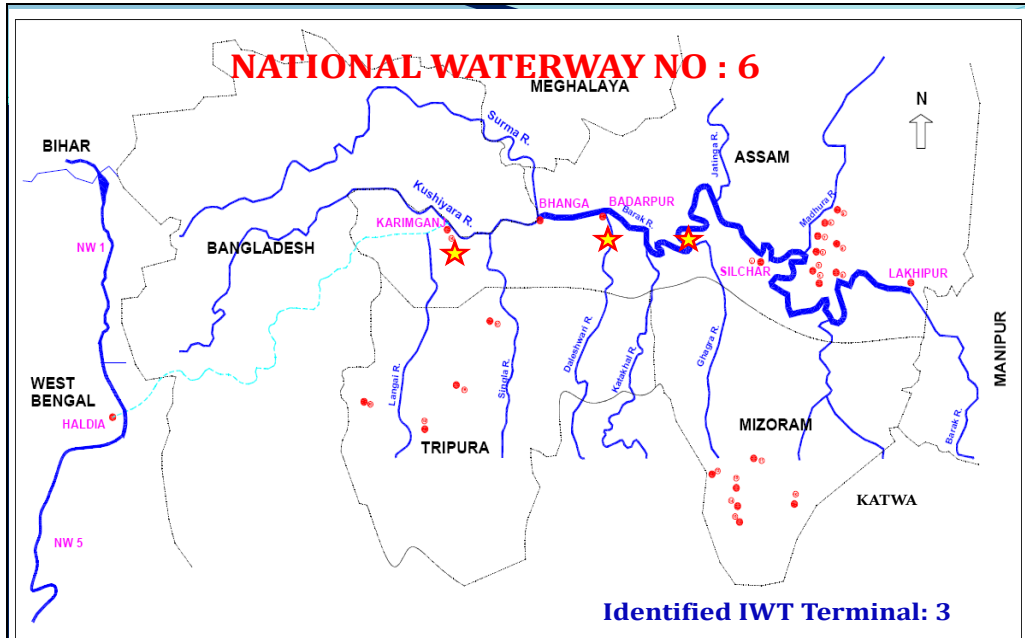
It is envisaged that a sum of Rs. 278 crores is required for the development of IWT Terminal at Kalinganagar. The breakup cost of investment required is detailed as follows:

Waterway development	: Rs. 200 crores
Road Connectivity	: Rs.13 crores
Terminal Development Cost	: Rs. 65 crores
Total Investment	: Rs. 278 Crores

4.8 CONNECTIVITY IN PROPOSED TERMINALS AT NATIONAL WATERWAY-6

The following terminals are falling under National Waterway-6.

National Waterways	SN.	Name of IWT Terminal	Nearest NH/SH	Nearest Railhead	Gauge
NW6	1	Silchar	NH -54 (old)/NH37 (New)	Silchar	MG
NW6	2	Badarpur	NH-44	Badarpur Jn.	MG
NW6/Kushiyara River	3	Karimganj	NH -44/NH-151	Karimganj Jn	MG



4.8.1 Terminal at Silchar

Silchar terminal is situated along the Barak River(NW-6) near bridge on NH-37 (New)/NH-54 (Old)in the Silchar city. At present land along the Barak River is under the control of PWD, Government of Mizoram and land of CIWTC is under encroachment of Bijayee Sangha club. A court case is pending over the ownership of the land. Presently no vessel movement is there. An old go down exist inside the old terminal area, the ownership of land belong to PWD, Government of Mizoram. The connecting road to terminal with NH is under encroachment on both sides by private shop owners.

Traffic:

Projected divertible traffic through Silchar Terminal

Silchar Total Traffic (MT)			
Year	Originating	Terminating	Total
2011-12	0.55	1.25	1.80
2021-22	0.75	1.40	2.15
2031-32	2.01	3.44	5.45
Important Commodities: Food grains, General goods			



View of Silchar Terminal land under PWD, Government of Mizoram



CIWTC land available at Silchar Terminal under occupation by Bijayee Sangha Club



A view of Connecting Road to Silchar terminal with NH54 (old)/NH 37 (new)

The location map of Silchar terminal describing road connectivity with existing National Highway (NH-54(old)/Nh-37 (new)) is shown below:



Legend	Length (Km)	Existing / Available Width (m)	Addl land width reqd (m)	Ownership of land	Development Cost (Cr)	Land cost (Cr)	Total Cost (Cr)
	0.05	3.7m/7.0m	5.0 m	Govt. of Mizoram/ CIWTC Ltd.	0.20	-	0.20
	0.15	3.7m/7.0m	5.0 m	Private	0.60	0.56	1.16

Location map of Silchar terminal

Road Connectivity:

It is observed that a 200m length of single lane road has to be converted in two lane road for connecting the existing IWT terminal with national highway. The cost for conversion of single lane to two lane road for 200m is considered on normative basis as Rs.0.80 crores and land acquisition cost is worked out as Rs. 0.56 crores. The total cost of road connectivity is thus worked out as Rs.1.36 crores. However considering other infra needs, a provision of Rs.2.0 crores is kept in the estimates.

Rail Connectivity:

The rail connectivity from the nearest rail head (Silchar) is found not feasible and also inside the boundary of IWT Terminal. The connecting Rail line has to pass through the heavily populated areas, difficult to acquire land for the rail connectivity. Further the traffic level of 1.90 MTPA at the 2031-32 level indicates inadequate for considering exclusive rail connectivity. Therefore, rail connectivity is not considered for this terminal.

Total Development Cost:

It is envisaged that a sum of Rs.272 crores is required for the development of IWT Terminal at Silchar (Assam). The breakup cost of investment required is detailed as follows:

Waterway development	: Rs. 250 crores
Road Connectivity	: Rs. 2 crores
Terminal Development Cost	: Rs. 20 crores
Total Investment	: Rs. 272 Crores

4.8.2 TERMINAL AT BADARPUR

Badarpur terminal is situated along the Barak River (NW-6) near Railway Bridge and also very near to NH-44 at Badarpur city. At present the terminal is operational and has one pontoon jetty. The terminal is under administrative control of Central Inland water Transportation Corporation Ltd. (CIWTC Ltd.). The cargo movement from Haldia/Bangladesh is presently carried out through this terminal. The terminal is also having the facility of go down; loading/unloading is carried out manually on this terminal. The photographs taken during site visit of the terminal by RITES are presented below:



View of Gangway and Pontoon Jetty arrangement Godown facility at Badarpur Terminal



View of existing Badarpur terminal with manual cargo handling at Badarpur Terminal



View of connecting road from NH-44 to Badarpur terminal

Traffic:

Projected divertible /estimated traffic through Badarpur Terminal

Badarpur Total Traffic (MT)			
Year	Originating	Terminating	Total
2011-12	0.65	0.85	1.50
2021-22	0.78	1.01	1.79
2031-32	1.28	1.50	2.78
Important Commodities: Food grains, General goods			

The location map of Badarpur terminal describing road connectivity with existing National Highway (NH-44) and possible rail connectivity with Badarpur Jn. is shown below:



Legend	Length (Km)	Existing / Available Width (m)	Addl land width reqd (m)	Ownership of land	Development Cost (Cr)	Land cost (Cr)	Total Cost (Cr)
	0.015	4.0	8.0 m	CIWTC Ltd.	0.06	-	0.06
	0.030	4.0	8.0 m	Private	0.12	0.16	0.28

Road Connectivity: It is observed that a 45m length of single lane road(4.0m wide) has to be converted in two lane road for connecting the existing IWT terminal with National Highway-

44. The cost for conversion single lane to two lane road of 45m is considered on normative basis as 0.18 crores and land acquisition cost is worked out as Rs. 0.16crores. The total cost of road connectivity is estimated as Rs.0.34 crores (Say 1 crore)

Rail Connectivity: The rail connectivity from the nearest rail head (Badarpur Jn.) is not found feasible neither outside nor inside the boundary of IWT Terminal. Further the traffic level of 0.92 MTPA at the 2025-26 level indicates inadequate traffic for considering exclusive rail connectivity. Therefore, rail connectivity is not considered for this terminal.

Total Development Cost:

It is envisage that a sum of Rs.271 crores is required for the development of IWT Terminal at Badarpur (Assam). The breakup cost of investment required is detailed as follows:

Waterway development	: Rs. 250 crores
Road Connectivity	: Rs. 1 crores
Terminal Development Cost	: Rs. 20 crores
Total Investment	: Rs. 271 Crores

4.8.3 TERMINAL AT KARIMGANJ

Karimganj terminal is situated along the Kushiyara River in the Karimganj city and also very near to NH-151. At present the terminal is operational and has two pontoon jetty with gangway arrangement. The terminal is under administrative control of Central Inland water Transportation Corporation Ltd. (CIWTC Ltd.). The cargo movement from Haldia/Bangladesh is going on to this terminal. The terminal is also having the facility of go down, loading/unloading is carried out manually on this terminal. The photographs taken during site visit of the terminal by RITES are presented below:



View of Gangway and Pontoon Jetty arrangement and Godown facility at Karimganj Terminal



A view of connecting road from NH-151 to Karimganj terminal via Nilmony Road



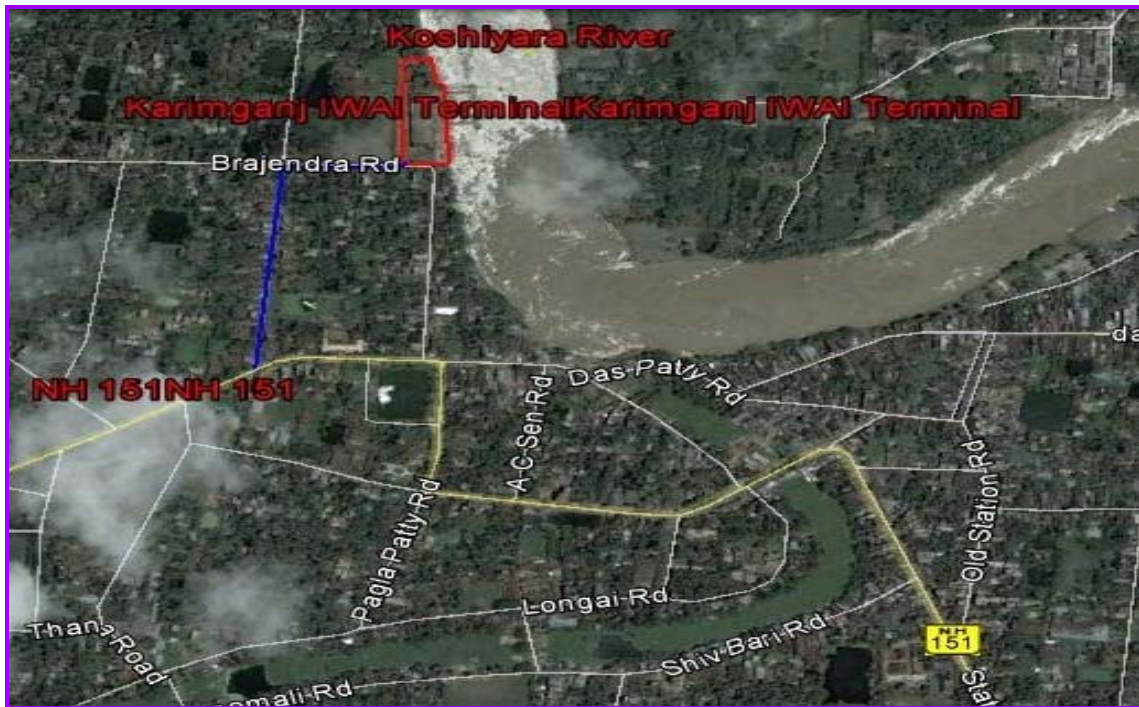
A view of connecting road from NH-151 to Karimganj terminal

Traffic:

Projected divertible traffic through Karimganj (Assam) Terminal

Karimganj Total Traffic (MT)			
Year	Originating	Terminating	Total
2011-12	0.65	1.20	1.85
2021-22	0.66	1.32	1.98
2031-32	1.79	2.35	4.14
Important Commodities: Food grains, General goods			

The location map of Karimganj terminal describing road connectivity with existing National Highway (NH-151) is shown below:



Legend	Length (Km)	Existing / Available Width (m)	Addl land width reqd (m)	Ownership of land	Development Cost (Cr)	Land cost (Cr)	Total Cost (Cr)
	0.8	7.0m/11.0m	-		-	-	-
	0.15	3.7m/11.0m	-		2.0	-	2.0

Road Connectivity:

It is observed that a 800m length of two lane road namely Nilmony Road (7m wide) is existing from NH-151 to terminal. The terminal has also connectivity with NH-151 via steamer Ghat Road which is single lane road (3.7m) and has to be converted in two lane road for better connectivity with the existing IWT terminal. The cost for conversion of single lane to two lane road of 500m via steamer ghat road is considered on normative basis as Rs.2.0 crore. Land acquisition is not required as sufficient land width (11m) for the proposed road development is available. The total cost of road connectivity is worked out as Rs.2.0 crore.

Rail Connectivity:

The rail connectivity from the nearest rail head (Karimganj Junction) is not found feasible and also inside the boundary of IWT Terminal. The proposed rail line connecting to terminal has to pass through heavily populated area around 1.4 km., although thereafter from old Railway Mall Godam to Karimganj Jn. Old MG line exists with sufficient Railway land. Further the traffic level of 1.31 MTPA at the 2031-32 level indicates inadequate for considering exclusive rail connectivity. Therefore, rail connectivity is not considered for this terminal. A photograph taken during site visit by RITES team is presented below:



Old Railway line (MG) from Mall Godam to Karimganj Jn.

Total Development Cost:

It is envisaged that a sum of Rs.272 crores is required for the development of IWT Terminal at Karimganj (Assam). The breakup cost of investment required is detailed as follows:

Waterway development	: Rs. 250 crores
Road Connectivity	: Rs. 2 crores
Terminal Development Cost	: Rs. 20 crores
Total Investment	: Rs. 272 Crores

4.9 CONNECTIVITY TO PORT LOCATIONS FROM NATIONAL WATERWAYS

The connectivity to Port locations from the proposed terminals is explored as ports are trade centres and acts as economic backbone. As more than 90% of export-import traffic is carried out through ports, the connectivity to the ports through waterways is expected to reduce the burden on the existing rail/ road connecting these ports. In total 8 ports are taken up for connectivity under this study namely, Haldia, Kolkata, Kochi, Kakinada, Krishnapatnam, Ennore Paradip and Dhamra. In Eastern Grid, ports like Haldia, Kolkata, Dhamra and Paradip were considered for connectivity. A separate terminal with finger jetties is proposed to handle IWT cargo in ports to facilitate transfer of goods from/ to the IWT Vessels and Sea Vessels within port limits. Terminals proposed on these eight locations are discussed hereunder:

4.9.1 PORT CONNECTIVITY TO NW-1

Haldia and Kolkata are the two main ports which were directly connected to NW-1. Port connectivity to the terminals proposed in NW-1 therefore has a direct link to these two ports. Further, it is needless to add that these two ports can also connect to terminals of NW-5. Apart from this, IWT terminals lying in NW-2 and NW-6 can also be catered through Bangladesh protocol route, i.e., Eastern Grid.

4.9.1.1 TERMINAL AT HALDIA and KOLKATA:

The port of Haldia is a riverine port and the designated berth is located within the impounded dock system. The entrance to the dock system is controlled by lock gates and the river passage of 70 nautical miles from the sea known as SANDHEADS is governed by the available draft depending on the tide of the day and is negotiated under the guidance of knowledgeable pilots of the Port. As per the information available loaded ships having 30000 DWT can be handled in the port.

The pilotage distance to Haldia is 121 Kms comprising 46 kms of river and 75 kms of sea pilotage. The Port maintains a pilot Vessel/Station at Sagar Roads. The River Pilot embarks on inwards bound vessels at Middleton Point and proceeds up the river. At Haldia the pilot bringing the vessel from Middleton point hands over the vessel at the lock entrance to the Berthing Master but all vessels bound for oil jetties are taken alongside by the same Pilot. The Haldia port is shown in Fig. below. The traffic from HDC handled through IWT mode in 2012-13 is 3.45lakh tonnes and it is 1.20% of total traffic handled at Haldia during this period. This traffic is expected to increase by 47.91lakh tonnes by year 2016-17.



Haldia port connectivity to NW 1

Port Connectivity and Terminal Development cost:

Finger jetty cost	:	Rs. 50.00 crore
Conveyor connectivity (0.85km)	:	Rs. 12.75 crore
General Cargo handling Equipment	:	Rs. 20.00 crore
Logistic support	:	Rs. 10.00 crore
Port connectivity (Dredging etc.)	:	Rs. 15.00 crore
TOTAL	:	Rs. 107.75 crore

KOLKATA PORT

Kolkata port is well connected to the National Waterway 1 as shown in Fig. below.



Layout of Kolkata port on the banks of NW 1

The loading / unloading of bulk cargo like coal and iron ore can be organized in two ways as stated below:

1. Using transhipper directly from the mother vessel anchored offshore as discussed earlier
2. Through the existing ports of Haldia and Kolkata

The imported coal can be directly loaded to IWT vessels in deep sea (at sand heads) with the help of transshippers. The loaded coal can be directly transported to the IWT nearest terminals at thermal power plants along NW 1. This mechanism will reduce the loading and unloading cost at port. The coal from IWT terminals along NW 1 can be transported through conveyors or road/ rail mode to the stack yard of thermal power plants.

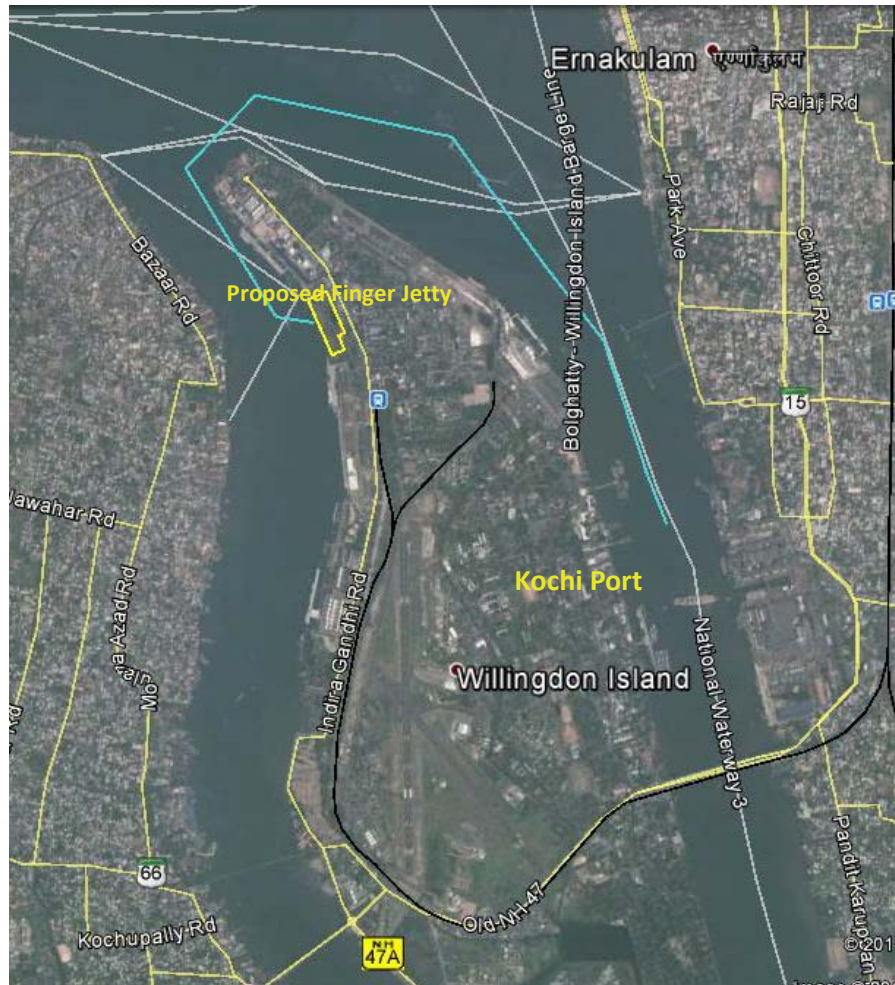
Port Connectivity and Terminal Development cost:

Finger jetty cost	:	Rs. 50.00 crore
Conveyor connectivity (0.55km)	:	Rs. 8.25 crore

General Cargo handling Equipment :	Rs. 20.00 crore
Logistic support :	Rs. 10.00 crore
Port connectivity (Dredging etc.) :	Rs. 15.00 crore
TOTAL :	Rs. 103.25 crore

4.9.2 PORT CONNECTIVITY TO NW-3

The Port of Kochi, Kerala, is the major port connecting to national waterway no.3. The map of Kochi port with proposed finger jetty for IWT is shown in Fig. below:



The Port of Kochi, Kerala is one of the most important natural ports in India. It is situated on Willingdon Island, just 20km from the direct Middle East to Far East sea-route. It has the most strategic geographic proximity to major marine sea routes. National Highways NH47 (Kanyakumari-Salem), NH49 (Kochi-Madurai) and NH17 (Kochi-Mumbai) connect the port to the state of Kerala, South Tamil Nadu and South Karnataka respectively. The presence of improved rail, road water, and air connectivity makes the port a preferred gateway for imports and exports to/from the region.

Traffic handled through IWT mode in 2012-13 is 19, 85,000Tonnes, which is expected to touch 45.50lakh tonnes by the year 2016-17. The Kochi port is approachable through two inner channels. The two inner channels are Ernakulam Channel and Mattancheri Channel. The width of Ernakulam Channel varies from 300m to 500m, while depth varies from 9.75m to 13.5m. The channel is nearly 2.8km-long and includes berths Q5 to Q10, the North and South Tanker Berths and Cochin Oil Terminal.

The NW- 3 passes through Ernakulam channel. Mattancheri Channel, which has a length of nearly 2.2km, varies in width from 180m to 250m, and has a depth of 9.75m. The channel consists of berths Q1 to Q4, North and South Coal berths and BTP.

Cost Estimate:

Kochi port is well connected to the national waterway since the Ernakulam channel itself passes through NW 3. It is required to provide finger jetty for cargo transfer from sea vessel to IWT barges. The cost of provision of finger jetty facilities at Kochi port is Rs. 95 crore in line with the details provided earlier. The breakup details of terminal development cost is as follows:

Terminal Development cost:

Finger jetty cost	:	Rs.50 crore
General Cargo handling Equipment	:	Rs.20 crore
Logistic support	:	Rs.10 crore
Port connectivity (Dredging etc.)	:	Rs.15 crore
TOTAL	:	Rs. 95 crore

4.9.3 PORT CONNECTIVITY TO NW-4

4.9.3.1 CONNECTIVITY TO KRISHNAPATNAM PORT:

Krishnapatnam is a port town in Muthukur Mandal of Nellore District, the southernmost coastal district in the state of Andhra Pradesh, India. The port operated small boats through Buckingham Canal, which runs behind the port and was used as a waterway for transportation between Chennai in the south and Krishna river delta in the north. Later in 1960's iron ore was exported by wooden boats from this port and in early 1980's Government of India declared this port as a minor port.

Location Details:

- 14° 15' N latitude, 80° 08' E longitude
- 180 km north of Chennai
- Located in Nellore District of Andhra Pradesh, on NH 5 (Chennai-Kolkata)
- 26 km from Venkatachalam, the nearest rail head on the Chennai–Kolkata main line
- Vast hinterland covering Southern Andhra Pradesh, Districts of Rayalseema, North Tamil Nadu and Eastern Karnataka
- Being on Eastern Coast, supports LOOK EAST Exim Trade Policy



Rail Connectivity to the Port:

Krishnapatnam Rail Company Limited (KRCL) is a Special Purpose Vehicle comprising the Government of Andhra Pradesh, Krishnapatnam Port Company Limited and Rail Vikas Nigam Limited, formed to provide rail connectivity to the port.

Phase I: A dedicated 19 km railway line connecting the port to the Chennai-Kolkata main line.

Phase II: A 91 km new broad gauge line between the port and Obulavaripalle in Dr. Y S Rajasekhara Reddy District (previously Cuddapah District), with an outlay of Rs.600 crore. This rail line will reduce the distance between the port and the regions of south-eastern Karnataka and south-western Andhra Pradesh by 70 km, thereby saving substantial freight cost.

Road Connectivity:

Dedicated 26 km four-lane road connecting the port to National Highway No. 5 (Chennai-Kolkata Highway) will be upgraded to six-lane road in the future for which the land acquisition is completed. It will also facilitate obstruction free passage for project cargo.

IWT Terminal: It is proposed that a finger jetty is planned within the port limits of Krishnapatnam Port for evacuation of inbound and export cargo routed through the National Waterway. A small stretch requires dredging for connecting the waterway is considered in the

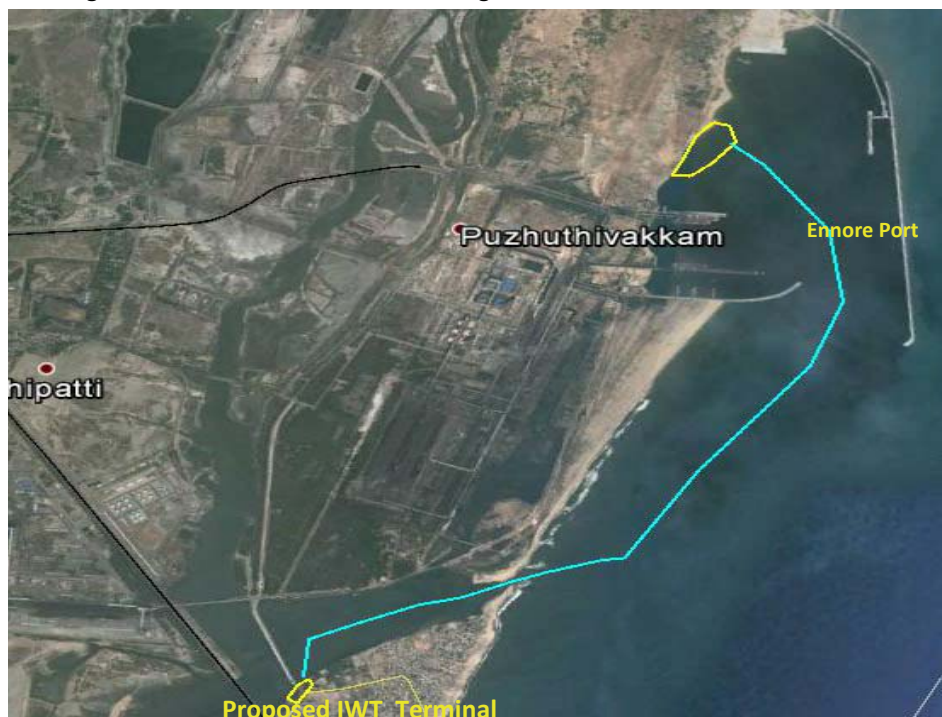
waterway development. Some handling equipment like cranes and conveyors are considered in the estimate.

Terminal Development cost:

Finger jetty cost	: Rs.50 crore
General Cargo handling Equipment	: Rs.20 crore
Logistic support	: Rs.10 crore
Port connectivity (Dredging etc.)	: Rs.15 crore
Conveyor connectivity (1.5km)	: Rs.22.5crore
Rail connectivity	: Rs. 38.6crore
Road connectivity	:Rs. 1.2crore
TOTAL	:Rs.157.30crore

4.9.3.2 TERMINAL AT ENNORE:

Ennore Port was originally conceived as a satellite port to the Chennai Port, primarily to handle thermal coal to meet the requirement of Tamil Nadu Electricity Board (TNEB). The scope was expanded taking into account subsequent developments. The satellite imagery indicating the tentative terminal location is given below:



Ennore port is connected to NW4 to North Buckingham Canal via Ennore creek. The IWT terminal is proposed at next to Ennore Creek Bridge No.44 around 200m away from bridge on KH road.

The proposed IWT terminal is located around 5 km from the port. The 2 km stretch falls in Ennore creek and remaining 3 km in the sea. This stretch falls in Ennore creek and the creek is

required to be dredged out for the movement of IWT vessels. The sea mouth of the creek also needs to be dredged out, as water only available in the high tides and during low tides it almost dries. The cargos unloaded on the deep sea port are to be loaded on IWT vessels for further movement through the national waterway to the consumption point. The IWT vessels are to be designed as sea going vessels. In view of this it is considered that Port connectivity to Ennore port may be differed now and can be considered in a later stage. However, the tentative cost has been worked out on normative basis to get an idea for future development. The finger jetty has to be provided at Ennore sea port. The tentative cost on normative basis for port connectivity has been taken as Rs. 65 Crores for coal terminals and Rs 50 crores for general cargo. The port charges may be considered as in the case of Haldia port.

Terminal Development cost:

Finger jetty cost:	Rs.50 crore
General Cargo handling Equipment:	Rs.20 crore
Logistic support :	Rs.10 crore
Terminal development cost:	Rs.115 crore
Port connectivity (Dredging etc.):	Rs.15 crore
TOTAL:	Rs.210crore

4.9.3.3 TERMINAL AT KAKINADA:



Kakinada Sea Ports Limited is a Special Purpose Company set up in 1999 as a part of its privatization initiatives by the government. This deep water port is located on the east coast of India at the confluence of backwaters where Kakinada and Samalkota canals fall.

Imports: The imported items mainly from Kakinada anchorage port consists of Murate of Potash, Rock Phosphate, Industrial salt, Urea and Crude palm oil.

Exports: The export items mainly from Kakinada anchorage port consists of Rice, Wheat, Maize, Soya bean meal, Rice bran extraction, Sand and Cement.

Kakinada port is connected to NW4 through Kakinada canal. The IWT terminal is proposed at Kovvuru road towards Atlakatta village. The connectivity of Kakinada port with National Waterway No.4 is shown in Fig. above.

The proposed IWT terminal is located around 10 km from deep sea port. This stretch has to be dredged out for the movement of IWT vessels. The cargo unloaded on the deep sea port is to be loaded on IWT vessels for further movement through the National Waterway to the consumption point. The IWT vessels are to be designed as sea going vessels. The finger jetty has to be provided at deep sea port. The tentative cost on normative basis for IWT terminal has been taken as Rs. 65 Crores for coal terminals and Rs 50 crores for general cargo. The port charges may be adopted as in the case of Haldia Port.

TERMINAL DEVELOPMENT COST:

Finger jetty cost:	Rs. 50.00 crore
Cost of road connectivity:	Rs. 2.84crore
Cost of rail connectivity:	Rs. 14.89 crore
Conveyor connectivity (5.68km):	Rs. 85.20 crore
General Cargo handling Equipment:	Rs.20.00crore
Logistic support :	Rs.10.00crore
Port connectivity (Dredging etc.):	Rs.15.00crore
TOTAL:	Rs.197.93crore

4.9.4 PORT CONNECTIVITY TO NW-5

4.9.4.1 TERMINAL AT PARADIP:

The ECC runs from Geonkhali on the right bank of the river Hooghly (approx. 34 nautical miles or 68 km downstream from Kolkata Port) to the Charbatia lock, where the canal joins to the river Matai and thereafter through the river section to the port of Paradip.

The Talcher coal mines are situated along the Brahamani River. The Brahamani River is the most important river under the National Waterway-5. The important port situated along the National Waterway No.5 is Paradip and Dhamra Port

PARADIP PORT:

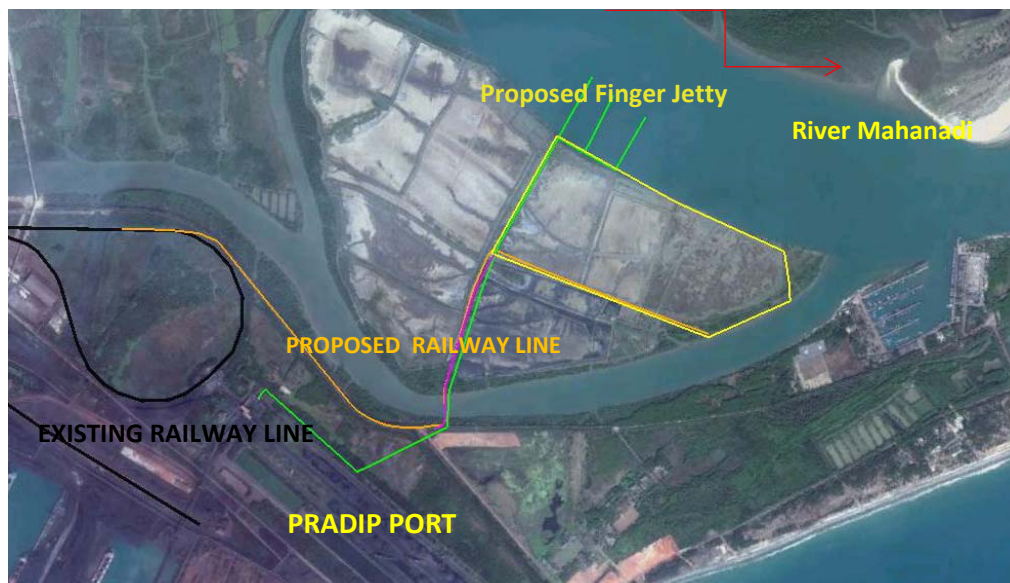
Paradip Port is one of the Major Ports of India serving the Eastern and Central parts of the country. Its hinterland extends to the States of Odisha, Jharkhand, Chhattisgarh, West Bengal,

Madhya Pradesh and Bihar. The Port mainly deals with bulk cargo apart from other clean cargoes. There is unprecedented growth in the traffic handled at this Port in the last decade. The Port has got ambitious expansion programme to double its capacity to meet the ever increasing demand.

This port was commissioned in 1968 for the export of iron ore to Japan. The initial capacity was 2.0 mtpa and the ore transport from mines to the port was by road using 30 t capacity special trucks imported from Japan. In 1979 augmentation of ore export was planned by MMTC the exporting authority. In line with this Paradip port was further development to receive ore by train with 2 nos. wagon tippers, expanded stock yard with 2 stackers and 2 bucket wheels declaimers merging the system with initially installed ore loading system and the 2500 tph ship loader. Maximum ship size for iron ore export remained 60000DWT and one berth as originally commissioned. Thus the project for 4 mtpa iron ore export capacity of the port with railway receipt and stock yard expansion was completed in 1984. The system can do 5-6 mtpa if all ships are of 60000DWT.

The coal is one of the major cargoes being handled by the Paradip port. The coal from Talcher mines gets transport by rail up to the Paradip port and then through coastal shipping move to Ennore port for TNEB power plant. Once the waterway is established, IWT will augment this coal movement.

The capacity of the Paradip load out system is around 20 mtpa and can cater to other coastal power stations. Presently 10.5 mtpa is being handled and capacity exists for loading out enhanced quantity of coal. The IWT system if developed from Talcher on the river system will be Brahmani - Kharsua- Hansua- Karnasi - Mahanadi. Brahmani passes through Talcher mines and confluence with Mahanadi which ultimately fall into sea at Paradip adjoining the port. In this IWT system the coal barges from Talcher can reach Paradip port before the Mahanadi confluence, with a barge terminal located ahead of the fisheries harbour.



Terminal Development cost:

Finger jetty cost:	Rs. 50.00 crore
Cost of rail connectivity:	Rs. 68.40 crore
Conveyor connectivity (3.4km):	Rs. 51.00 crore
General Cargo handling Equipment:	Rs. 20.00 crore
Logistic support :	Rs. 10.00 crore
Port connectivity (Dredging etc.):	Rs. 15.00 crore
TOTAL:	Rs.214.40 crore

4.9.4.2 TERMINAL AT DHAMRA:

The Dhamra Port is a major newly developed Port in Bhadrak district, Odisha, India, on the shore of the Bay of Bengal about seven kilometers from the old port of Dhamra. The agreement to develop the port was signed in April 1998. The Dhamra Port Company Limited (DPCL) was formed as a result of a 50:50 joint venture between Larsen & Toubro and TATA Steel to run the port. The Port received its first vessel on 8 February 2010 and the first commercial vessel on 10 April 2011. The Port has an initial capacity of 25 million tonnes annually, eventually growing to 80 million tonnes annually.

Dhamra Port is located near the village Dhamra on the North of the river Dhamra, about 65 km from Bhadrak in Odisha. It is situated between Haldia and Paradip Ports. Dhamra is in close proximity to the mineral belt of Odisha, Jharkhand and West Bengal and its deep draft suitable for large vessels makes the port one of the most cost-effective and efficient Ports on the Eastern coast of India. Few parameters of the Port are mentioned below :

- ❑ Fully mechanized and efficient cargo handling systems
- ❑ Discharging Vessels at the rate of 60,000 tonnes/day
- ❑ Loading Rakes within 1.5 hours
- ❑ Unloading rakes within 3 hours
- ❑ Loading vessels at the rate of 80,000 tonnes /day
- ❑ Iron-ore Stock pile Capacity -710,000 tonnes
- ❑ Coal Stock pile Capacity – 630,000 tonnes
- ❑ Cargo : Export of Iron Ore and Imports of Coal & Limestone
- ❑ 2 x 2,800 tph ZPMC Ship Un-Loaders, 1 x 5,000 tph ZPMC Ship Loader, 2 nos. 25 tips/hr Wagon Tippler system, 4 nos. Stacker Reclaimers and 2 nos. Rapid Loading Systems
- ❑ Railway Connectivity to Bhadrak on main line, total length of 65 km and entry and exit towards both Kolkata and Chennai directions complete with auto signaling & telecommunication and overhead electrification
- ❑ 132 KV Transmission line from Bhadrak along our corridor & Switchyard at Port

The proposed IWT terminal and the connectivity is indicated in the satellite imagery below: