

7. Integration between Coastal Shipping and Inland Water Transport (IWT)

7.1. Overview of the Inland Water Transport market in India and its contribution to existing linkage with coastal shipping segment

Inland water transport (IWT) sector in India has significant potential to complement coastal shipping for feeder and evacuation as against road and rail. Currently, the IWT sector's traffic volume stands at 146 million MT in FY-25, witnessing growth at a CAGR of approximately 15% in the last five financial years, wherein the contribution of cargo is over 90% by volume. This growth has been achieved through continued focus and investment in the IWT sector through policy interventions, infrastructure and service development, and operationalization of waterways which have been undertaken by the Inland Waterways Authority of India (IWAI). Below is a snapshot of the traffic growth experienced in the last five financial years.

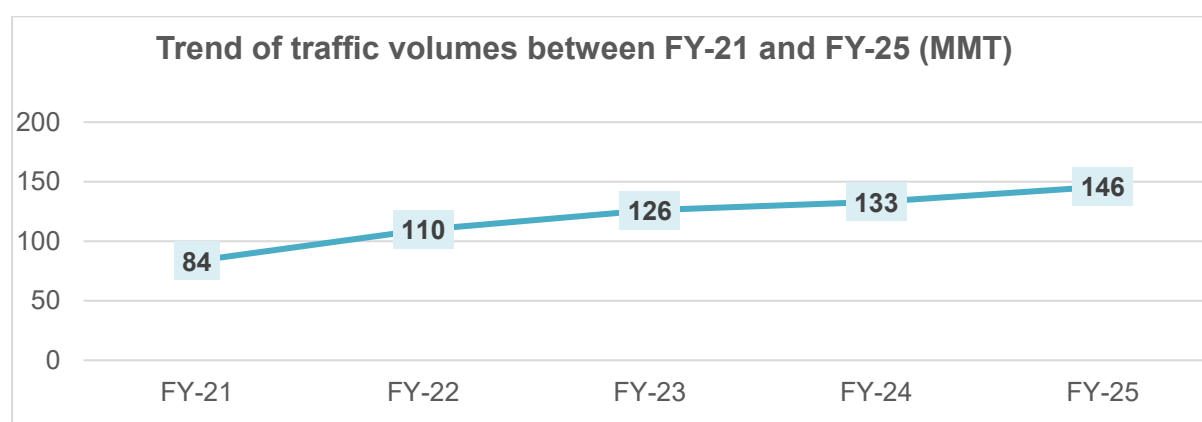


Figure 47: Trend of traffic volumes between FY-21 and FY-25 (MMT)

By concentrating its efforts on operationalization of waterways, IWAI currently has 32 operational national waterways which includes 29 being operational for cargo movement. Below is a detailed list of national waterways that have been gradually operational since 2013-14.

Table 69: India's Operational National Waterways (2013–14 to 2025–26)

Sl. #	NW No.	Inland Waterways Name	Cargo	River Cruise	Pax	Operational length (km)
Operational Waterways in 2013-14						
1	NW-1	Ganga-Bhagirathi-Hooghly River System (Haldia-Allahabad)	ü	ü	ü	1,620
2	NW-2	Brahmaputra River (Dhubri-Sadiya)	ü	ü	ü	891
3	NW-3	West Coast Canal	ü	ü	ü	205
4	NW-10	Amba River	ü		ü	45
5	NW-83	Rajpuri Creek	ü		ü	31
6	NW-85	Revadanda Creek-Kundalika River System	ü			31
7	NW-91	Shastri River - Jaigad Creek System	ü		ü	48
8	NW-68	Mandovi River	ü	ü	ü	41
9	NW-111	Zuari River	ü		ü	50

Sl. #	NW No.	Inland Waterways Name	Cargo	River Cruise	Pax	Operational length (km)
Total Length 2013-14						2,962
Operational Waterways in 2017-18						
10	NW-73	Narmada River	ü	ü		226
11	NW-100	Tapi River	ü		ü	436
Total Length 2017-18						3,624
Operational Waterways in 2018-19						
12	NW-4	Krishna Godavari River Systems	ü	ü	ü	82
13	NW-97	Sunderbans Waterway	ü	ü	ü	172
Total Length 2018-19						3,878
Operational Waterways in 2019-20						
14	NW-16	Barak River	ü		ü	121
15	NW-44	Ichamati River	ü		ü	63
16	NW-94	Sone River	ü			141
Total Length 2019-20						4,203
Operational Waterways in 2020-21						
17	NW-86	Rupnarayan River	ü		ü	72
Total Length 2020-21						4,275
Operational Waterways in 2021-22						
18	NW-5	East Coast Canal And Matai River/Brahmani-Kharsua-Dhamra Rivers/Mahanadi Delta Rivers	ü	ü	ü	233
19	NW-64	Mahanadi River	ü		ü	98
Total Length 2021-22						4,606
Operational Waterways in 2022-23						
20	NW-23	Budha Balanga	ü		ü	56
21	NW-8	Alappuzha-Changanassery Canal	ü	ü	ü	29
22	NW-9	Alappuzha-Kottayam – Athirampuzha Canal	ü	ü	ü	40
23	NW-14	Baitarni River	ü	ü	ü	48
24	NW-31	Dhansiri/Chathe	ü			114
Total Length 2022-23						4,894
Operational Waterways in 2024-25						
25	NW-48	Jawai-Luni-Rann Of Kutch River	ü			34

Sl. #	NW No.	Inland Waterways Name	Cargo	River Cruise	Pax	Operational length (km)
26	NW-53	(Kalyan-Thane-Mumbai Waterway, Vasai Creek And Ulhas River)	ü		ü	68
Total Length 2024-25						4,996
Operational Waterways in 2025-26						
27	NW-27	Cumberjua River	ü	ü	ü	17
28	NW-47	Jalangi River	ü		ü	84
29	NW-87	Sabarmati River		ü		34
30	NW-57	Kopili River	ü			6
31	NW-110	Yamuna River		ü		7
32	NW-40	Ghaghra River		ü		12
Total Length 2025-26 (Aug)						5,155

Source: Inland Waterways Authority of India

Coastal traffic is majorly handled on 14 operational national waterways which are operational for cargo movement. The below diagram shows the 14 national waterways that have direct port linkages along with the major commodities that are moving along the coasts.

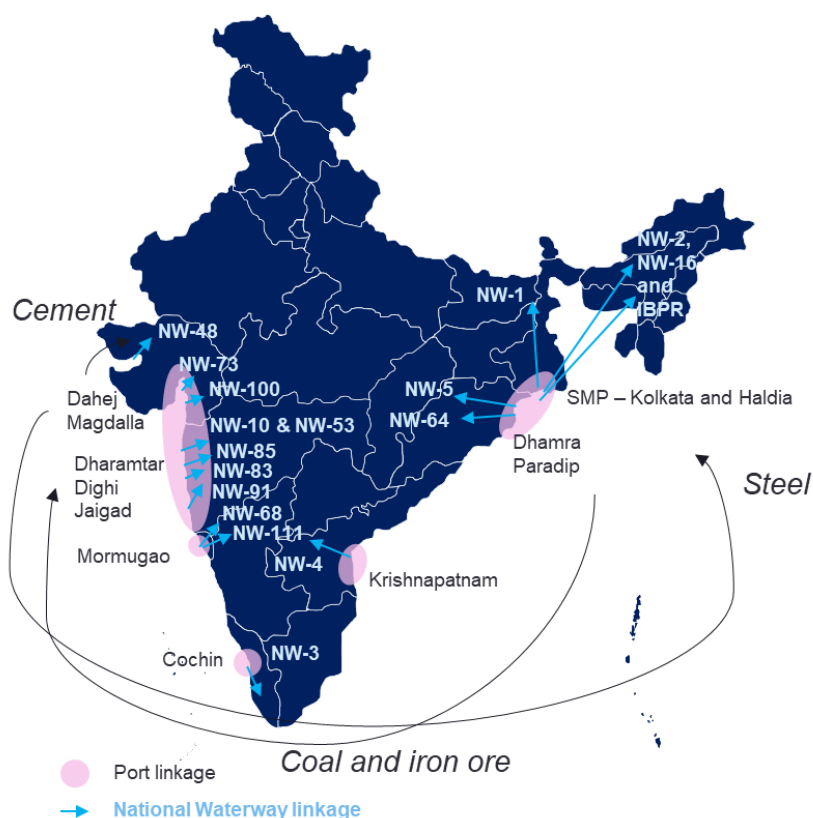


Figure 48: Strategic integration of National Waterways with coastal ports enables multimodal movement of coal, iron ore, cement, and steel across India

In terms of the voyage-wise characteristics of IWT traffic, the four broad segments are Coastal traffic, EXIM traffic, traffic on the Indo-Bangladesh Protocol route, and traffic within inland waters. Coastal traffic typically forms approximately 25-30% of the total IWT sector traffic volume currently handled on the operational national waterways. Below is a snapshot of the contribution of traffic volumes from the different traffic segments.

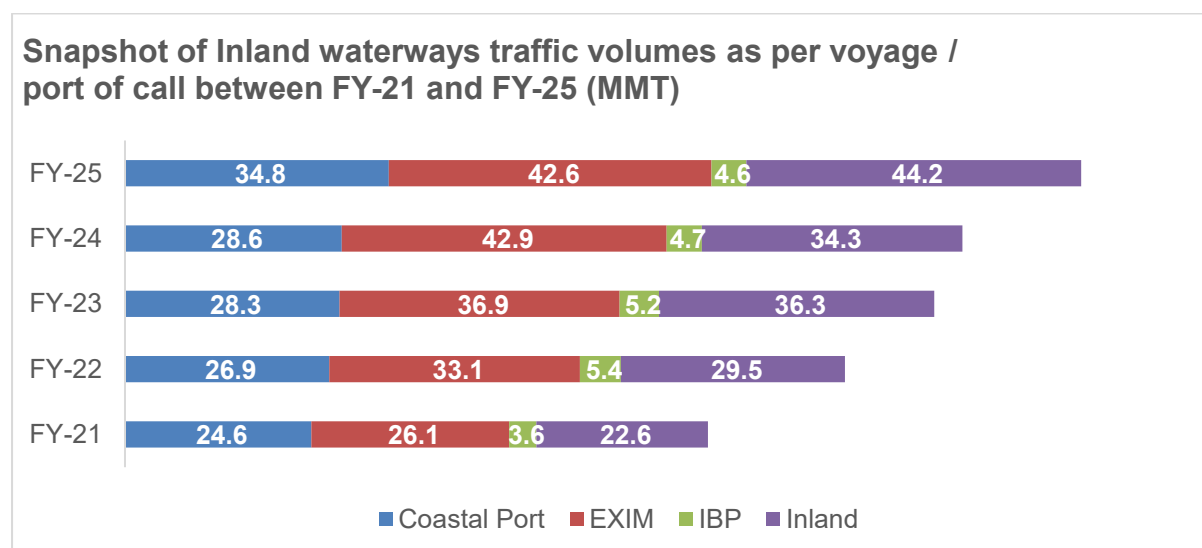


Figure 49: Snapshot of Inland waterways traffic volumes as per voyage / port of call between FY-21 and FY-25 (MMT)

Source: Study Team Analyses

7.2. Assessment of coastal traffic handled by the national waterways

Analysis of the traffic data recorded by the Inland Waterways Authority of India (IWAI) indicates that the following national waterways account for the maximum volume of coastal traffic handled by the National Waterways. Below is a year-on-year coastal traffic volumes handled across major national waterways.

Table 70: Assessment of coastal traffic handled by the national waterways

National Waterway	Coastal Traffic Volume (in metric tonne)				
	2020-21	2021-2022	2022-23	2023-24	2024-25
NW-100	1,38,62,362	1,70,94,327	1,54,45,354	1,67,35,846	1,83,93,996
NW-10	97,88,153	68,70,572	69,83,742	67,69,553	66,48,507
NW-91	4,93,393	24,80,002	53,64,618	42,88,953	38,08,503
NW-53					25,44,787
NW-48					24,02,067
NW-85	3,23,550	1,76,340	3,12,810	5,89,652	5,77,924
NW-4		5,083	1,56,300	1,00,450	2,50,910
NW-83	1,01,421			92,613	1,37,420
NW-3	1,846				1,519
NW-73			25,259		1,279
NW-2	1,755				

Source: Inland Waterways Authority of India

Key highlights of the coastal traffic handled on the above-mentioned national waterways are:

- Traffic handled on NW-100 is mostly characterized by the coastal cargo traffic handled by the Magdalla Port and private companies such as Ultratech and Ambuja
- NW-10 and NW-91 account for substantial iron ore handling for the captive requirements of JSW Steel Dolvi Works
- NW-48 has recently been operationalized under IWAI and is currently handling cement as the only commodity between Jakhau and Sangipuram
- In addition to the above mentioned major national waterways handling coastal traffic, other few waterways such as NW-1, NW-68 and NW-111 have additional potential to cater to future transportation requirements particularly to link the Kolkata Port and the Mormugao Port.

A deeper assessment of the major commodities under the coastal traffic that are currently moving on the national waterways are indicated in the following table.

Table 71: Commodity-wise cargo mix trend across FY 2021–FY 2025, highlighting dominance of iron ore, cement, coal, and steel-related cargo

Commodity	FY-21	FY-22	FY-23	FY-24	FY-25
Iron Ore	1,35,28,649	1,45,46,577	1,31,46,817	1,25,37,280	1,24,81,650
Iron Ore Fines	44,16,372	74,78,367	89,24,314	90,40,226	69,60,688
Cement	7,77,180	10,76,124	9,15,635	9,10,993	35,89,234
Clinker	7,04,891	7,26,264	8,20,952	9,88,773	32,60,847
Iron Ore Lumps	6,20,120	7,16,254	14,49,246	14,22,718	18,41,261
Coal	16,44,496	5,63,017	3,75,293	12,70,132	16,90,698
Steel Cargo	14,53,658	7,41,547	4,52,734	6,39,141	5,26,712
HR Coils		4,35,912	9,46,337	10,85,915	10,54,911
Truck					18,15,380
Iron Ore Pellets	71,432	20,070	6,23,600	1,67,140	1,57,589
Coking Coal	8,39,692				
Slag		19,515	50,076		3,99,270
Machinery	77,930	92,510	1,63,764	73,230	29,657
Car					3,84,607
Others	1,62,950	1,01,407			91,500
Ethylene	81,256	68,400	79,203	64,000	46,461
Mill Scale	37,980	97,952	46,100	62,900	58,000
Bentonite	14,255	28,577	54,390	98,225	72,700
Coke	21,602	1,03,882			57,750
Passengers					1,17,448
Molasses			76,764		

Commodity	FY-21	FY-22	FY-23	FY-24	FY-25
Quartzite	4,000	53,700	15,589		
Crude Palm Oil (CPO)		36,406		33,133	
Bentonite Lumps				33,214	35,200
Propylene	36,336	7,075	1,200	6,463	16,663
Limestone	13,000			54,000	
Steam Coal	9,909				55,650
Sugar			31,990	19,375	
Other Ore			48,078		
Liquefied Petroleum Gas (LPG)			22,482	18,594	
CSFO		5,083		29,326	
Rock Phosphate					26,609
VCM	4,314	5,594	4,996	2,965	7,752
Liquid effluent	22,000				
SILICA SAND			16,900		
Coal Fines			14,985		
Refined, Bleached & Deodorised Palm Oil (RBD)				12,990	
Caustic Soda	11,984				
Project Cargo		415			11,506
Ethyl Alcohol	10,834				
Butene-1		5,320	2,031	957	
Bitumen	3,198			3,731	
Butane				4,991	
Cement Clinker		2,907			
Billets	2,596				
Butadiene			2,557		
OLIFLUX			2,050		
Fuel	1,846				
Motorcycle					1,841
Container				385	329

Iron Ore, Steel, Coal, Cement, Clinker, Machineries (including project cargo) are some of the major coastal traffic commodities which are handled on the waterways. In addition, liquid bulk goods such as chemicals and POL which are transported to and from majorly the Magdalla port also accounts for a substantial volume of the overall coastal traffic handled by the national waterways.

7.3. Exploring the scope for integrating inland water transport with coastal shipping

7.3.1. Market Considerations

The review of the overall IWT market and assessment of the coastal traffic within the IWT market indicated the following key points for consideration while exploring the scope for integrating inland water transport with coastal shipping.

- Magdalla is the largest originating point for coastal traffic bound to ports, captive ports, and inland water transport jetties / river port anchorage points. Diverse segment of cargo comprising bulk, break bulk and liquid bulk goods such as Coke, HR Coils, Iron Ore Fines, Machinery, Mill Scale, Steel, Cement, Clinker, chemicals and POL are being handled at Magdalla. The presence of the industrial areas within the hinterland such as Surat, Vapi, Bharuch and Jafrabad makes it suitable for handling significant volumes of coastal cargo for exports and indigenous consumption.
- The ports Dharamtar and Jaigad, which are operated by JSW, handle substantial volumes of Coal and Iron Ore for the captive usage of JSW Steel. The Coal and Iron Ore are majorly sourced from Dhamra and Paradip ports in Odisha and Vizag in Andhra Pradesh. Feedback from stakeholders at the Jaigad port has suggested that the port is also expected to increase its cargo handling capacity from its existing ~55 MTPA to ~80 MTPA along with diversification of commodities, such as salt from the coasts of the Kutch region of Gujarat.
- Paradip, Dhamra and Mormugao are the major consolidators of iron ore for distribution to steel plants. In addition, Paradip and Dhamra also handle substantial volume of coal for thermal power plants, steel plants and other captive power plants under heavy industries.
- In addition to the above, below are some of the other considerations based on consultation with industry stakeholders:
 - Linking Haldia with Dhamra and Paradip will enable the transportation of iron ore and coal to the hinterlands of West Bengal, Jharkhand, Bihar and Uttar Pradesh. Further, transportation of coal may also be looked at in the similar circuit by linking Talcher for easing the congestion on the existing railway networks.
 - Extension of the Jalvahak - Cargo Promotion Scheme to link inland waterways traffic with coastal traffic, particularly linking Haldia and Kolkata with coastal shipping routes
 - Timely vessels availability and seamless last mile connectivity including adequate cargo handling infrastructure at the terminals.

7.3.2. Potential IWT linkages with Coastal Shipping

In view of the market dynamics of inland water transport and the scope for larger integration with coastal shipping, below are some of the potential routes that are derived from the existing market size of coastal traffic within inland water transport and the market considerations for integrating inland water transport with coastal shipping.

Table 72: Illustrative commodity-wise coastal–inland waterway logistics corridors linking hinterlands, ports, and National Waterways across India

Commodity	Origin Hinterland	Origin National Waterway	Origin Port	Destination Port	Destination National Waterway	Destination Hinterland
Iron ore, pellets etc.	Keonjhar–Barbil	Brahmani–Baitarani system	Dhamra / Paradip	Haldia	NW-1	Eastern Uttar Pradesh, Bihar,

Commodity	Origin Hinterland	Origin National Waterway	Origin Port	Destination Port	Destination National Waterway	Destination Hinterland
	mining belt (Odisha)	(NW-5) / Mahanadi (NW-64)				Jharkhand steel clusters
Coal	Talcher	Brahmani River (NW-5) / NW-64	Paradip	Haldia	NW-1	Domestic coal requirement for NTPC Barh, Kahalgaon, Barauni (Bihar) and NTPC Rihand, Singrauli, Anpara, Obra power stations in Uttar Pradesh etc.
Coal	Indonesia / Australia	–	Ports in Indonesia / Australia	Haldia	NW-1	Imported coal requirement for power, cement, and industrial consumers in West Bengal, Bihar, Jharkhand, and eastern Uttar Pradesh, with Haldia serving as the primary import gateway
Coal	South Africa	–	Mundra	Haldia	NW-1	Imported coal requirement for power, cement, and industrial consumers in West Bengal, Bihar, Jharkhand, and eastern Uttar Pradesh, with Haldia serving as the primary import gateway
Coal	Talcher and IB Valley	Brahmani River (NW-5) / NW-64	Paradip	Ennore (Kamarajar)	–	Tamil Nadu power stations such as Ennore (Kamarajar), North Chennai, Tuticorin, and Mettur etc.
Coal	Haldia hinterlands	NW-1	Haldia	Krishnapatnam	NW-4 (Krishna)	Simhadri, Dr. NTTPS (Vijayawada), Krishnapatnam, and Kothagudem–Ramagundam complex etc.
Limestone	Odisha	NW-5	Gopalpur	Haldia	NW-1	Cement and grinding units in eastern Uttar Pradesh

Commodity	Origin Hinterland	Origin National Waterway	Origin Port	Destination Port	Destination National Waterway	Destination Hinterland
						(Mirzapur–Sonbhadra–Chandauli belt) and Bihar (Bhabua–Rohtas–Patna region) etc.
DAP / NPK	West Asia	–	Kandla	Haldia	NW-1	West Bengal, Bihar, Jharkhand, and eastern Uttar Pradesh
DAP / NPK	Kandla	–	Kandla	Kakinada	NW-4	Andhra Pradesh and Telangana agricultural belts etc.
Urea	Andra Pradesh and Telangana	NW-4	Kakinada	Kolkata	NW-16	Northeast India
Rice	Odisha	NW-5 / NW-64	Paradip	Kolkata, Mumbai, Kochi	NW-2 / NW-16	Northeast India, Western India and Kerala
Cement	Andra Pradesh	NW-4	Krishnapatnam	Haldia	NW-1	Haldia industrial belt (Haldia, Durgachak, Mecheda, Purba Medinipur) supported by NW-1 connectivity for supply from Bihar, Jharkhand, and Eastern UP
Cement	Gujarat	–	Pipavav	Haldia	NW-1	Haldia industrial belt (Haldia, Durgachak, Mecheda, Purba Medinipur) supported by NW-1 connectivity for supply from Bihar, Jharkhand, and Eastern UP
Clinker	Rajasthan / Gujarat	NW-48	Mundra	Haldia	NW-1	Cement and brick clusters in Haldia, Kolaghat, Uluberia, Sankrail, Budge Budge, and

Commodity	Origin Hinterland	Origin National Waterway	Origin Port	Destination Port	Destination National Waterway	Destination Hinterland
						nearby belt (West Bengal)
Clinker	Odisha	NW-5	Dhamra	Haldia	NW-1	Cement and brick clusters in Haldia, Kolaghat, Uluberia, Sankrail, Budge Budge, and nearby belt (West Bengal)
Clinker	Tamil Nadu	–	Tuticorin	Haldia	NW-1	Cement and brick clusters in Haldia, Kolaghat, Uluberia, Sankrail, Budge Budge, and nearby belt (West Bengal)
Fly ash	NTPC Talcher	NW-5	Paradip	Haldia	NW-1	Cement and brick manufacturing clusters located in Uluberia, Sankrail, Budge Budge, Dankuni, and Kolaghat–Haldia belt (West Bengal); Barh, Mokama, Begusarai, and Munger (Bihar); and Mirzapur (Uttar Pradesh)
Fly ash	Gujarat	NW-73	Hazira	Haldia	NW-1	Cement and brick manufacturing clusters located in Uluberia, Sankrail, Budge Budge, Dankuni, and Kolaghat–Haldia belt (West Bengal); Barh, Mokama, Begusarai, and Munger (Bihar); and Mirzapur (Uttar Pradesh)
Fly ash	NTPC Kahalgaon	NW-1	Haldia	Kakinada	NW-4	Cement grinding units and RMC plants in Kakinada–Rajahmundry–Eluru belt, demand from fly ash brick clusters in East

Commodity	Origin Hinterland	Origin National Waterway	Origin Port	Destination Port	Destination National Waterway	Destination Hinterland
						and West Godavari etc.

Source: Primary Data

7.4. Key Interventions for IWT and Coastal Shipping Linkages

Tailored interventions would be required to realize the future potential of the envisaged inland waterways and coastal shipping linkages. Based on the commodity-wise origin and destination hinterlands that may be potentially linked by the combination of national waterways and coastal shipping networks, specific interventions may be planned around three developmental fronts, namely –

- First and last mile connectivity between the inland waterways' jetties / ports and the production / consumption point
- Cargo handling and storage infrastructure
- Deployment of cargo vessels / barges

The below matrix indicates some of the potential interventions around these developmental fronts that may be considered further.

Table 73: Priority Development Interventions to Strengthen Coastal–Inland Waterway Logistics Corridors

Developmental interventions	Potential origin-destination pairs	Remarks on interventions
First and last mile connectivity	IWT jetties / terminals on NW-1 and NW-86	Establishment of road networks to and from the jetties in West Bengal, Jharkhand, Bihar, and Uttar Pradesh
Cargo handling and storage infrastructure	NW-5 / NW-64 – Paradip and Dhamra Loading and unloading jetty on NW-4 for agri produces and fertilizers IWT jetties / terminals on NW-1, NW-2 and NW-86	Terminal infrastructure for handling and storage of coal, rice, iron ore and other break bulk cargo
Deployment of cargo vessels / barges	Paradip and Dhamra – Haldia and Kolkata, Krishnapatnam	Dedicated cargo vessels for fly ash movement, lighterage operations between coastal shipping and inland waterways