TECHNICAL ASSISTANCE REPORT

ACTION PLAN FOR PROMOTION OF COASTAL SHIPPING IN INDIA

FINAL REPORT

October 2019

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Abbreviations

3PL	Third Party Logistics
ADB	Asian Development Bank
AEO	Authorized Economic Operator
ARR	All Rail Route
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
BoCG	Bill of Coastal Goods
B/E	Bill of Entry
CAGR	Compound Annual Growth Rate
CFPs	Call for Proposals
CHAs	Customs House Agents
DG Shipping	Directorate General of Shipping
DPR	Detailed Project Report
DRI	Direct Reduced Iron
DWT	Dead Weight Tonnage
ECB	External Commercial Borrowings
ECR	East Coast Railways
EDI	Electronic Data Exchange
EEDI	Energy Efficiency Design Index
EILU	European Intermodal Loading Unit
EU	European Union
EXIM	Export Import
FAL	Facilitation Committee
FCI	Food Corporation of India
FY	Financial Year
GCV	Gross Calorific Value
GDP	Gross Domestic Product
GSFC	Gujarat State Fertilizers and Chemicals
GST	Goods and Services Tax
HFO/IFO	Heavy Fuel Oil/Intermediate Fuel Oil
HP	Horse Power
HSD	High Speed Diesel
ICD	Inland Container Depot
ICEGATE	Indian Customs EDI Gateway
ICT	Information and Communication Technology
IFFCO	Indian Farmers Fertilizer Cooperative
IGM	Import General Manifest
IGST	Integrated Goods and Services Tax
IMO	International Maritime Organization
INR	Indian National Rupees
IOCL	Indian Oil Corporation
IPA	Indian Ports Association
IPR	Intellectual Property Rights
IRR	Internal Rate of Return
ISO	International Organization for Standardization
ISPS	The International Ship and Port Facility Security
IWAI	Inland Waterways Authority of India Limited
IWT	Inland Water Transport
JNPT	Jawaharlal Nehru Port Trust

JS	Joint Secretary
JSPL	Jindal Steel and Power Limited
Kribhco	Krishak Bharati Cooperative
LAD	Least Available Depth
LNG	Liquefied Natural Gas
LPPT	Logistics Planning and Performance Monitoring Tool
LSP	Logistics Service Provider
MCL	Mahanadi Coal Fields
MGO	Marine Gas Oil
MIS	Management Information System
MMT	Million Metric Tonnes
MMTPA	Million Metric Tonnes Per Annum
MoRTH	Ministry of Road Transport and Highways
MoS	Ministry of Shipping
MT	Metric Tonnes
NBS	Nutrient Based Subsidy
NCTS	New Computerised Transit System
NIC	National Informatics Centre
NM	Nautical Miles
NPP	National Perspective Plan, Sagarmala
NW	National Waterways
OCP	Opencast Project
OD	Origin-Destination
OEMs	Original Equipment Manufacturers
PDS	Public Distribution System
PEG	Private Entrepreneurs Guarantee Scheme
PIANC	Permanent International Association of Navigation Congresses
PMC	Project Management Consultant
PMU	Project Management Unit
POL	Petroleum Oil and Lubricants
PPP	Public Private Partnership
PSC	Port State Control
PSU	Public Sector Undertaking
RIL	Reliance Industries Limited
RMS	Risk Management System
RoFR	Right of First Refusal
RoRo	Roll-on/Roll-off
SAD	Single Administrative Document
SAIL	Steel Authority of India limited
SECL	South Eastern Coalfields Limited
SEZ	Special Economic Zone
SOP	Standard Operating Procedure
SSP	Single Super Phosphate
TEN-T	Trans-European Transport Network
TEUs	Twenty Foot Equivalent
TPS/TPP	Thermal Power Station/Thermal Power Plant
TLC	Total Logistics Cost
UFS	Urea Freight Subsidy

USFO	Ultra Low Sulphur Fuel Oil
USD	United States Dollar
VAT	Value Added Tax
VRC	Vessel Related Charges
WCL	Western Coalfields Limited

Executive Summary

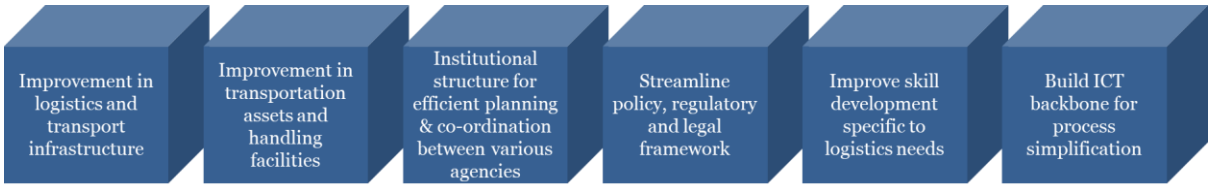
Study Background

Logistics is the most crucial driver of competitiveness in the modern economy, and an important and integral factor of the value-chain that links production to consumption. It therefore needs to be seen as a core activity and not a supporting pillar of any economic activity.

Logistics costs to Indian economy are estimated at 13–14% of India's GDP, which is significantly higher than costs of developed nations of USA (9.5% of GDP) and Germany (~8% of total GDP). Recognizing the critical contribution of the logistics sector for improving efficiencies in domestic and global trade networks, the Indian Government has set a target of reducing logistics cost to GDP from 14% to 10% by 2022.[1]

To optimally meet the demand of growing economy, India needs to lay emphasis on logistics improvement through an integrated approach aligning the development of each element of logistics infrastructure—rail, roads, ports and terminals, airports, waterways, and storage/interchange segments.

In alignment with the country's vision for improving logistics infrastructure and services, the Asian Development Bank (ADB) is supporting the Government of India on multiple initiatives based on following 6 building blocks that define key pillars of an integrated logistics framework.



As part of this overall initiative, ADB along with Ministry of Shipping, in particular, is focusing on improving the water transport in the country. It is well established that compared to other modes, waterway transportation is a cost-effective, sustainable and environment friendly mode of movement. Maritime shipping is the world's most carbon-efficient form of transportation – far more efficient than road or rail transport. On a per metric ton of cargo basis a large container vessel emits half the carbon dioxide than rail and almost one-sixth to that of road transport, thus, playing an important role in reducing carbon emission and pollution in the mainland.

In spite of these advantages of waterway movement, India is not able to fully utilize its 7,500 km coastline and over 14,000 km of navigable inland waterways. In the past few years, several initiatives have been taken to promote coastal shipping such as green channel clearance, priority berthing, discount on vessel and cargo related etc. A Rapid growth of coastal shipping of around 13% Compounded Annual Growth Rate (CAGR) in the last two years compared to about 4% in preceding years underline the positive impact of these initiatives. However, the country has not realized the full potential of its waterways. With only 6.4% modal share of water transport, India's transport modal share is relatively more skewed towards road and rail. This has significant implications on congestion and pollution levels on key land-based trade routes. By contrast, waterways contribute to 24% in People's Republic of China's (PRC) freight modal mix, 17% in Australia, 11% in Germany, making India's waterway modal share lowest amongst top 10 economies of the world. Moreover, developing economics of South Asia such as Bangladesh (16%) and Thailand (12%) too have a higher share of water-based transport than India.

The benefits of water transport and India's peninsular geography provides an excellent opportunity to tap an environmentally friendly water-based modal transport that would complement rail and road transport mode. To realize the vast potential of coastal shipping sector, a more focused approach is required to identify the key issues that are preventing the growth of coastal shipping in the country. Given this context, Ministry of Shipping in association with ADB, has conducted this study to develop an actionable roadmap for promotion of coastal shipping.

[1] Press Information Bureau, 23 AUG 2018, Release ID: 1543709, Ministry of Commerce and Industry.

The core objective of this study is to identify key issues impacting coastal shipping and developing solutions to address these issues in order to make coastal shipping a more prominent mode of transport in India's domestic logistics.

This study has adopted a consultative approach backed by a robust route-cause analysis of issues to identify the core challenges and find suitable solutions. Deep dive assessment of logistics chain across commodity categories—bulk (coal, cement, sugar), break-bulk (steel, automobiles), liquid (POL) containers (foodgrain, fertilizer, cotton) and origin-destination (O-D) pairs (covering east to west, east to east, west to west multimodal movements, coastal plus inland waterway movement)—to get a holistic view of the sector and to identify the on-ground issues. The solutions for the key issues will be arrived at based on root cause analysis and study of relevant global practices to resolve similar issues, keeping in context the Indian requirements. Further, the feedback/demand from stakeholders have been taken into consideration and the optimum solution is proposed.

Prevalent Issues and Challenges in Coastal Shipping

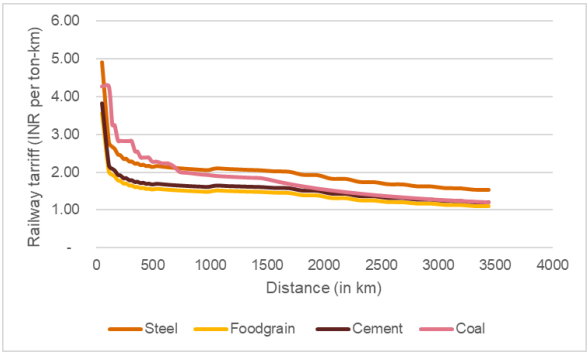
1. *Water transport cost is cheaper than road/rail transportation cost, but last and first mile handling and transport make it more expensive*

Presently, industries from logistics perspective are located with a view to lower the road or rail freight. Interventions are needed to rationalize and align the existing distribution system and infrastructure development considering the advantages and limitations of multimodal coastal movement. Moreover, going forward, logistics planning and industrial development should take into account alternate modes of coastal shipping and inland waterways.

Coastal shipping is multimodal in nature and is dependent on other transport modes for first and last mile movement. While the water transport cost is cheaper than road/rail cost, end-to-end multimodal coastal shipping costs may not always be cheaper vis-à-vis direct rail/road movement because:

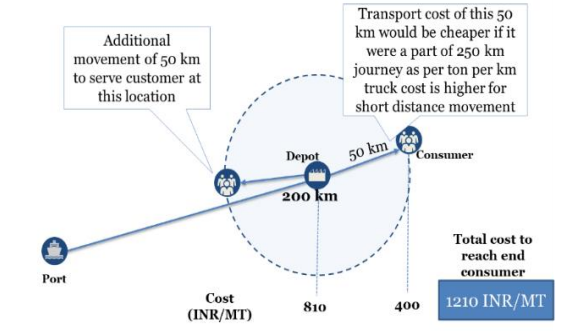
- **Origin/destination centers located at more inland locations from the coast**. For instance, for coastal movement of foodgrain from production centers of Punjab to consumption centers of southern states, the first mile distance is 1200 km and constitutes ~36% of total coastal shipping costs. Similarly, for coal, coastal shipping costs for plants having linkages with SECL mines is expensive vis-à-vis rail, due to high first mile distance ~600 km.
- Even for the cases when the location is located closer to coast, the last mile cost is high because of long lead distance from existing ports. For instance, Boisar, a steel consumption center in Thane, is located only 10–15 km from coast line; however, its distance from existing ports Mumbai/JNPT is ~130 km.
- Telescopic freight structure of railways and roadways, where the cost per ton-km for short lead is higher than long lead movement, further impact the competiveness of multimodal coastal shipping which is dependent of road or rail for first mile movement.

Railway Tariff Structure (INR per Ton–Km)



Source: Railway freight calculator

Current Last Mile Movement of Foodgrain



- Inefficiency in the first/last mile movement due to existing set-up of storage infrastructure, which are aligned with road/rail movement. For instance, in last mile coastal movement for foodgrains.

  – The first leg of inefficiency is movement to serve consumers which are located in between port and depot, additional movement of 50 km
  – The second leg of inefficiency is movement to consumers which are located further from the depot, transport cost would be cheaper if it were a part of direct journey from port to end consumer
  – Each transhipment in the movement increase the handling of cargo, thereby increasing the overall handling cost of cargo as compared to other modes where the number of handlings are lower

Presently, industries from logistics perspective are located with a view to lower the road or rail freight. Interventions are needed to rationalize and align the existing distribution system and infrastructure development considering the advantages and limitations of multimodal coastal movement. Moreover, going forward, logistics planning and industrial development should take into account alternate modes of coastal shipping and inland waterways.

2. Unavailability of return cargo leads to vessel empty return, impacting the viability of coastal shipping

If there is no return cargo available on the return leg of coastal movement, the cost of vessel empty return is recovered from the shipper. This empty return cost reduces the competitiveness of coastal shipping vis-a-vis road and rail modes, which does not explicitly recover the empty return cost from the particular movement. Additionally, road and rail modes have the flexibility to direct the rakes or trucks to locations where the cargo is available, reducing the impact of empty return costs.

In commodities such as auto, cement, steel, which require specialized vessels, the issue of empty return costs is more prevalent. For example, roll-on/roll-off (RoRo) vessels are required for transportation of automobiles. These vessels have higher capital cost than standard vessels of similar dead weight tonnage (DWT). As a result, fixed cost recovery component becomes significant part of voyage cost. In most cases, these specialized vessels cannot be utilized for carrying other cargo which would remove the vessel empty return costs. For instance, for coastal movement from Ennore to Kandla, no return automobile cargo is available and vessel empty return costs contribute 25% of total end-to-end cost, reducing the viability of coastal shipping.

For containerized movement, in addition to vessel empty return cost, shipper has to bear the cost of return movement of empty containers. Because of limited availability of domestic containers at origin location and return cargo on most of the coastal shipping routes, logistics players need to reposition the empty containers to load port and in worst cases to cargo origin location, increasing the logistics cost of coastal shipping of container cargo. For instance, multimodal coastal movement of food-grain from Punjab to Karnataka, empty container repositioning cost alone accounts for ~20% of the total logistics cost.

Vessel empty return costs can be removed by creating circuits for coastal movement wherever possible. Additionally, cases where deploying a dedicated coastal vessel is not a viable option because of empty return cost, EXIM vessels plying in the coastal route and have empty capacities can be utilized to eliminate the empty return cost and allow pricing of coastal leg on marginal cost basis. However, interventions are required to effectively utilize such EXIM vessels, ensuring a level playing field for Indian flagged vessels.

3. *Smaller parcel size of individual players and lack of agglomeration leading to unutilized ship capacity*

While road and rail mode have the flexibility to handle smaller parcel size of cargo, coastal shipping requires a larger shipment size to efficiently utilize the available vessel. However, the parcel size available with individual players may not be sufficient to utilize the vessel capacity. For example, in case of steel, EXIM Supramax vessel is suitable for coastal shipping, whereas the individual players' shipment size ranges from 5,000 to 20,000 MT which is not adequate to efficiently utilize Supramax vessels and partial loading of vessels leads to high voyage costs per ton of cargo.

Moreover, as size of vessel decreases, the per ton-km cost of water transportation increases. As a result, usage of smaller vessel may not be viable for all O-D pairs across various commodities. For cost economics to work out for coastal shipping, larger vessels need to be utilized and, in certain cases such as steel, only larger vessels are suitable for coastal movement.

For coastal movement of commodities such as fertilizer for certain O-D pairs, where the cost economics work out using the smaller vessels, smaller wooden vessels or barges can be utilized. For other cases, cargo agglomeration is required at origin location to make suitable shipment size for loading the vessels and to reduce cost through economies of scale in handling, storage, and transportation of cargo.

4. *Lack of level playing field for coastal shipping with other mode of transports*

Road and rail mode have been the primary modes of transport in the country. Industry players are aware of the requirements and limitations of both the transport modes, and accordingly plan and set expectations from the movement. Whereas, coastal shipping is evolving and its requirements are different from the road/rail modes. Players, many a times, do not take into consideration the specificities of coastal shipping and as a result, coastal shipping does not get a level playing field. For example, existing multimodal coastal shipping contracts of public sector undertakings (PSUs) have clauses detrimental to coastal shipping such as no minimum guarantee of cargo, no fuel price variation for bunker fuel, or fixed transit period of delivering the cargo.

5. *Limited availability of vessels for coastal shipping*

The seamless availability of vessels providing cost-competitive service for coastal trade is currently a challenge. While the participation of foreign-flagged vessels is restricted due to cabotage regulations, the costs of Indian flagged vessels are higher on account of various financing and taxation related factors. The growth of coastal fleet can be encouraged if the below highlighted high cost factors are addressed for Indian flagged vessels. Further, certain high volume commodities such as coal and steel require large sized vessels (>50,000 DWT) which are not currently available with Indian flagged coastal fleet. The availability of foreign-flagged vessels for such movement becomes restricted due to existing cabotage regulations.

An analysis of the life-cycle costs of Indian-flagged vessels as compared to foreign-flagged vessels suggests that the Indian flagged vessels may need to quote ~20% higher tariff (in INR/ton) to achieve the same rate of returns. The

Pricing/ton charged to customer (INR/ton) to render same Equity IRR for ship owner is ~20% higher for Indian flagged vessel

disparities leading to increase in operating costs for Indian flagged vessels are:

Short loan tenure	• *Typical tenure of about 6-8 years for Indian flag compared to 15 years for foreign flags* • *Challenges in re-financing of loans*
High interest rates	• *Interest rate on purchase of vessels in India is ~12-14% as compared to 5-6% in other countries* • *Financing through ECB results in similar rate (~11%) owing to hedging costs*
Costlier bunker fuel in India	• *Disparity in base price of bunker fuel available in India* • *Due to higher bunker prices, net GST pay-out is higher for Indian flag vessel*
Crew cost	• *Disparity exists if seafarer on Indian flag spends more than 183 days while one on foreign flag spends less than 90 days* • *Increase in net salary pay out by ~35%, reducing the profit margins*
GST related	• *5% IGST levied on capital cost of vessel; Offsetting on revenue earned across multiple years* • *Inability to claim tax offset if the firm is not registered in state where bunker supply is given*

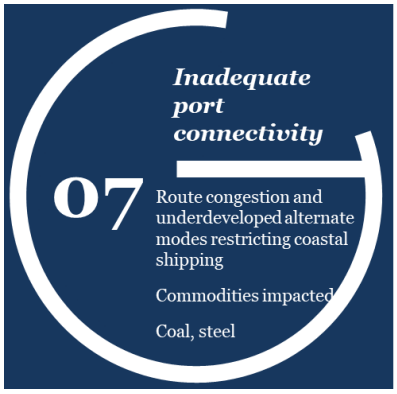
A level playing field for Indian & foreign flagged vessels will invite more Indian flagged vessel owners in the market, increasing availability of the vessels for coastal trade.

Alternatively, the government can look at ensuring vessel availability through relaxing cabotage regulations for foreign-flagged vessels, which in turn would lead to Indian vessel owners flagging their vessels abroad and then take advantage of financing terms etc. offered by foreign entities. However, this option would result in further depletion of Indian fleet.

6. *Inadequate handling and storage infrastructure at ports leading to higher vessel turnaround time at berth*

Voyage cost is one of the critical components of multimodal coastal shipping costs because of its dependency on market conditions. During the loading/unloading operations, vessel lie idle and charter and bunker costs are added to the coastal shipping costs. Delay in loading/unloading of vessel increases the turnaround time at berth and leads to higher coastal shipping cost. For instance, in case of cement, ports that do not have silo infrastructure unload the bulk cement to a truck at a rate of 3500 MT/day. In case of unloading to a silo near berth, 14,000 MT/day of discharge rate can be achieved, resulting in saving of 5 days of unloading time and corresponding vessel costs.

7. *Inadequate connectivity of ports/berths with origin/destination centers, restricting coastal movement of cargo*



Infrastructure connecting ports/coastal berths to production or consumption centers is constrained with excessive dependency on a single mode, leading to congestion and higher first or last mile costs. For example, the track capacity from Talcher to all key ports of Odisha is severely congested with current capacity limited to movement of 20 coal rakes per day from Talcher to Paradip port. In certain cases, rail infrastructure connecting ports is not present. For example, the Hazira Port is not connected with rail, restricting the movement of coal cargo through coastal route.

There is a need to improve the port connectivity infrastructure for faster and smooth first/last mile movement of coastal cargo.

Additionally, use of alternate modes such as inland waterways also need to be explored to ease out the burden on any single transport mode.

8. Inefficient documentation and operational processes impacting ease of coastal movement

Process related operations for coastal shipping have several redundancies and inefficiencies due to which more time and cost is used in the process than required. For instance,

– Clearance of EXIM cargo is done electronically through Indian Customs EDI Gateway (ICEGATE) system while the customs clearance of coastal cargo is done through manual filing and physical inspection of Bill of Coastal Goods (BoCG) document

– Currently, the physical inspection is undertaken for 100% of the cargo instead of sample basis as there is no risk management system (RMS) intelligence based inspection system used for coastal cargo

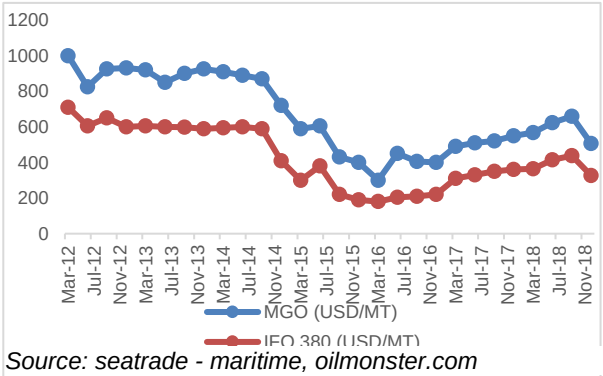
Most major ports have not adequately implemented the requirements of green channel clearance of coastal cargo (i.e. exclusive coastal berths, storage areas, and gates for coastal cargo outside the customs bonded area), impacting the faster movement and evacuation of coastal cargo.

9. The IMO 2020 fuel sulphur regulation to increase the bunker cost for shipping globally, impacting the competitiveness of coastal shipping with other transport modes in domestic market

The International Maritime Organization (IMO) 2020 regulation will enforce ship operators to use 0.5% sulphur content fuel. Traditionally, Heavy Fuel Oil (HFO), a high sulphur content fuel (3.5%), is used to power vessels. The use of HFO resulted in emissions of harmful gases to the environment. IMO regulation will enforce ship owners to switch to costlier alternative such as marine gas oil (MGO) or ultra-low sulphur fuel oil (UFSO), increasing the operating cost of vessel and thereby reduce the cost competiveness of coastal mode vis-à-vis other transport modes. For instance, on shifting from (Intermediate Fuel Oil) IFO 380 to MGO fuel, foodgrain movement from Punjab to Kerala becomes costlier by ~100 INR/MT.

An alternative to use the costlier bunker is to install abatement technology such as scrubbers or using liquefied natural gas (LNG) as fuel. Scrubbers allow vessel owners to use HFO fuel and meeting the emission restrictions of IMO. However, the high capital cost of scrubber, which ranges from USD 1–7[2] million (depending on the type of scrubber and size of vessel) and technical challenges in retrofitting, deterring vessel owners to install such technology.

Fuel Price Trend (IFO and MGO)

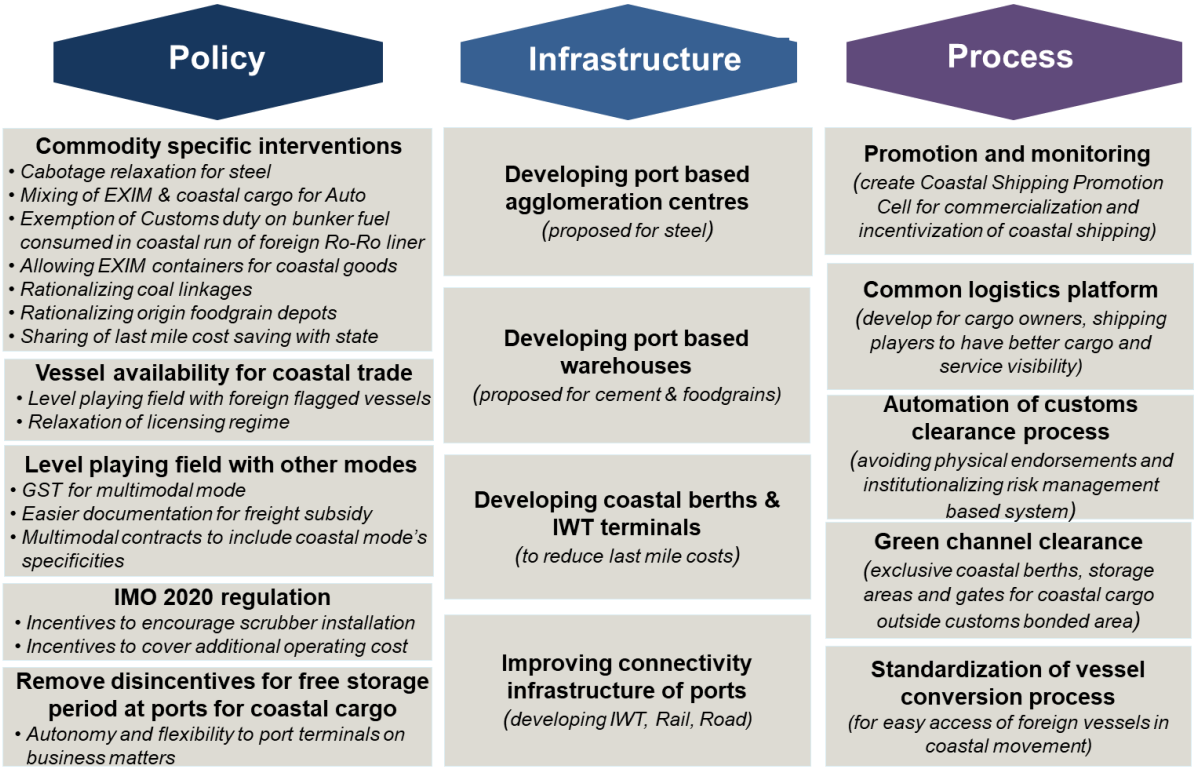


Source: seatrade - maritime, oilmonster.com

[2] Only equipment cost. Cost of installation, retrofitting, and maintenance are additional.

Interventions Required to Address the Issues and Challenges in Coastal Shipping

The interventions for the issues discussed above are required across three key areas: **Policy, Process and Infrastructure**



Policy Level Interventions

1. Relax the cabotage restrictions for steel cargo to increase the vessel availability

For coastal movement of steel, deploying a dedicated coastal vessel is not viable due to unavailability of return cargo. For viability of coastal shipping, the steel industry would need to depend on the import vessels calling at east coast ports and returning empty towards west to avoid empty return cost. As per the current manning norms, if a foreign vessel undertakes more than 30 days of costal run cumulatively in a year, it needs to employ Indian crew. Since hiring fresh crew will not only increase paper work but also add to the costs in terms of repatriation of foreign crew, carrying out medical and insurance of Indian crew, vessel operators are not willing to employ Indian crew specifically for coastal leg.

Vessels calling multiple times at east coast ports, which can be utilized in coastal shipping, contribute to 40–45% of the total vessel movement at the ports. Under existing manning norms, these vessels can only be utilized once for coastal voyage from east to west India, which takes 17–20 days (one way), impacting the availability of vessel for coastal movement. Relaxing the current norms of 30 days without the need to employ Indian crew will enable these foreign vessels to undertake coastal voyages on each of their import trips, thereby increasing the vessel availability for coastal movement.

Hence, Ministry of Shipping may consider relaxing cabotage law for steel cargo so that manning restrictions are removed.

2. Allow mixing of EXIM and coastal cargo on foreign Ro-Ro vessels to reduce voyage costs

Coastal movement of automobile from the origin cluster of Chennai to Kandla port is unviable due to high coastal shipping costs. High coastal shipping cost is primarily due to voyage cost, loaded on one way and empty return. This accounts for ~70% of total coastal shipping costs. High voyage cost is primarily due to fixed cost of vessel charter and costs related to empty run on return journey.

Existing international RoRo liners call at multiple Indian ports as part of their liner service routes and have empty capacities that can be utilized for coastal movement of automobiles. If mixing of coastal

and EXIM cargo is allowed then these sevices can utilize their part empty capacities while on their onward journey from Chennai/Kamarajar ports and drop off coastal cargo on west coast of India. Mixing of EXIM and costal cargo would allow pricing of coastal leg on marginal cost basis, reducing the impact of charging entire fixed cost as well as eliminate empty return costs, making coastal mode a viable option.

3. **Allow use of EXIM containers for carriage of coastal cargo to reduce the cost of repositioning empty domestic containers**

High empty container repositioning cost is one of the key issues in coastal shipping of container cargo impacting commodities such as foodgrain, fertilizer, or cotton. The empty repositioning costs of domestic containers can be partly reduced by allowing the use of EXIM containers for carriage of coastal cargo. The movement of EXIM containerized cargo from different parts of the country is higher than domestic cargo and thus it is cheaper and time efficient to reposition the EXIM containers. Once coastal leg is complete, the EXIM containers can be repositioned to nearby ports/inland container depots (ICD) for onward export, saving the cost of repositioning empty containers back to origin location. Customs, in 2001, had provided temporary permission to use EXIM containers for domestic movement; however, in practice, ambiguity exists with regard to such use of EXIM containers. To promote coastal shipping, customs should consider allowing the use of EXIM containers for carrying domestic cargo.

4. **Rationalize coal mine linkages with power plants to reduce the first mile cost for multimodal coastal movement**

Historically, to lower the costs of railway movement, coal mine linkages from the logistics perspective have been done. However, rationalizing coal mine linkages based on multimodal movement involving coastal shipping/inland waterway can further reduce logistics cost in some cases. For instance, changing linkages from SECL to MCL for west coast plants can reduce the first mile distance to about 200 km, making the coastal shipping cost lower than current rail cost. Therefore, any new study into relooking at rationalization of linkages should take into account alternate modes of coastal shipping and inland waterway movement.

5. **Utilize origin foodgrain depots closer to ICDs to reduce the first mile cost of multimodal coastal movement**

Containerized movement of foodgrains is the cost effective mode for coastal shipping. Typically, the distance to container depots from current originating grain depots (that serve coastal districts) ranges from 50–100 km compared with distance to rail goods shed which ranges from ~0–5 km, increasing the first mile cost of coastal movement. Realigning dispatches for coastal districts with grain depots closer to ICDs can reduce first miles costs.

6. **Share the last mile cost saving due to port based warehouse with the State**

With port based food-grain warehouses, there is expected to be overall reduction in logistics cost for movement of food-grains. However, the transportation costs for the State Governments may increase, as they would need to off-take food-grains from port-based warehouses that may be located farther from districts instead of FCI depots located within the districts. Therefore, to lower the cost burden on state government and encourage them to adopt port-based warehouse set-up to serve coastal districts, a mechanism may need to be developed by Ministry of Food and Public Distribution/FCI to share the cost saving from port-based warehouse with the state.

7. **Remove disincentives for offering free storage period at port for coastal cargo**

Coastal shipping would be encouraged by offering adequate storage space within the port, especially, for containerised cargo. The ports can take a decision on economic viability of providing excess free storage period to the coastal cargo depending upon its existing cargo profile and utilization levels. However, under the current TAMP regulations, a terminal operator would need to pay the revenue share related to port storage as per the schedule of rates, even when the storage is provided as free of cost to the users in order to promote coastal cargo. This may lead to additional cost burden on the terminal operator. In case of exim cargo, the excess storage requirements are catered by inland facilities such as container freight stations (CFS) and Inland Container Depots (ICDs), and the liners/end customers

are not entirely dependent on the port storage. Since the total logistics cost for coastal cargo needs to be competitive as compared to corresponding rail or road costs, multiple handlings for taking the cargo to another storage facility need to be avoided.

Hence, there needs to be greater flexibility provided to port terminals to evaluate economics for providing free storage space. Basis this, a port wise review/revision of extending free storage days for coastal container in the range of historical average dwell time may be undertaken. Further, in case, private terminals at major ports look to offer discounts on free storage above and beyond the revised free storage period, then flexibility of revenue share being calculated on discounted tariff (with a ceiling) may be provided to terminal operators.

8. **Ensure vessel availability for coastal trade through addressing high cost factors of Indian flagged vessels**

a) Develop a maritime development fund to enhance the credit availability at favorable terms in the maritime sector

Internationally, foreign currency bonds fund ship acquisition, whereas in India, banks primarily fund the acquisition of a ship. As a result, foreign vessels avail a loan for 15 years, while the Indian vessel owners get a shorter loan duration of 6–8 years. Moreover, because of higher risk perception of the maritime sector by banks, players have to provide a collateral over and above the vessel. This discourages small ship owners to purchase a vessel. To provide longer tenor funds at a lower cost of borrowing, a specialized maritime development fund is required which would provide credit in favorable terms depending on the requirement of sector. The fund could be initiated by government with participation from multilateral/bilateral agencies and large financial institutions which lowers the cost of borrowing funds and allows disbursement at lower interest rate.

b) Relaxation on Indian vessel to carry coastal cargo via foreign port/intermediate port while having both EXIM and coastal cargo

Typical interest rate for Indian flag vessels is 12–14% as compared to 5–6% outside India. Borrowing cost for external commercial borrowings (ECBs) is also higher owing to hedging costs. The difference in interest cost can be partly reduced by earning in dollar amount and taking loan corresponding to that earnings. With 20% USD earning ~45% loan can be taken in USD, reducing the average interest rate to ~8.8%. For dollar earnings, Indian flag vessels should be allowed to carry both EXIM and coastal cargo via foreign ports and allow loading/unloading of EXIM cargo at those ports during coastal run.

c) Reduce disparity in bunker fuel cost from Indian and foreign ports

For IFO 380, Indian flagged vessels plying only between Indian ports would need to pay ~14–15% more than foreign counterparts. This is primarily due to higher base price of bunker fuel at Indian ports vis-à-vis foreign ports. The difference prevails even after applying relevant taxes to domestic and foreign bunker. With the development of short sea shipping, the coastal vessels would be able to take bunker fuel from neighboring country ports. This might reduce the differential of bunker costs depending upon the IFO price available at neighboring ports as compared to other international ports where foreign-flagged vessels call as a part of their EXIM run. Further, the export price of IFO from Indian oil companies should be looked at to understand the additional cost elements applicable for domestic sale leading to higher price. This might result in reducing the IFO price for domestic sale as well by ensuring parity with export price.

d) Propose a representation before the GST Council to bring Indian and foreign vessels at equal footing

Vessels imported in India under Indian flag have to pay 5% Integrated Goods and Services Tax (IGST) on capital cost of the ship, which takes a long time to offset, impacting the cash flow of Indian shipping lines. Furthermore, Goods and Services Tax (GST) on operating expenses of the ship can only be claimed if the firm is registered in the state where expense has been made. To reduce the impact of IGST and ease in claiming of GST for operating expenses, representation has to be proposed to GST council on “Inverted Duty Structure” and review the “Place of Supply” rule.

9. Ensure level playing field for coastal transportation with other modes

a) Lower the GST rate in multimodal transportation for parity between railway and waterway movement

GST for single mode of transportation like railways is 5% while for multimodal, like coastal shipping, is 12%. For commodities with lower GST, such as fertilizer, this becomes an additional cost. Therefore, representation needs to be sent to the GST council, as in case of coastal shipping, owner is unable to claim complete input credit due to higher input taxes.

b) Standardized procedure and subsidy for all the modes of transportation

Recently, freight subsidy on fertilizers was extended to multimodal movement including coastal and inland waterways. However, the process for reimbursement is not streamlined for coastal movement, with issues such as preparation of multiple bills and no mechanism to upload coastal bills on the Department of Fertilizer portal, etc. being faced by coastal players.

In order to encourage players to adopt coastal shipping mode, standard procedure for filling of reimbursement for all modes and fast tracking of reimbursement submission mechanism for coastal shipping in online system are required. Standardized subsidy for players, independent of mode of transportation is being discussed with Department of Fertilizer, however, until the same is approved and implemented, online system should be made hassle free for coastal / multi-modal mode

c) Ensure the multimodal contracts of PSU account for specificities of coastal shipping

Existing multimodal contracts of PSUs do not account for specificities of coastal shipping. The review of key clauses of recent PSU contracts for coastal shipping highlights issues detrimental to coastal shipping such as no minimum guarantee of cargo, no fuel price variation for bunker fuel, fixed transit period of delivering the cargo.

Therefore, to increase participation in coastal tenders and provide a level playing field to coastal shipping, contracts for multimodal transportation include conditions which are conducive for the coastal shipping. Public sector cargo owners should develop model contracts through detailed discussions with the shipping lines and consequent review from respective ministries.

10. Interventions to sustain cost competiveness of coastal movement post IMO regulation

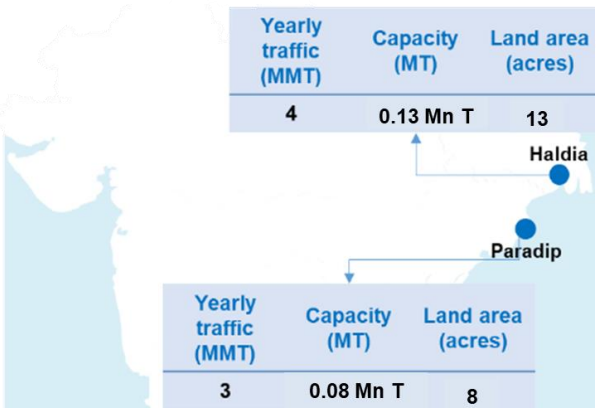
The Government may look at providing incentives to cover the additional operating costs of vessels on account of compliance with IMO 2020 regulations. It is suggested that a mechanism to evaluate project specific incentive demand of players may be established so that incentives can be targeted to routes or commodities where coastal shipping has become unviable in comparison to Rail and road modes after IMO 2020 regulations. The proposed coastal shipping promotion cell may take up the tasks of evaluating the business cases for incentives and the proposed maritime development fund may be used to provide such incentives. The Marco Polo program of European Union provided similar incentives for promotion of coastal trade.

Infrastructure Interventions

1. Develop port based agglomeration centers to increase the parcel size of coastal cargo

For commodities such as steel, the parcel size of individual steel players are not sufficient to efficiently utilize the capacity of vessels suitable for coastal shipping. To arrange for a suitable shipment size, port based agglomeration centers near the load port can be developed. At port based agglomeration centers, steel commodities of individual players will be aggregated to make suitable shipment size for loading the vessels. These centers would not only provide advantage of cost reduction through economies of scale in handling and storage of cargo but also provide increased market access to smaller players.

Location of Steel Agglomeration Centres



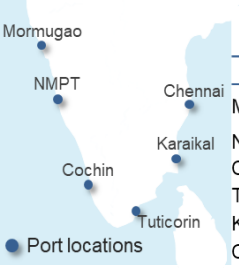
Source: Study team analysis

2. Develop port based storage warehouses at discharge ports for improving the cargo handling rate and reducing inefficiency in last mile movement

Foodgrain warehouses near ports

Existing set-up of storage warehouses at destination location for commodities such as foodgrain results in inefficient last mile movement and thereby increasing last mile costs. This inefficiency can be removed by developing port based storage warehouses. Foodgrains can be stored in these warehouses at the port and directly transported to final consumers, without the need of first transporting the grains to Food Corporation of India (FCI) depots and then to end consumers, thereby reducing the last mile cost.

Port Based Foodgrain Warehouses



Port based warehouse capacity required (MT)

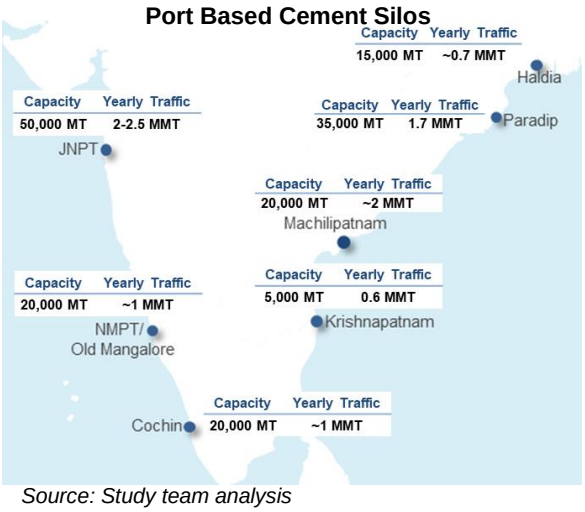
	Immediate	FY25
Mormugao	64,000	154,000
NMPT	101,000	172,000
Cochin	42,000	187,000
Tuticorin	45,000	66,000
Karaikal	45,000	79,000
Chennai	51,000	96,000

Since FCI would have ongoing contracts with existing warehouses, it is proposed that initially port based warehouse of capacity equivalent to lesser of storage shortage in districts and requirement for storage of coastal cargo could be developed near the ports. Estimation of warehouse size has been provided in annexure

Total investment needed to develop 0.75 MMT of warehouse by FY25 would be around INR 2.25 billion (excluding land cost). Of the total investment, ~INR 1 billion would be required in the short term (1–2 years) for development of 0.35 MMT of warehouse. The port based grain warehouse can be developed by state/central warehousing corporations, private players through PPP under Private Entrepreneurs Guarantee (PEG) scheme of FCI.

Cement silos

Movement of cement in break bulk form results in low loading/unloading rate, increasing the turnaround time of the vessel and costs. Movement of cement in bulk form would result in faster loading/unloading of cement at ports provided that port has a silo infrastructure near berth which increases the handling rate by 4 times compared with break bulk/bulk (without silo near berth) handling rate. Port based cement silos would reduce vessel turnaround time and thereby the cost for movement through coastal shipping.

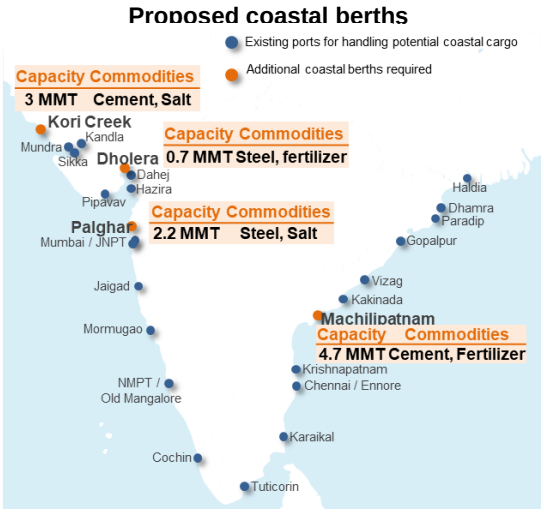


Source: Study team analysis

To develop the proposed silos, estimated investment of INR 5–6 billion (excluding the cost of land) is required. These cement silos can be developed by the individual cement player with port trust providing land for silo development or can be developed by port trust on a PPP mode and leasing the facility to the cement players.

3. Develop coastal berths to reduce the last mile costs

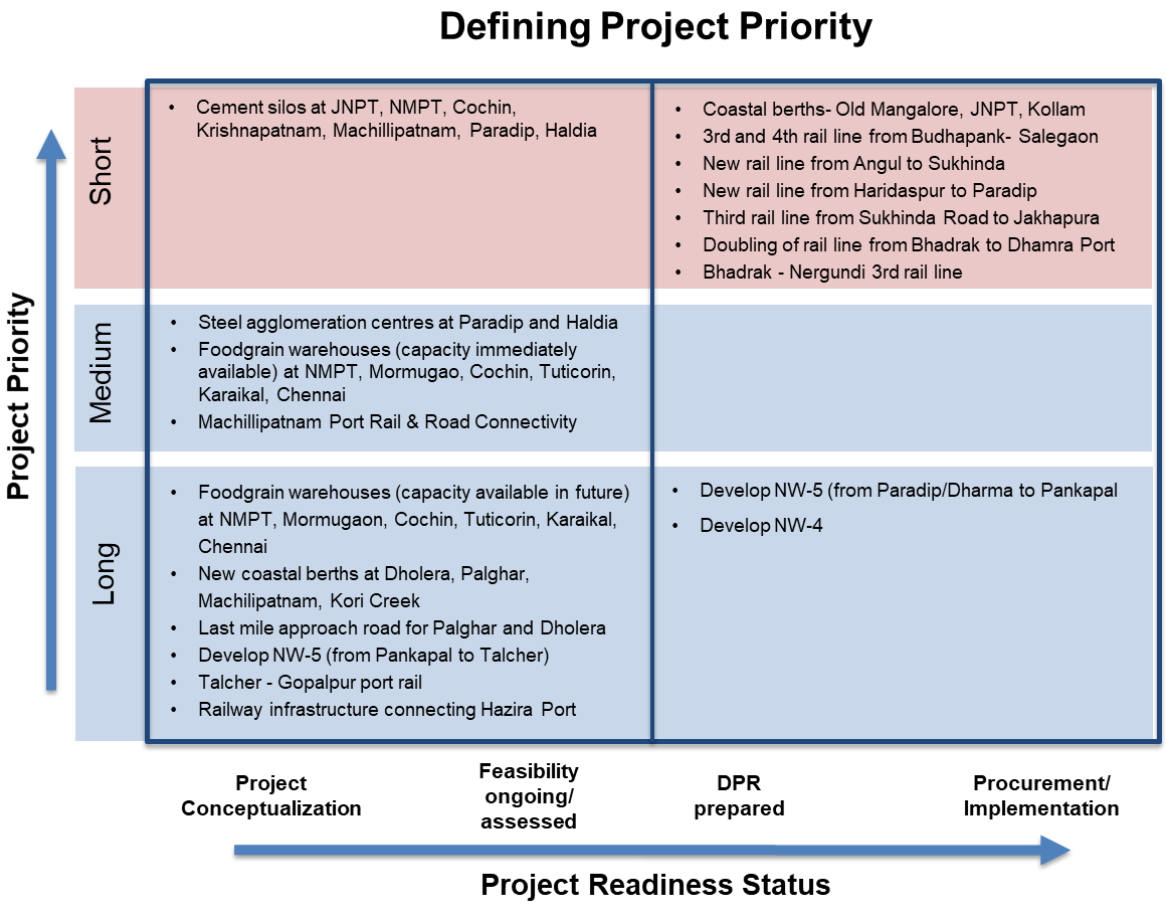
In certain cases, the cargo needs to be unloaded at the ports, which are not optimally located along the coast, increasing the first/last mile costs and thereby coastal shipping costs. In order to reduce the first/last mile costs, coastal berths can be developed in the coastal locations nearest to the production/demand centers with all the facilities required for handling and storage of cargo.



To develop these proposed coastal berths, estimated total investment of INR 2–3 billion (excluding the cost of land) is required. The coastal berths can be developed by major/non-major ports/State Maritime Board/state governments with financial assistance from “Coastal Berth Scheme” launched by the Ministry of Shipping.

4. Develop connectivity infrastructure for movement of coastal cargo to/from ports

Excessive dependency on a single mode, leading to congestion and higher first or last mile costs constrain infrastructure connecting ports to production or consumption centers. In certain cases, suitable connectivity infrastructure is not available, such as rail connectivity at Hazira Port for movement of coal, restricting the coastal movement of cargo. To facilitate faster and smooth first/last mile movement of coastal cargo, adequate connectivity infrastructure needs to be developed at existing and upcoming ports/berths. A list of key connectivity projects identified under the Sagarmala Programme that need to be prioritized and other critical projects has been provided in section 4.4.1.



Process Level Interventions

1. Create a coastal shipping promotion cell for promotion and monitoring of coastal shipping projects

A coastal shipping promotion cell should be established under the purview of Ministry of Shipping which will undertake the active role in commercializing the viable coastal shipping projects through B2B meetings with the various stakeholders involved. The agency will also act as interface between authorities and industry, and organize communication between stakeholders, identify the bottlenecks, involve in research based on identified gaps and suggest suitable policy action for the Ministry. Institutional structure of cell will have two units headed by Joint Secretary (JS)/Director of the Ministry of Shipping - PMU and a marketing unit.

The PMU should be responsible for promotion of coastal shipping through acting as a single node for all communications, coordination, clarifications, and outreach activities for implementation of coastal shipping related projects. PMU will coordinate with various players for undertaking pilot run and execution of long-term contracts between cargo owners and shipping liners. A consulting organization can be appointed to run the PMU activities.

Marketing unit may have a network of marketing officers across ports headed by a nodal officer at the Ministry of Shipping. The large network of marketing officers would help in undertaking on-ground marketing activities and increasing coastal movement. These officers should have a substantial variable pay component in relation to the additional cargo they bring on the coastal mode. Alternatively, the Marketing Unit can also have independent freight forwarders empanelled as Business Associates, who would be paid a commission according to the additional cargo volume they bring in. However, a fixed reporting frequency of these Business Associates would need to be adhered to ensure that continuous efforts are being made for conversion of coastal cargo.

2. Develop common logistics platform for cargo owners, shipping players for better utilization of coastal mode

In order to increase visibility of coastal shipping in logistics e-market place and to encourage modal shift, a coastal shipping logistics data bank that would contain the real time and historical data needs to be created. Currently, several data banks such as Freight Operating Information System, Port Communication System and E-way Bill System are present in the logistics system. However, these systems work in silos which limit the usage of information sets by relevant government agencies. Having a common logistics platform across all the modes will enable effective data capturing and utilization and provide a comprehensive and transparent picture to service providers as well as the end consumers. It will increase visibility of coastal shipping among players who are not getting adequate service in their primary mode of transport.

Logistics Division, Department of Commerce in its Draft National Logistics Policy has proposed setting up of two integrated logistics platforms–Logistics Data and Analytics Centre and National Logistics e-marketplace. Integrating coastal shipping data in this common logistics platform will enable shippers to effectively and optimally utilize the coastal shipping mode.

3. Digitize and automate coastal cargo customs clearance process incorporating RMS intelligence based inspection approach (similar to EXIM cargo clearance)

While the entire documentation and process for customs clearance of EXIM cargo is undertaken through the ICEGATE system, the same for coastal cargo is done manually at present. For ease of tracking and tracing by customs, it is important to capture the coastal cargo movement details in the ICEGATE system. This would help the cargo owners as well as eliminate the need for physical filing and physical endorsement on BoCG. Once the coastal cargo is captured in the ICEGATE system, the existing risk management module available in ICEGATE can be extended to coastal cargo owners as well so that the need for 100% physical inspection of cargo is eliminated.

4. Integrate NIC portal (e-way bill) with ICEGATE portal for eliminating any duplicity of documents

The ICEGATE portal would also need to be integrated with the e-way bill (NIC portal) so that duplicity of documents and process in filing bill of coastal goods is removed. The existing e-way bill for costal leg need to be modified to capture BoCG related details. Once the modified e-way bill is filled by Cutoms House Agents (CHAs), the relevant details would be fed to the ICEGATE portal through integration of E-way bill (NIC portal) and ICEGATE portal. The requirement of physical endorsement of BoCG at customs freight station/port customs will be eliminated after the integration of NIC portal with ICEGATE portal.

5. Ensuring green channel clearance in all the major ports for faster movement of coastal cargo

All major ports should implement priority berthing for coastal vessels and green channel clearance process which include exclusive coastal berths, storage areas, and gates for coastal cargo outside the custom bonded area for faster movement and evacuation of coastal cargo from the ports.

6. Easing out the process of foreign vessel conversion for coastal run

Usage of foreign vessels for coastal movement is critical for some commodities and O-D pairs to ensure viability. This requires conversion of the vessels for coastal leg and reversion after the coastal leg for foreign movement. Currently, the conversion process is not standardized across ports and has issues which need to be resolved to ease out the process.

- The process of conversion is ambiguous, varying with each port. Also, vessel has to file Bill of Entry (B/E) even though there is no payment of duty. The requirement of B/E for coastal voyage should be waived and standard terms and practices without ambiguity should be followed by all of the ports
- All the Indian ports are ISPS compliant and existing rules are followed by shipping agents. Thus, there is no need for authorities to board the ship and mis-declaration by master should be strictly dealt with, including a whistle blower policy for compliance

- Currently, duty is charged on bunker consumption from last Indian port of call which should be instead charged from the initial load port for coastal movement
- Bulk, liquid, and project coastal and EXIM cargo are not allowed to be co-loaded, while the same are allowed for some commodities. Allowing this for all the cargo would help ship owners utilize a ship efficiently and save logistics cost on coastal movement
- Customs insist upon bunker sampling at the time of conversion, which is a time consuming process. The bunker fuel is supplied by approved vendors, therefore, the sampling process is unjustified. Customs should instead formulate standard SOP of surveys to remove inefficiency and ambiguity
- Assessment of final B/E at time of reversion from coastal to foreign run takes a long time, ranging from 5 to 12 months. This should be reduced to 15 days, as stipulated in customs' circular.
- Import duty should be exempted on edible consumable provisions carried on foreign going vessels converted for coastal trade.

Short Sea Shipping

BIMSTEC[3] member nations have a potential to increase inter-regional trade through adopting short sea shipping under which the maritime transportation among the countries can be carried out through cost effective coastal vessels. Further, implementation of discounted port charges similar to coastal movement and streamlining of customs clearance processes would encourage higher trade.

India is the lead member of BIMSTEC and has formulated a draft coastal shipping agreement and Standard Operating Procedure (SOP) for short sea shipping among the member nations. European Union short sea shipping. The development of short sea shipping in European Union (EU) may be looked at for deriving useful insights for creating effective institutional and policy framework. EU focused on ground level realization of short sea shipping trade through creation of dedicated focal points and promotion centers. Further, continuous incentives are provided to the users through various schemes such as the Marco Polo Program.

BIMSTEC member nations should also focus on promotion centers and undertake feasibility studies to reduce the cost of short sea shipping (example, evaluation of LNG vessels for short sea shipping) and simplify the processes. The existing fleet of 600+ sailing vessels (wooden vessels) may be looked at for deployment in short sea shipping as these vessels can reduce the voyage costs due to negligible fixed costs. Further, the proposed committee for short sea shipping may also look at allowing carriage of third country cargo during short sea shipping to optimize the voyage costs and increase transhipment opportunities.

Critical areas requiring funding support

The funding or financing of the following interventions may be prioritized for promotion of coastal shipping as a preferred mode of transportation

- **Maritime development fund**: The fund is conceptualized to enhance the credit availability at favourable terms for development of Indian flagged coastal fleet, provide support in complying with IMO regulations and to provide modal-shift incentives as part of coastal shipping promotional effort. Given the importance of fund in the development of coastal shipping sector, there is a need to prioritize the formulation of this fund. The funding source should be identified through discussions between Ministry of Shipping, Logistics Division and multilateral funding institutions.

- **Coastal shipping promotion cell**: The cell would be essential for increasing awareness, knowledge dissemination, performance measuring and commercialization of coastal shipping projects. Funding support may be required to establish the two units of promotion cell: program management unit and marketing unit.

- **Logistics platform for coastal shipping**: Coastal shipping data bank/portal would be required to increase visibility of coastal shipping in e-marketplace. Funding support may be required for

[3] Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation: Member countries include India, Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka, and Thailand.

creating robust costal shipping data bank/portal and integrating such facility with already planned national logistics portal.

- **Infrastructure projects**: Several key infrastructure projects across port connectivity, terminal and storage infrastructure, logistics centres have been identified to enable coastal movement. A detailed list of identified projects which would require funding support has been provided in section 4.5.

A detailed roadmap for implementation of suggested interventions is highlighted below.

Actionable Roadmap

Area	Intervention	Reference section	Responsible authority	Expected implication		Total yearly coastal traffic by FY25
				Coastal traffic increase due to interventions (FY25)	Yearly cost saving (FY25)	
Commodity specific interventions						
Coal	***Rationalization of coal linkages:*** Review coal mine power plant linkages considering both railway and coastal mode	2.3.3.1	Ministry of Coal	110 MMTPA	INR 54 billion	140 MMTPA
	Improve connectivity infrastructure – Prioritize the development of key rail connectivity projects identified in Sagarmala • 3rd and 4th line from Budhapank – Salegaon via Rajatgarh • New Line from Angul to Sukhinda • New Line from Haridaspur to Paradip • Third line from Sukhinda Road to Jakhapura – Non major Port rail connectivity on west coast of India – NW-5 development connecting Talcher to Paradip and Dhamra	2.3.3.2	Indian Railways, IWAI			
	Linkage allotment to private plants	2.3.3.3	Ministry of Coal			
Steel	***Relaxation of manning norms/ cabotage restrictions*** to increase availability of vessels	2.1.3.2	Ministry of Shipping	6 MMTPA	INR 3.5 billion	10 MMTPA
	Develop agglomeration centers at load ports to agglomerate shipment quantities of different players to optimize capacity utilization of vessels Key locations of agglomeration centers at Paradip and Haldia of capacity 0.9 lakh MT and 1.3 lakh MT, respectively.	2.1.3.1	Port Authority/Ministry of Shipping			
	Develop coastal berth near key consumption centers to reduce last mile costs Key locations for coastal berth of steel: near Phalghar, Thane; Dholera, Gujarat; JNPT	2.1.3.3	Port Authority/ State Maritime boards			
	Develop NW-5 and utilize IWT as an alternate mode of transport	2.1.3.4	IWAI			
Foodgrain	***Rationalization of origin FCI depots:*** Utilize depots closer to ICDs to reduce first mile cost of coastal movement	2.2.3.1	FCI	3 MMTPA	INR 0.75 billion	3 MMTPA
	Allow use of EXIM containers for domestic movement to reduce the empty container repositioning costs	2.2.3.2	Customs			

Area	Intervention	Reference section	Responsible authority	Expected implication		Total yearly coastal traffic by FY25
				Coastal traffic increase due to interventions (FY25)	Yearly cost saving (FY25)	
	Develop/hire port-based warehouses to remove last mile movement inefficiencies *Key locations for warehouses*: Mormugaon, New Mangalore, Cochin, Chennai, Tuticorin, Karaikal *A total 0.75 MMTPA capacity of warehouse by FY25 with an investment of INR 2.25 billion (excluding land cost).*	2.2.3.3	FCI			
Fertilizer	Utilizing the empty spaces in ***existing vessel services*** or ***combining fertilizer cargo with other containerized commodities*** such as foodgrain, cotton to increase parcel size for dedicated movement	2.4.3.1	Shippers/industry players	3.5 MMTPA	INR 0.75 billion	3.5 MMTPA
	Use of wooden vessels for movement of small parcel of fertilizer cargo	2.4.3.2	Shippers/ Industry players			
	Level playing field with other modes: – Representation to GST council on Inverted Duty structure as cargo owner is unable to claim complete input credit due to higher input taxes – Standardized SOP for filling of reimbursement for all modes – Fast tracking of reimbursement submission mechanism for coastal shipping in online system	2.4.3.3	Department of Fertilizer/ GST Council			
Cement	***Develop silo infrastructure at ports*** to reduce vessel turnaround time Key ports for silo development: JNPT, New Mangalore/Old Mangalore, Cochin, Krishnapatnam, Machilipatnam, Paradip, Haldia	2.5.3.1	Cement manufacturers/Ports	12 MMTPA	INR 6 billion	22 MMTPA
Automobiles	***Allow mixing of coastal and EXIM cargo on foreign RoRo vessels*** to reduce voyage costs	2.7.3.1	Customs	200,000 – 250,000 cars	-	200,000 – 250,000 cars
	Provide exemption of Customs and Central Excise Duty on coastal run of foreign Ro-Ro liners *to reduce voyage costs*	2.7.3.2	Customs			
	Use containers for coastal movement of cars to eliminate the vessel empty return costs	2.7.3.3	Shippers/industry players			
	Create conducive support infrastructure *at ports (isolation from dirty cargo, dedicated lane for port entry) to attract coastal cargo*	2.7.3.4	Ports			

Area	Intervention	Reference section	Responsible authority	Expected implication		Total yearly coastal traffic by FY25
				Coastal traffic increase due to interventions (FY25)	Yearly cost saving (FY25)	
POL	***Develop and enhance terminal capacities at load/unload port*** Key ports: Kamarajar port, Kolkata and Vizag port	2.10.3	Ports	17-18 MMTPA	INR 17 billion	65-70 MMTPA
Cotton	***Allow use of EXIM containers for domestic movement*** to reduce the empty container repositioning costs	2.6.3.1	Customs	0.3-0.4 MMTPA	INR 60 million	0.7 MMTPA
	Provide financial assistance to specific projects providing end-to-end services	2.6.3.2	Ministry of Shipping			
Salt	***Rationalization of handling cost for wooden vessel***	2.8.3.1	Ports/ vessel operators	0.2 MMTPA	INR 15-20 million	0.5-0.6 MMTPA
	Develop coastal berth near Palghar, Thane	2.8.3.2	Ports/State Maritime Boards			
Sugar	***Improve navigation and jetty infrastructure along NW-1***	2.9.3.1	IWAI	1-2 MMTPA	-	1-2 MMTPA
Tiles	***Encourage entry of integrated service providers***	2.11.3.1	Ministry Of Shipping	3 MMTPA	INR 3 billion	5 MMTPA
Total coastal cargo potential for studied commodities				**~160 MMTPA**	**~INR 85 billion**	**~255 MMTPA**
Additional coastal cargo from other commodities presently constituting coastal traffic[4] Iron ore and Iron-ore pellets (40 MMTPA), Crude Oil (15 MMTPA), Non-thermal Coal (13 MMTPA), Containers (7 MMTPA)						~75 MMTPA
Total potential coastal shipping cargo by FY 25						**~330 MMTPA**
Additional cargo from Short-sea shipping[5]						~25 MMTPA
Total coastal and short-sea cargo potential by FY25						**~355 MMTPA**
Initiate pilot movements for key commodities						
Steel	Meeting and coordination with Ministry of Steel and key steel players (SAIL, JSW, TATA, Bhushan, small steel players from Kalinganagar, Jamshedpur, Durgapur clusters) for pilot movement	6.2	Ministry of Shipping			

[4] FY19 coastal shipping data at Major ports and Non-major ports has been used to identify the existing coastal cargo volumes not covered under the shortlisted commodities for this study; FY 25 volumes of such commodities have been projected basis the growth rate estimates for user industries

[5] The current trade volumes of India with BIMSTEC countries have been considered as potential for conversion to short-sea shipping. Please refer report section 2.12 for details.

Area	Intervention	Reference section	Responsible authority	Expected implication		Total yearly coastal traffic by FY25
				Coastal traffic increase due to interventions (FY25)	Yearly cost saving (FY25)	
Fertilizer	Coordinating with major fertilizer plants (*e.g. IFFCO, KRIBHCO)* for container/wooden boat movement to Maharashtra		Ministry of Shipping			
Fertilizer	Coordinating with IWAI and key plants in Odisha for IWT barge movement along NW-1 to West Bengal		Ministry of Shipping			
Foodgrain	Coordinating with FCI and CONCOR for containerized movement from Punjab to Southern states		FCI/CONCPR			
Coal	Coordinating with Ministry of Coal and MCL mines for movement of coal to west coast power plants		Ministry of Coal			
Sugar	Coordinating with Indian Sugar EXIM Corporation for short sea movement from Uttar Pradesh (UP) to Bangladesh via Kandla port		Indian Sugar EXIM Corporation			
Salt	Coordinating with salt manufacturers in Gujarat and wooden boat association for movement from Gujarat to Maharashtra		Ministry of Shipping			
Sector level interventions – Policy						
Improve vessel availability for Coastal Trade	***Relaxation of cabotage law***	3.2.2				
	Create maritime development fund to enhance credit availability in coastal shipping sector	3.2.1	Ministry of Shipping /Ministry of Finance			
	Allow mixing of EXIM and coastal cargo from foreign ports for adjustment of foreign loan in dollar by the dollar earning, effectively reducing the interest rate		Customs			
	Reduce the cost of bunker fuels in Indian ports to bring the costs in level with foreign competing ports		Ministry of Petroleum/ Oil PSUs			
	Propose a representation for GST council to resolve the issue of IGST and review the "Place of Supply" rule		GST Council			
IMO regulations	***Support the retrofitting of scrubbers on existing vessels or support new vessels to have LNG fuelling or scrubber technology installed by providing incentives***	3.4	Ministry of Shipping			
Free Storage Period	***Remove disincentives for offering free storage period at port for coastal cargo***	3.5	Ministry of Shipping			
Sector level interventions – Process						

Area	Intervention	Reference section	Responsible authority	Expected implication		Total yearly coastal traffic by FY25
				Coastal traffic increase due to interventions (FY25)	Yearly cost saving (FY25)	
Promotion and Marketing initiatives: ***Promotion cell***	***Institutionalize the promotion cell under MoS with representations from Logistics division, Railways, MoRTH, and IWAI***	5.1	Ministry of Shipping			
	Hire program management consultancy (PMC) for operationalizing the promotion cell		Ministry of Shipping			
	Hire marketing officers OR contract with Business Associates for on-ground conversion of coastal shipping volumes		Port Authorities			
Common Logistics Platform	***Develop coastal shipping databank***	5.2	Ministry of Shipping			
	Integrate the databank with the overall logistics databank and Integrated Logistics Planning and Performance Monitoring Tool (LPPT)		Logistics Division, Ministry of Commerce			
	Develop e-freight marketplace for coastal shipping and integration with e-freight marketplace for logistics sector		Logistics Division, Ministry of Commerce			
Customs Process	***Automate the coastal cargo customs clearance process with inspection based on customs intelligence***	5.3	Customs			
	Integrate NIC portal with ICEGATE portal		Customs			
	Standardize the process of foreign vessel conversion for coastal movement	5.5	Customs			
Green Channel Clearance	***Ensure proper implementation of green channel clearance and priority berthing for coastal cargo***	5.4	Major Ports			

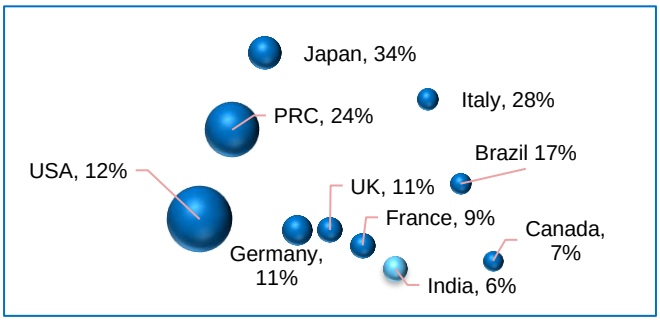
**For some commodities, coastal shipping costs become competitive with road/rail mode post intervention, resulting in modal shift of some portion of total cargo. For such commodities, there may not be direct logistics cost saving, however, utilizing coastal mode would result in indirect cost saving by reducing congestion on other modes of transport and other benefits such as reduced pollution and accidents.*

The interventions suggested above will result in annual logistics cost saving of INR ~85 billion and add a volume of 150–160 MMTPA in coastal shipping traffic by FY25 for the studied commodities. The total coastal traffic for all of the above commodities including short sea shipping volumes is expected to reach ~ 355 MMTPA by FY-25.

1 Introduction

India has a long and contiguous coastline spanning 7,500 km and over 14,000 km of navigable inland waterways providing an excellent opportunity to tap an environmentally friendly water based modal transport, which can complement rail and road based cargo movement. Currently, coastal and inland waterways contribute ~6% of the country's freight modal mix, which is the lowest amongst top 10 economies of the world. Developing economies of South Asia, like Bangladesh (16%) and Thailand (12%) too have a higher share of water-based transport, highlighting the scope for improvement in share of water-based transport in India.

Figure 1: Domestic Water Transport Share in Top 10 Economies



Note: Size of the bubble indicates economy size in terms of GDP, % indicates water transport share of the country; Source: India Maritime Plus, Ministry of Shipping, Government of India

Source: IMO, Ministry of Shipping, country reports

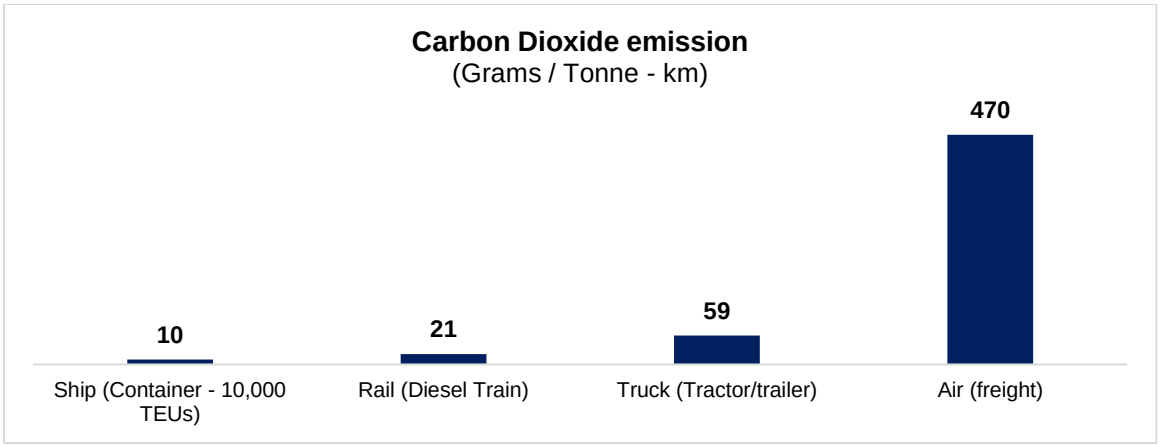
The improvement of water-based transport share would lead to lowering of logistics costs for end-user industries as water-based transport is inherently cheaper than rail and road modes.

Table 1 Waterways Transport Comparison to Rail and Road

Parameters	Waterways	Rail	Road
Energy efficiency: 1 horsepower (HP) moves what weight of cargo (kg)	4,000	500	150
Fuel efficiency: 1 liter of fuel can move how much freight (ton-km)	105	85	24
Cost efficiency: Cost for transporting freight in 1 ton-km	Rs. 0.3	Rs. 1	Rs.1.5
Equivalent single unit carrying capacity	1 barge	15 wagons	50 trucks

Source: Vision document for coastal shipping, tourism, and regional development, Ministry of Shipping

Also, other indirect benefits such as reduced air and noise pollution and reduced rate of accidents would benefit the economy as a whole. Maritime shipping is the world's most carbon-efficient form of transportation – far more efficient than road or rail transport. A container vessel of 10,000 TEUs emits half the carbon dioxide than rail and almost one-sixth to that of road transport, thus, playing an important role in reducing carbon emission and pollution in the mainland.

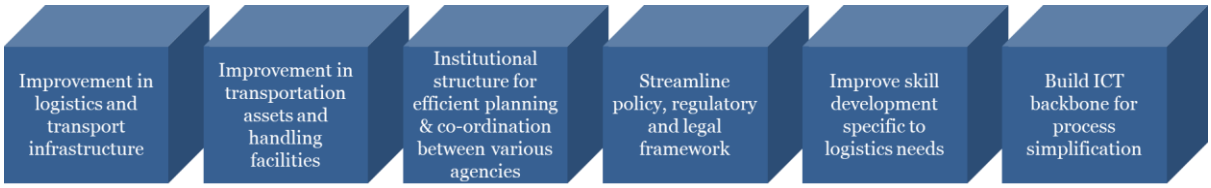


Source: World Shipping Council (2009)

However, development of water-based transport would require development of effective multimodal solutions as first mile/last mile connectivity, lead times and costs become important factors for ensuring a shift from door-to-door services provided by road and rail-road modes. Thus, an integrated approach

to development of logistics is required to design the most cost-effective and hassle-free logistics solutions for the end-user industries. India is now working towards developing an action plan for the integrated development of the logistics sector through mandating the newly constituted Department of Logistics[6] to identify the policy changes, process improvements, identification of bottlenecks, and introduction of technology in the logistics sector. In line with the above, ADB is supporting the Government of India on multiple initiatives based on following 6 building blocks that define key pillars of an integrated logistics framework.[7]

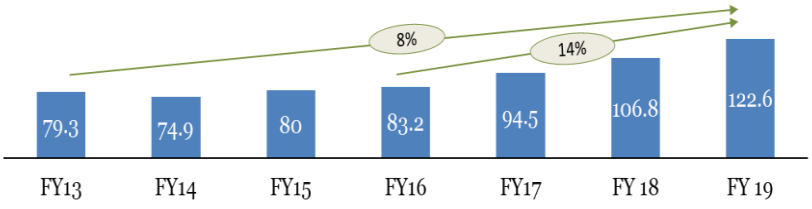
Figure 2: Building Blocks of Integrated Logistics Framework



The present study by ADB in association with Ministry of Shipping, India, aims to identify the action steps specific to development of coastal shipping as per the integrated logistics framework.

Ministry of Shipping had launched the Sagarmala Programme in April 2016 to focus on port led economic development and improvement of coastal and inland water transport share from ~6-7% to 12% by 2025. The program identified key projects across port modernization, new port development, port connectivity enhancement, port led industrialization and coastal community development. Ministry of Shipping, in the last 4 years, also undertook several initiatives[8] to facilitate coastal shipping such as incentivizing creation of coastal berths, reducing port tariffs for coastal cargo, provisioning green-channel clearance of coastal cargo, prioritizing berthing of coastal vessels and relaxation of cabotage rules for increasing vessel availability. The positive impact of the approved initiatives is reflected in the increased growth rate of coastal shipping movement in past two years when the CAGR was 13% as compared to a nominal growth of 4% in the preceding years.

Figure 3: Growth of Coastal Shipping in India



Source: Ministry of Shipping, Sagarmala NPP

However, the vast potential of coastal shipping is not yet fully realized and a more focused approach is required to realize this potential. The objective of this study is to examine the issues impending the growth of coastal shipping in India and provide actionable solutions to promote coastal shipping in the country. The study focuses on total logistics cost (TLC) based approach to first identify the commodity-wise[9] economically viable O-D pairs or highlight the cost differential in favor of alternate modes. Then, a root cause assessment of the individual cost components including the first mile costs, last mile costs, handling costs, port statutory charges, cargo handling charges, voyage costs (depending on discharges rate at ports, vessel sizes, occupancy levels, availability of return cargo) has been undertaken to identify the key issues making coastal shipping unviable. Additionally, other areas such as commodity specific prerequisites (lead time concerns, handling damage concerns, and cargo agglomeration) and present processes impacting ease of doing the coastal movement have also been analyzed to comprehensively identify the root causes and suggest interventions for realization of the coastal movement for each commodity group.

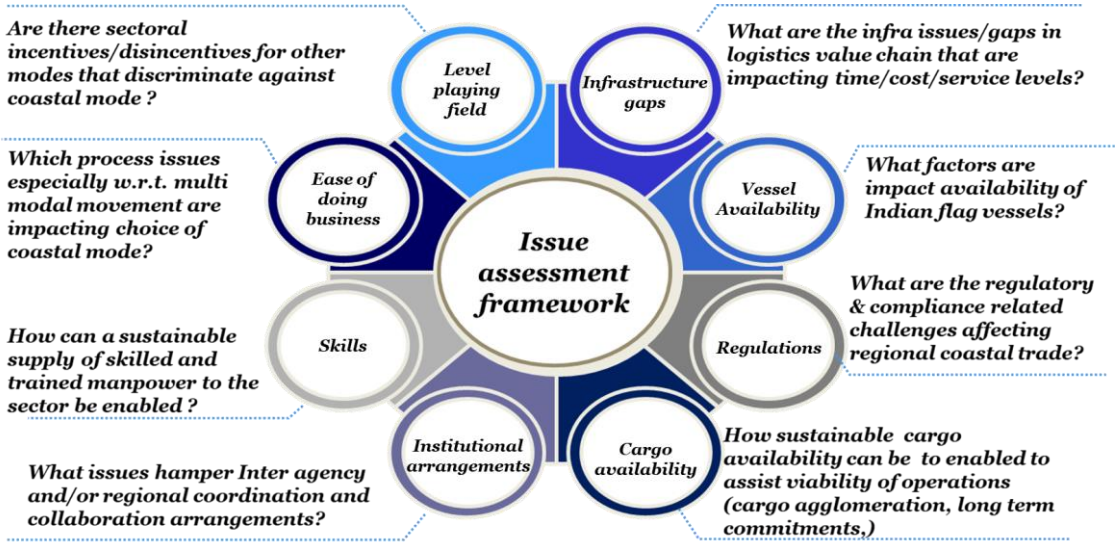
[6] The Logistics Division in the Department of Commerce had been created consequent to the amendment to the Second Schedule of the Government of India (Allocation of Business) Rules, 1961, on 7 July 2017.

[7] Please refer annexure for the overall integrated logistics framework.

[8] Please refer annexure for list of initiatives undertaken by the Government of India for promotion of coastal shipping.

[9] Commodities studied are bulk commodities (coal, POL, and cement), break-bulk commodities (steel, fertilizer, foodgrains, fertilizers, sugar, and other containerized commodities (tiles, cotton, and automobiles).

Figure 4: Issue Assessment Framework



Source: Study team analysis

The final output of the study is an action plan detailing the interventions required across infrastructure upgradation, policy development, institutional development, and process improvements including the immediate steps required for promotion of coastal shipping. Integration of the interventions with the already planned projects of Department of Logistics has also been highlighted to ensure coordinated approach towards improvement of logistics in the country.

Commodity-specific deep-dives have been discussed next followed by detailing of the required interventions.

2 Deep-dive Assessment of Logistics Chain of Key Commodities

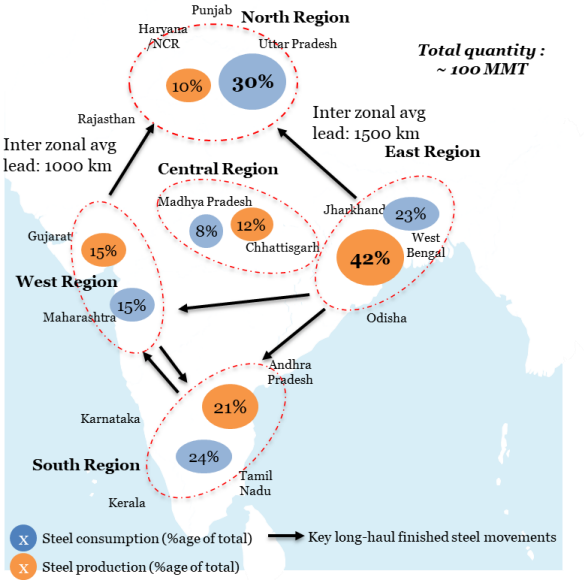
2.1 Steel

The overall steel production in India is ~100 MMT[10] per annum with 7 large players[11] contributing ~60% of the production, and balance is by numerous small sized players (who use scrap melting or DRI based methods of production).

East India region (Odisha, Jharkhand, and West Bengal) accounts for the largest share of steel production constituting both large sized and small sized players. The small sized players predominantly serve the regional markets, however, owing to high production surplus in Eastern region, these players are also servicing the demand of Northern and Southern markets.

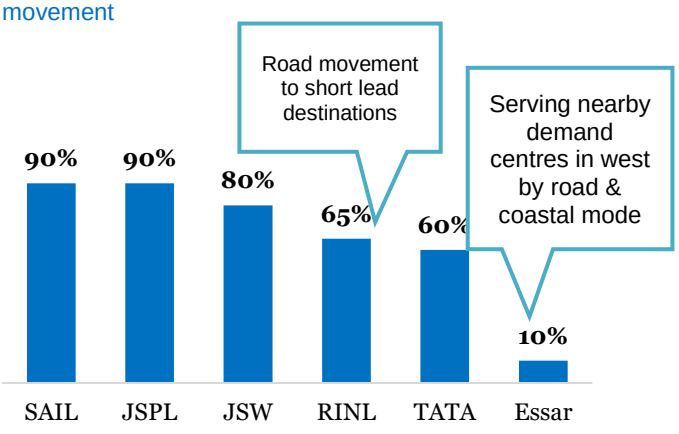
Major long-haul movement of steel is between the steel production clusters in Eastern India to Western and Northern India's auto and capital goods production clusters, major cities and infrastructure project sites. The steel production in South India mainly caters to the manufacturing and consumption clusters of South India and Western India. While the Central and Western regions have proportionate productions to their respective demands, large players service the entire country rather than restricting the distribution to corresponding regions.

Figure 5: Zone-wise Production and Consumption Center



Source: Annual reports, Lok Sabha unstarred question No. 606, Study team Analysis

Figure 6: Player-wise Rail Share (% of production) in steel movement



Source: Company reports, Primary interactions with major players

The large players are predominantly using rail mode for long-haul distribution of steel products, even for the markets situated in proximity of the coast such as Mumbai and Ahmedabad. The small players, on the other hand, are using road mode even for long-haul distribution owing to their small parcel sizes. The current coastal movement is primarily restricted to movement from Essar's plant in Hazira to consumption centers of Maharashtra, Karnataka and Kerala.[12]

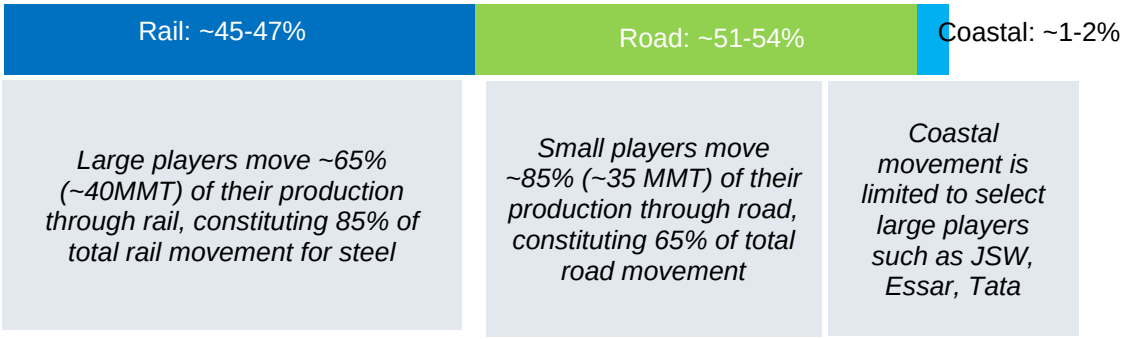
The overall modal share for steel industry (finished products) is thus skewed towards rail and road modes, indicating a potential to create multimodal solutions to enable shift to coastal mode.

[10] Production figure of FY17, 91 MMT in FY16, 92 in FY15, source: Indian Bureau of Mines, Lok Sabha unstarred questions; exports have in the range of 5-8 MMT only, most of the production consumed domestically

[11] SAIL, TATA, JSPL, RINL, ESSAR, JSW, Bhushan (details of state-wise plants and production are provided in annexure)

[12] Other coastal movement are JSW (Kandla to Mormugaon), MAN industries (Paradip to Kandla, Kandla to Paradip), TATA plus Bhushan (Paradip to Mumbai)

Figure 7: Modal Mix for Steel Movement in India



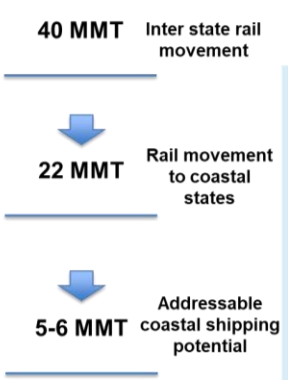
Source: Railway data, Primary interactions with major players

2.1.1 Opportunities for Coastal Shipping

~5-6 MMTPA additional steel volume has potential for conversion from long-haul rail based movement to multimodal coastal movement

The interstate rail movement in coastal states[13] accounts for 50% (22 MMT) of the total inter-state rail movement of finished steel. A further deep-dive into district-wise movement indicates that ~5-6 MMTPA steel moves on rail mode from plants located near the east coast to consumption centers in the coastal districts.

Figure 8: Addressable potential and key O-D pairs for coastal shipping based on current steel movement



Destination Cluster	Existing rail movement
Jamshedpur – Thane	0.6
Angul – Vizag	0.4
Dhenkanal – Mumbai	0.3
Jamshedpur – Mumbai	0.2
Bokaro – Mumbai	0.2
Jamshedpur – Tiruvallur	0.2
Kalinganagar – Kutch	0.2
Jamshedpur – Vizag	0.2
Kalinganagar – Tiruvallur	0.2
Jamshedpur – Chennai	0.2
Bokaro – Chennai	0.15
Bokaro – Ahmedabad	0.1
Other OD pairs	~ 1.6
Dolvi – Thane	0.8
Total (~60 OD pairs)	**5-6 MMT**

Source: Study team analysis, railway movement data

Overall, in addition to the existing coastal shipping volumes of ~2 MMTPA of steel cargo, ~5-6 MMTPA from 60 identified O-D pairs can be potentially shifted to coastal mode. Key issues hampering this shift have been analyzed in detail.

2.1.2 Key Issues

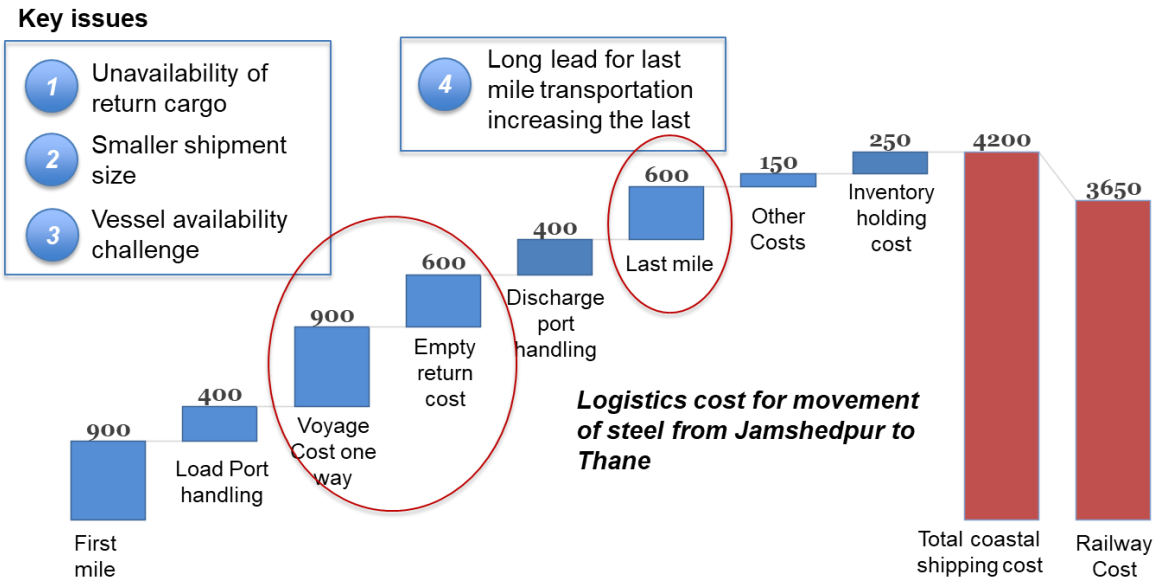
The total logistics cost for multimodal coastal shipping comes out to be ~15% higher than the railways cost for key routes, primarily because of non-optimal vessel utilization and high last mile distances

The total logistics cost analysis for principal O-D pairs indicates that the coastal shipping cost exceeds the railways movement cost. While players would be inclined to shift some portion of their rail movement to coastal even with higher costs given the existing challenges in rake availability, a fundamental shift to coastal mode may not be possible unless the cost economics work out for the players.

[13] All states along the coast. Rail movement to Odisha, West Bengal are mostly from Jharkhand and Chhattisgarh, whereas rail movement to Goa is from inland plants of Karnataka. Hence, the rail movement to these states has not been considered for coastal shipping potential.

Assessment of cost components of multimodal coastal shipping movement indicates that the higher costs are primarily on account of non-optimal utilization of vessels and inefficient last mile movement. The vessels remain underutilized because of unavailability of return cargo and small parcel sizes of individual players.

Figure 9: Logistics Cost for Movement of Steel from Jamshedpur to Thane



Key assumptions:

- *Handymax vessel of 33000 DWT (loading of 20,000 MT load)*
- *Empty vessel return cost included*
- *Last mile from nearest major port*

Source: Study team analysis

2.1.2.1 Issue 1: Unavailability of Return Cargo Leading to Empty Return Cost

Deploying a dedicated vessel would result in empty return movement due to unavailability of return cargo on key coastal routes. Vessel operators recover the cost of empty return, which includes vessel cost and bunker cost, from the shipper, increasing the coastal shipping cost.

2.1.2.2 Issue 2: Smaller Shipment Size Leading to Unutilized Ship Capacity

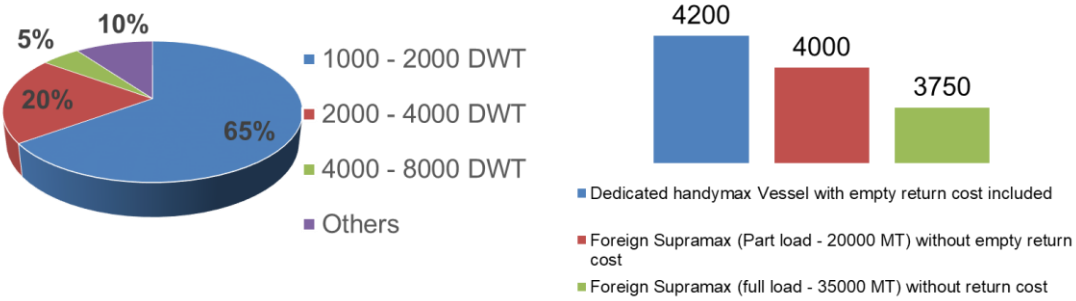
To eliminate empty return cost, EXIM vessels having empty capacities and moving towards west from east coast ports can be utilized. However, the EXIM vessels calling at the east coast ports are mostly of Supramax[14] and above size, and individual players' shipment size are not adequate to efficiently utilize these vessels.

Readily available vessel sizes on the coast weigh 50,000+ DWT (Supramax); however, the typical parcel size of steel players for coastal movement range from 5,000 MT to 20,000 MT.

The shipment volume of individual players are not sufficient to efficiently utilize the vessels available for coastal shipping, leading to high voyage costs per ton of cargo.

Figure 10: Right: Size-wise Share for Bulk and Break-bulk Carriers Calling at Kolkata, Haldia, and Paradip Ports (2160 vessels in FY17); Left: Multimodal Coastal Shipping Cost for Various Loading Scenarios

[14] 50,000—60,000 DWT vessels.



Source: IPA, study team analysis

2.1.2.3 Issue 3: Reduced Availability of EXIM Vessels Owing to Existing Manning Norms

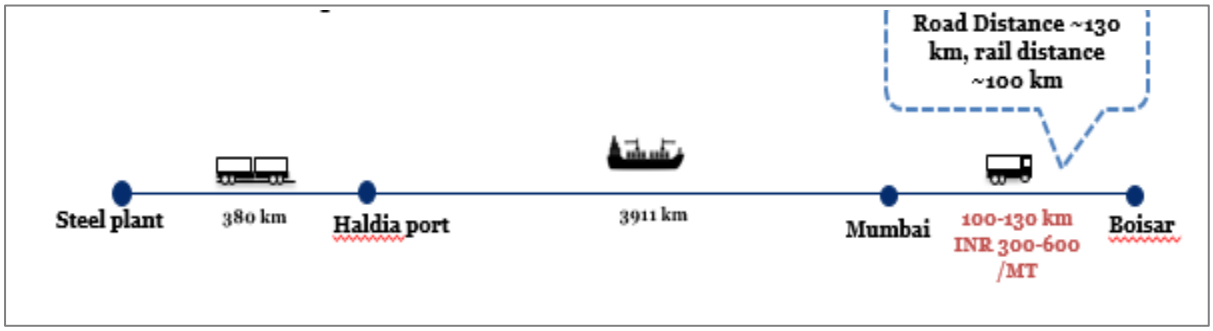
Another key issue in effectively utilizing the foreign vessels for coastal movement of steel is existing regulations on manning norms for vessels operating in India. As per the current manning norms[15], if a foreign vessel undertakes more than 30 days of coastal run cumulatively in a year, it needs to employ a specified proportion of Indian crew. Since hiring fresh crew not only increases paper work but also adds to the costs in terms of repatriation of foreign crew, carrying out medical and insurance of Indian crew, vessel operators are not willing to employ Indian crew for short coastal voyage.

Analysis of foreign vessels calling at east coast ports suggests that 40–45% of total vessel movement at the ports are undertaken by vessels calling multiple times at the ports. Voyage time from east coast to west coast ranges from 17 to 20 days (one way), limiting the number of coastal voyage of these foreign-flag vessels calling at east coast ports to one in a year unless they change a proportion of the crew to Indian crew

2.1.2.4 Issue 4: Long Lead for Last Mile Transportation Increasing Last Mile Costs

In certain cases, the last mile distance from existing discharge ports to consumption centers becomes long due to limited options for discharge ports. For example, the nearest available discharge port for the Thane consumption cluster is the Mumbai Port which is at a distance of ~130 km leading to last mile cost of INR 300/600 per MT (depending on road or rail mode).

Figure 11: Movement from Tata Steel Jamshedpur to Thane



2.1.2.5 Issue 5: Constrained First Mile Connectivity Infrastructure

Infrastructure connecting ports to production or consumption centers is constrained with excessive dependency on a single mode, leading to congestion**.** Rail is the cheapest mode, but facing issues of rake unavailability and track congestion (on Talcher to Paradip/Dhamra route). Road mode used intermittently, especially for steel coils, however, timely truck availability is a challenge.

2.1.3 Possible Interventions

2.1.3.1 Developing Port Based Agglomeration Centers to Increase the Parcel Size of Coastal Cargo

The agglomeration of shipment quantities of different players can optimize Supramax vessel capacity utilization. The agglomeration centers need to be created near the load ports so that the parcel sizes of

[15] Shipping Development Circular No.1 of 2013, dated 18/01/2013

individual players can be aggregated for loading the vessels. The centers would provide additional advantage of cost reduction through economies of scale in handling and storage of cargo and increased market access to small players who are forced to serve only the regional markets owing to small parcel sizes. Further, the future production units can be located within the agglomeration centers to economize the logistics cost for coastal/rail transportation. Internationally, such agglomeration centers are a key part of the steel logistics infrastructure to optimize the logistics costs and increase market reach for the steel industry.

A Case Study of The Jiulong Steel Logistics Park in Zhangjiagang, People's Republic of China

Located in East PRC, which accounts for 35% of PRC's steel production, the park was set up in association with Shagang (large steel producer) as anchor player with numerous small players setting up production unit once the park became operational.

Key features

- Spread over an area of **8 million sqm,** the park houses logistics companies, processing units
- Provide integrated common user facilities and all round logistics service that large and small players can leverage: **Inventory center, cutting and pre-processing** center, **distribution center,** steel logistics information center
- Further envisages development of high-end services like recycling of faulty products, e-commerce platform, steel production plant

Park benefits

- **Reduce transport costs**
- Opportunity of **outsourcing storage and processing** business to steel players
- **Offer access** to larger domestic and global markets to **small players**
- Higher **steel trade**

Source: Industry reports and articles

Proposed agglomeration centers could be developed at Haldia and Paradip ports to handle ~4-5 MMTPA and ~3 MMTPA of steel cargo, respectively

The steel logistics agglomeration centers need to be prioritized near east coast ports of Paradip and Haldia as the eastern region provides the potential for coastal movement of steel. The key features of the logistics centers would be:

- Rail based steel warehouse facility at ports
- Cargo consolidation to make a shipment size for efficiently utilizing Supramax vessel
- Cargo sorting based on product type and players
- Value added service likes packaging and labeling for various steel products

The agglomeration of steel cargo would require involvement of a third party player such as freight forwarder who will be responsible for coordinating dispatch schedule for participating players to ensure suitable shipment size.

2.1.3.2 Relaxation of Manning Norms/Cabotage Rules to Increase Vessel Availability

Deploying dedicated vessel for coastal movement of steel may not be viable due to empty return cost due to unavailability of return cargo on key coastal routes. For viability of coastal shipping, the steel

industry would need to depend on the foreign flagged vessels calling at east coast ports and returning empty towards west to avoid empty return cost. However, current manning norms impact the usability of such foreign flagged vessels for coastal movement of steel.

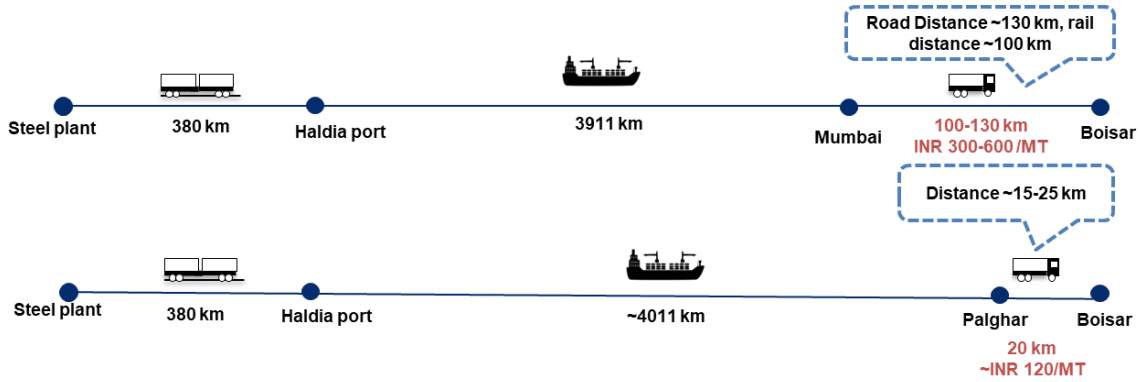
DG Shipping, under the Ministry of Shipping may consider relaxation of manning norms by increasing the license period days beyond which deploying Indian crew becomes mandatory. Relaxing the current norms of 30 days to 180 days without the need to employ Indian crew will enable these foreign-vessels to undertake 8–10 coastal voyages, thereby increasing the vessel availability for coastal movement. The period of increase may be suitably decided depending upon the existing availability of vessels across all the key load ports.

Alternatively, Ministry of Shipping may consider relaxing cabotage law for steel cargo, ensuring level playing field for Indian-flagged vessels in the long run.

2.1.3.3 Developing Coastal Berths to Reduce the Last Mile Costs

In order to reduce the last mile costs, coastal berths can be developed in the locations nearest to the coastal production/demand centers with all the facilities required for handling and storage of cargo. As an instance, developing the coastal berth at Palghar which is approximately at a distance of 15–25 km from the consumption center, Boisar would decrease the last mile distance from existing 100–130 km to less than 25 km.

Figure 12: Coastal berth reducing last mile distance (Jamshedpur to Thane movement)



Potential location of coastal berth for steel cargo

- *North of Dahej (0.6 MMT[16]). Proposed port in Dholera can be evaluated for development of coastal berth*
- *Palghar, Thane (~2 MMT). Proposed captive port of JSW Nandgaon can be evaluated for coastal movement*

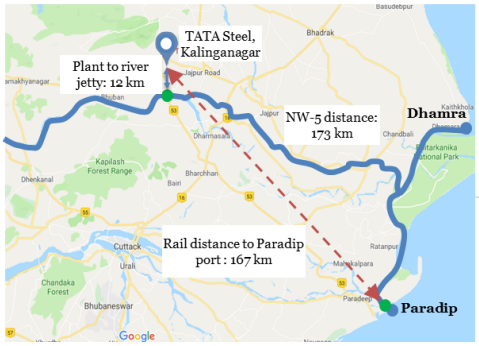
2.1.3.4 IWT as an Alternative Mode for First Mile Movement to East Coast Ports to Ensure Sustainable Coastal Shipping

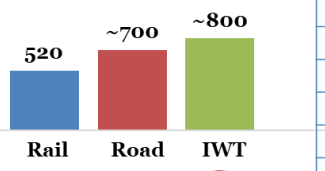
In order to facilitate coastal shipping, the NW-5 fairway development should be prioritized as the current congestion on rail tracks leading to Odisha ports (Paradip and Dhamra) may prevent players from using coastal movement from these ports as a preferred choice. The key infrastructure interventions required for operationalizing NW-5 for steel movement are

- LAD of 2.5-3 m to handle barges of 1500-2000 MT
- IWT Jetty at Kalinganagr and Paradip
- Terminal infrastructure: cranes, waterfront for truck movement

[16] Capacity for only steel cargo. Total capacity of coastal berth will be more depending on coastal shipping potential of other commodities such as foodgrain, fertilizer, and cement

Figure 13: NW-5 as an alternate mode for first mile movement of steel





Of the total cost, only **36% cost is water transport cost**, rest 64% is handling and first/last mile

Waterway cost components	Cost (INR/MT)
First mile cost	50-100
Load port charges	150-200
Vessel fixed cost	***110***
Bunker cost	***181***
IWT user charge	***8***
Unload port charges	150-200
Last mile cost	50-100
Total NW-5 cost	**800**

Source: Study team analysis

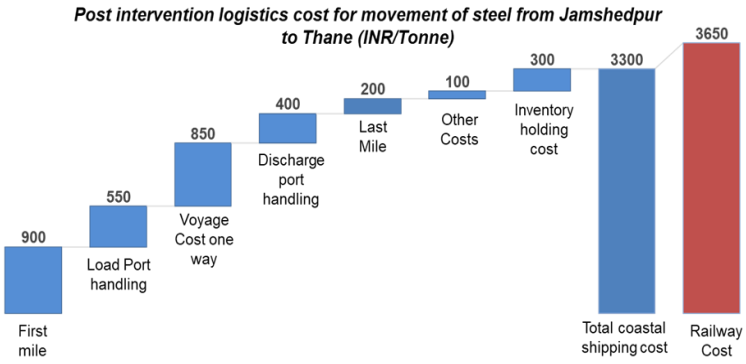
The current cost estimates for IWT transportation come out to be higher than the railways and road costs. On analysis of the IWT costs, it emerges that the actual voyage cost constitutes just ~35% of the total cost, with the balance constituted by terminal charges and first/last mile costs. The following solutions may be explored to bring down the IWT costs: transfer using RoRo trucks, containerized movement, and packaging/palletization to reduce handling challenge and time.

2.1.4 Outcome of Interventions

Post intervention, 6 MMT of additional steel cargo could be shifted to coastal mode, resulting into cost saving of INR 3.5 billion per annum; total coastal shipping of steel has the potential to reach to 10 MMTPA[17] by FY25

Suggested interventions would result in reduction of the total logistics cost for most of the key O-D pairs, making the coastal shipping a competitive option for the steel players. By FY25, potential on the viable O-D pairs is expected to reach to ~6 MMT. This is in addition to the expected ~4[18] MMT movement in existing coastal routes by FY25. A pilot movement could be initiated from east to west coast agglomerating cargo of TATA, SAIL, JSPL, Bhushan steel and other small players.

Figure 14: Post Intervention TLC; Viable O-D Pair Post intervention



Destination Cluster	Potential (FY25)
Jamshedpur - Thane	1.1
Dhenkanal - Mumbai	0.5
Jamshedpur - Mumbai	0.4
Bokaro - Mumbai	0.4
Jamshedpur - Tiruvallur	0.3
Kalinganagar - Kutch	0.4
Kalinganagar - Tiruvallur	0.3
Jamshedpur - Chennai	0.3
Bokaro - Chennai	0.3
Other O-D pairs	1.6
Total Additional	**6 MMT**
Growth on existing coastal routes	**4 MMT**
Total	**~ 10 MMT**

Source: Study team analysis

[17] 6 MMTPA additional quantity due to modal shift and 4 MMTPA on growth of existing coastal shipping routes
[18] Based on the steel demand growth rate. Growth rate estimated as per the methodology adopted in National Steel Policy i.e. GDP to steel demand growth multiplier

Figure 15: Summarized list of issues and interventions

	Key issues	Description	Proposed intervention
1	**Unavailability of return cargo**	Due to unavailability of return cargo on key coastal routes deploying dedicated vessel would incur empty return cost	**Utilize existing EXIM vessels plying on coastal route**
2	**Smaller shipment size**	The available EXIM vessels are mostly of Supramax and above size; however individual players shipment size may not efficiently utilize these vessels	**Agglomeration of cargo at load port**
3	**Reduced usability of foreign vessels**	Existing manning norms imply that a foreign going vessel may be able to undertake only one coastal movement per year without deploying Indian crew	**Relaxation of cabotage for steel cargo**
4	**Long lead for last mile transportation increasing the last**	The last mile distance from existing discharge ports to consumption centers become high due milted options for discharge ports	**Develop coastal berth near key consumption centres**
5	**Constrained first mile connectivity infrastructure**	Excessive dependency on single mode leading to congestion, may prevent players from using coastal movement	**Develop IWT as an alternate mode of transport**

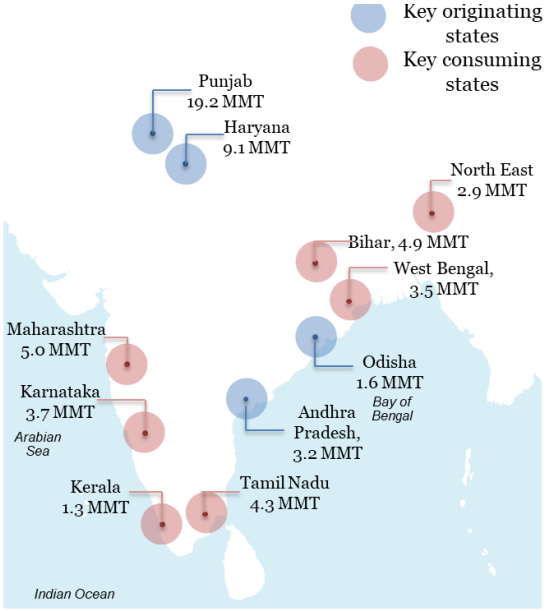
2.2 Foodgrains

FCI is the largest aggregator and distributor of foodgrains in the country undertaking majority of long distance rail movement in the country. FCI undertakes distribution of foodgrains throughout the country under public distribution system (PDS) and also maintains buffer stocks to ensure national food security.

FCI dispatched 37.5 MMT of foodgrain (rice and wheat) all over India in FY18, of which 30 MMT was dispatched to coastal /NW-1 states[19] and north east states. Rice is the key commodity transported to Southern India.

FCI primarily uses railway (in break bulk form) for transportation of foodgrains. Road transport is mainly used in intra-state movement and for movement to regions not connected by rail. FCI has explored feasibility of moving through coastal /riverine mode to Kerala[20], North East, Lakshadweep islands and Andaman and Nicobar Islands, although the share of this movement in overall FCI movement remains negligible.

Figure 16: Key origin and coastal/NE dispatch states for FCI foodgrain



Source: FCI Movement Plan, 2018, Study team analysis

Figure 17: Modal mix of FCI

Source: FCI Movement Plan, 2018, Study

2.2.1 Opportunities for Coastal Shipping

~2.5 MMTPA of FCI's movement to coastal states presents addressable potential for coastal shipping

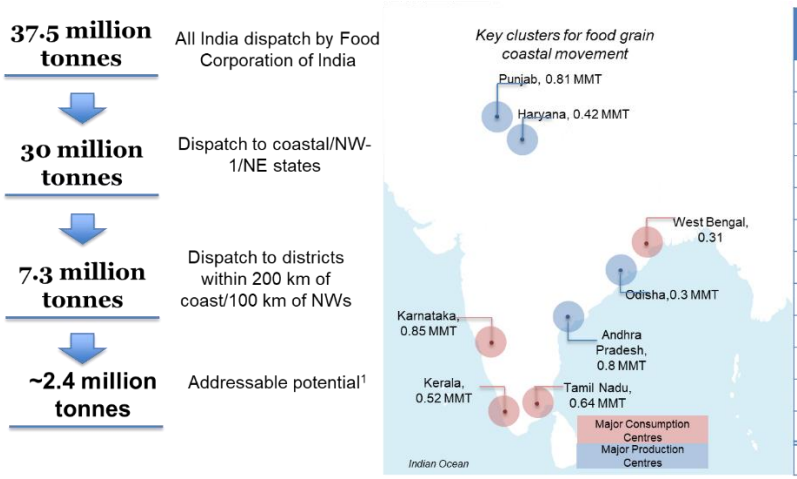
The existing rail movement of FCI from North India (Punjab/Haryana) to coastal districts of Maharashtra, Karnataka, Kerala and Tamil Nadu may have potential for conversion to a multimodal (Rail-Coastal) route through bringing the food-grains upto Gujarat ports (e.g. Kandla) via Rail mode and onward journey to end-destination in coastal districts through coastal mode. In addition, the rail movement of food-grains from Andhra Pradesh to Kerala, Tamil Nadu and West Bengal may also have potential for conversion to coastal mode.

Considering the increase in number of handlings for multimodal coastal movement and possible risk of pilferage, the movement in containerised form becomes important for enabling a modal shift. Presently, FCI moves foodgrains in break bulk form in covered wagons and has storage depots both at origin and destination points. The multimodal coastal movement in containers would eliminate the need for establishing additional offices at intermediate handling points (such as at origin ports) and coastal movement can be undertaken without any significant institutional changes in FCI. Some of the private players, for example, ITC, are already moving foodgrains from Kandla to Cochin on coastal mode in containerised form. Once FCI starts the movement, other private players may also look at coastal shipping as a viable option. The provisioning of door-to-door logistics through an integrated service provider would be required to reduce any additional efforts on part of cargo owners to undertake the coastal movement.

[19] Incudes all states along Indian coast (except Gujarat), and Bihar

[20] Foodgrain movement from Andhra Pradesh to Kerala through coastal shipping: This route has seen a steep decline of 85% from FY15 (~1,00,000 MT) to FY17 (~14,000 MT). Recently a FCI awarded a tender for 5000 MT per month movement of foodgrain on this route

Figure 18: Addressable Coastal Shipping Potential and Key O-D Pairs Based on Current Movement



O-D Pairs	Potential (MMTPA)
Punjab – Karnataka	0.53
Andhra Pradesh – Kerala	0.41
Odisha- West Bengal	0.30
Andhra Pradesh- Tamil Nadu	0.22
Haryana- Karnataka	0.20
Punjab – Tamil Nadu	0.20
Haryana – Tamil Nadu	0.20
Haryana – Tamil Nadu	0.19
Punjab – Kerala	0.08
Haryana – Kerala	0.03
Andhra Pradesh- West Bengal	0.03
Odisha- Tamil Nadu	0.03
Total	**~2.4**

Source: FCI movement plan, railway data, study team analysis

[1]Excluded very low volume origin-destination (OD) pairs, OD where road/rail distance is very short compared to multimodal movement or movement where coastal shipping distance is very small compared with first mile rail distance such as movement from Punjab to Maharashtra.
Also, excludes the ~2.4 MMT movement from Punjab/Haryana to North East. Total logistics cost assessment of movement of foodgrains from Punjab/Haryana to North-East states using combination of rail, road, IWT shows that the multimodal movement in not viable and is significantly expensive than direct rail movement even after considering IWT interventions. TLC assessment provided in annexure

A total of 2.4 MMT of foodgrain has the potential to be shifted to coastal shipping currently. Key issues hampering this shift have been analyzed in detail.

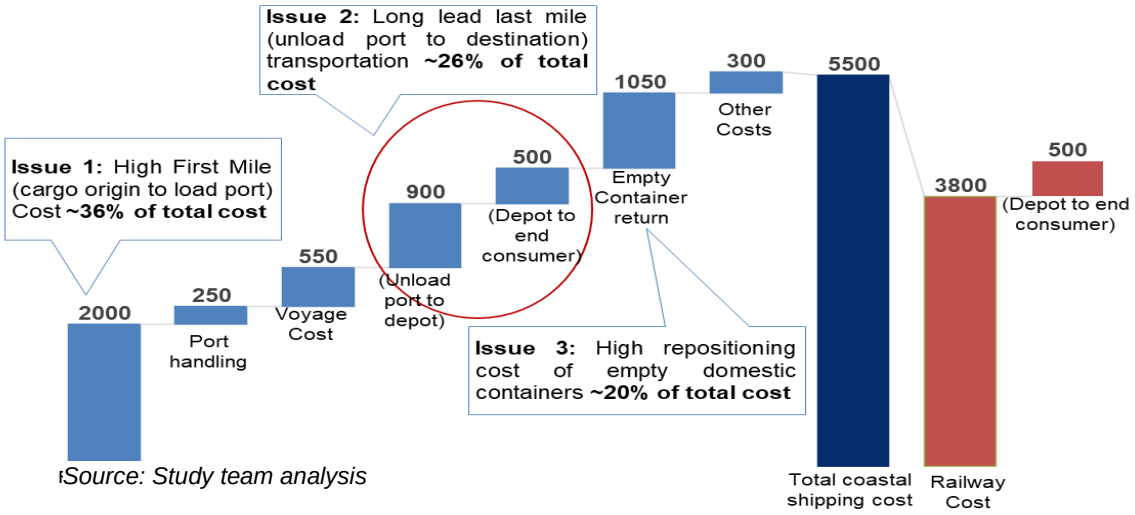
2.2.2 Key Issues

The total logistics cost for multimodal coastal shipping comes out to be ~28% higher than the railways cost for Punjab/Haryana to South India, primarily because of high first and last mile costs and repositioning of empty containers

The total logistics cost analysis for key O-D pairs indicates that the coastal shipping costs with existing set-up of FCI depots exceeds the railways cost for key O-D pairs. Punjab and Haryana are the major production centers, with a share of more than 50% in potential coastal shipping movement. Analysis of multimodal containerised movement[21] from Punjab/Haryana to southern states suggests that the cost of coastal shipping leg of in the end-to-end movement has a minor share in overall costs. Other costs such as first mile, last mile and empty container repositioning escalate the total multimodal coastal shipping cost. The high share of these costs necessitates detailed analysis of each component to identify the inefficiencies involved and opportunity for cost reduction.

[21] Comparison of total logistics cost for movement of foodgrain in break-bulk and container is provided in annexure

Figure 19: Key Areas of Issue for Foodgrain Movement



Source: Study team analysis

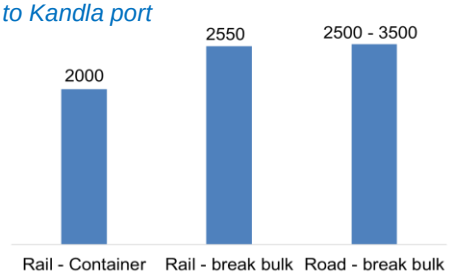
TLC assessment for movement from Punjab (Moga) to Karnataka (Shimoga)
Cost of transportation of grains from destination depot to end consumer is borne by state.
It is to be noted that FCI would require door-to-door services for multimodal coastal movement from origin grain depot to destination grain depot. This necessitates the involvement of 3PL player who could also provide first/last mile transport services along with coastal shipping movement.

2.2.2.1 Issue 1: Non-optimal Utilization of Depots Increasing First Mile Costs

While container train option is cheapest, typically the distance to container depots from current originating grain depots (that serve coastal districts) ranges from 50-100 km

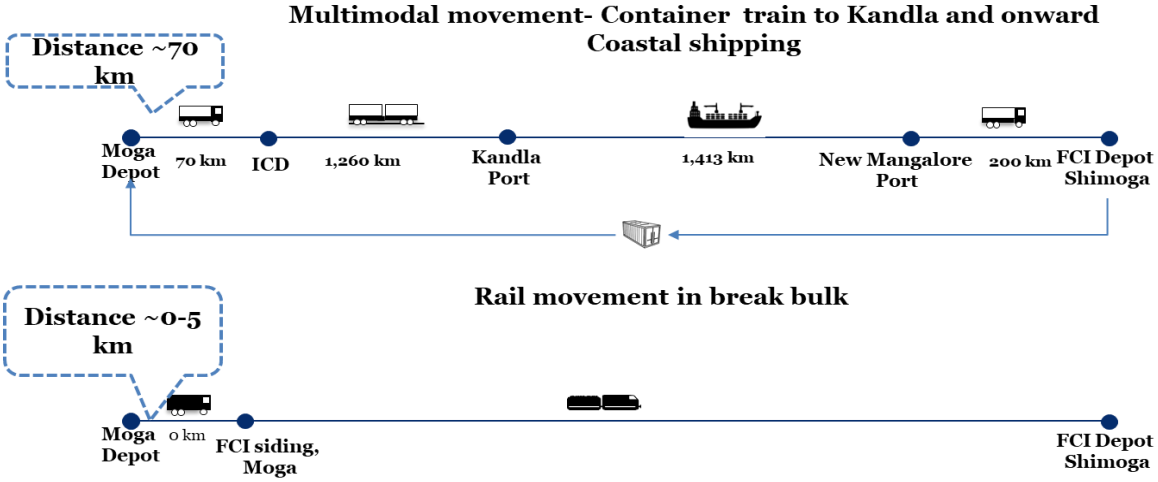
Container train option for first mile movement is the lowest cost option. However, typical the distance to container depots from current originating grain depots (that serve coastal districts) ranges from 50-100 km; whereas, break bulk movement of grain takes place from rail goods sheds which are within 5-10 km radius of existing grain depots. The longer distance between origin depots, serving coastal districts, and nearby ICD is increasing the first mile cost.

Figure 20: First mile cost from Punjab depot to Kandla port



Source: Study team analysis

Figure 21: Difference in Distance of ICDs and Rail Goods Shed from Origin FCI Depot

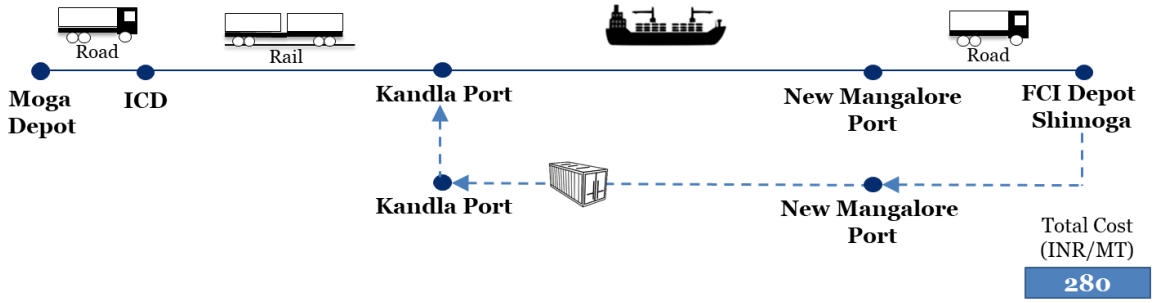


2.2.2.2 Issue 2: High Repositioning Costs of Empty Domestic Containers

Limited availability of return cargo necessitates repositioning of empty containers to origin location

Currently, there is a limited availability of return cargo on most of the coastal shipping routes, resulting in the requirement of repositioning of empty containers back to origin location (either to load port or in worst case to the cargo origin location) for onward movement. Cost of repositioning empty containers is added to the total cost incurred by cargo owner, increasing the overall logistics of the movement.

Figure 22: Movement of Containers from ICD to Shimoga and Back to Origin ICD

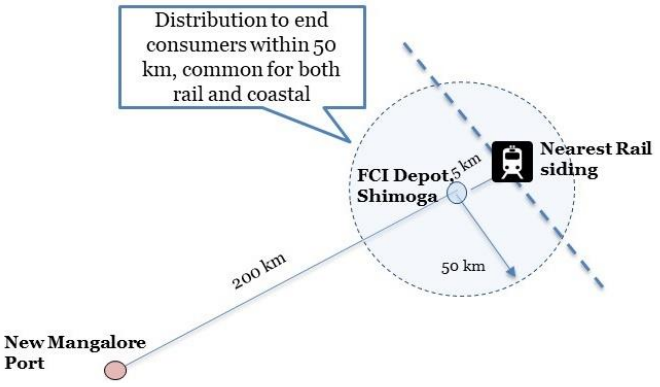


2.2.2.3 Issue 3: Inefficient Last Mile Movement Increasing Last Mile Costs

While rail goods shed may be 5-10 km from existing receiving depots, ports may be 50-200 km away, thus transportation cost from port to grain storage depot much higher in case of coastal movement

In the existing set up, railways have dominated FCI movement and hence majority of receiving depots are situated in close proximity to railway good sheds (~5–10 km), while the ports are at a distance of ~50–200 km from the destination depot. This increases the last mile cost of transporting foodgrains from discharge port to FCI depots in case of coastal movement.

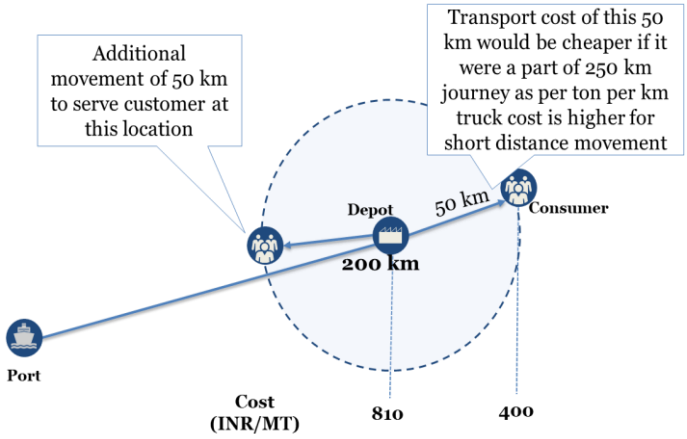
Figure 23: Last mile distances for railway and coastal movement



Source: Study team analysis

Moreover, current set-up of the depots require movement from ports to storage depots located far from port and then to consumers located within 50 km of the depot, leading to inefficiencies in the movement.

Figure 24: Inefficient last mile movement of foodgrain from port



Source: Study team analysis

- The first leg of inefficiency is movement to serve consumers which are located in between port and depot. Foodgrain first move to depot located far from the port and then from there foodgrain is transported back to a location in between port and depot, increasing the costs.
- The second leg of inefficiency is movement to consumers which are located further from the depot. Transport cost of this leg would be cheaper if it were a part of direct journey from port to end consumer

instead of short distance movement from depot to end consumer, since per ton per km cost of road transportation is higher for short distance movement than cost for long distance movement.

These issues are the key reasons for making coastal shipping uncompetitive in comparison with railway movement. In the following section, suitable interventions have been proposed which on successful implementation will render coastal mode competitive vis-à-vis rail movement.

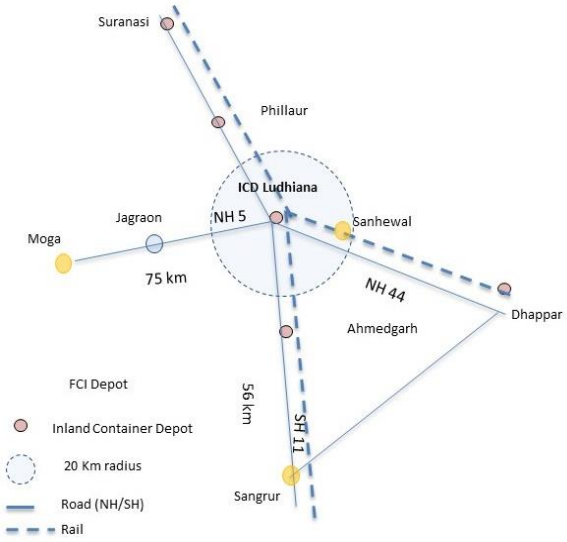
2.2.3 Possible Interventions

2.2.3.1 Rationalization of origin depots to reduce first mile costs

Realigning dispatches for coastal districts with grain depots closer to ICDs can reduce first miles costs by ~10-15%

Depots currently serving coastal states are located at distance of 50–100 km from container depots. The longer distance is increase the first mile cost of coastal movement. To address this issue and reduce cost, foodgrain depots closer to ICDs can be utilized. Most of the FCI depots located along the ICDs in Punjab and Haryana have surplus foodgrain stock[22] and can be utilized for coastal shipping movement of foodgrains.

Figure 25: Re-alignment of origin depots



Source: Study team analysis

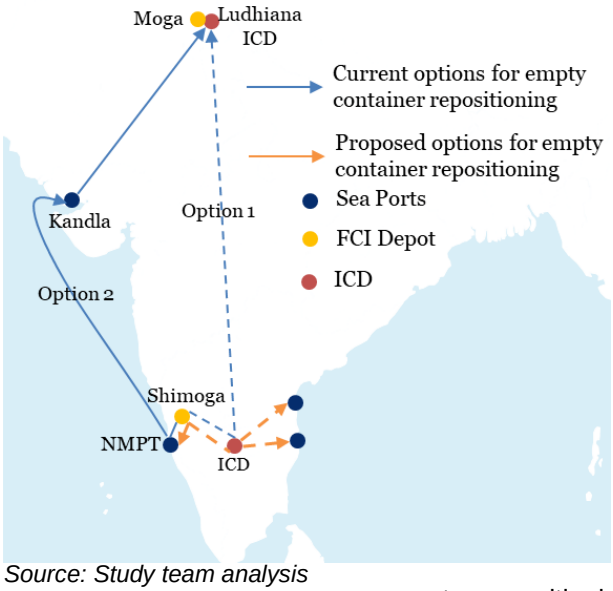
2.2.3.2 Allow use of EXIM containers for domestic movement

Empty container repositioning costs can be optimized by allowing use of EXIM containers for coastal movement

Utilizing EXIM containers for coastal cargo movement can reduce repositioning cost to allow logistics service provider to reposition the EXIM containers to nearest port/ICD after unloading domestic cargo, for further EXIM use.

Since there is higher volume of EXIM cargo from different parts of the country (as compared to domestic containerized cargo), it becomes cheaper and more time efficient to reposition an EXIM container vis-a-vis a domestic container. After completing the coastal movement, EXIM containers can be repositioned to nearby ICD/port for onward export. If an EXIM container circuit can be created, there is a potential to reduce the costs by ~70-80%.

Figure 26: Repositioning options of EXIM containers in coastal movement



Source: Study team analysis

empty repositioning

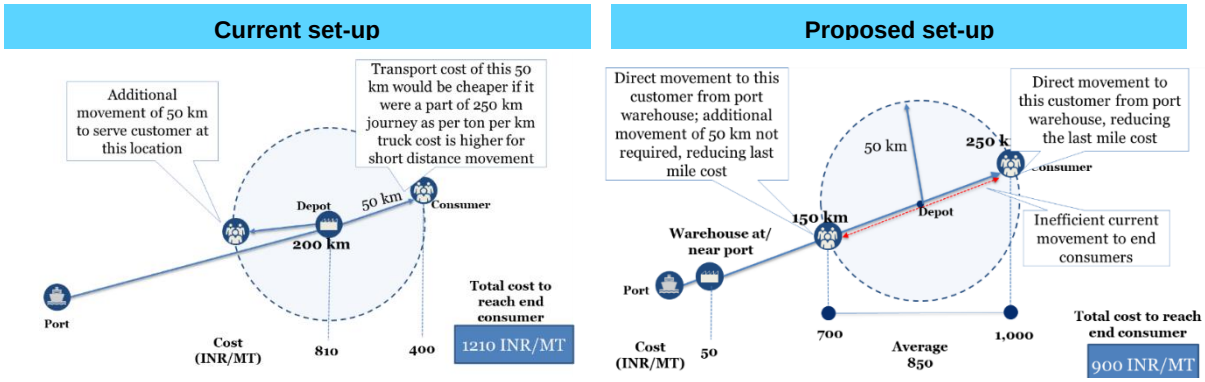
[22] Interactions with FCI

2.2.3.3 Developing Port-based Warehouses to Remove Last Mile Movement Inefficiencies

Port based grain storage depot for destination districts can help reduce inefficiencies in last mile movement and decrease the last mile cost

From the port-based warehouses, foodgrains can directly move to end consumers without the requirement of first transporting the grains from port to FCI depots located in the districts and then to end consumers, thus reducing the inefficient movement and bringing down the overall last mile costs by 20%.

Figure 27: Efficient Last Mile Movement under Port-based Warehousing



Source: Study team analysis

Analysis of FCI foodgrain storage capacity in coastal states of Karnataka, Kerala and Tamil Nadu suggests that FCI has storage capacity shortage in ~27 coastal districts these 3 states. Port locations may be considered for planned investment in storage warehouse.

For port-based warehouse to serve far away revenue districts, both Ministry of Food and Public Distribution and state government should be taken on board

- FCI current policy restricts movement of foodgrain from one revenue district to another. Also, FCI bears transportation costs till movement to destination FCI depot.
- Responsibility of distribution of foodgrains from depot to end consumer lies with state government. With port based warehouse, FCI's movement cost will reduce more than the increase in cost of state government, resulting in reduction overall logistics cost in the system.
- However, since the state will now have to procure foodgrains from port-based warehouse located farther from district instead of FCI depots located within the district, a mechanism needs to be developed to share the cost saving from port based warehouse with the state.

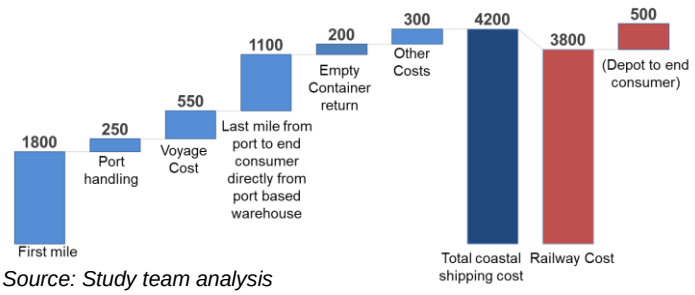
2.2.4 Outcome of Interventions

~3 MMTPA foodgrain cargo has the potential to be shifted to coastal mode by FY25, resulting into annual cost saving of INR 0.75 billion annually

Suggested interventions would result in reduction of the total logistics cost for most of the key O-D pairs, making the coastal shipping a viable transport option for foodgrain movement. By FY25, potential on the viable O-D pairs is expected to reach to 3 MMT. A pilot movement from Punjab/Haryana to Southern states (Karnataka, Kerala and Tamil Nadu) could be initiated in coordination with FCI.

Figure 28: Logistics Cost Post Proposed Interventions; Potential on Viable O-D Pairs by FY25

Post suggested interventions, multimodal coastal movement from Punjab to Karnataka costs ~INR 100/MT cheaper than direct rail cost



Source: Study team analysis

O-D Pairs	Potential FY25 (MMTPA)
Punjab – Karnataka	0.6
Andhra Pradesh – Kerala	0.5
Odisha- West Bengal	0.4
Andhra Pradesh- Tamil Nadu	0.3
Haryana- Karnataka	0.2
Punjab – Tamil Nadu	0.2
Haryana – Tamil Nadu	0.2
Andhra Pradesh - Karnataka	0.1
Punjab – Kerala	0.1
Others	0.2
Total	**~3**

Figure 29: Summarized List of Key Issues and Interventions

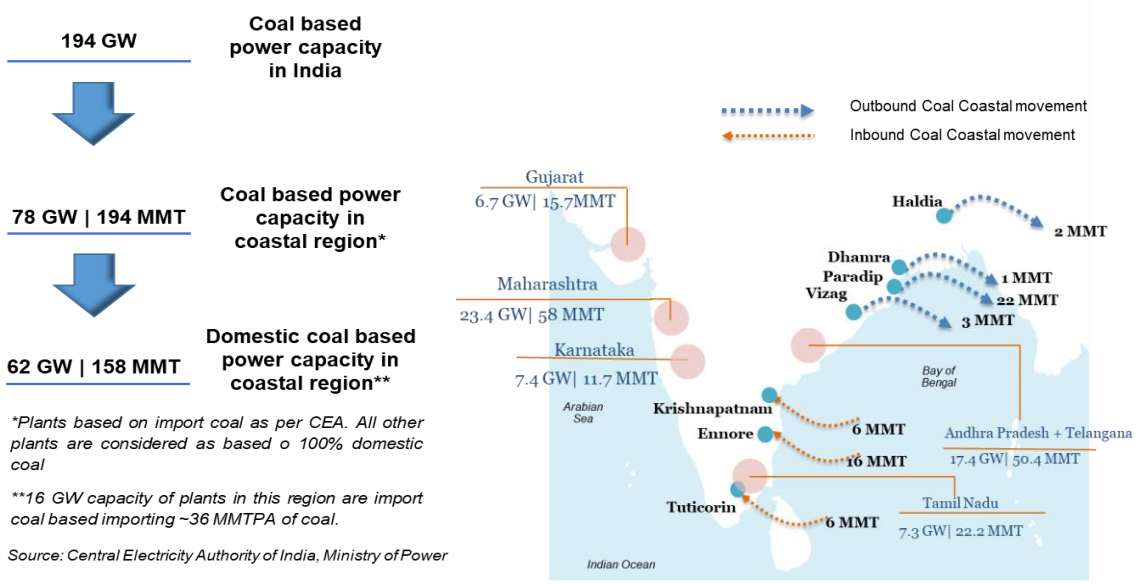
	Key issues	Description	Proposed intervention
1	**High first mile cost**	Typically the distance to container depots from current originating grain depots (that serve coastal districts) ranges from 50-100 km	**Rationalization of origin depots to reduce first mile costs**
2	**Repositioning of empty containers**	Limited availability of return cargo necessitates repositioning of empty containers to origin location	**Allow use of EXIM containers for domestic movement**
3	**Inefficient last mile movement**	Current set-up of the depots require movement from ports to storage depots located far from port and then to consumers located closer to depot	**Develop port based warehouses**

2.3 Coal

The movement of coal in India is majorly done through rail. Majority of the coal moved through coastal mode is loaded at Paradip Port. Haldia and Vizag Ports are other load ports through which coal is moved. This coal is unloaded at Krishnapatnam Port, Ennore Port, and Tuticorin Port from where it is moved to power plants in the hinterland.

The power plants in Andhra Pradesh and Tamil Nadu have linkages with MCL mines which are located in close proximity to Paradip port, providing opportunities for coastal shipment. The power plants in Maharashtra and Gujarat predominantly have linkages from SECL and WCL mines in order to optimize the rail based transportation from mines to these plants. Overall, the current mine-power plant linkages have been designed with an objective of optimizing the railway based transportation costs.

Figure 30: Thermal Coal-based Power Plants in Coastal Region and Existing Coastal Movement



2.3.1 Opportunities for Coastal Shipping

Potential for coastal shipping lies in movement of thermal coal from MCL/ ECL mines to power plants located in coastal region of southern and western states

The opportunities for coastal shipping for thermal power plants primarily depends on the following criteria:

a) Geographic location – Plants located in coastal states – Gujarat, Maharashtra, Karnataka, Goa, Kerala, Tamil Nadu and Andhra Pradesh

b) Type of coal used – Power plants using domestic/ blended coal or imported coal are relevant for coastal potential evaluation. Lignite based power plants are not relevant as they are located at the pit head and there is no scope for coastal movement

While most of the Southern states are already using coastal mode for transportation of coal, there is significant potential for additional coastal movement of coal for plants based in Gujarat and Maharashtra.

Potential for coastal movement of thermal coal through imported coal substitution

Several factors affect the decision for import coal substitution in plants designed for imported coal. The most important factors include boiler capacity configuration with respect to gross calorific value (GCV), ash content handling capacity and environment concerns.

- Import coal based plants are designed for high GCV coal in range of 5500 Kcal/ Kg to 6000 Kcal/ Kg. have high GCV compared to domestic coal. The GCV range of these plants is about 5,500 kcal/kg to 6,000 kcal/kg whereas GCV value of domestic coal is around 4,000 kcal/kg. Boilers in power plants are designed according the GCV value of coal used. Imported coal having high GCV value have small sized boilers as it requires lesser coal to produce power while boilers consuming low GCV coal are large in size. In order to substitute imported coal with domestic coal, power plants may need to change boiler itself which would need a high capital investment.

- Imported coal based plants are typically designed to operate with low ash content of less than 10% (maximum range~14%) at which they can operate continuously. However, ash content of domestic coal varies from 25% - 30%. The existing ash hoppers in import coal based plants may need to be redesigned to handle high ash content from domestic coal.

- Environmental clearances have been obtained for a particular design parameter. High GCV coal has lesser emissions than a low GCV coal. In case domestic coal is substituted, plant will need to invest in bigger electrostatic precipitators (ESP) and alteration of design.

On discussion with several import based power plants, it is found that plants may be able to blend a small amount of domestic coal without significant changes in the plant designs. As such, up to 10% of the total coal requirement in these plants can be substituted with domestic coal. However, this substitution percentage would change for each plant and a detailed techno-commercial feasibility needs to be carried out.

Thermal coal requirement in non-power producing sectors

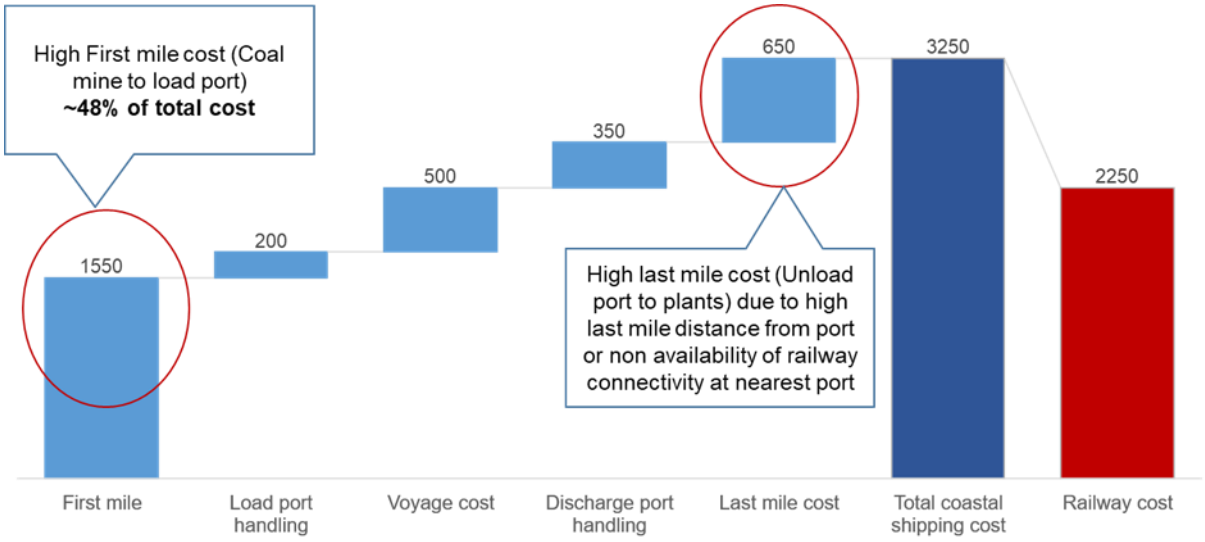
The thermal coal requirement for the non-power producing sectors is presently met typically through imported coal as the mine linkages are prioritised for the thermal power plants. Coal allocation for non–regulated sector, such as cement, steel/sponge iron, aluminium, and others are auction based. The tenure is decided by Ministry of Coal (Fuel Supply Agreement) subject to a maximum duration of 15 years. Proportion of coal allocation between power and non-power sector is 75:25. The cement grinding plants constitute a bulk of the demand in non-power sector. It is estimated that ~9.5-10 million MT thermal coal can be moved via coastal to the cement plants if linkages from MCL mine is provided. The cement plants with coastal movement potential are located in Tamil Nadu (Ariyalur, Salem, Tuticorin, Permbalur, and Kadapa region), Gujarat (Sikka and Bhuj region).

Overall, ~200 MMTPA of thermal coal requirement in the coastal region needs to be evaluated for viability of coastal movement.

2.3.2 Key Issues

The TLC assessment for coastal movement of thermal coal to power plants in Gujarat, Maharashtra and other coastal states (except plants where coastal movement is already operational) comes out to be higher than railways cost with current mine linkage situation. The root causes of factors leading to higher costs for coastal movement are detailed below.

Figure 31: Logistics Cost for Movement of Coal from SECL Mine to Ukai Thermal Power Station



Key Assumptions

- *Panamax vessel carrying 75,000 MT coal*
- *Nearest port as load port (Paradip)*
- *Discharge at Dahej port (due to non availability of railway siding at nearest Port*

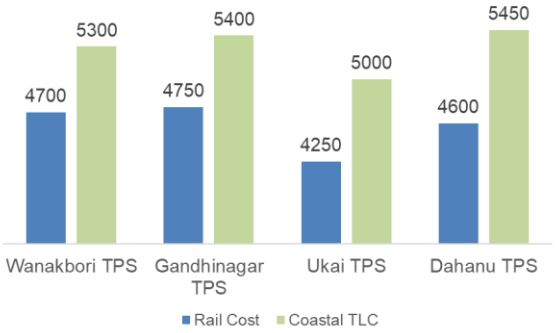
Source: Study team analysis

2.3.2.1 Issue 1: High First Mile and Last Mile Costs

Power plants in Gujarat and Maharashtra have linkage with SECL mine. SECL mines are at a significant distance from the nearest port which increases the last mile cost (48% of TLC for Ukai TPS) in coastal movement of coal from SECL to power plants thereby making the coastal movement unviable as compared to rail (ARR) movement.

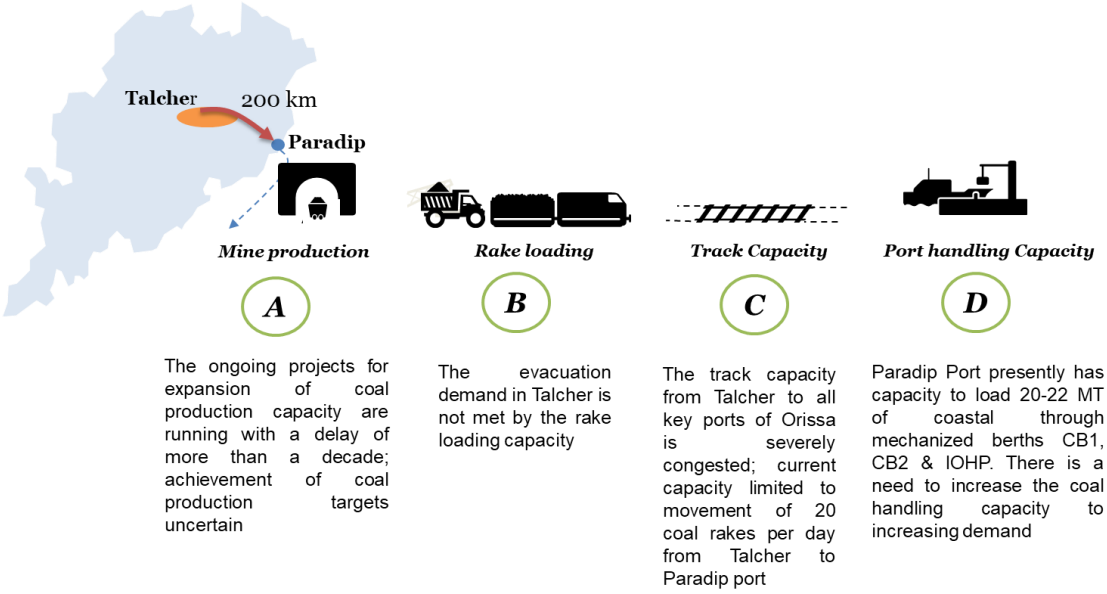
All the above power plants may have potential for coastal shipping. However, the coastal shipping from SECL mines comes out to be expensive vis-à-vis rail. The first mile cost forms a major portion of total logistics cost for coastal movement of coal from SECL mine to these plants making coastal movement unviable.

Figure 32: Comparison between coastal TLC and ARR TLC from SECL mine (INR/tonne)



Source: Study team analysis

2.3.2.2 Issue 2: Infrastructure Capacity Constraints



In some ports like Hazira, there is no railway siding at Adani and Essar berth. The nearest siding is 15–20 km far, resulting in inter-carting cost. Due to unavailability of railway siding, the last mile cost is considerably higher from the next nearest unloading port.

Figure 33: Last mile distance comparison of Ukai Thermal Power Station from Hazira and Dahej Ports

2.3.2.3 Issue 3: Linkage Allotment to Private Power Plants

Several private thermal power plants do not have mine linkages due to which they are importing coal. Coastal movement can be a viable option for some of these plants located in Gujarat, Andhra Pradesh, and Maharashtra.

2.3.3 Possible Interventions and Outcomes

2.3.3.1 Thermal Coal Mine Linkage Rationalization

Shift in linkage of power plants in Gujarat and Maharashtra from SECL mine to MCL mine can make costal movement viable

Thermal power plants located in Gujarat and Maharashtra have existing linkages with SECL, which is about 600 km from Paradip Port. Changing linkages from SECL to MCL for plants can reduce the first mile distance to about 200 km resulting in significant cost saving making coastal movement of coal viable. However, connectivity infrastructure interventions with Paradip/ East Coast Port will be required to address evacuation capacity issues to enable this movement.

Figure 34: Shift in linkage from SECL to MCL mines for power plants located in Gujarat

Source: Study team analysis

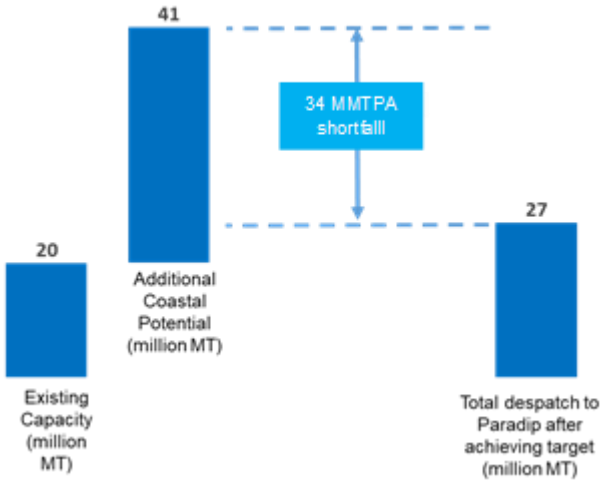
2.3.3.2 Infrastructure Improvement

Production capacity of MCL Mines

The current production in MCL mine is 143 million MTPA, of which around 26 million MTPA of coal is moved through coastal. To cater the additional coastal movement of 37 million MTPA, the production of coal in MCL needs to be accelerated to meet the demand. The ongoing projects (Bhubneswaru OCP, Kaniha OCP, Bharatpur OCP – Phase II, Hingula – II OCP Expansion, Ananta OCP – Phase III, and Others U/G) will increase the production capacity by 57 MTPA. The additional capacity can cater to the additional potential coastal shipping but it is running with a delay of more than a decade

Rail capacity augmentation

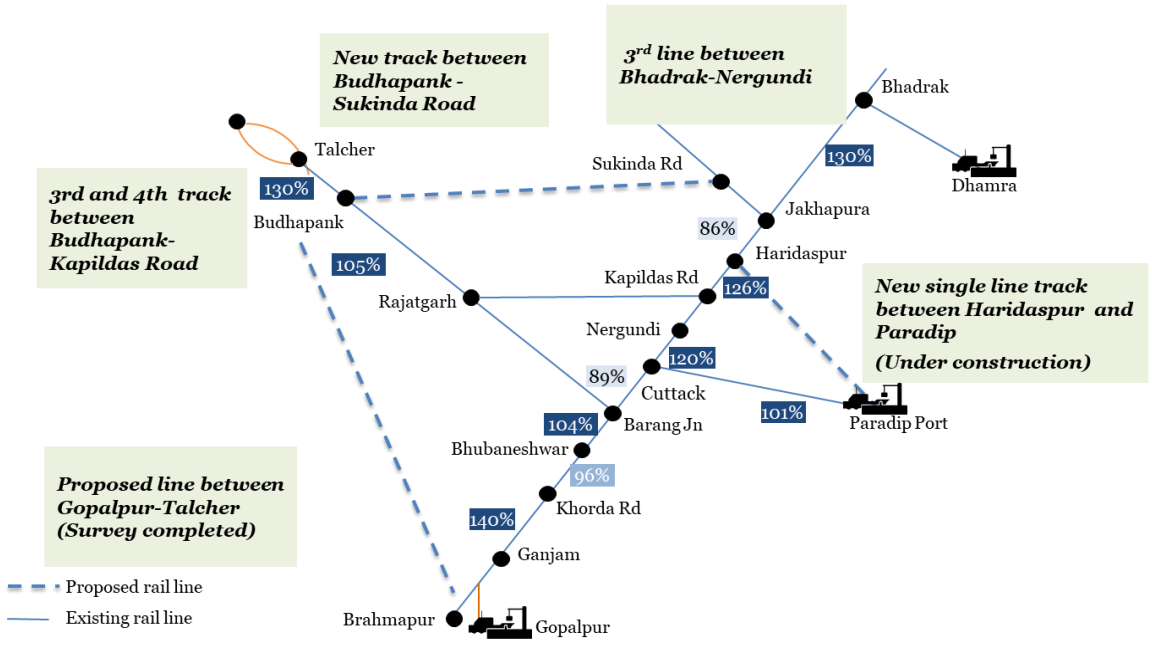
a) Talcher-East coast ports' rail connectivity: The rake loading capacity should be increased by ~34 million MTPA to cater to increased evacuation demand at Talcher. The current capacity at Paradip is 20 million MT, assuming the target for despatch to Paradip has been achieved, the rake movement capacity will reach 27 million MT which would not be sufficient to meet the potential demand.



Source: Study team analysis

East Coast Railway (ECR) has taken several projects like 3rd and 4th tracks between Budhapank–Kapildas Road, new track between Budhapank–Sukinda Road, 3rd line between Bhadrak–Nergundi, new single line track between Haridaspur and Paradip (under construction) and proposed line between Gopalpur–Talcher (survey completed).

Figure 35: New Projects to Decongest Track Capacity from Paradip and Dhamra Ports

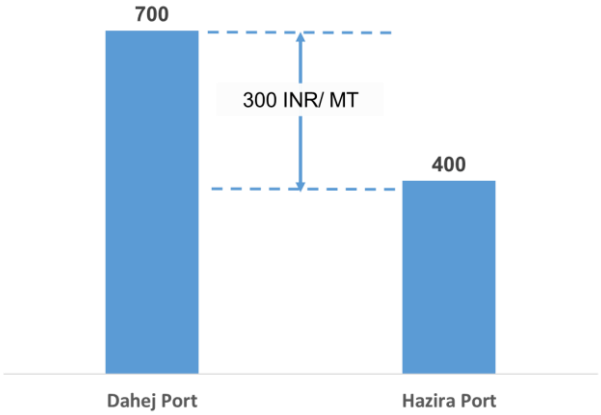


Source: East Coast Railway Line Capacity, 2017

b) West Coast ports to Gujarat power plants' rail connectivity:

Development of railway siding at Adani and Essar berth at Hazira Port will reduce the last mile cost for Ukai Thermal Power Plant by 280 INR/MT.

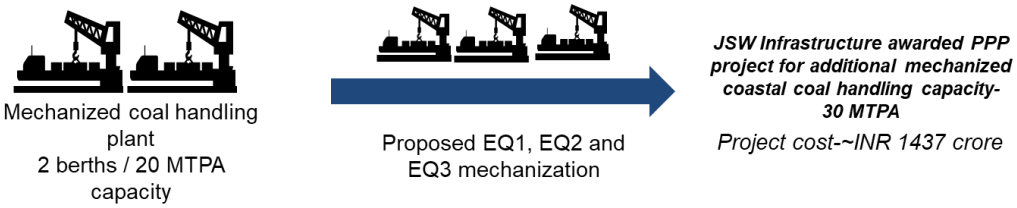
Figure 36: Last Mile Cost Comparison from Dahej and Hazira Ports for Ukai TPS



Source: Study team analysis

Port Handling Capacity

The additional potential coastal movement can be resolved by increasing the port handling capacity by 30–40 million MTPA catering to coal commodity. A mechanization plan for 3 berths—EQ1, EQ2 and EQ3—is under implementation which will increase the coastal coal loading capacity to ~50 MT. The additional capacity of 20—30 million MTPA will not be sufficient for the upcoming requirement for coastal shipment. Considering the power plants which may be operational by 2025, the potential coastal movement will reach ~139 million MTPA. To meet the coastal demand, the port handling capacity in the hinterland should increase to ~140 million MTPA.



2.3.3.3 Linkage Allotment to Private Plants

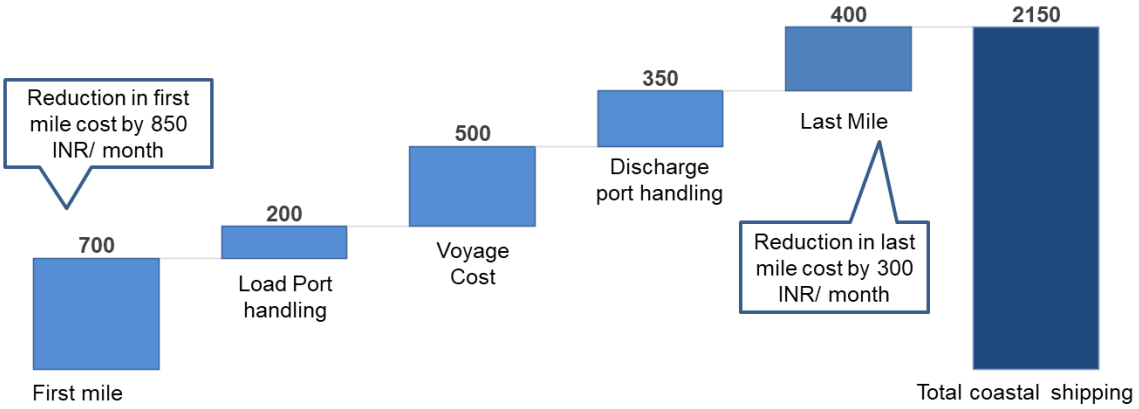
There is a case for coastal movement of coal for some power plants currently not having linkages if they are provided coal linkage with MCL/ECL mines. Ministry of Coal launched the SHAKTI scheme under which coal linkages of ~ 27 million MT were granted on auction basis to 10 private power plants which were having long-term Power Purchase Agreement. Under the prospective Shakti 2 scheme, the ministry has identified 40 GW stressed power assets with midterm power purchase agreements to grant coal linkage. However, coastal shipping can be viable if these private power plants are granted coal linkage with MCL or ECL mines.

2.3.4 Outcome of Interventions

~41 MMT additional coastal movement potential exists for thermal coal from Odisha to Gujarat/ Maharashtra primarily through shift in linkage from SECL to MCL and through linkage allocation to private plants

The coastal mode becomes competitive with shift in intake from SECL to MCL mine and rail connectivity from nearest port for power plants located in Gujarat. Coastal mode makes ~23 million MT of linkage with SECL mines when shifted to MCL, viable. The total logistics cost from MCL mines through coastal mode is lesser than logistics cost from SECL mines through rail mode.

Figure 37: Total Logistics Cost for Ukai Thermal Power Station via MCL - Paradip - Hazira - Thermal Power Station

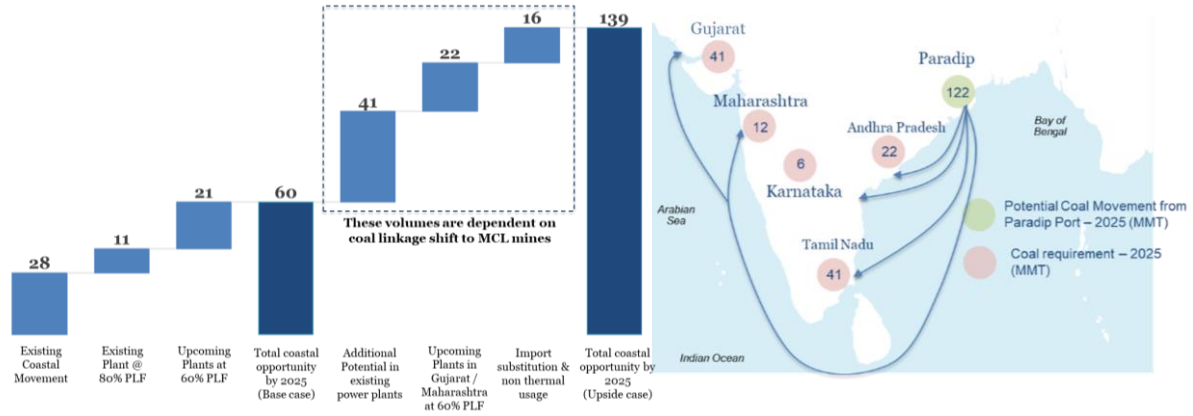


Key Assumptions

- *Panamax vessel carrying 75,000 MT coal*
- *Nearest port as load port (Paradip)*
- *Discharge at Dahej port (due to non availability of railway siding at nearest Port*

It shall be noted that since there is likelihood of grade slippage from G11 to G12 at MCL mines, landed cost per unit through coastal mode is at par or at a slightly higher side for a few plants due to increase in quantity of coal to be transported due to grade slippage. In such instance also, reduction in congestion will make a strong case to shift to coastal mode. Further, if in future MCL is able to provide G11 or better grade coal through new mines, it will make coastal mode highly attractive.

Figure 38: Total coastal opportunity by 2025



Source: Study team analysis

Total current potential for coastal movement is ~69 million MT out of which 28 million MT is already moved through coastal mode. There is further potential to move ~41 million MT of cargo which majorly comes from shift in linkage of ~23 million MT and provision of linkage to private plants of ~12 million MT. Some plants are not able to take linkage quantity available to them due to supply side issues or plant operations. Further, some power plant operators optimize on total logistics cost and move linkage coal allocated to port based plant to another plant which does not have sufficient linkage and is situated far away from a port. In such cases coal for the port based plant is generally imported to optimize logistics cost. These operators will move linkage coal to coastal plants when sufficient linkage is available for the plants which are located are away from ports. A quantity of ~6 million MT can be moved through coastal mode once these issues are resolved.

In total, ~60 million MT coal can be moved through coastal mode by 2025 if existing plants are run at 80% PLF and upcoming plants in Karnataka, AP and TN are run at 60% PLF. The coastal volumes can rise upto ~140 million MT if issues of linkage rationalization for private plants and plants in Gujarat / Maharashtra, and import substitution are resolved.

Cost savings of ~INR 54 billion per annum can be achieved by 2025 through enabling coastal movement of coal for Gujarat/Maharashtra based state power plants and allocating linkages to private power plants

Figure 39: Summary of Key Issues and Interventions

	Key issues	Description	Proposed intervention
1	**High first and last mile cost**	Due to high first mile distance from mine, coastal shipping is not viable. Power plants located far from unloading port have high last mile cost	Shift in linkage from SECL to MCL mine, railway siding at port berths
2	**Infrastructure capacity constraints**	There are infrastructure constraints from rake loading at mine to port handling capacity	Increase rake loading capacity at Talcher by 30 MMT; reduce road congestion in MCL-Paradip route and increase port handling capacity by ~100 MMT by 2025
3	**Linkage allotment to private power plants**	Many private power plants do not have coal linkages for which coastal movement can be viable	Providing MCL linkages to private power plants in Gujarat, Andhra Pradesh and Maharashtra can lead to potential coastal shipping

2.4 Fertilizer

India is the third largest producer and consumer of fertilizer in the world, with production of ~41 MMTPA and further import of ~18 MMTPA of finished and raw fertilizers. Of the ~41 MMT production, 37 MMTPA production is constituted by urea and complex fertilizer plants which are dependent on either the imported raw materials or supply of natural gas through the pipeline grid. Consequently, a majority of these plants are located near coast, accounting for ~65% production share (24 MMTPA). The balance are located along the natural gas pipeline in states of Madhya Pradesh, Rajasthan, Punjab, Haryana, and Uttar Pradesh.

SSP fertilizer plants constitute 4 MMTPA production, which are evenly spread out across the country.

Figure 40: State-wise production of fertilizer in India

Source: Fertilizer Stat book, Department of Fertilizer; MoPNG

Imports are majorly handled at Kandla (~21%), Mundra (23%), and Kakinada (12%) ports. Other ports such as Gangavaram in Andhra Pradesh (8%) and Vishakhapatnam in Andhra Pradesh (8.5%) also import significant quantity of fertilizer. The SSP production and imports are not relevant for coastal shipping assessment as the distribution is inland rather than long haul movement along the coast.

2.4.1 Opportunities for Coastal Shipping

~3 MMTPA of existing rail movement of fertilizer from coastal plants provides the addressable potential for coastal shipping

Rail has been the primary mode of transport for long-distance movement of fertilizer, even for movement between coastal plants and coastal consumption centers. However, to promote coastal shipping, government has recently taken some policy initiatives in the last two years:

- **Extending NBS policy for P and K fertilizer and UFS policy for urea to coastal and inland waterways**: Government has extended the freight subsidy under NBS policy to coastal and inland waterways. For coastal/inland water movement, subsidy provided is equal to notional railway freight from plant/port up to nearest rail head of delivery points (cost of costal/inland waterway movement includes the first and last mile cost by rail/road)[23]
- **Relaxation of cabotage rule**: According to the DGS order, a foreign flag vessel is now not required to obtain a license from the DGS for engaging in coastal trade of India for carriage of fertilizers by sea; subject to the quantity of coasting trade of fertilizers contributing to at least 50% of the total cargo on-board the ship

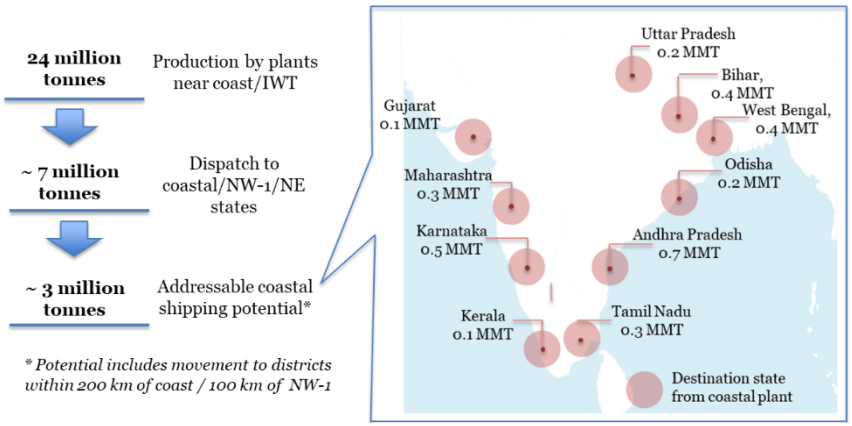
Consequently, a few major fertilizer manufacturers like IFFCO are exploring coastal routes to lower the logistics cost and benefit from cheaper coastal movement. IFFCO has coastal plants, producing complex fertilizers, in both east and west coast of total capacity 4.3 MMTPA (~20% of total complex fertilizer production capacity in the country). In past 1.5 years, IFFCO moved ~200,000 MT of fertilizer cargo on containers coastally, mostly from IFFCO Kandla plant to southern districts. The movement in

[23] Press Information Bureau dated 21 April 2015 – Pricing of Fertilizers.

break-bulk form (bagged form) comes out to be costlier than containerized movement due to additional handling costs for bagged cargo.[24]

In addition to the current movement, another ~3 MMT of rail movement can be potentially shifted to coastal movement. Odisha, Gujarat, and Tamil Nadu are the key originating states, while the consumption is spread across the coastal districts evenly, with Andhra Pradesh as the highest consumption state.

Figure 41: Interstate movement of coastal plants to coastal / NW-1 states



O-D Pairs	Potential (MMTPA)
Tamil Nadu – Andhra Pradesh	0.2
Andhra Pradesh – West Bengal	0.2
Gujarat – Andhra Pradesh	0.2
Odisha – West Bengal	0.2
Odisha – Bihar	0.2
Tamil Nadu – Karnataka	0.2
Goa – Maharashtra	0.2
Andhra Pradesh – Odisha	0.1
Kerala – Tamil Nadu	0.1
Kerala – Andhra Pradesh	0.1
Others	~ 1.2
Total	**~3.0**

Source: Study team analysis, Railway data

To make the modal shift plausible, issues impacting competiveness of coastal shipping vis-à-vis rail mode need to be addressed

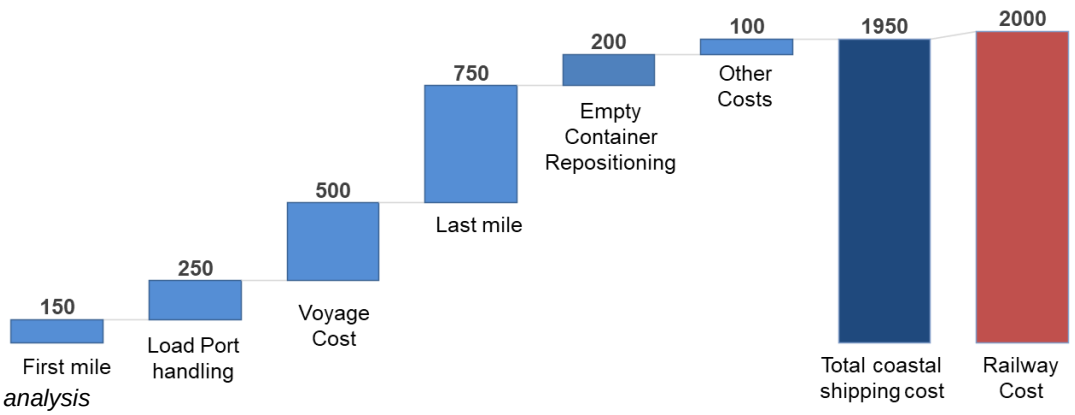
2.4.2 Key Issues

While the multimodal coastal movement of fertilizer in containers is competitive vis-à-vis rail cost, there are other issues such as small parcel size, delay in freight subsidy reimbursement, higher GST rates on multimodal movement preventing players to utilize coastal mode

The total logistics cost analysis for key O-D pairs indicates that the coastal shipping cost of fertilizer in containers is competitive vis-à-vis railways cost and for some O-D pairs the cost is much lower than rail cost. However, in spite of the cost advantage players, expect IFFCO have not started to utilize coastal shipping for movement of fertilizers. The key reason being the small parcel size of cargo which is not sufficient to deploy a dedicated container vessel and issue of level playing field with other transport such as delay in coastal freight reimbursement which are deterring players to use coastal shipping. A more detailed analysis of issues and their impacts on coastal shipping is discussed subsequently.

Figure 42: TLC Analysis for Containerized Fertilizer Movement from Andhra Pradesh to West Bengal

Logistics cost analysis for movement from Coromandel, Kakinada to Hooghly, West Bengal



Source: Study team analysis

[24] Comparison of logistics cost in break bulk and container movement is provided in annexure.

Costing assuming a 10,000 DWT vessel which can carry ~350 TEUs with 28 MT of fertilizer per TEU. Total logistics cost for movement from plant to fertilizer warehouses/societies at destination

2.4.2.1 Issue 1: Small Parcel Sizes Leading to Higher Cost for Movement of Dedicated Vessels

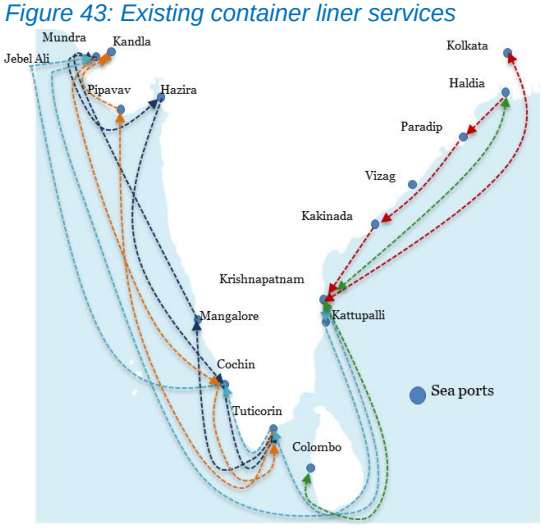
Deploying a dedicated vessel service for fertilizer movement where existing container liner service do not operate may not be viable due to small parcel size of fertilizer cargo

Fertilizer dispatch pattern from some of the fertilizer plants suggests that from a single fertilizer plant, monthly quantities servicing a coastal destination is typically in the range of 50–200 TEU per month. For smaller plants, the dispatch quantity to single destination location would be even smaller.

Routes where existing container services operates can cater to the low parcel size cargo without increasing the logistics cost. The fertilizer from plants can be mixed with the existing services to achieve sizable quantity for viability of coastal movement.

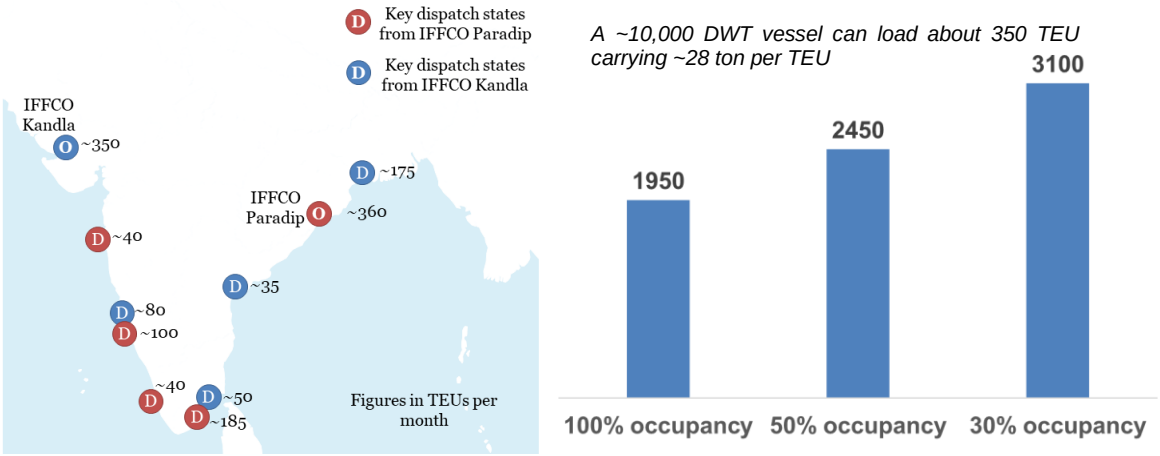
For routes where existing container services do not operate, deploying a deploying a dedicated vessel will not be a viable option because part loading of vessel results in significantly higher logistics cost per ton of cargo. Aggregation of cargo from different players is difficult as plants are spread across the coast with only few players located in the hinterland of same origin port. Moreover, plants which are located closer to each other, may not always serve the same destination market, reducing the possibility of deploying a dedicated vessel on a particular route.

Figure 43: Existing container liner services



Source: Shipping Corporation of India

Figure 44: Fertilizer Dispatch Pattern for Key Fertilizer Plants; Impact of Per Ton Logistics Cost on Part Loading of Vessel



Source: Railway data, Study team analysis

2.4.2.2 Issue 2: Level Playing Fields with Other Modes of Transport

There are two key issues that are impacting the competiveness of coastal shipping vis-à-vis the transport modes.

Documentation for freight subsidy in case of multimodal coastal movement resulting in delay of freight reimbursement

Department of Fertilizer portal does not have mechanism for uploading bills for multimodal coastal movement. Currently, coastal movement bills are submitted manually whereas the bills for railway movement are uploaded on department's portal along with railway receipt. While the process of clearing

bills for railway movement is standardized, for coastal movement significant manual intervention required resulting in delay of reimbursement of freight subsidy. This issue is deterring fertilizer players, particularly small players, to utilize coastal mode as delay in reimbursement locks-up significant working capital.

Additionally, multiple bills need to be prepared to show costs for movement up to destination rake point,[25] while actual cargo goes directly from port to fertilizer societies.

Higher GST on multimodal transport impacting the commodities where final product GST is low

Goods and Services Tax rate on multimodal services is 12% while that on single mode of transport such as road, rail or waterways is 5%. Therefore, effectively, railway (Indian Railways) movement has a GST rate of 5%, while coastal movement incur GST of 12%. This becomes a cost component in case of products like fertilizers where final product GST is lower (5% in case of fertilizers) as players are unable to claim complete input tax credit.

2.4.3 Possible Interventions

2.4.3.1 Combining fertilizer with other cargo

Fertilizers cargo can be combined with other containerized cargo such as foodgrain movement to achieve the parcel size a suitable parcel size for dedicated vessel movement. If the foodgrain coastal movement is made viable post interventions, dedicated coastal services can be started for some of the routes combining fertilizer and foodgrain.

Figure 45: Dedicated Service Combining Fertilizer with Foodgrain

Schedule	Yearly potential
Kandla-Mormugao-NMPT-Kandla	Yearly: 0.8 MMT; 30,000 TEUs Fortnightly quantity: 31,500 MT, 1125 TEUs
Kakinada-Cochin-NMPT-Tuticorin-Kakinada	Yearly: 0.5 MMT; ~20,000 TEUs Fortnightly quantity: 20,000 MT, ~750 TEUs

Source: Study team analysis

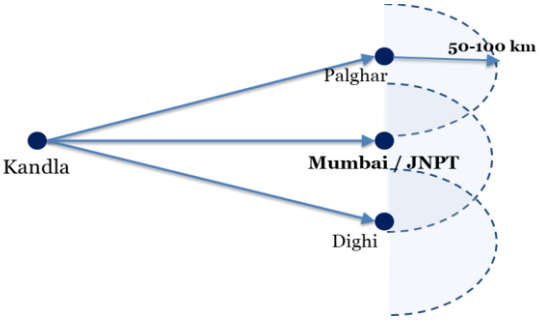
2.4.3.2 Use of Wooden Vessels for Small Parcel Size Movement

For O-Ds where existing container services do not operate and dedicated service combining fertilizer with other cargo is not viable, wooden vessels can be explored as potential option for coastal shipment on such routes. Wooden vessels are of 500–2000 MT size. Because of its small size, in some cases, these vessels can be explored to carry fertilizer cargo directly to a berth/jetty closer to its consumption center, thereby reducing the last mile costs.

Figure 46: Wooden vessel for small parcel size movement

Wooden Vessel

- Cargo carrying capacity : 500-2000 MT
- Fuel type : Diesel
- Draft Requirement : 4 – 8 m
- Speed : 5 -6 knots
- Commodity : Break bulk (Bagged cargo) that can be



Wooden vessel can be explored to carry small parcel size directly to port/jetty closer to consumption centres

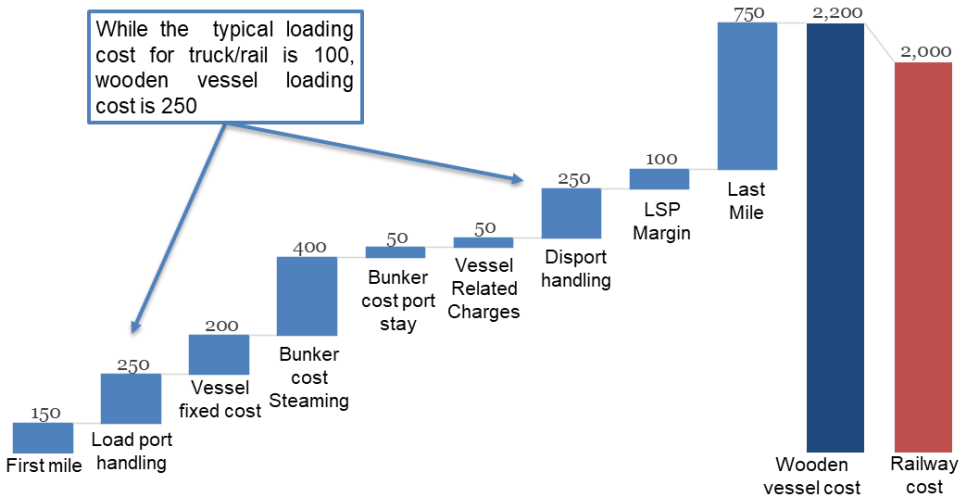
Source: Study team analysis

Logistics cost for movement through wooden vessel is currently slightly higher compared with direct rail cost for certain key O-D pairs because of high bunker and handling cost. Loading/unloading cost for wooden vessels is in the range of INR 250 per ton compared with INR 100–150 per ton (bagged cargo)

[25] Freight subsidy for multimodal coastal movement linked to rail movement from plant to specific rake point near the destination location

for truck/rail loading. The high handling cost in wooden vessel is due to limited business. The cost can be can be rationalized to INR 100-150 based on increase in cargo and vessel frequency.

Figure 47: TLC Costing Wooden Vessel Movement of Fertilizer from Kandla to Pune



Source: Study team analysis

2.4.3.3 Interventions to Ensure Level Playing Field with Other Modes

Issues related to delay in freight subsidy reimbursement: Standard procedure for filling of reimbursement for all modes and fast tracking of reimbursement submission mechanism for coastal shipping in online system are required to encourage players to adopt coastal shipping mode. In the longer run, standardized subsidy for players, independent of mode of transportation should be in place. Until the standardized subsidy model is in place, online system should be made hassle free for coastal / multi – modal transportation.

Issue related to higher GST rate for multimodal transportation: To ensure coastal shipping is not at a disadvantage, representation needs to be sent to GST council on inverted Duty structure as in essence owner is unable to claim complete input credit due to higher input taxes.

2.4.4 Outcome of Interventions

Post interventions, coastal shipping of fertilizer has the potential to reach ~3.5 MMTPA by FY25, resulting into cost saving of ~ INR 0.75 billion per annum

Suggested interventions would encourage fertilizer players to utilize coastal mode and lower their transportation cost on key O-D pairs. By FY25, potential on the viable O-D pairs is expected to reach to 3.5 MMT. Pilot movement could be initiated on key routes on wooden vessel/barge: wooden vessel movement from fertilizer plants (IFFCO, Kribhco, GSFC) in Gujarat to Maharashtra and coastal plus IWT barge movement from Odisha (IFFCO, Paradip Phosphate Limited) to locations along NW-1 (costing for coastal plus NW-1 movement is provided in annexure).

Figure 48: Summarized list of issues and interventions

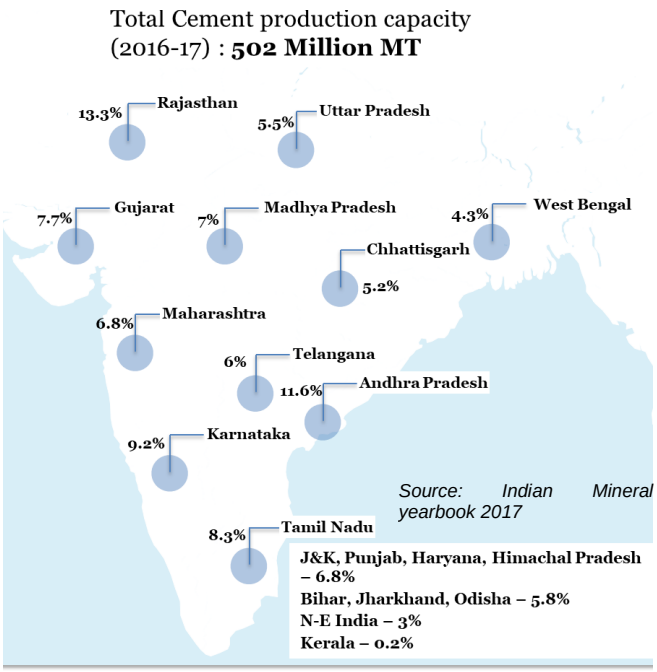
	Key issues	Description	Proposed intervention
1	**Small parcel size cargo which can not be service by existing container services**	Routes covered by existing container vessel services limited; deploying dedicated vessel increases cost due to part loading of cargo	• Option 1: Combine fertilizer with other containerized commodities • Option2: Use wooden vessel
2	**Level playing field with other modes**	Delay in subsidy reimbursement locks-up working capital of players; higher GST on multimodal movement becomes cost for fertilizer players	• Standardized SOP for filling of reimbursement for all modes • Fast tracking of reimbursement submission mechanism for coastal shipping in online system • Representation to GST council on higher GST rate

2.5 Cement

The cement plants are fairly spread out across the country servicing the close-by markets. Cement is a highly cost sensitive commodity with production clusters distributed across country, serving nearby regions. Majority of cement is transported through road, accounting for ~65% of total movement. 35% of the movement also happens through rail, primarily by large players with captive railway sidings who are able to optimize the logistics costs over longer lead distances. However, all the large players have multiple plants to service the different regions of the country which again indicates the need to establish plants close to consumption centers, while simultaneously ensuring proximity to lime stone reserves or thermal power plants to ensure proximity to raw material.

With consolidation of major cement players, the logistics cost of existing rail movement is further being optimized by developing grinding units near the consumption markets and moving clinker in bulk through railways to these grinding units.[26]

Figure 49: Cement Production Capacity Distribution



About 280 MMT of cement was produced in FY17. The cement plants are running at an average capacity utilization of ~56%

Currently, coastal shipping contributes only ~2% in total movement of cement. The coastal movement is primarily limited to two large players (Ultratech and Ambuja) who have captive loading jetties in Gujarat with silo infrastructure to optimize the costs through bulk movement of cement. These players have maintained captive bulk cement vessels to service the coastal leg.

Figure 50: Modal Mix of Cement Movement

Source: Railway Yearbook, Study team analysis

2.5.1 Opportunities for Coastal Shipping

In addition to existing coastal volumes of ~ 6 MMTPA, an additional cement volume of ~8 –10 MMPTA presently moving on rail and road to / from coastal districts may have potential for conversion to coastal mode

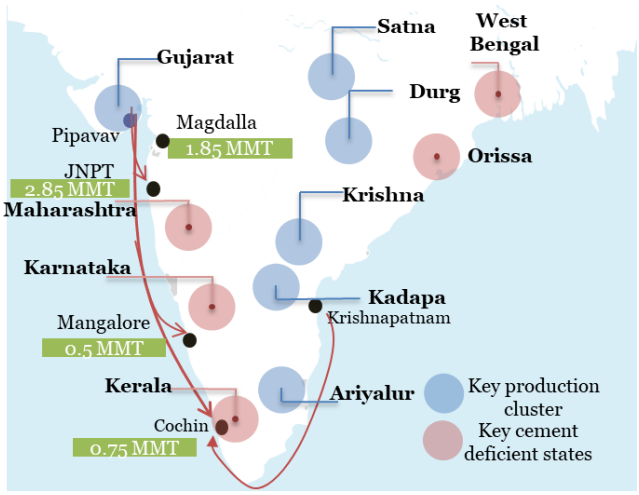
80% of the existing coastal cement movement is from Gujarat and Maharashtra region, where the cement plants are located close to load ports, thus reducing the first mile costs. Cement produced in Gujarat is distributed to southern Gujarat, Maharashtra and Karnataka through Pipavav port. Another operational coastal shipping route is from YSR Kadapa in Andhra Pradesh to Kerala through Krishnapatnam port.

For these major cement players in Gujarat and Maharashtra, which are already involved in coastal shipping, logistics cost can further be reduced after proposed interventions, owing to which they can serve more demand centers in the last mile. In the west coast, ~1-2 MMT cement movement can be increased on the coastal route, primarily on 2 routes:

[26] Comparison of logistics cost for railway movement of cement in break bulk and clinker is provided in annexure

- **Coastal Gujarat to Mumbai/Thane**: Gujarat based cement players such as Shree cement, who currently don't have captive silo based loading jetties, have the potential to move 0.5 – 1 MMTPA cement, after third party common user jetty infrastructure is made available.
- **Coastal Maharashtra to New Mangalore / Cochin**: Maharashtra based cement players such as JSW Cement have the potential to transport 0.5 – 1 MMMTPA cement.

Figure 51: Existing Coastal Movement of Cement



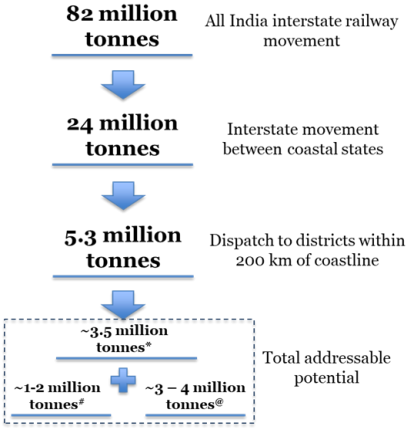
Source: Primary interactions with cement players

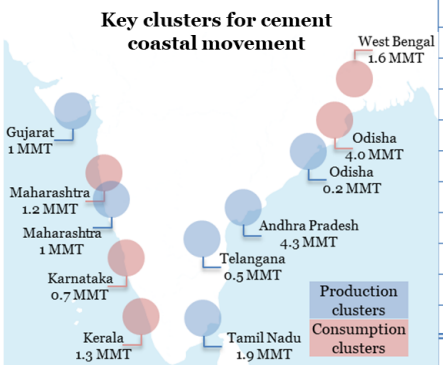
In addition to the potential on existing coastal movement routes, the long haul rail movement of ~3.5 MMT from production clusters located in coastal districts of Andhra Pradesh, Telangana and Tamil Nadu to coastal consumption regions of Maharashtra, Karnataka, Kerala, Odisha and West Bengal also has the potential to shift to coastal mode, which has been discussed in the Figure 52.

Additionally, a few of the large players from southern states are setting up grinding units in Odisha and West Bengal[27] to serve the eastern markets. Players would be transporting clinker to these grinding units and distributing cement to Odisha and West Bengal markets. ~3-4 MMT of clinker has the potential to be transported on coastal shipping mode on Andhra Pradesh/Tamil Nadu to Odisha/West Bengal route.

The total addressable potential for coastal shipping and the key O-D pairs have been highlighted below.

Figure 52: Addressable Coastal Shipping Potential; Key O-D Pairs Based on Current Rail and Road Movement





O-D Pairs	Potential (MMTPA)
Andhra Pradesh – Odisha	2.2
Tamil Nadu – Odisha	1.5
Andhra Pradesh – West Bengal	1.3
Gujarat – Maharashtra	1.0
Andhra Pradesh – Kerala	0.5
Maharashtra – Karnataka	0.5
Maharashtra – Kerala	0.5
Telangana – Odisha	0.3
Tamil Nadu – Kerala	0.3
Telangana – West Bengal	0.2
Other O-D pairs	0.6
Total	**~ 8 – 10**

* 3.5 MMT – Rail movement that can be shifted to coastal mode
# 1-2 MMT – Road movement in western coast from Gujarat and Maharashtra, which can be shifted to coastal mode
$ 3-4 MMT – Additional rail/road movement which can be shifted to coastal mode after completion of upcoming grinding units

Source: Railway data, study team analysis

The key issues impacting the realization of full potential of coastal shipping for cement are discussed in the subsequent section.

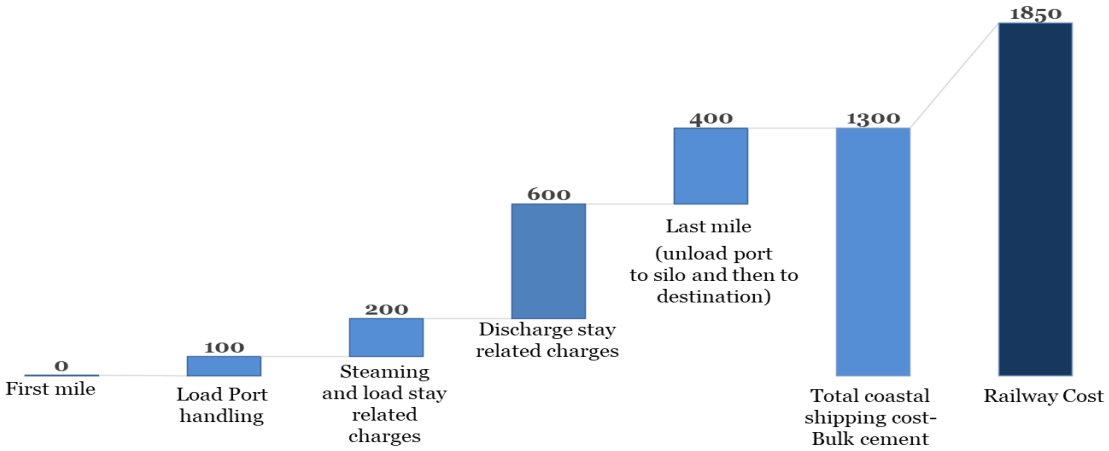
[27] West Bengal has existing / upcoming grinding units of ~1 MMT and Odisha has upcoming grinding units of ~2-3 MMT capacity

2.5.2 Key Issues

While on the west coast coastal shipping cost is competitive with rail costs, cement silos are not optimally located, increasing coastal shipping cost. Whereas, on the east coast, unavailability of grinding unit/silos infrastructure at the port makes coastal shipping in bulk form unviable and coastal movement in containers costs 15% higher than the railways cost

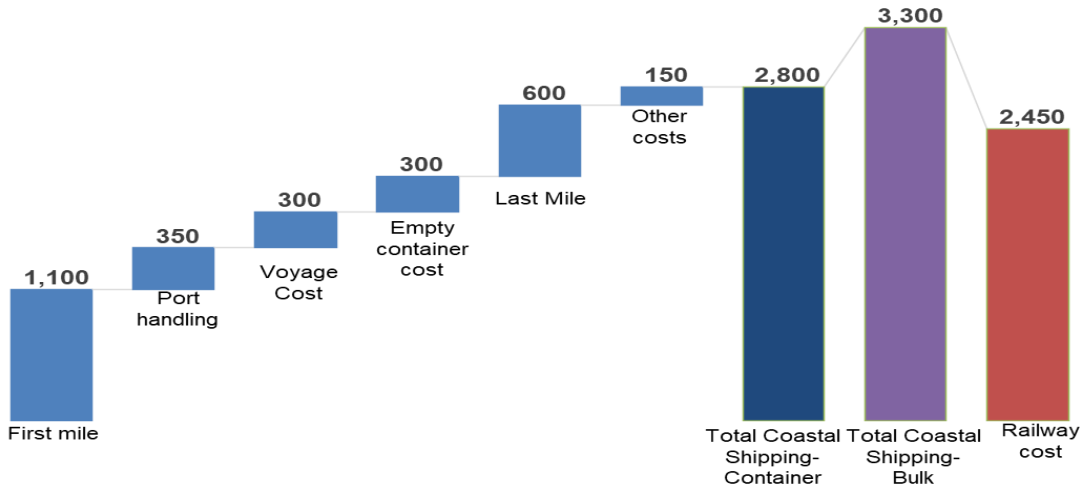
On the west coast, players are already moving cement in bulk form from their coastal plants in Gujarat to destination markets in Maharashtra, Karnataka and Kerala. However, at some destination ports unavailability of port based silos result in higher turnaround of vessels, increasing the cost of coastal transportation. The total logistics cost analysis for key O-D pairs indicates that the coastal shipping costs with existing port infrastructure (silos located away from port) is cheaper than the railway costs. Reducing the coastal shipping costs further would result in serving the larger destination market from the same cement silo.

Figure 53: Logistics Cost Analysis of Bulk Cement Movement from Pipavav to Mumbai (via JNPT)



On the east coast, cement plants are located at more inland locations from the port (~200 km). Due to unavailability of grinding unit/silo infrastructure at load and unload ports, bulk transportation of cement would be expensive because of high first mile costs and vessel costs (because of low handling rate at load and unload port). Transportation of in bagged cement in containers also results in higher costs than railway mode because of high first mile costs increasing. The total logistics cost analysis for key O-D pairs indicates that the coastal shipping costs (in both containerized and bulk form) with existing port infrastructure is costlier than the railway costs (break bulk movement of cement).

Figure 54: Logistics Cost Analysis of Cement Movement (Bulk and Containers) from the Ports for the Route of Andhra Pradesh to Odisha



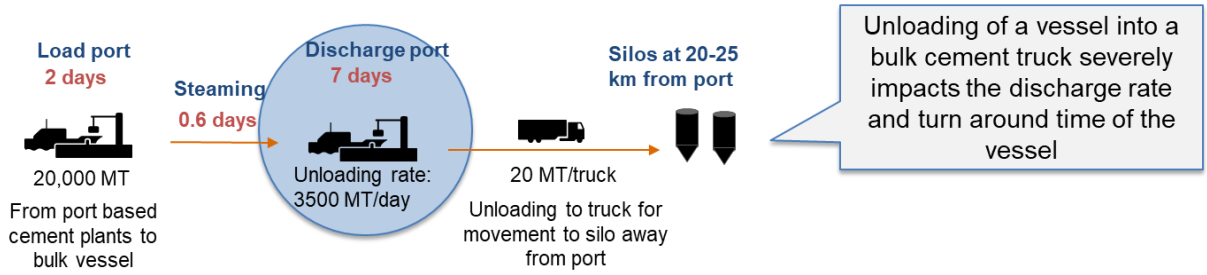
Source: Study team analysis

2.5.2.1 Issue 1: Unavailability of Bulk Cement Handling Infrastructure at Ports

Silos at destination ports on west coast located away from port, resulting in high vessel turnaround time

On the west coast, cement plants are located along the coast which allows direct loading of bulk vessels through pneumatic loading systems. However, at the destination ports, cement silos are located away from port due to which cement is unloaded onto the trucks directly from the vessel. Unloading bulk cement from vessel to truck reduces the discharge rate -~3,500 MT/day compared with 12,000- 14,000 MT/day to direct loading/unloading to a silo. As a result a vessel stays at unload port for 6-7 days as against 2 days at load port where cement is directly loaded onto bulk vessel from silo. The higher stay of vessel at an unload port results in higher vessel cost.

Figure 55: Higher Vessel Turnaround Time without Port-based Silos



On east coast, unavailability of grinding unit and silo infrastructure at load port increases coastal shipping costs, primary because of high first mile costs and vessel costs

Cement plants are located 200-250 km from the east coast ports. Cement players can either transport cement in bulk or in containers[28]. However, with current infrastructure at the ports, both the options for coastal shipping costs higher than railway cost (in break-bulk form).

In the bulk cement movement from plant to destination market, the movement results in higher cost than the rail mode because of –

- High first mile costs: The first mile movement would be the road movement in bulk carrier as there is limited availability of specialized bulk handling wagons in railways.
- High vessel costs: Without silo infrastructure at both load and unload ports, the cement would result be loaded/unloaded from truck to vessel directly, resulting in lower discharge rate and higher vessel turnaround time and costs.

Similarly, container movement of cement from plant to destination markets costs higher than the rail mode, primarily because of high first mile costs. Since the players would need to procure empty containers from the nearby container handling facility and in most cases container would be transported by road as there are limited presence of rail-based container handling facility in the proximity of cement plants in Andhra Pradesh and Tamil Nadu, the first mile transportation becomes high.

2.5.3 Possible Interventions

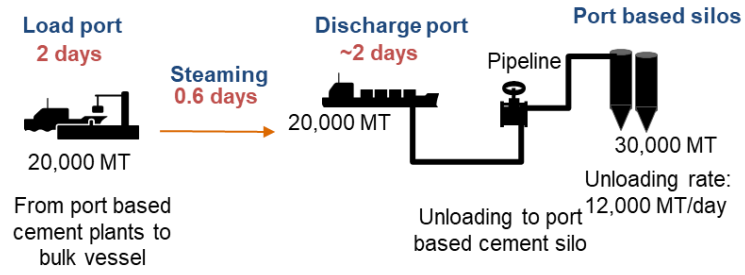
2.5.3.1 Developing Port Based Silos to Reduce the Inefficiency in Cement Handling at Ports

Port based silos can increase the handling rate and reduce the vessel turnaround time

Vessels can use port based silos to load / unload the cement, instead of unloading the cement directly from bulk carrier trucks. The silos can further transport cement to trucks, without the need of vessel staying at berth for the duration. This reduces the inefficiency in cement handling at ports, bringing down the vessel cost.

[28] As discussed in other commodities such as fertilizer, foodgrain transportation of bagged cargo in containers is cost effective because handling is faster and efficient

Figure 56: Reduced Turnaround Time due to Port-Based Silos



Port based silos have potential to reduce the overall logistics cost by ~20-30%

On the west coast, developing a port based silos at unload ports would reduce the coastal shipping costs and allow players to serve larger destination markets, increasing the potential of coastal shipping on the existing routes. Moreover, new players such as JSW would also enter to the coastal transportation adding new coastal shipping routes on west coast. A few cement players in Kori Creek region (Gujarat) would also benefit from construction of common user facilities (jetty with cement silo based infrastructure) to service the west coast market through coastal route.

On the east coast, as cement plants are located 200-250 km from the port, in addition to the port based silos, cement players need to set-up a grinding unit near the load port. Establishing grinding unit at the port would allow players to transport clinker, which will reduce the first mile cost as players can transport clinker in rail. Moreover, clinker transportation effectively costs 70% of cement transportation as 0.7 MMT of clinker is required to produce 1 MMT of cement[29].

Another option is to transport clinker to the destination location and establish grinding unit at unload port or the destination market. This option is the cheapest option[30] but setting up of multiple grinding units at various destination markets might not be a feasible option for all the players owing to higher capital expenditure (compared with setting up one large grinding unit at load load) and other operational risks.

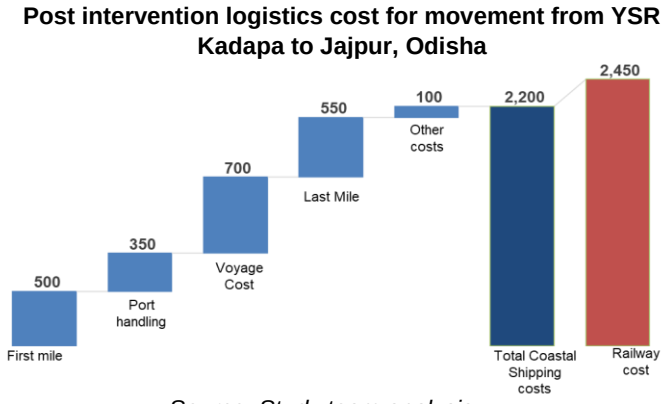
2.5.4 Outcome of Interventions

Post interventions, 11-12 MMTPA of additional cement cargo could be shifted to coastal mode, resulting into cost saving of ~INR 6 Billion per annum; total coastal shipping of cement has the potential to reach to 22 MMTPA[31] by FY25

By FY25, potential on the viable O-D pairs is expected to reach to ~22 MMTPA[32]. The expected potential includes the potential from modal shift from rail, addition of new coastal shipping routes and demand growth on existing routes. As a way forward, cement players need to be reached out to encourage setting-up of either the port based silos and grinding units (on east coast) to increase potential of coastal shipping.

[29] Other major raw material is the fly ash which cement plants procure from power plants. There are several power plants in east coast ports from where the fly ash can be procured for grinding unit. The cost of fly ash transportation from power plant to inland cement plant and power plant to grinding unit is assumed to be same.
[30] Comparison of logistics cost for all the possible options for coastal movement is provided in the annexure
[31] Includes the growth on existing coastal shipping routes
[32] Assuming major cement players develop port based silos or grinding units near demand centres

Figure 57: Post Intervention TLC; Potential for Coastal Shipping by 2025



Origin Destination Pair	Potential (FY25)
Gujarat – Maharashtra	6.5
Gujarat – Magdalla (Gujarat)	3.5
Andhra Pradesh – Odisha	3.0
Tamil Nadu – Odisha	2.2
Andhra Pradesh – West Bengal	2.0
Andhra Pradesh – Kerala	1.1
Maharashtra – Karnataka	1.0
Maharashtra – Kerala	1.0
Gujarat – Karnataka	1.0
Telangana – Odisha	0.5
Other O-D pairs	0.5
Total	**~22 MMT**

Source: Study team analysis

Figure 58: Summarized List of Issues and Interventions

Key issues	Description	Proposed intervention
1 **Unavailability of bulk cement handling infrastructure at ports**	On west coast, cement silos are located away from unload port, increasing the vessel turnaround time; whereas on east coast, unviability of grinding unit and silo infrastructure at ports make bulk cement movement unviable due to high first mile costs and vessel costs	**On west coast, develop port based cement silos at unload ports and common user jetty with silo infrastructure at loading ports in Gujarat (Kori Creek)** **On east coast, develop grinding unit with silos at load port and port based silos at unload port**

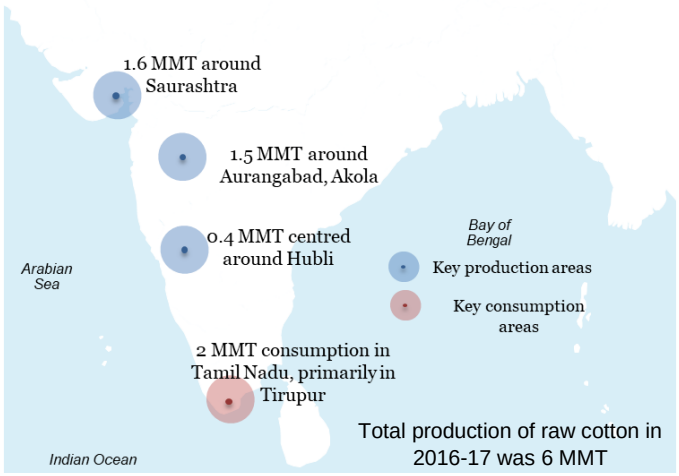
2.6 Cotton

Long-haul transportation of cotton is undertaken primarily from production cluster of Gujarat to consumption centers in Tamil Nadu and Punjab

Cotton is produced in about 10 states in India out of which two states – Gujarat and Maharashtra have a total production share of more than 50%. Most of the cotton produced in the country is used for domestic consumption in the spinning mill and handloom industry while ~1/7th is exported in raw cotton form.

Tamil Nadu is the major cotton consuming state accounting for 38% of total consumption, followed by Punjab (15%). The high consumption of cotton in Tamil Nadu is because of presence of spinning mill hub at Tirupur, whereas, in Punjab cotton is consumed in handloom industry located in Ludhiana.

Figure 59: Major Suppliers to Major Consumption Hubs



Source: Cotton Corporation of India, Primary interactions

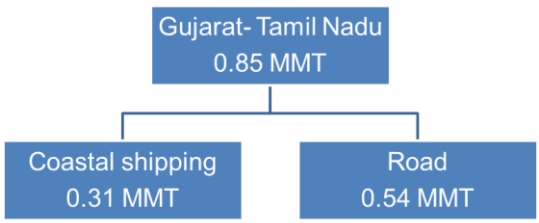
2.6.1 Opportunities for Coastal Shipping

Coastal shipping opportunities exist in long-haul transportation of cotton primarily from production cluster of Gujarat to consumption centers in Tamil Nadu; in addition to current movement of 0.3 MMT, additional coastal shipping potential of 0.5 MMT exists on this route

As Tamil Nadu consumes about 2.0 MMT of cotton while its production is merely 0.1 MMT, cotton is normally transported from other states mainly Gujarat, Maharashtra, Karnataka, and Telangana. Gujarat to Tamil Nadu offers opportunity for coastal shipment because of long haul movement and lower first and last mile costs involved since both the production and consumption hubs are located closer to the coast.

Spinning mills require door-to-door services and shipping player such as Shreyas Shipping are providing door-to-door service for containerized movement of bales. Containers are loaded in Gujarat and moved to Tuticorin Port/Cochin Port from where they are delivered by road to mills in Tirupur. As a result ~37% of the total movement on Gujarat-Tamil Nadu route is done through coastal mode. However, majority of the cotton movement, ~63% on Gujarat to Tamil Nadu O-D pair occurs currently on road. The quantity currently moving on road can be potentially shifted to coastal shipping.

Figure 60: Gujarat to Tamil Nadu Cotton movement



Source: Primary interactions

Movement from Hubli region to Tirupur on coastal shipping is not viable because of high first and last mile distance with relatively lower sea distance than Gujarat-Tamil Nadu movement[33].

2.6.2 Key issues

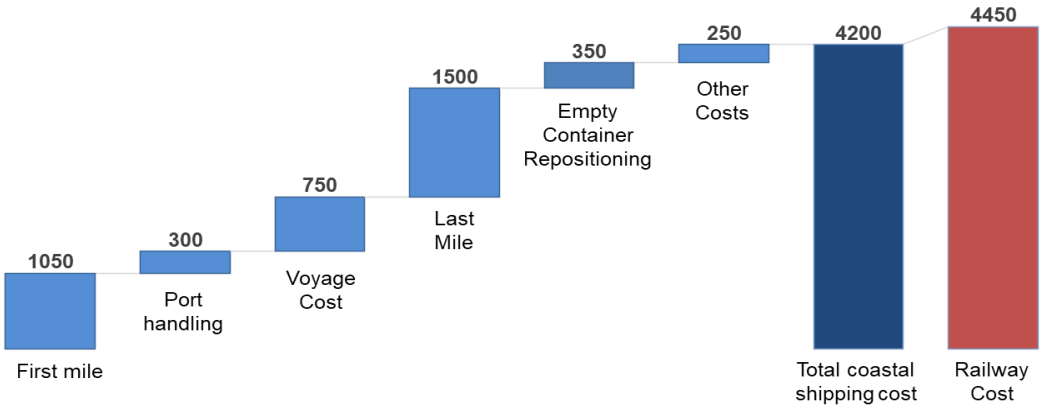
Logistics cost for containerized movement of cotton from Gujarat to Tamil Nadu is slightly lower than current road cost, however, small mills are not able to utilize coastal shipping mode because of higher lead time in coastal mode

Most of the existing coastal movement from Gujarat to Tamil Nadu takes place through Pipavav, Kandla/Mundra to Tuticorin and Cochin respectively. TLC analysis suggests that the door-to-door

[33] TLC provided in annexure

logistics cost of multimodal coastal movement in case of Rajkot–Kandla–Tuticorin–Tirupur turns out to be competitive with road cost. However, only large millers are currently utilizing the coastal mode, resulting in lower realized quantity of coastal shipping on Gujarat to Tamil Nadu route.

Figure 61: TLC Analysis for Cotton Movement from Rajkot, Gujarat to Tirupur, Tamil Nadu



Source: Study team analysis
Coastal shipping cost assuming movement in a 40 ft container. In addition to the above costs, there may be an additional inventory holding costs in coastal movement, depending on the player

2.6.2.1 Issue: Higher Lead Time Reducing Competitiveness of Coastal Shipping for Smaller Players

High lead-time in coastal mode leads to higher inventory holding costs, discouraging smaller millers to adopt coastal mode as players need to incur additional working capital cost. Larger players has the flexibility to use internal cash reserves or borrow working capital loan from bank at a favorable rate, reducing the impact of such additional costs. Smaller players get such loans at a much higher interest rate and in some cases do not get access to such financing options. The key reasons for higher lead-time for coastal mode, particularly for smaller players are:

On an average one FEU worth consignment is worth ~Rs 35-40 lacs of material; INR 200-350 per ton is the additional cost involved in working capital financing due to longer lead time of 4-6 days

- **Smaller shipment sizes due to ex-works movement of cotton bales** as mill owners arrange for the transport. Due to this, shipment sizes, mostly for small millers, are not compatible for coastal movement and would require agglomeration of cargo which takes time. Also presence of aggregators in the market is required

- **Irregular availability of 40ft' and vessel service during peak season (Nov-Feb)** leads to less reliability on coastal as a mode for transit during peak cargo season. Real time unavailability often leads to switch to road as an alternative. Currently only 3 services a week are available from Gujarat to Tamil Nadu

- **Multimodal logistics involves considerable first and last mile road movement and handling time at ports, increasing the time and cost for the movement.** 500-550 km (first and last mile combined) of transit still needs to be moved on road in the case of coastal voyage adoption. Smaller lead road distances (first and last mile) are relatively higher priced.

In addition to lead times there are few other reasons for preference to road mode.

- **Reduced inventory due to price speculation** has led to large just-in-time purchases with minimum required inventory levels. While trucks can be positioned within 2 hours of deal fixation with the ginners allowing for operating at minimum inventory levels, replenishing such hand to mouth inventory levels may not be possible by coastal movement as positioning of vessels and shipment size takes time.

- **Load restrictions for road bound trucks have been upwardly revised** leading to better economies of scale from road bound trucks reducing the cost differential with coastal. *The cargo carrying limitation has been revised to 20 tons from 16 tons for a 10 wheeler and from 20 to 25 tons for a 12 wheeler. In some cases, the benefits are passed onto the spinners, thus reducing the differential saving from coastal voyage*

Thus, small millers prefer road movement even on longer distances. While coastal movement from Gujarat to Tamil Nadu is cost competitive, the saving is not enough to offset the long lead time disadvantage especially for the small millers.

2.6.3 Possible Interventions

The cost for coastal movement of cotton needs to be reduced further so that it becomes more attractive option for small millers.

2.6.3.1 Allow Use of EXIM Containers for Coastal Movement to Increase Container Availability and Reduce Container Empty Repositioning Costs

The repositioning cost of empty containers can be reduced by utilizing EXIM containers for coastal cargo movement which will allow logistics service provider to reposition the EXIM containers to nearest port/ICD after unloading domestic cargo, for further EXIM use. Further, allowing the use of EXIM containers will increase the availability of 40ft containers which is in short supply in domestic market, reducing the lead time of coastal movement. Therefore, allowing EXIM containers for domestic movement will reduce the repositioning cost of empty domestic containers, increasing the attractiveness of coastal movement.

2.6.3.2 Specific projects where multimodal coastal shipping costs are higher can be evaluated by Ministry of Shipping for financial assistance

Presently, there are limited number of integrated service providers providing door-to-door services for multimodal coastal transportation. The integrated service providers would eliminate the challenges with respect to the coordination between different intermediaries. Encouraging more players to provide door-to-door services will result in better service offerings and cost and transportation time reduction. Ministry of Shipping on case by case basis can decide to provide financial assistance to specific projects/service providers during the start-up phase to encourage entry of more integrated service providers in the multimodal coastal shipping transportation. The specific proposal of players can be evaluated by coastal shipping promotion cell, discussed subsequently in section 5.1.

2.6.4 Outcome of Interventions

Interventions suggested above would increase the competiveness of coastal shipping mode and would encourage smaller millers to utilize coastal shipping mode. Assuming that modal share reverses in the favor of coastal transportation (current 37% to 60%[34]) for transportation of raw cotton from Gujarat state to Tamil Nadu, the coastal traffic of cotton would reach by ~0.7 MMT by FY25, an additional quantity of 0.3-0.4 MMT, resulting into a cost saving of INR 60 million.

Figure 62: Summary of issues and proposed interventions

[34] Considering that 40% players will still be using the road mode owing to the just-in time purchases of the millers and the flexibility the road mode provides for such movement

Key issues	Description	Proposed intervention
Higher lead time in coastal movement	While the logistics cost of coastal mode is cheaper than road/rail mode; higher lead time discourages players to use coastal shipping as a primary mode of transport	• Allow use of EXIM containers for coastal movement to reduce empty container repositioning cost and increase 40ft container availability • Provide financial assistance to specific projects for better services and efficiency in coastal movement

2.7 Automobiles

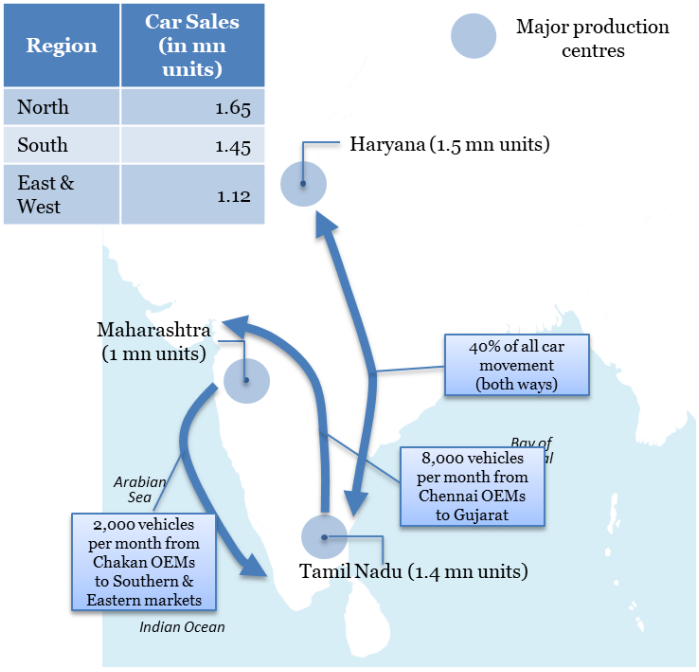
Long-haul movement of auto between northern and southern clusters, and from southern production center to western consumption centers

Automobile manufacturing is a capital intensive business and requires large land parcels, availability of power supply, skilled labor and other supporting infrastructure and services. Because of these reasons, automobile manufacturing facilities have been developed in clusters in India. The three major car production clusters in India are located in Haryana, Tamil Nadu and Maharashtra. In terms of sales, the Northern India accounts for the major chunk of car sales in India, followed by southern India.

Since the production is concentrated in clusters, automobile companies need to transport cars to long distances to reach to the consuming markets. Movement between north and south markets contribute ~40% of total car movement in the country. Additionally, significant car movement is undertaken from Tamil Nadu to consumption markets in west and from Maharashtra to southern and eastern markets.

Figure 63: Car movement in India

Region	Car Sales (in mn units)
North	1.65
South	1.45
East & West	1.12



Source: Primary interaction with OEMs

Roads are the primary mode of transport for automobiles with 90% modal share followed by rail with 10% modal share; coastal shipping of automobiles negligible

Roads are the primary mode of transport for automobiles. Railways share in automobile movement has traditionally been low mainly due to limited availability of suitable rolling stocks and handling facilities at railway goods shed. However, with introduction of policies and schemes such as automobile freight transport operator (AFTO) scheme, which provides logistics players and automobile manufactures opportunities to invest in specialized wagons, railways have started gaining share in the overall movement of automobiles. Currently, the use of coastal shipping for transportation of cars is negligible with few pilot movements undertaken in the past.

2.7.1.1 Opportunities for Coastal Shipping

Movement primarily from Chennai auto cluster to consumption centers in west can be shifted from road to multimodal coastal shipping

Around 8,000-10,000 vehicles/month are moved from Chennai auto cluster to west India. Currently, road and rail are the key modes of transport on this route. There are 3 major automobile (car) players in the Chennai region, namely, Hyundai, Renault–Nissan, and Ford. Among these, Ford is only major player have facility in the western part of the country. Other 2 players (Hyundai, Renault–Nissan) don't have any facility in the rest of India. Therefore these OEMs are sending cars from their production hubs in southern India to rest of India. Coastal location of production and consumption markets of southern and western India, offers potential route for coastal shipping.

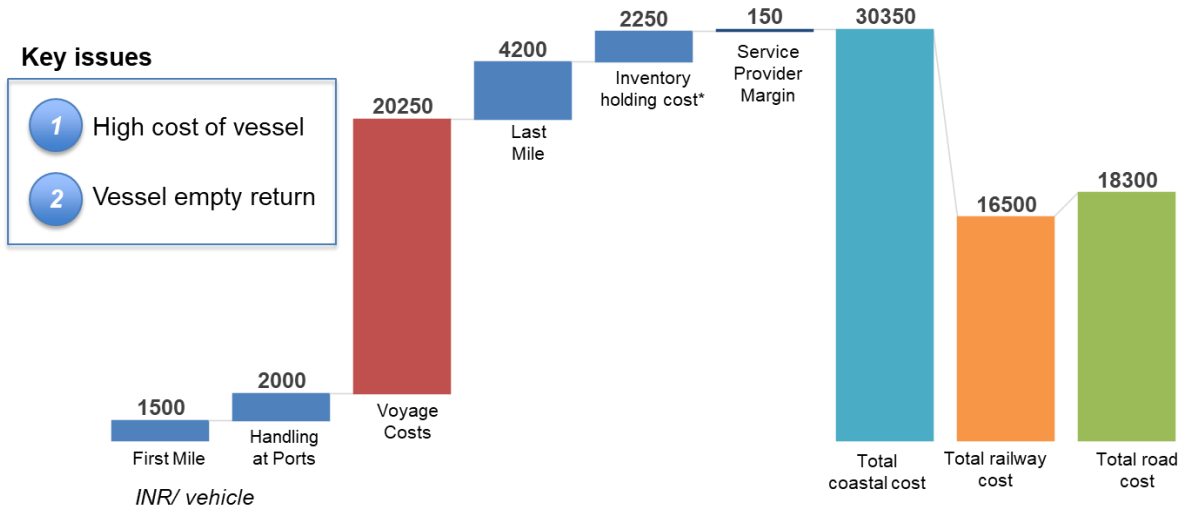
Additionally, around 2,000-3,000 cars/month are moved from Maharashtra auto cluster to coastal regions in Southern and Eastern India. Currently, road is the key mode of transport on this route, with railways gaining ground. The cluster hosts automobile production plants for the Volkswagen, Daimler-Benz, Mahindra & Mahindra, Jaguar Land Rover and Hyundai. The proximity of JNPT to the Chakan auto cluster makes it a potential route for coastal shipping.

2.7.2 Key Issues Related to Coastal Shipping

The multimodal coastal shipping logistics cost is 22-50% higher compared with road cost, primarily because of high voyage costs

To assess the viability of coastal shipping of automobiles on south to west route, automobile players conducted few movements on coastal mode between Kamarajar and Kandla Ports; however the movement did not continue because the coastal shipping cost was higher than the cost for rail/road mode. TLC analysis suggests that the higher cost is primarily due to high voyage costs which contributes 67% of the total coastal shipping costs. This warrants a detailed assessment of components of voyage costs which are increasing costs.

Figure 64: Logistics Cost Assessment of Ro-Ro Movement of Cars from Chennai to Ahmedabad



Source: Study team analysis

Logistics cost is estimated assuming no discount on VRC, cost includes the vessel empty return cost.

** Inventory holding costs: end to end multimodal coastal movement takes ~20 days compared with 8 days in direct road movement, leading to inventory holding cost. It's a notional cost which may not be explicitly incurred by car dealer and will depend on whether the dealer has taken working capital loan from bank or using internal cash reserves.*

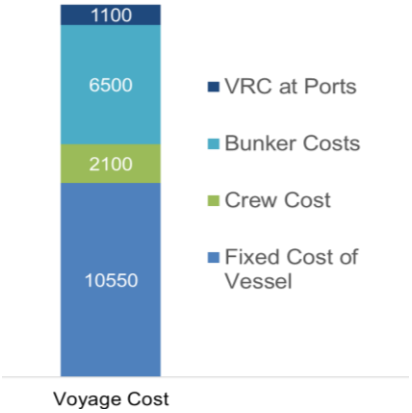
Overall cost may vary for liners which are hiring vessels on longer term charter from international market. At best per car costs can be ~ INR 24,000 (including inventory holding cost) which is still significantly higher that road/rail costs

2.7.2.1 Issue 1: High Vessel Costs Impacting Coastal Shipment Viability

Since Ro-Ro vessels capital cost is much higher than standard vessels of similar DWT, recovery of fixed cost component becomes very significant part of voyage cost. Analysis of voyage costs suggests that high voyage costs are primarily due to high fixed cost of vessel charter (52%), and bunker fuel cost (32%), whereas VRC accounts for only ~6% of voyage costs.

Further, since vessel related charges account for a small percentage of total coastal shipping cost, providing discount on VRC will bridge only 7-13% of difference between road cost and coastal shipping cost. Therefore, providing discount on VRC alone[35], with no other interventions, will not make coastal shipping competitive vis-à-vis rail and road mode.

Figure 65: Break-up of Voyage Cost

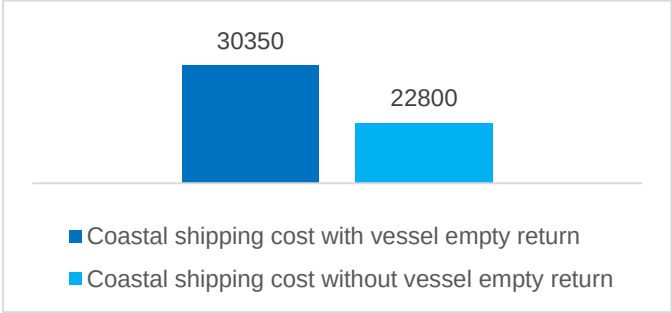


Source: Study team analysis

2.7.2.2 Issue 2: Empty Return Cost of Coastal RoRo Vessels Impacting Cost Economics

Vessel empty return cost is one of the largest component of voyage cost, contributing 37% of the total voyage cost. Since return cargo suitable for RoRo vessels are not available from west to south, automobile player transporting car from south to west has to take on the cost of vessel empty return. This additional empty return cost makes the coastal shipping uncompetitive compared to road and rail mode. Road or rail mode typically find the return cargo by diverting to another route where the cargo is available, especially for long distance movement.

Figure 66: Logistics Cost Comparison With and Without Vessel Empty Return



Source: Study team analysis

Apart from these issues, other issues specific to Maharashtra cluster are infrastructure gap at ports and lack of railway connectivity for Chakan area.

2.7.2.3 Issue 3: Infrastructure gap for Maharashtra cluster

Proximity to Mumbai & JNPT port makes Chakan auto cluster a viable option for coastal shipping to southern & eastern markets. However, vehicle manufacturers have informed that the parking conditions at the Mumbai port need improvement for attracting coastal cars. In their previous experience of shipping export cars from the port, cars had to be washed twice before shipment due to ineffective segregation of parking area from dusty cargo areas. Additionally, Mumbai port is highly congested, which results in delay in port entry through road. An alternative is railways, however, Chakan cluster lacks railway connectivity, and cars have to be transported to JNPT / Mumbai port through road.

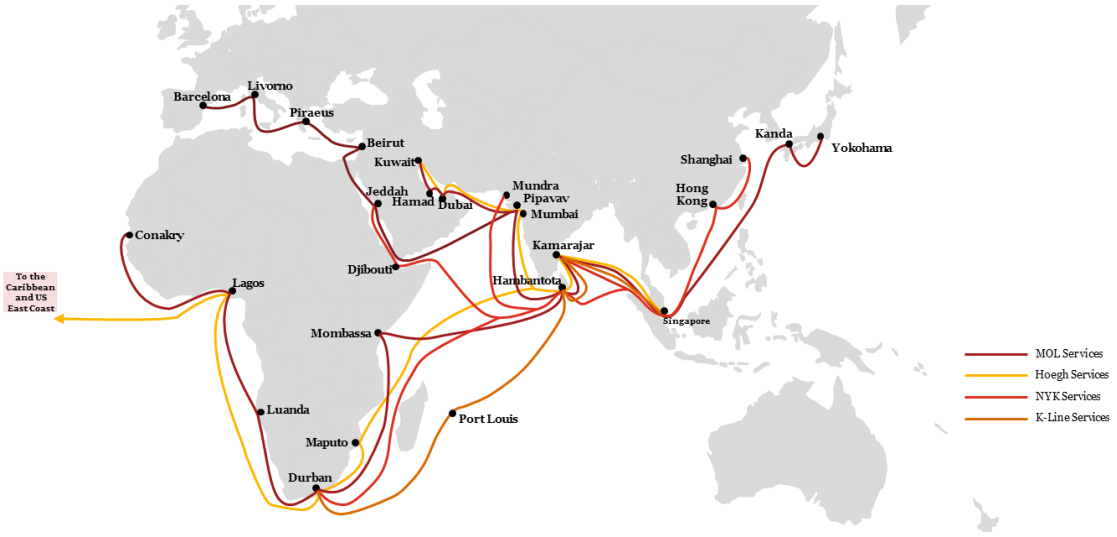
[35] Ministry of Shipping (MOS) in its letter No. 16/(88) 2016-PD-VII dated 20 September 2016 directs all the Major Port Trusts to provide discount of 80% for a period of 2 years on the vessel related charges for coastal transportation of vehicles through RoRo ships.

2.7.3 Possible Interventions

2.7.3.1 Allow Mixing of Coastal and EXIM Cargo on Foreign RoRo Vessels

Existing international RoRo liners call at multiple Indian ports as part of their liner service routes and can be utilized for coastal movement of automobiles. Kamarajar port handled 151 RoRo vessels in FY18, of which 44 vessels called at more than one Indian port. The vessels calling at multiple ports have unutilized capacity of 1000-2000 cars after loading EXIM cars at Kamarajar port. If mixing of coastal and EXIM cargo is allowed on these services then vessels can utilize their part empty capacities while on their onward journey from Chennai/ Kamarajar ports to west and drop off coastal cargo on west coast of India. This can aid in pricing coastal movement leg on marginal cost basis, reducing impact of charging entire fixed cost as well as eliminate empty return costs.

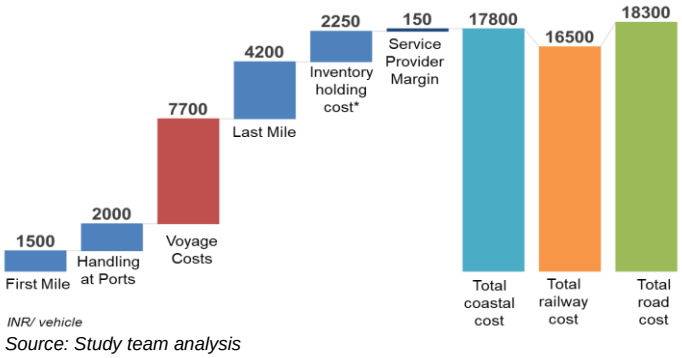
Figure 67: Existing International RoRo Liner Routes Touching Indian Ports



Source: Industry interactions, study team analysis

Coastal shipping becomes competitive vis-à-vis road and rail mode if coastal cars are carried as part of a mixed EXIM payload. In such a scenario, coastal cars would bear their share of operating expenses in full but can receive a discount on their share of the vessel hire cost. Whereas, EXIM cargo would bear their share of the operating expenses in full and the remainder of the fixed capital recovery cost. Foreign liners would provide discount for coastal cargo to recover some part of vessel fixed cost corresponding to unutilized ship capacity, which would not be recovered in case of no coastal cargo.

Figure 68: TLC for Chennai to Ahmedabad Movement in Case of Mixing of EXIM and Coastal Car



Source: Study team analysis

Assuming the vessel is only recovering 40% of the share of fixed cost from coastal cargo, coastal cost can be reduced by ~40% (INR~12500) to INR 17,700 per vehicle, making the coastal mode competitive vis-à-vis road which is primary mode of transport for cars

Logistics cost assuming no discount on VRC for coastal cargo. The cost will be reduced further if proportionate discount on VRC for coastal cars will be provided. Moreover, inventory carrying cost may not be accounted by some players which will further reduce the coastal shipping costs, making coastal shipping competitive vis-a-vis both rail and road mode.

Coastal shipping cost assuming 30:70 mix ratio of coastal and EXIM cars. Actual share of coastal cargo on recovery of fixed cost is 30% of total vessel fixed cost. It has been assumed that vessel operator will charge on marginal

cost basis (assumed 50% of the actual share) so that it can recover some part of total cost which anyway the operator will bear because of utilized ship capacity.

Percentage fixed cost recovery depends on the vessel operator and could be as low as 5-10%, depending on the additional days vessel has to stay at port for loading/unloading of coastal cars and days needed for any deviation from the existing route. This provides the foreign liners sufficient margin to accommodate coastal cars.

It is to be noted that OEMs need end-to-end transport facility from their plant to dealer networks at the destination location. This necessitates the involvement of 3PL players who could provide first/last mile transport services along with coastal shipping movement. Alternatively, foreign Ro-Ro liners who provide inland transportation services could also cater to the requirement of OEMs.

2.7.3.2 Exemption of Customs and Central excise duty on bunker fuel consumed in coastal run of foreign Ro-Ro vessels

While allowing mixing of coastal and exim automobiles on foreign Ro-Ro vessels will enable the foreign Ro-Ro liners to provide cost-competitive rates for coastal shipment of automobiles, the current customs guidelines mandate levy of customs duty and excise duty on the entire imported bunker fuel consumed in the coastal run of the vessel. This implies that even if the coastal cars loaded form a miniscule proportion of the exim cars loaded on the vessel, the entire voyage from one Indian port to other is treated as coastal run. This becomes a dis-incentive for the foreign flagged Ro-Ro vessels to carry coastal automobiles as the custom duty payment process leads to additional time and cost for the vessels. The shipping liners may then be interested in taking up coastal automobiles if the quantum of coastal automobiles is significant enough to overcome the cost and time implications. The movement from Kamrajar port to West Coast ports may still be viable due to good potential of coastal cars from Tamil Nadu auto cluster, the movement from West Coast to South Coast may not remain viable. In order to promote coastal shipping of automobiles, an exemption in levying of custom duty on imported bunker fuel for foreign flagged Ro-Ro vessels may be looked at.

2.7.3.3 Coastal Shipping of Cars in Containers

Internationally, containers with/without rack systems have been transporting cars. Rack system provides safe and efficient movement of cars in containers. Depending on the size, 2–3 cars can be transported in a 20 feet container.

Figure 69: Rack and Cassette Systems for Loading of Cars in Containers

Rack and cassette systems for loading cars enable better utilization of space within the TEU. Such systems can be removed from the container when cargo other than cars are being transported

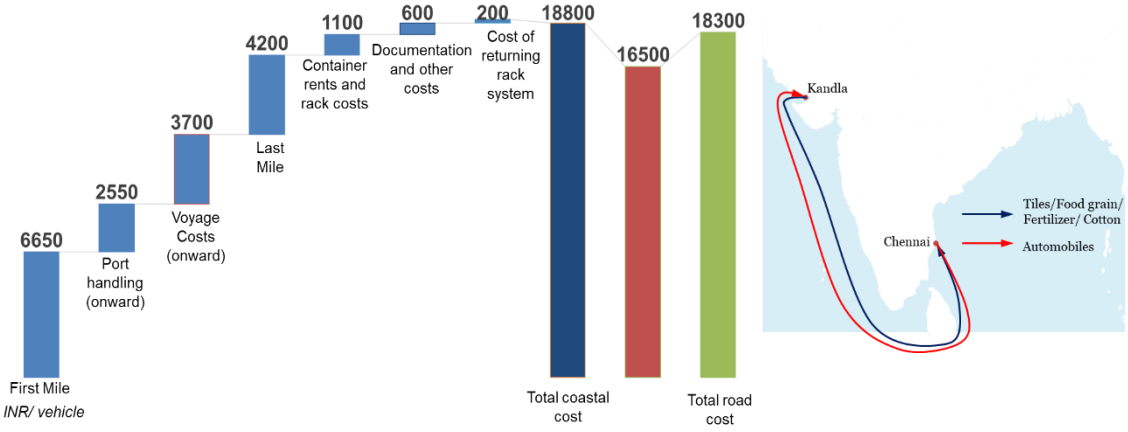
Source: Trans-Rak International

Utilizing the empty containers returning from south to west will cut the total logistics cost; only the rack system will need to be returned, for which a small number of TEUs will be needed

Using container for transport of cars can make a commercially attractive option. This is because on return voyage from west to south, empty containers can carry cargo such as tiles, foodgrain or fertilizer, eliminating the empty return cost.

Logistics cost of multimodal coastal movement of cars in containers is slightly higher than cost of road transport. Coastal shipping in containers can offer a competitive alternative mode of transportation to automobile players.

Figure 70: Logistics Cost Analysis of Coastal Car Movement via Containers Using a Rack System



Source: Study time analysis

Figures in INR/vehicle
Key assumptions:

- *Vessel size of 1700 TEUs fully loaded; one TEU can contain 2 cars*
- *Charter rate of USD 9000 per day (average of past 3 months)*

Cost does not include inventory carrying cost which may or may not be accounted by some players. The inventory holding cost will reduce the coastal shipping competiveness; however, existing container services returning empty from south to west can accommodate car containers by charging on marginal cost basis, making coastal shipping of cars in containers a viable alternative.

2.7.3.4 Infrastructure improvement for Chakan cluster

The development of a safe passageway from parking yard to berths is critical for auto players. Especially for Mumbai port, where the parking yard is at a considerable distance from the loading berth, providing a restricted or dedicated lane for car movement would be essential to attract coastal traffic. In addition, suitable measures to ensure segregation of parking yards from dusty cargo would be required to prevent additional expenses in washing of cars.

Railways can also be used as viable alternative for first mile from Chakan cluster to Mumbai port, for which, a common railway loading facility for OEMs can be developed at Dehu Road railway station, nearby Chakan area. Furthermore, any other nearby unutilized railway sidings can be looked into, to be commercialized and developed for these OEMs.

2.7.4 Outcome of Interventions

Coastal shipping can be made competitive with road and rail through the implementation of the suggested interventions and a quantity of 8,000-10,000 cars per month can be potentially shifted to coastal mode. A pilot run can be conducted by mixing of coastal cars on foreign RoRo liners for movement from Kamarajar to Kandla. Further, the same movement can also be undertaken on containers by utilizing the existing container services calling at Kattupalli port. In addition to this, if infrastructure issues are resolved for Chakan cluster, ~2000-3000 cars per month have potential to move to coastal markets through sea.

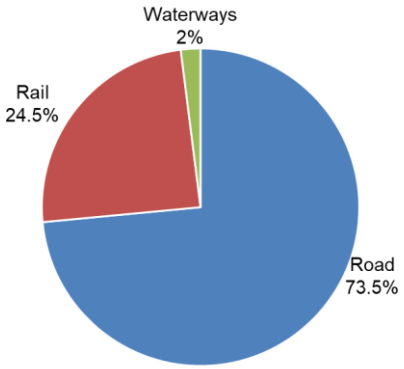
	Key issues	Description	Proposed intervention
1	High vessel cost	Ro-Ro vessels capital cost is much higher than standard vessels of similar DWT, recovery of fixed cost component becomes very significant part of voyage cost	Option 1: Allow mixing of coastal and EXIM cargo on foreign Ro-Ro vessels Option 2: Movement of cars in containers
2	Empty return cost of coastal Ro-Ro vessels	Unavailability of return cargo on Ro-Ro vessels leading to empty return cost	
3	Infrastructure gap for Maharashtra cluster	High port congestion and damage probability to cars during movement inside the port, ineffective segregation of parking space from dusty cargo and lack of railway connectivity at Chakan	Dedicated late for movement in port, conducive parking space and railway siding at Dehu Road, near Chakan

2.8 Salt

India produced about 29 million tonnes of salt in FY17. Salt production is concentrated mainly in the coastal states of India with Gujarat producing ~82% of total salt, followed by Rajasthan and Tamil Nadu with a share of ~8% each. About 72% of the salt produced is consumed domestically by the households (human consumption) and chemical industries. The share of industrial consumption is ~64% of the overall domestic salt consumption.

Road and rail are mainly used to transport salt for domestic consumption; coastal shipping of salt is limited with only ~2% share (0.37 MMT).

Figure 71: Modal Mix for Domestic Movement of Salt



While the industrial salt is primarily consumed locally, salt for human use is transported across country.

Salt for human consumption over longer distances is mainly transported through rail network (~65% modal share). Currently, the salt for human consumption is not being transported through coastal shipping.

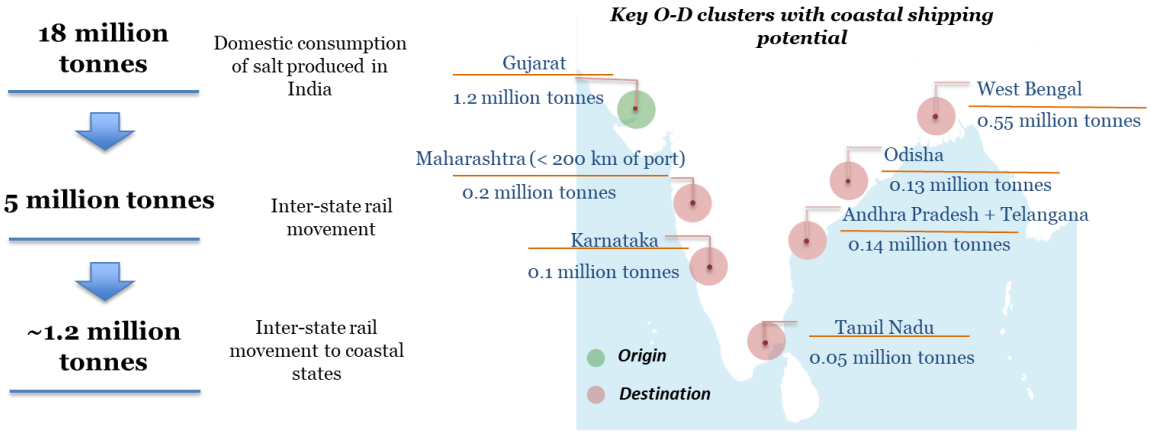
Whereas, industrial salt is transported on road (~95%) due to shorter lead distance. Coastal movement is limited to the transportation of industrial salt among the coastal states of west and south.

Source: Statistics of Inland Coasting Trade Consignments of India, April 2015 – March 2016, Study team analysis

2.8.1 Opportunity for Coastal Shipping

The long distance movement of salt to/from regions with shorter first/last mile distances (within 200 km) from coast provides the opportunity for coastal movement. As per the data collected by the DGCI&S about 1.2 million tonnes of salt is moved from production clusters in Gujarat through rail network to the coastal states.

Figure 72: Addressable Potential and Key O-D Pairs for Coastal Movement of Salt



Source: Railway data, study team analysis

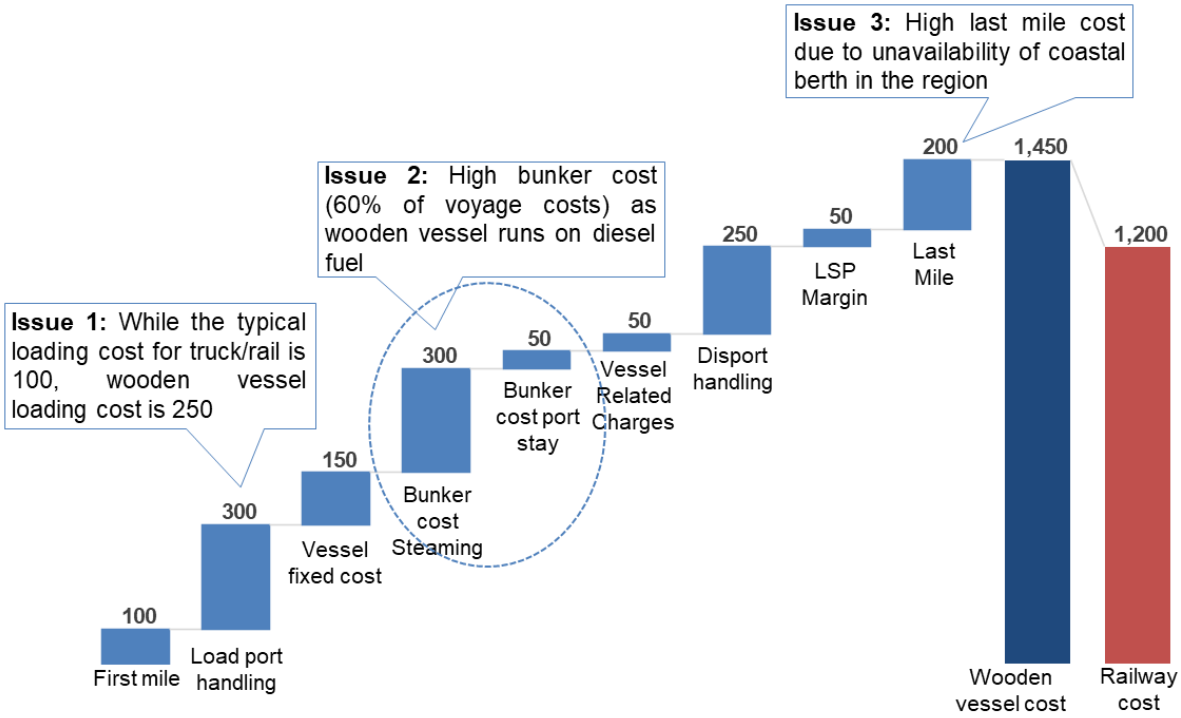
The shift to coastal movement is expected to come from the human consumption category as the production and demand clusters for industrial salt are located in close vicinity limiting coastal movement. The key issues limiting the coastal movement of salt have been discussed below.

2.8.2 Key Issues

TLC analysis suggests that multimodal coastal movement of salt is expensive than direct movement primarily due to higher handling and bunker costs in coastal movement

The salt producers in human consumption category have parcel sizes suitable for smaller vessels. Tata Chemicals one of the market leaders in the segment has a daily production capacity of ~3,500 MT which is distributed across country. Use of large vessel would result in higher per ton cost due to part loading of vessel. Smaller wooden vessels would be a cost effective option for transportation such small parcel sizes through coastal routes due to lower fixed costs for wooden vessels. However, the coastal shipping costs is still higher than direct rail cost.

Figure 73: Logistics Cost Analysis for Coastal Movement from Bhimrana, Gujarat to Boisar, Maharashtra



Source: Study team analysis

2.8.2.1 Issue 1: High Handling Cost for Wooden Vessels

The cargo handling costs at load port and discharge port together account for about 41% of the overall logistics cost impacting the viability of the movement. The loading/unloading costs from trucks/rail are typically in the range of INR 100-150 per MT which is about INR 150 per MT lower than that for wooden vessel.

2.8.2.2 Issue 2: Long Lead for Last Mile Increasing Last Mile Costs

Although Boisar, the destination location for the movement, is located within 10 km of the coast, the last mile cost is high due to unavailability of terminals/ports in the vicinity. The cargo would be unloaded at Mumbai Port and would then be transported through rail to the destination over a distance of about 130 km.

2.8.3 Possible Interventions and Outcomes

2.8.3.1 Rationalization of Handling Cost for Wooden Vessel

The handling costs at load and discharge ports is higher on the account the limited business availability at the terminal. Based on the increase in cargo and vessel frequency at the terminals, the handling cost need to be rationalized with respect to other transport modes.

2.8.3.2 Development of a Coastal Berth in the Vicinity of Demand Clusters

Development of coastal terminals in the vicinity of demand clusters would reduce the cost of last mile transportation. In the considered movement, a berth/jetty in the Palghar region of Maharashtra would reduce the last mile distance from 130 km to less than 10 km. This reduction in last mile cost can further reduce the difference between logistics cost for rail and coastal transportation by over INR 100 per MT.

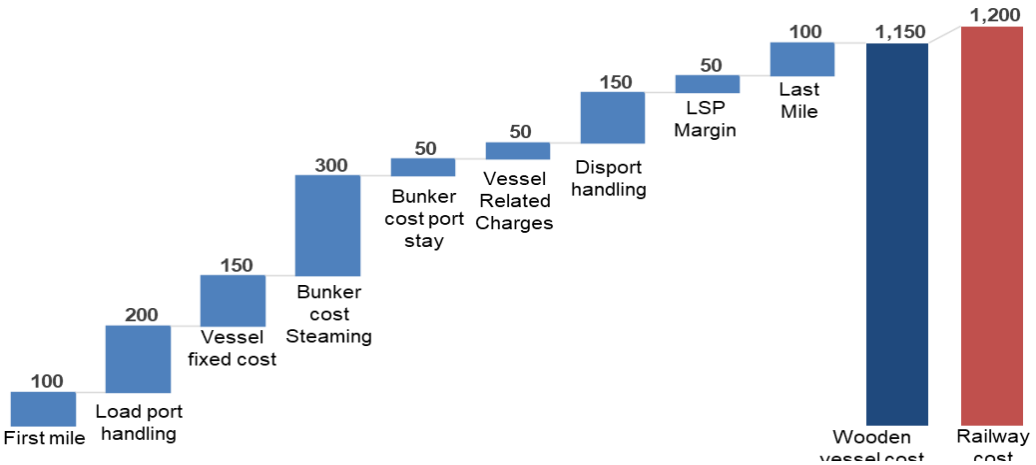
2.8.4 Outcome of Interventions

Post interventions, coastal shipping of salt has the potential to reach ~0.2 MMTPA by FY25, resulting in a cost saving of INR 15-20 million

Post interventions, the costal movement would become more competitive on some of the O-D pairs, resulting in modal shift of about ~0.2 MMT of salt to coastal shipping, resulting into a yearly cost saving

of ~INR 20 million. A pilot run between Bhimrana and Boisar may be conducted to assess the on ground viability of the coastal movement.

Figure 74: Logistics Cost Analysis for Movement Between Bhimrana and Boisar Post Interventions



Source: Study team analysis

Interventions with respect to rebate in the fuel cost has not been considered while estimating the revised logistics cost. Any tax rebate on fuel would further reduce the cost of coastal movement thereby improving the viability.

Figure 75: Summarized List of Issues and Proposed Interventions

	Key issues	Description	Proposed intervention
1	High handling cost for wooden vessels	While the loading/unloading costs in road/rail is Rs 100-150 per ton, the same operation costs Rs 250 per ton	Rationalize the handling costs for wooden vessel
2	High bunker cost for wooden vessels	Wooden vessels run on diesel fuel which is costlier than IFO fuel	Rebate on diesel price for wooden vessel
3	Long lead for last mile	While the consumption center is near the coast, the nearest port is located far, increasing last mile costs	Develop coastal berth near consumption center

2.9 Sugar

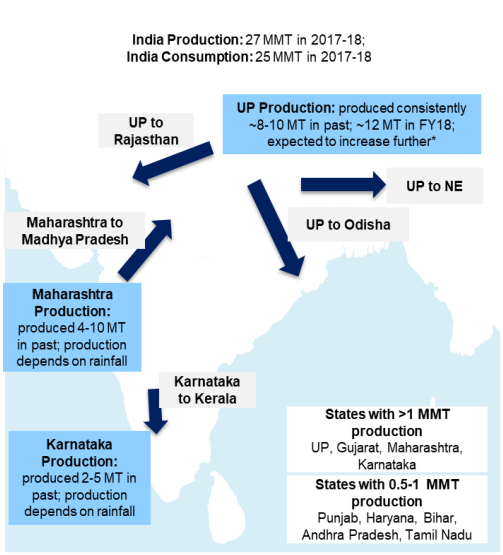
Volatile production in the past, India is currently a sugar surplus country with Uttar Pradesh (UP) showing potential to export 1-1.5 MMT of sugar to Bangladesh

Sugar production and trade flows is highly volatile given the high dependency of the sector on the monsoons. Sugar being a low value commodity is not transported to very large distances. Deficit sugar states meet their requirement from nearby surplus states, limiting the scope for long haul coastal shipping movement. However, surplus sugar produced can be exported to neighboring countries such as Bangladesh and Sri Lanka through short sea movement.

Exports in the past have been volatile depending on the sugar production; export primarily from coastal states to Middle East (Saudi Arabia), Africa (Kenya), Europe and certain volumes to Sri Lanka.

Going forward, surplus is expected to be positive and increasing, owing to increase in production in UP[36]. With consumption not expected to grow significantly from 25 MT level, UP surplus needs to be exported.

Figure 76: Sugar production and trade flows



Source: Department of Agriculture Co-operation & Farmers Welfare

2.9.1 Opportunities for Coastal Shipping

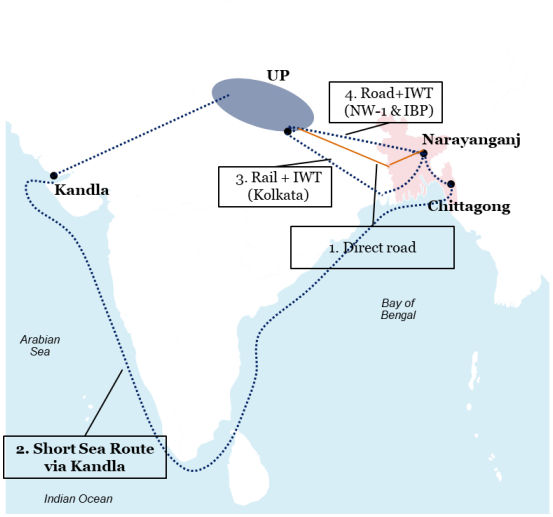
Among neighboring countries, Bangladesh faces sugar deficit and currently imports 2.5 MMT of raw sugar from Brazil to its refineries located along Meghna River. Surplus raw sugar from UP can be exported to Bangladesh provided that exporters match or offer lower landed cost than that of Brazil raw sugar. India can meet Bangladesh's sugar deficit in the range of ~1-1.5 MMT of raw sugar from UP initially. Based on the logistics efficiencies and sugar surplus, India can aim to provide the complete requirement of Bangladesh.

2.9.2 Route Options and Key Issues

Movement to Bangladesh can be undertaken through four potential route options. Except for direct road movement, all other options involve multimodal waterway movement.

[36] In past 2-3 years, the recovery rate in UP has increased from 9.5% to 10.6%. India surplus of 6 MT this year and is expected to increase further; majority of surplus from UP

Figure 77: Potential Options for Sugar Movement from UP to Bangladesh

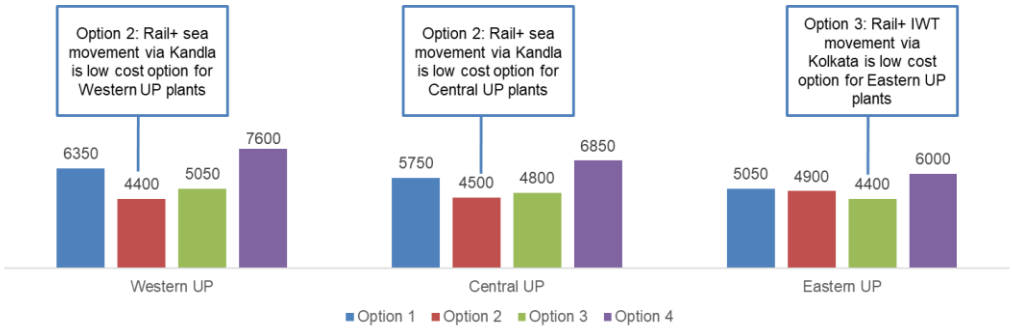


Option 1: Direct road	• First leg: Road movement from sugar mills to Benapole Land Check Point • Second leg: Benapole to Narayanganj
Option 2: Short sea movement (via Kandla)	• Rail movement from sugar mills to Kandla port • Ship movement from Kandla port to Chittagong port • Inland water movement from Chittagong to Narayanganj on barges
Option 3: Rail+ IWT movement	• Rail movement from mills to GR Jetty • Inland water movement from GR Jetty to Narayanganj (India- Bangladesh Protocol Route)
Option 4: Road +IWT movement	• Road movement from factory to river terminals (Varanasi, Patna, Buxar, Hazardwari) • Inland water movement from river to Narayanganj terminal

Source 1: Study team analysis

Logistics cost assessment suggests that short sea shipping via Kandla and Kolkata (IBP route) are the low cost options and can be explored for movement of sugar from UP to Bangladesh

Figure 78: Outcome of TLC assessment for all potential route options



Source: Study team analysis

Costing for Option 4 is considering the movement from Hazardwari terminal; with current available infrastructure along NW-1, option 4 (Road+ IWT movement) is not viable from upstream terminals of Varanasi, Patna, Buxar. IWT cost includes vessel empty return cost

2.9.2.1 Inadequate Infrastructure and Unavailability of Return Cargo Impacting Viability of IWT Movement

For IWT movement (option 4) to be viable, return cargo will be most critical, coupled with adequate infrastructure at the riverine jetties. Some of the key infrastructure issues making IWT movement unviable are-

- Current least available depth (LAD) insufficient in Bihar and UP regions, increasing first mile costs for journey to Hazardwari[37] which is at a distance of 800-1500 km from the mills
- Lack of night navigation facilities restricts 24 hrs vessel movement, resulting in higher vessel hire cost
- Lack of handling equipment at riverine terminals at both ends leading to low discharge rate of ~300 MT/ day, leading to higher idle time for the vessel and thus higher costs (around 7 days for loading and unloading each)

[37] Currently LAD of 2.5m+ available from downstream stretch of Hazardwari

- River terminals at Hazardwari and Buxar are floating pontoon terminals with no dedicated storage infrastructure; cargo stored on pontoons

2.9.3 Possible Interventions

2.9.3.1 Jetty and Waterway Infrastructure Improvements along NW-1

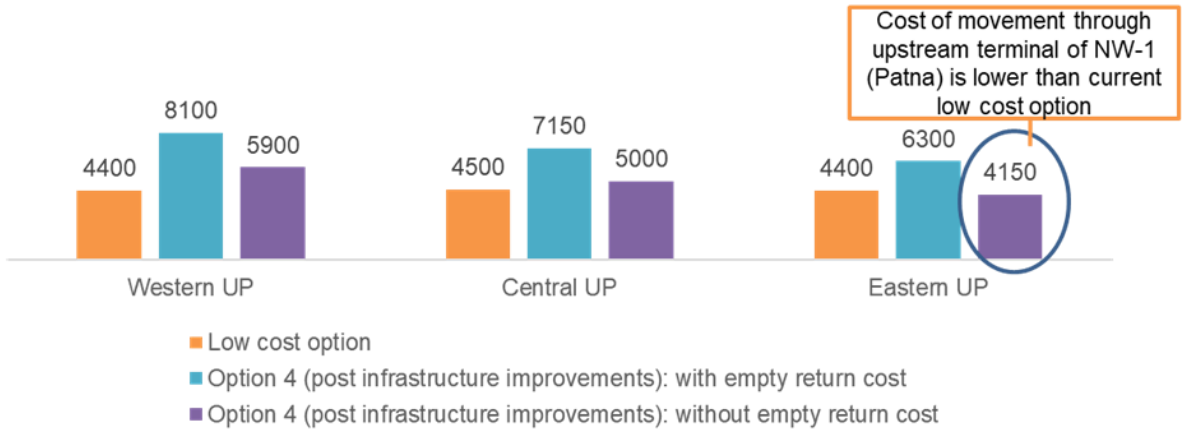
IWT movement of sugar from upstream terminals of NW-1 can be made viable through infrastructure improvements

Waterway movement viable from upstream terminals when

- Return cargo is available to eliminate vessel empty return cost
- Least Available Depth (LAD) is increased to 2.5-3 m from current 1 m to allow movement of 1500-2000 DWT vessel
- Improvement in jetty infrastructure-
  - Berth size (>70 m) to handle multiple cranes
  - Dedicated cargo handling equipment; availability of crane with suitable capacity to achieve >800 tons per day discharge rate
  - Adequate width along waterfront for movement of trucks/crane operation
  - adequate parking facilities for trucks, storage space for cargo

  Under JMVP, multimodal terminals are proposed at Varanasi, Sahebganj and Haldia. Further, improvements in LAD and navigation facilities are being made to allow movement of 1500-2000 DWT vessels. Other jetties along NW-1 also need to be upgraded to have minimum infrastructure available (as mentioned above) for viable movement along NW-1. It is expected that with infrastructure improvements, more players located along the river will be utilizing IWT mode of transportation, resulting in the availability of return cargo.

Figure 79: Logistics Cost of IWT Movement Post Infrastructure Improvements



Source: Study team analysis

Costing of option 4 shown is from Patna terminal (lowest cost among Buxar, Varanasi, Hazardwari terminals in post infrastructure improvement scenario

2.9.4 Outcome of Interventions

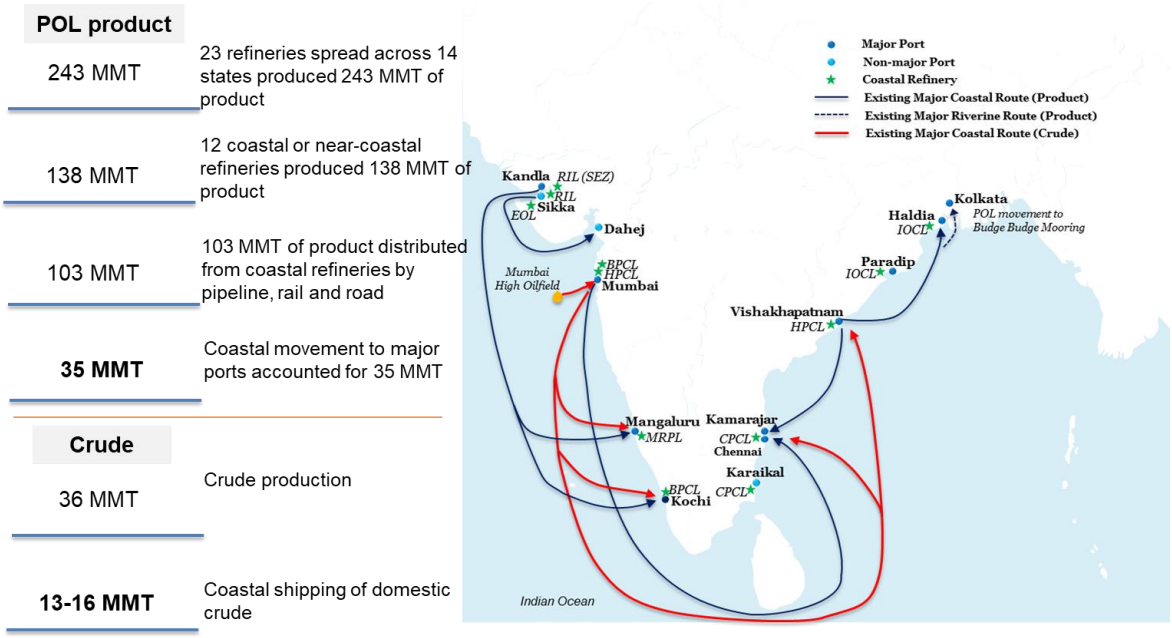
Short sea shipping of sugar produced in UP to Bangladesh via Gujarat ports is the low cost option. The movement can be undertaken with the existing set-up. Going forward, with the improvements proposed on NW-1 under JMVP and proposed infrastructure interventions on existing jetties, IWT mode could be viable alternative for movement of sugar to Bangladesh from some part of UP. Depending on the surplus production, ~1-2 MMT of sugar has the potential to be shipped to Bangladesh.

2.10 POL

Domestic movement of crude and POL products is mostly done through four modes of transport, namely, pipeline, road, rail, and coastal shipping. Pipeline is the cheapest mode of transport and dominates distribution of crude and POL products in the country. Considering the cost advantages of pipeline, any existing movement through pipeline will continue to be on the same mode. On the other hand, railway primarily serve the requirements of the landlocked states where coastal shipping may not be a viable option. Whereas, transit by road is either short-lead distance or mainly from the land locked refineries with limited rail and coastal connectivity. Therefore, it is expected that with current demand-supply scenario, further modal shift to coastal shipping from the existing modes will be limited. Moreover, coastal shipping will remain competitive for coast based movement. The ongoing pipeline constructions[38] might result in shift in some cargo from road/ rail and slightly from long haul coastal movement along the east coast as pipeline is the cheapest mode of transit of POL.

The existing coastal movement of POL product and crude from Mumbai to Chennai/Kamarajar is ~50% cheaper than rail transportation. TLC provided in annexure

Figure 80: Existing Coastal Shipping Quantity and Routes of Crude and POL Products



Source: industry interactions, MoPNG, IPA

2.10.1 Opportunities for Coastal Shipping

Coastal shipping in current demand supply scenario almost fully tapped; opportunities exists from future coast based refining capacities

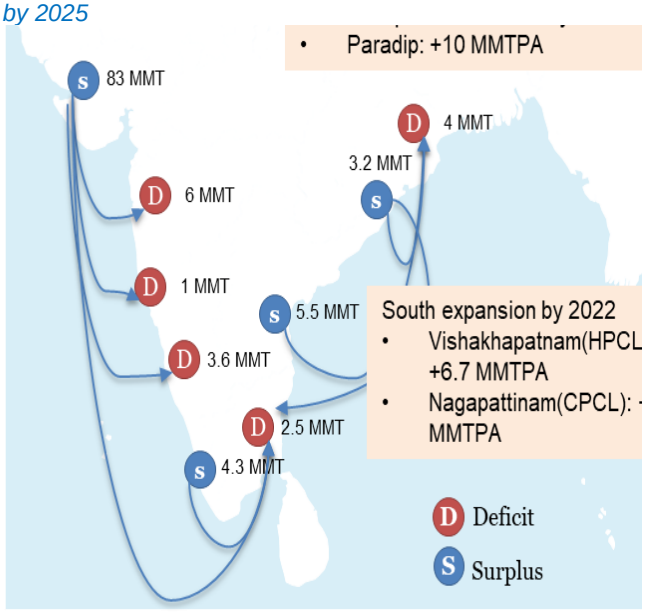
Going forward, with the limited domestic production of crude envisaged, the coastal movement of crude is not expected to increase further. Whereas, processing capacity of refineries is expected to reach ~275-290 MMTPA by 2025, with ~17 MMT of capacity expansion planned in coastal areas which could lead to increased coastal shipping.

Keeping the planned capacity expansions into consideration and the estimated growth in the demand of the POL products (as per the 13th five year plan), **incremental coastal shipping potential of 17–18 MMT exists for POL product.**

[38] Ongoing pipeline projects provided in annexure

Additional coastal shipping potential could originate post 2025 from the planned 60 MMT mega refinery at Ratnagiri, to be served by the proposed Vijaydurg Port and further 10 MMTPA planned expansion of Paradip refinery. Moreover, SEZ refineries at Gujarat (EOL, served by Vadinar port, and RIL SEZ, served by Sikka port), which are currently not selling in domestic market due to tariff restrictions, could offer additional potential if government relaxes tariff restrictions in the need of serving growing demand.

Figure 81: Refinery Expansion Plan and Additional Coastal Shipping Potential by 2025



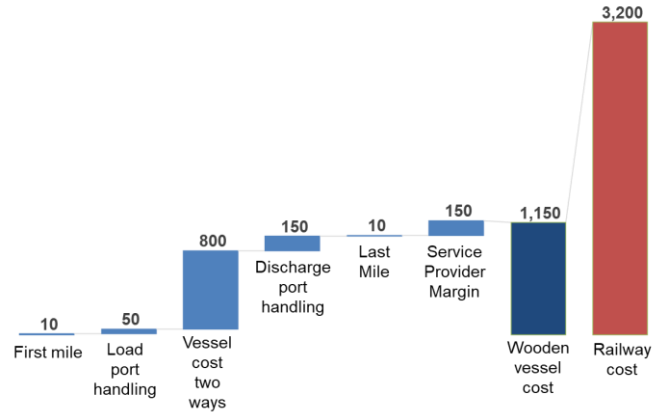
Source: MoPNG, study team analysis, Sagarmala NPP

2.10.2 Key Issues

The total logistics cost for multimodal coastal shipping comes out to be ~50-60% cheaper than the railways cost for key potential future routes

Coastal shipping mode is widely used for transportation of POL products currently. The cost of coastal movement is significantly lower than rail cost for key potential routes. Future coastal shipping potential of 17-18 MMT can be adequately served provided that the ports have sufficient handling infrastructure and capacities to handle the additional POL potential. Most of liquid berths at major ports are running at high capacity utilization.

Figure 82: TLC costing for key future potential routes for POL products



Origin - Destination	Rail (INR/MT)	Coastal (INR/MT)
Potential route		
Paradip – Kamarajar (Product)	2,227	886
Kandla (Vadinar) – Kamarajar (Product)	3,194	1,155
Note: Coastal shipping costs include cost for empty return journeys		

Source: Study team analysis

Assuming first and last mile movement via pipelines

2.10.3 Possible Interventions

Seamless coastal shipping potential can be realized by ensuring infrastructure upgrades

It is imperative to ensure that evacuation and handling infrastructure capacity does not become a major constraint for coastal transportation of POL. Therefore, handling capacities at key destination ports need to be augmented.

Port	Infrastructure requirement
Augmentation of berthing infrastructure required at Kamarajar Port	• In FY 18, Kamarajar's single liquid berth (MLT-1) had utilization of ~91%. Additionally, product movement to Chennai port (2.4 MMT) is being gradually shifted to Kamarajar. Even Chennai port has been witnessing high capacity utilization (~80%) of its three existing POL berths at Bharathi docks. • Construction of two new berths at Kamarajar i.e., 3 MT MLT-2 (INR 3.93 billion) and 3 MT IOCL captive jetty (INR 4.80 billion) will commence in 2019
Haldia/ Kolkata Port need to be equipped to be able to handle ~4 MMT more POL products	• Currently the Kolkata port is served by a single storage tank at Budge Budge mooring. This reduces capability of maintaining buffer stocks. Additional storage facility needs to be created at port/ port vicinity. • Moreover, if the planned IOCL product pipelines from Balasore to Haldia/ Kolkata is not started on time, there will be additional stress on the already highly utilized DOJ I, II and III berths of Haldia. With the existing berthing infrastructure Haldia port might only be able to handle ~1-1.5 mmt of POL products. Thus, one additional berth from the existing berths need to be either modified for handling POL products or a new berth needs to be commissioned.
POL berths at Vizag Port need to be able to accommodate deeper draught vessels for POL movement	• Vizaq currently has three POL berths, all of them are having greater than 60% utilization. However, only one outer harbour berth has a draft greater than 10 m. • OR1 and OR2 needs to be deepened, to accommodate larger vessels to achieve economies of scale for POL movement. Shifting from 50,000 DWT tankers to 100,000 tankers will cut logistics costs by 30%.

2.10.4 Outcomes of Interventions

With adequate handling infrastructure at ports, an incremental traffic of 17-18 MMT may have potential to be transported through coastal shipping by 2025, resulting in a cost saving of INR 17 billion per annum.

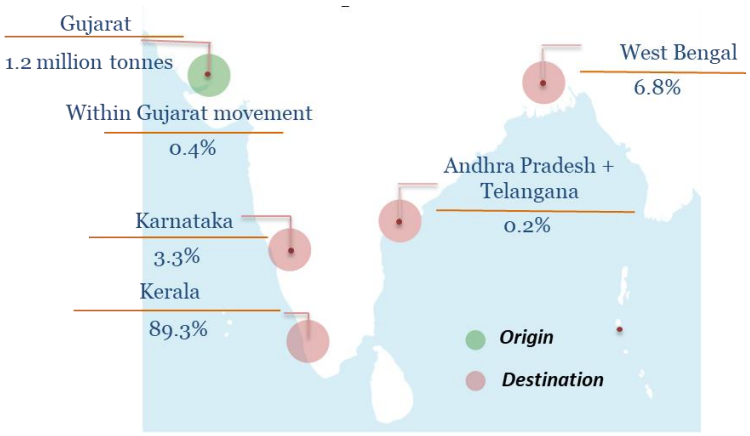
2.11 Ceramic Tiles

India with a production of about 1,080 million square meter (MSM) of ceramic tiles in the year 2017 is the second largest ceramic tiles manufacturer in the world. Morbi in Gujarat is the second largest ceramic tiles manufacturing cluster in the world and contributes to about 90% of overall production in India. In addition to Morbi the key tile producing clusters are Thangarh (Gujarat), Himatnagar (Gujarat) and Virudhachalam (Tamil Nadu). The major consumers for the tiles are the housing and commercial building development industries.

The transportation of tiles is currently being done majorly through road and coastal routes. Coastal shipping has about 30–35% share in the overall transportation of tiles in India and caters to the demand from all the coastal states. The transportation through coastal mode is done through container vessel. The modal share of road in transportation of ceramic tiles is about 50–60%.

As per the data collected by DGCI&S[39] in the year 2015–16, Morbi region has almost 100% share in the coastal trade of ceramic tiles. The movement from Morbi to Kerala has about 89.3% share in the overall tiles movement from Gujarat through coastal routes.

Figure 83: Key existing O-D clusters for coastal movement of ceramic tiles



Source: Statistics of Inland Coasting Trade Consignments of India, April 2015 – March 2016

2.11.1 Opportunity for Coastal Shipping

The industry is currently transporting about 5,000 to 7,000 TEUs per month of ceramic tiles across different coastal shipping routes. It is estimated that the total movement of ceramic tiles from the Morbi region to the rest of India is about 15,000 to 20,000 TEUs per month. Based on the industry interactions, the total potential for coastal movement of tiles from the Morbi region is over 50% of the total production.

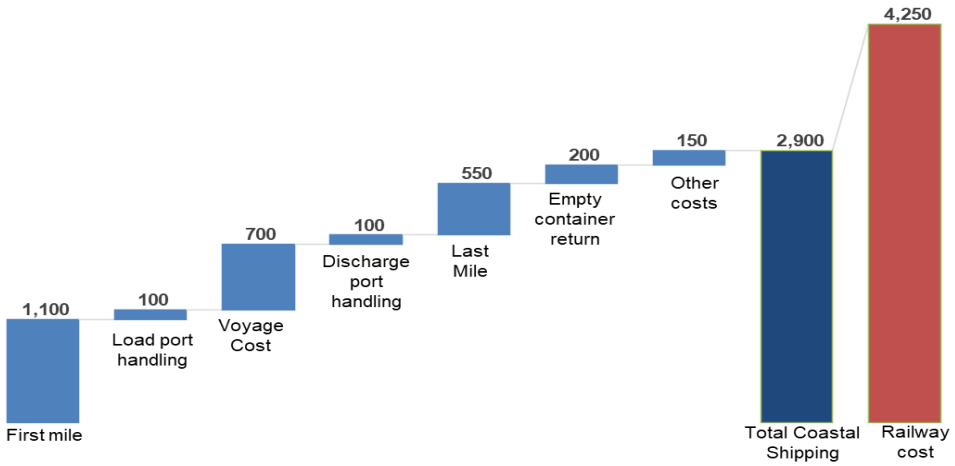
2.11.2 Key Issues

Although the multimodal coastal movement cost is much cheaper than direct road or rail cost, the industry prefers road/rail due to lower lead times for end-to-end transportation

The total end-to-end cost for coastal shipping movement is about 31% lower as compared to the end-to-end rail transportation cost. A total logistics cost analysis for the key O-D pair (Gujarat to Kerala) for coastal movement of ceramic tiles has been presented in the following figure.

[39] Statistics of Inland Coasting Trade Consignments of India, April 2015 – March 2016

Figure 84: Logistics Cost Analysis for Coastal Movement from Gujarat to Kerala



Source: Study team analysis; movement of tiles through rail as well as coastal shipping in containers

2.11.2.1 Issue: Higher Lead Time in Coastal Movement Compared with Road Movement

The key reasons for higher lead time in coastal movement and preference to road mode are

- **Timely availability of containers and rakes in the market:** During peak demand periods the industry faces challenges with respect to availability of containers in the market. As a result, to maintain the lead time, it has to rely on road transportation for serving its customers. In addition to the unavailability of containers during peak demand periods, the industry also faces challenges with respect to the availability of rakes for movement of cargo to the load port.
- **High transportation time for coastal movement:** The typical transportation time through coastal shipping mode from Gujarat to Kolkata in West Bengal is 12–15 days, while the time taken through road transportation is 6–7 days. As a result the industry prefers road transportation over coastal shipping for movement to eastern destinations in India.

2.11.3 Possible Interventions

2.11.3.1 Entry of integrated service providers

The issues with respect to the first mile connectivity of the industries would be resolved by a third party integrated logistics service provider. The logistics service provider catering to the end-to-end service requirements would eliminate the challenges with respect to the coordination between different intermediaries and would also increase the visibility of demand to the service provider. Better visibility of demand would result in improved planning thereby reducing any delays and time wastages in the logistics chain making the coastal movement more time competitive to the other modes. CONCOR has recently started its coastal shipping services and is expected to encourage the industries to increase the coastal movement.

Ministry of Shipping can provide financial assistance to specific projects/shippers during the start-up phase to encourage entry of more integrated service providers in the multimodal coastal shipping transportation. Such proposals by shippers could be evaluated by coastal shipping promotion cell.

2.11.4 Outcome of Interventions

As per industry players, the entry of more players providing end-to-end services can increase the modal share of coastal shipping to about 50% for transportation of ceramic tiles from Gujarat region i.e. 0.2 million TEUs yearly by FY25 (an addition of 12000 TEUs per month in coastal movement of tiles).

2.12 Short sea shipping

The term short sea shipping like marine highway, motorways of the sea, coastal shipping refers to movement of cargo and passengers along a coast without crossing an ocean. European Union defines short sea shipping as "*the movement of cargo and passengers by sea between ports situated in geographical Europe or between those ports and ports situated in non-European countries having a coastline on the enclosed seas bordering Europe. Shortsea shipping includes domestic and international maritime transport, including feeder services along the coast, to and from the islands, rivers and lakes.*"

In the context of this report, while coastal shipping means such movement within a country, short sea shipping means such movement between two or more countries. EXIM trade is normally carried out through foreign going vessels. However, in cases where maritime boundaries are very close, such trade can be carried out through coastal vessels as well which will reduce logistics costs and allow the carrier increased options of carrying domestic cargo making voyages more viable. India shares close maritime boundaries with Sri Lanka, Bangladesh and Myanmar and use of coastal vessels for EXIM trade will reduce overall logistics costs and may also increase overall coastal movement of domestic products to a certain extent.

2.12.1 Current Maritime Transport Framework between India and Neighbouring Countries

Presently, India has coastal shipping agreement in place with Bangladesh which allows movement of goods through river-sea vessels (RSVs)[40] between the two countries. Ministry of Shipping, India has drafted a coastal shipping agreement with member countries of BIMSTEC which was discussed with member countries in November 2017. Subsequent to ratification of agreement by the member countries, SOP for short sea shipping between the countries would be developed. India is the lead country in BIMSTEC for cooperation in transportation and communication and would take the initiative for finalizing the agreement and SOP.

While existing trade volume of India with its neighbouring countries is not much as compared to its overall trade, there is significant potential to increase this volume through deeper regional trade and connectivity. A short sea shipping agreement would address the connectivity issues by providing cheaper and faster access to ports and inland terminals of neighbouring countries.

2.12.2 Potential of short sea shipping

India and Bangladesh trade: The existing coastal shipping agreement allows movement of bilateral and transit (destined to North-East India) cargo. The present traffic through coastal and inland waterways is ~21 MMT and mainly consists of fly-ash from power plants in West Bengal to cement companies in Mongla, Khulna, Narayanganj. A container feeder service was initiated between Krishnapatnam and Chittagong Ports after signing of the agreement. Also, transportation of automobiles through RoRo vessel has also taken place. A bulk of the traffic movement (~17 MMT) still takes place through the land ports, specifically Petrapole–Benapole land port, and rest ~4 MMT through sea. However, majority of the land port traffic consists of locally produced commodities such as fruits, which cannot be shifted to coastal movement, with the exception of traffic at Bhomra and Benapole land ports. Bhomra & Benapole land ports are used to transport manufactured goods, amounting to ~3 MMT cargo and can be shifted to coastal route, along with existing ~4 MMT sea traffic.

Additionally, the agreement between India and Bangladesh currently does not allow transportation of inward/ outward cargo to and from the ports of any third country. Since the local vessels cannot carry a third country's goods under this agreement, the main line operators that carry goods from US, EU, and other countries do not unload Bangladesh bound containers at Indian Ports and instead take them to other ports like Singapore or Colombo, from where they are carried to Bangladesh in smaller vessels.

[40] Classification note: Application of IRS Rules to Indian River Sea Vessels; https://www.irclass.org/media/1870/classification-note-rsv_3_4_main_rules-dm-aug-2013.pdf

If the Coastal Shipping Agreement allows movement of third country goods through local vessels, it will increase the transshipment volume from Bangladesh at Indian Ports.

India and Myanmar trade: The trade between India and Myanmar was ~1.5 MMT in FY-19 and happens majorly through deep-sea shipping as there is no coastal agreement between the two countries. The commodities exported from India are refined sugar, iron and steel (forged bars and rods) and animal feed constituting ~0.3 million MT traffic. Major commodities imported from Myanmar are edible seeds amounting ~0.5 million MT.

India has constructed Sittwe Port in Myanmar as a gateway port to connect to its north-eastern states through Mizoram. The construction of Sittwe Port is part of the Kaladan multimodal transit transport project and its objective is to create a multimodal sea, river and road transport corridor for shipment of cargo from the eastern ports of India to Myanmar through Sittwe port as well as to north-eastern part of India via Myanmar. Both countries signed a bilateral Memorandum of Understanding (MoU) on 22nd October, 2018 for operationalization of the port at Sittwe and Inland Water Transport (IWT) Terminals at Sittwe and Paletwa in Myanmar. The ratification of coastal shipping agreement would reduce the logistics cost for the multimodal trade.

India and Sri Lanka trade: Bilateral trade between the countries in FY 19 was ~6 MMT, of which India exported ~ 3 million MT of cement and clinker to Sri Lanka. Coastal shipping agreement with Sri Lanka will allow Indian players to transport cement in same vessel for delivery to Sri Lanka and South Indian ports. It will reduce logistics costs for the carriers and provide them access to smaller markets in South India there by increasing the quantity of cement moved through coastal mode.

India and Thailand trade: Dolomite, crude palm oil, electrical resistance wire, carbon resistors, and other electrical equipment are major imports from Thailand. Major export commodities in bulk are salts, residual materials and pig iron constituting ~0.4 million MT. The bilateral trade stood at ~4.5 MMT in FY 19 and can be boosted further through the coastal shipping agreement.

Total cargo volume of ~25 – 30 MMTPA can be moved through short sea between India and neighbouring countries by FY 25. *This trade can further be increased through coastal shipping agreement and an organization to execute the same, represented by all the member countries.*[41]

2.12.3 Lessons from Short Sea Shipping Development in European Union (EU)

Short sea shipping in Europe is at a matured level and important lessons can be learnt from the European experience. It is important to understand the existing administrative structure of the short sea shipping organisation structure in EU which can be utilized to develop a similar organisation in Indian sub-continent as well. In addition to the organisation structure, various incentives and promotion strategies implemented by EU can also be helpful in developing similar strategies for India.

European Union Short Sea Shipping

The development of Short Sea Shipping could be dated back to 1985 which was proposed by European Commission. Short sea shipping is an integral part of European Union (EU) transport policy. The main goal is to develop efficient, multi modal transport system to meet logistics requirement effective from May 2004. The European Commission has an active policy to promote short sea shipping. EC White Paper in European Transport Policy for 2010 stressed the role of short sea shipping in maintaining an efficient transport system.

Administrative Structure:

European Parliament: European Parliament is mainly tasked with passing of EU laws, together with the council of European Union, based on European Commission proposals.

Council of the European Union: Together with the European Parliament, the Council is the main decision-making body of the EU. In the Council, government ministers from each EU country meet to

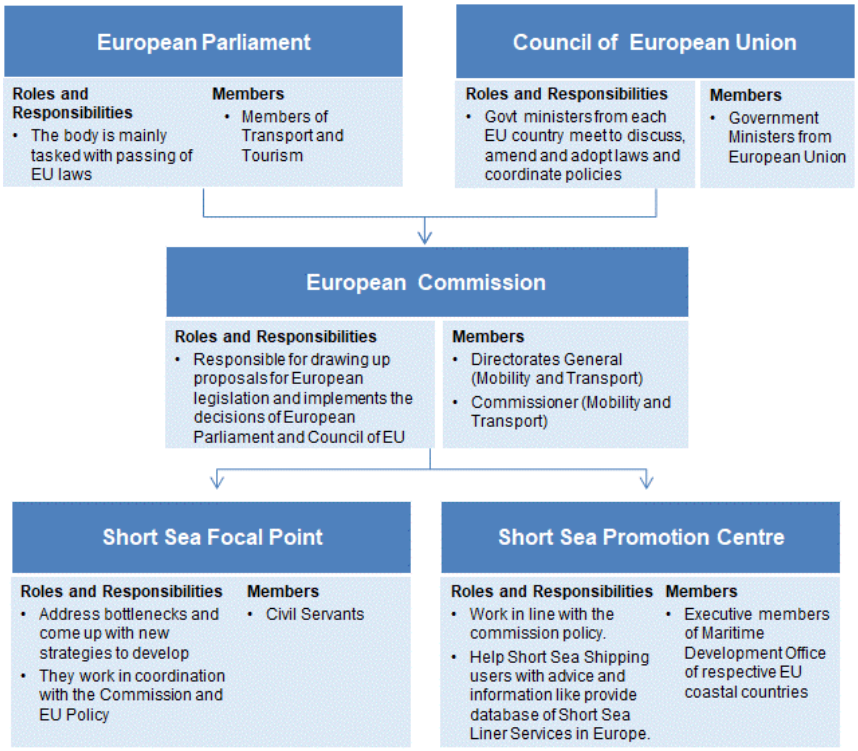
[41] Total volume for short sea shipping is calculated on basis of past growth rate of bilateral trade with individual countries

discuss, amend and adopt laws, and coordinate policies. The ministers have the authority to commit their governments to the actions agreed on in the meetings.

European Commission: The European Commission is the EU's politically independent executive arm. It is alone responsible for drawing up proposals for new European legislation and it implements the decisions of the European Parliament and the Council of the EU. The political leadership is provided through Commissioners (for short sea shipping, Commissioner – Mobility and Transport) while the day to day running of Commission business is performed by its staff organized into departments known as Directorate-General (for short sea shipping – DG Mobility and Transport).

The industry players may not be aware of the modern benefits of door-to-door Short Sea Shipping. This is being tackled by general promotion at EU level and two separate European networks of promotion each with their specific tasks: Short Sea Shipping Focal Points and Short Sea Promotion Centres.

Figure 85: Organization Structure for Short Sea Shipping in Europe



Source: Commission of European Communities

Focal Points: Short Sea Shipping Focal Points are highly-qualified civil servants in national administrations and responsible for the mode nationally within their public administrations. They work in coordination with the Commission and EU policy. On the initiative of the Commission, the focal points network at EU level to exchange experience, discuss ways to promote short sea shipping, address bottlenecks that hinder the development of the mode and come up with new strategies to improve the attractiveness of the mode among transport users. On average they meet twice a year under the chairmanship of the Commission. The Maritime Industries Forum is represented as an observer in those meetings.

Short Sea Promotion Centres and European Short Sea Network: 16 national Short Sea Shipping Promotion Centres operate in Europe. These Promotion Centres work in line with the Commission policy but they demonstrate a wide variety of working methods to approach their national audiences. They are led by business interests that understand the benefits in having a neutral body that promotes the use of short sea shipping. These Centres help prospective Short Sea Shipping users with advice and information, for example they maintain and provide a database of Short Sea Liner Services in Europe on their website. Promotion work is done, inter alia, through the media of presentations for target audiences, bilateral meetings with targeted groups, responses to individual inquiries, mail-shots (fact sheets), press releases and exhibitions. Shippers and road-haulers are being specifically targeted by this work to influence their mindset and work with Short Sea Shipping. Some Promotion Centres are also running specific initiatives, such as introducing young people to careers in the Short Sea/maritime logistics sector.

The European Commission strongly supports these Promotion Centres and their Network and works to ensure their good functioning and give necessary policy guidance for their concrete activities.

Initiatives to support short sea shipping

Figure 86: Initiatives to support short sea shipping in European Union

- **Including short sea shipping in long term transportation policy and the Trans** – European Transport Network (TEN-T) – Short sea shipping has been a priority of the EU transport policy since 1995. It remains central to the comprehensive strategy for a clean, safe and efficient European transport system set out in the Commission's 2001 White Paper, European transport policy for 2010: time to decide. Infrastructure is vital in enhancing the competitiveness of multimodal transportation relative to trucking. The European Commission in 1996, adopted guidelines for the development of Trans-European Transport Networks (TEN-T) which was directed towards the implementation and development of a Europe-wide network of roads, railway lines, inland waterways, maritime shipping routes, ports, airports and rail-road terminals. TEN-T envisages coordinated improvements to various logistics modes providing integrated and intermodal long-distance and high-speed routes. The European Commission oversees and co-finances the implementation of several strategic transport corridors through its TEN-T program.
- **Marco Polo Program** - The five Marco Polo programs are distributed through a Call for Proposals (CFP) process seeking CFPs from private companies. These proposals are initiated by the private sector and must demonstrate that service offerings will meet the market requirements of cargo interests and that the project will be self-sustainable after the funding is over. It has financed 167 projects (feasibility studies and operating projects). Marco Polo program made a substantial contribution to convert intermodality into existence with a budget of 18.75 million euros to shift 12 billion tonne-kilometres a year from road to short sea shipping. It is interesting to note that the Marco Polo program views education, training and dissemination of learning as key elements in short sea shipping promotion. They have financed short sea shipping promotion centers, and make available funding to support this type of activity.
- **Development of Motorways of the Sea (MoS)** – European Tansport Policy 2010 strongly emphasized the concept of "Motorways of the Sea" and that these Motorways of the Sea shall become part of the Trans-European Network (TEN-T) providing door-to-door logistics service by offering efficient, regular and frequent services that can compete with other modes of transportation. It required ports connected to the Motorways to have efficient hinterland connections, rapid administrative procedures and a high level of service that is targeted to making short-sea operations successful. Funding was allowed for the execution of projects for development of the motorways.

- **European Intermodal Loading Unit (EILU)** – It was implemented to standardize the stackability of a container, improving the cargo capacity by 63% in case of euro pallets and 55% for UK pallets. The EILU would combine the benefits of containers with those of swap bodies. Together with their ability to be stacked, and in order to meet the necessary requirement, the new European units will allow maximum space for transporting ISO pallets, fast loading and unloading at ports in order to reduce cost. Harmonization and standardization of loading units have a positive influence on Short Sea Shipping, by enabling it to penetrate the all-land swap-body market.
- **Directive on reporting formalities** - This directive aims to simplify and harmonize the administrative procedures applied to maritime transport by establishing a standard electronic transmission of information and by rationalizing reporting formalities for ships arriving in and ships departing from European Union (EU) ports. It has directed member states to accept IMO FAL forms for the fulfillment of reporting formalities.
- **Customs procedures on short sea shipping** - The Commission presented in 2002 a Guide to Customs Procedures for Short Sea Shipping. The Guide has a two-fold purpose. First, it outlines the EU customs rules that apply to Short Sea Shipping, including the opportunities that are available to use simplified customs procedures. And, second, it gives a concise basis for identifying whether there could be concrete needs for modifications or further simplifications. Custom offices in member states implemented the New Computerized Transit System (NCTS) as first steps in e-customs. The procedure relating to transport under the single administrative document (SAD) is replaced by electronic messages.
- **Port Services and Security** - Short Sea Shipping needs efficient and short-sea friendly ports whether these are seaports, island ports or sea-river ports. It needs reasonable turnaround times, and transparent procedures and charges. The Commission is working to increase the efficiency and lower the costs of certain port services: pilotage, towing, mooring, services to passengers and cargo handling. In the port security domain, short sea shipping could benefit from the opportunity in the SOLAS (Safety of Life at Sea) Convention to conclude bilateral or multilateral agreements between the Member States on alternative security arrangements.
- **Pilotage Exemption Certificates** – The Commission Communication and action plan with a view to establishing a European maritime transport space without barriers invited Member States to create a regulatory framework which would permit easier pilotage exemptions. This communication specified that the conditions required for obtaining a PEC should be reasonable and should not contain elements of protectionism. This could induce lower costs for Short Sea Shipping operators and faster turnaround times of vessels in ports, simplify and speed up the formalities relating to the arrival, departure, and clearance of ships which is done without compromising safety or security.
- **One-stop administrative shops** – The Commission is working towards creating “one-stop administrative shops” that would further simplify and speed up the formalities relating to the arrival, departure and clearance of ships which is done without compromising safety or security.
- **Open Cabotage regime** – European Union passed Act in 1992 with the aim to eliminate restrictions on the freedom to provide maritime transport services within the European Union (EU). The law ensures that, within a given EU country, shipping companies or nationals based in other EU countries have the right to offer maritime transport services (known as maritime cabotage) provided they comply with all the conditions for carrying out cabotage within that country. Shipping companies based in countries outside the EU, but controlled by EU nationals, may also offer such services. The cabotage regime plays a large part in the development of short sea services as most short sea feeder operators charter their vessels rather than own them, to ensure maximum flexibility and ability to respond to market conditions and demand.

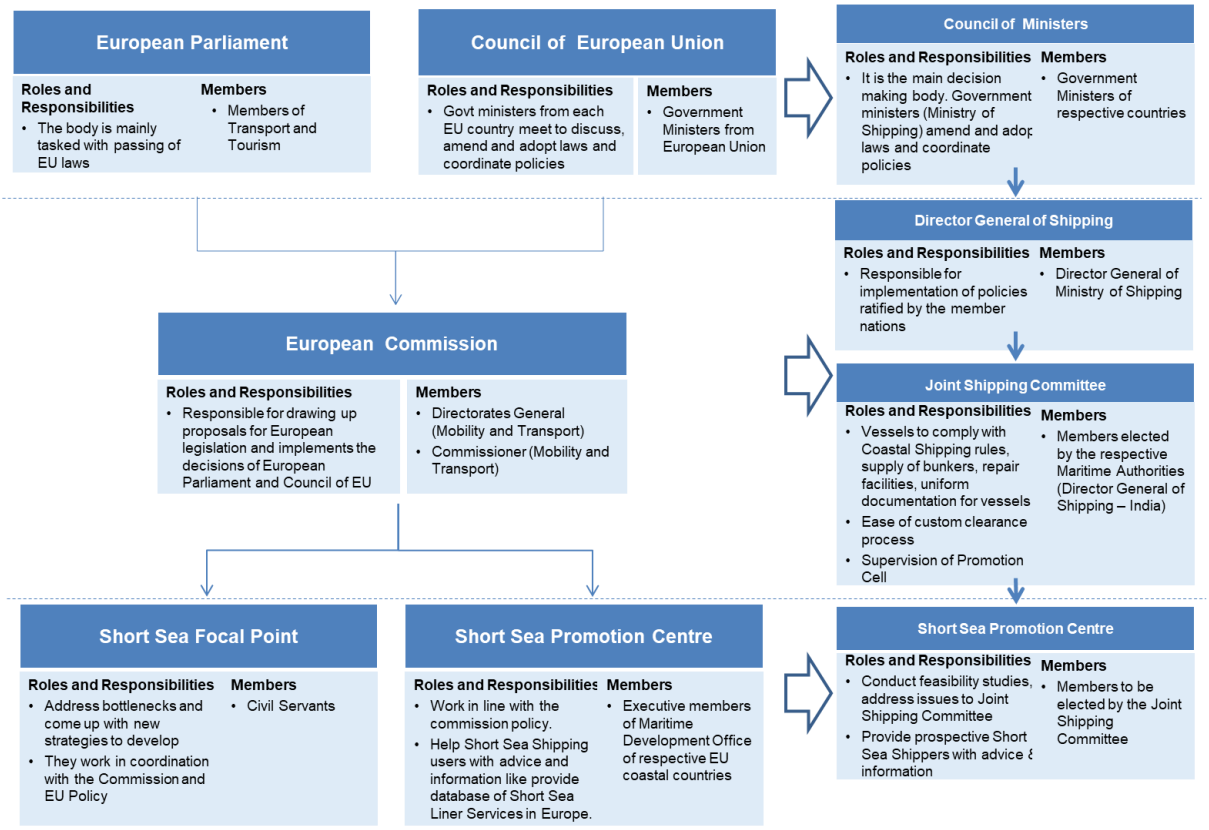
The European Commission has implemented several policies to create a conducive atmosphere for short sea shipping, however, Short Sea Shipping Promotion Centre is important for better on ground visibility and to reach out to the major players. Various incentives like Marco Polo Program and Development of Motorways of the Sea, in addition with Short Sea Promotion Centre play an important role in meeting the objectives of the European Commission to increase short sea shipping.

2.12.4 Suggestions for Short Sea Shipping in Indian Subcontinent

2.12.4.1 Organizational Structure and Responsibilities

Organization structure to execute short sea shipping agreement can be based on the existing structure in the European Union with a council of Ministers, DG Shipping, Joint Shipping Committee and Short Sea Promotion Centre being the like-to-like replacement of their EU counterparts.

Figure 87: Proposed Organization Structure for Short Sea Shipping in Indian Subcontinent



Short Sea Shipping Council

Short sea shipping council shall comprise Minister of Transport of participating nations. The members shall have authority to commit their governments to the actions agreed on in the meetings.

Joint Shipping Committee

The Joint Shipping Committee will be responsible for vessel related regulations, supervise the working of Promotion Centers and ease out the customs and documentation processes. Respective maritime authority or his designated representative, for example, Director General, shall act as the focal point for the execution of the Agreement. Focal point shall have executive responsibility towards implementation of policies ratified by the member nations,

Main functions of the Joint Shipping Committee shall include following.

a) Liaising with partner countries - Members of the Joint Shipping Committee shall liaise with each other to ease out and resolve any issues related to short sea shipping. It shall identify further points of discussions and amendments to the Agreement in order to promote short sea shipping. It shall deliberate on vessel specification, PSC inspections, and manning norms, and forward its recommendation to the Short Sea Shipping Council for any required amendment to the Agreement.

b) Determine norms for vessel certification or exemptions in line with international norms or as prescribed under the Agreement. These norms or exemptions approved by the Joint Shipping Committee shall be recognized by the maritime authorities of the participating nations.

India has ~600 wooden vessels which can be looked at for deployment for the short sea shipping through including the wooden vessels in the vessel certification norms. These vessels are already plying between Gujarat and Middle-East; they require less capital expenditure and also attracts lesser vessel related charges. Allowing wooden vessels in short sea shipping will promote the domestic industry of the country as well.

c) Determine norms with regard to the applicability of the Port State Control (PSC)

d) Determine manning norms for vessels operating on short sea route as per international standards or as decided under the Agreement. Determine norms related to allowing shore leave to crew in ports of other country

e) Evolve uniform documentation for vessels. Since, vessels operating under short sea shipping spend a lot of time at ports, reduction in non-operational time and documentation procedures may have significant reduction in overall operational costs thereby increasing the viability of the short sea movement. It shall work towards creating "one-stop administrative shops" that would further simplify and speed up the formalities relating to the arrival, departure and clearance of ships which is done without compromising safety or security

f) The Joint Shipping Committee shall work with customs in their country to ease out processes for faster vessel operations which shall include setting up of customs stations at or near points of entry or exit in each country

g) Approve norms related to 20 NM limit or any other as decided under the Agreement for short sea shipping

h) Determine addition of new routes and new Ports of Call

i) Monitor draft and navigational aids are maintained and port services are available in line with the Agreement

j) Ensure and identify adequate bunker and repair facilities for vessels plying on short sea route. LNG can be used as an alternative fuel for vessels as fewer polluting substances are emitted. The Joint Shipping Committee can provide incentives for using LNG as a fuel

k) Identify assistance cells to provide necessary facilities to the vessels of other country which may be grounded or otherwise in distress during her voyage in its waterways

l) Approve norms related to the procedures for obtaining permissions to use waterways of the other country

m) Industry liaising and Promotion Cell

In addition to the above discussed main functions, Joint Shipping Committee should also look into the feasibility of allowing domestic vessels to carry coastal cargo via foreign / intermediate ports while having both EXIM & Coastal cargo. Indian vessels carrying both coastal and EXIM goods between Indian ports can be allowed to call at intermediate foreign ports such as Sri Lanka, Bangladesh in between the coastal run and undertake loading/unloading of EXIM cargo at these ports. This will enable maximum utilization of the vessel and will allow vessels to earn in dollar and reduce the interest rate on loans for purchase of vessel.

Short Sea Promotion Centres

Promotion centers shall work towards promotion of short sea shipping and liaise with industry to address its issues related to the short sea shipping movements. It shall also work together with industry to find ways to increase short sea shipping and reduce total logistics costs. It shall maintain and provide a database of short sea liner services, ports of call, tariffs and information on hinterland connectivity. It can provide short sea shippers with assistance and information. The promotion cell can carry out feasibility study for cost effective and environment friendly transit. The team can address the issues that hinders the development of this mode of trade.

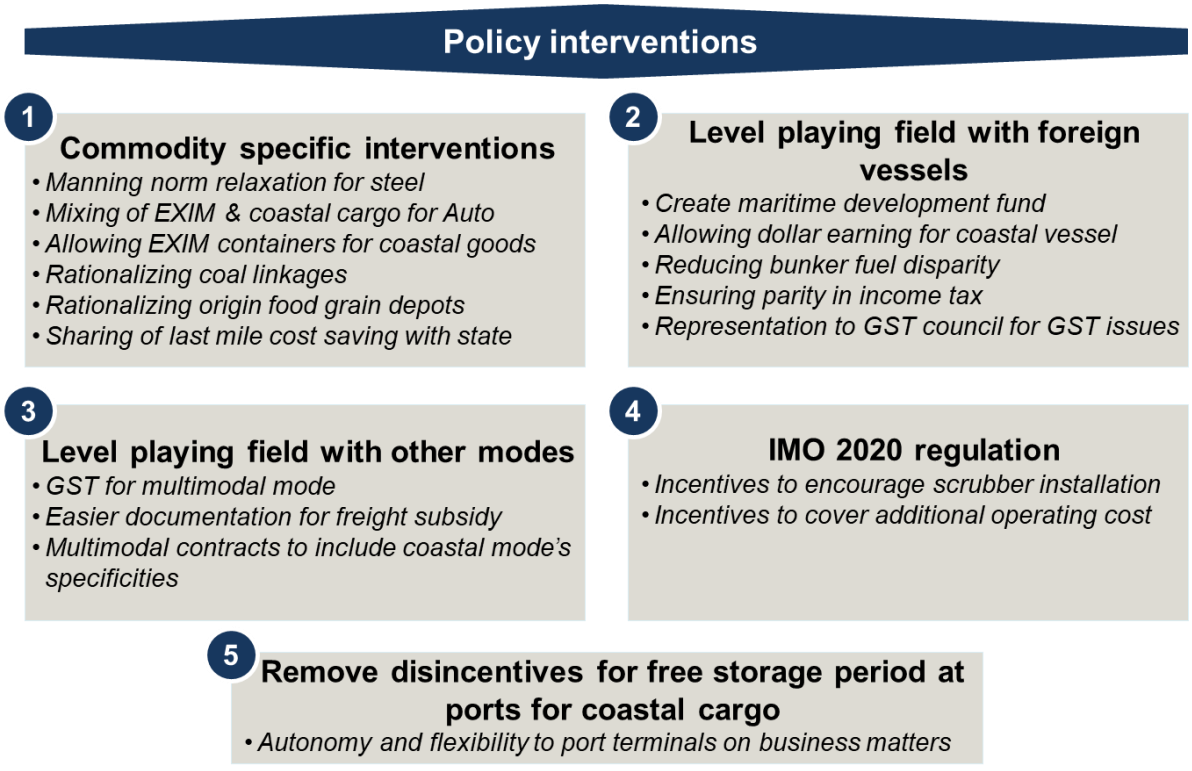
2.12.5 Suggestions in Existing Coastal Shipping Agreement Between India - Bangladesh

Currently third country containers are not allowed to carry goods between the ports in Bangladesh and India under the existing law, which restricts transshipment of inbound and outbound containers from Bangladesh through Indian ports. Coastal Shipping agreement shall be amendment to allow third party containers which will divert transship containers from Chittagong in Bangladesh to Haldia, Krishnapatnam or Visakhapatnam in India thereby saving significant lead time for Bangladeshi export and increasing the transshipment volume of India. Bangladesh bound cargo can be unloaded in Indian Ports and then carried by local vessels from ports in India to Chittagong or Mongla. At present, these containers are being transshipped through Singapore which causes significant delay in transporting materials to markets in Europe and America.

3 Policy level Interventions

In this chapter policy and regulatory issues impacting the coastal shipping have been assessed and interventions are suggested across four key areas.

- **Commodity specific interventions**: As discussed in commodity deep-dives, specific policy level interventions are required to promote coastal shipping for particular commodity groups. The current regulations along-with the proposed interventions have been highlighted in this chapter.
- **Improve availability for coastal trade:** One of the most important measure to improve coastal shipping sector in India is to ensure vessel availability for coastal shipping. The availability can be improved by addressing cost elements related to financing and taxation regime in India, which result in higher costs for Indian vessels. Foreign vessel availability can be improved by relaxation of cabotage laws for specific commodities. Both the options have been highlighted in this chapter, to improve availability of Indian as well as foreign flagged vessels in India.
- **Level playing field with other transport modes**: It has been observed that certain procedures and policies do not account for specificities of coastal mode and lead to non-level playing field for coastal shipping mode as compared to rail and road modes. Such interventions have also been covered in this chapter.
- **IMO 2020 regulation**: With the implementation of IMO 2020 regulations restricting the sulphur content in the shipping fuel, the cost of shipping is expected to increase which would put coastal shipping at a disadvantageous position with respect to road and rail modes. The impact of these regulations on coastal shipping and the interventions needed along with international examples for interventions have also been captured in this chapter.
- **Remove disincentives for free storage period at ports for coastal cargo**: Multiple shipping liners engaged in coastal shipping have expressed requirement of extended free storage period at the port terminals. However, it has been observed that major ports are restricted by TAMP guidelines to provide free storage period beyond the period indicated in the schedule of rates. Additionally, the private terminals in major ports need to share the revenue for storage period with the Government, even if the storage has been provided at discounted rate.



3.1 Commodity Specific Interventions

3.1.1 Relaxation of Cabotage restrictions for Enabling Coastal Movement of Steel Cargo

Under the current cabotage rules, DG Shipping lays down the following manning norms for engaging Indian crew on board foreign ships[42]

– License period is 30-90 days, minimum of 1/3rd crew should be Indian

– License period exceeds 90 days, one half of crew should be Indian

– If license period is not continuous, above conditions will be imposed whenever cumulative period exceeds 30 or 90 days.

– As per this norm, if a foreign vessel undertakes more than 30 days of costal run cumulatively in a year, it needs to employ Indian crew as per the criteria mentioned above. The above regulations have been put in place to protect the interests of Indian flagged vessels and Indian seafarers in cabotage movement. Since hiring fresh crew is an operational challenge in terms of identifying the Indian crew available for the voyage, additional paperwork required and also adds to the costs in terms of repatriation of foreign crew, carrying out medical and insurance of Indian crew, foreign vessel operators are typically not interested in undertaking coastal movement beyond a period of 30 days. While this should benefit the Indian flagged vessels engaged in coastal shipping, in some specific cases such as movement of steel cargo, this regulation is acting as a hindrance for coastal shipping as deploying dedicated coastal vessels with no return cargo comes out economically unviable for steel movement. However, for foreign vessels which bring import cargo and are anyways returning empty, it is possible to provide competitive rates for coastal movement as compared to corresponding rail & road costs. The non-existent coastal movement of steel, especially from production clusters in the East coast to the coastal consumption centres in the West coast is a testimony to the fact that dedicated coastal vessels are not viable. Further, there is non-availability of Supramax vessels in the coastal fleet (except for a few vessels dedicated for coal movement) which are required to make the coastal shipping of steel economically viable. Overall, the regulation has not been able to

Case of coastal movement of steel cargo: Existing manning norms reduce the usability of EXIM vessels for coastal shipment as only 1 coastal voyage per year is possible without changing the ship crew

Due to unavailability of return cargo on key coastal routes, deploying dedicated vessel for coastal movement of steel may not be viable due to empty return cost. For viability of coastal shipping, the steel industry would need to depend on the import vessels calling at East coast ports and returning empty towards West to avoid empty return cost

Table 2: Voyage time for east to west coastal movement of steel

Voyage time	Voyage Days
	loading/unloading of 35000 MT of steel products
Paradip Pre-berthing	1.8
Paradip Port	4.5-7
Extra Paradip (days)	0.25
Paradip-Mumbai (one way movement)	6.7
Mumbai Pre-berthing	0.4
Mumbai Port stay	4.5-7
Extra Mumbai (days)	0.25
TOTAL	18-23 days

Source: Study team analysis

Analysis of voyage time of one way movement from east coast to west coast ranges from 18 to 23 days, limiting the number of coastal voyage of foreign-flag vessels to one in a year under existing norms and regulations. It is to be noted that the vessels which are doing multiple calls at East coast ports in a year are impacted by current manning norms, These vessels constitute ~40% of the total vessel calls at the concerned East coast ports.

[42] Shipping Development Circular No.1 of 2013, dated 18/01/2013

achieve the intended benefits for Indian flagged vessels and seafarers as foreign vessels have not opted to undertake more than 30 days coastal shipping.

Analysis of vessels calling at east coast ports of Paradip and Vishakhapatnam suggests that vessels visiting multiple time to east coast ports contribute 40-45% of the total vessel movement at the ports; relaxing manning norms will allow such vessels to be utilized for coastal shipping

The vessels that are visiting the port multiple times in a year can only be utilized once for coastal movement under current manning norms, impacting the overall vessel availability for coastal movement of steel. Since such vessels contribute 40-45% of the total vessel movement at the ports, relaxing manning norms will allow such vessels to undertake coastal leg on each return journey to western foreign ports in Africa, Middle East, and Europe.

It is recommended that specifically for steel cargo, DG Shipping may look at relaxation of the cabotage regulations so that current manning norms do not remain applicable. This will enable foreign-vessels to undertake coastal voyages on each of their import journey to India, thereby increasing the vessel availability and frequency for coastal movement of steel. However, this relaxation can be granted as a short term measure to promote coastal shipping, in the long term, level playing field needs to be provided to Indian vessels to ensure a competitive and healthy Indian shipping industry.

3.1.2 Allowing Mixing of EXIM and Coastal Cargo on RoRo Vessels

Coastal shipping for automobiles can be made competitive by allowing mixing of coastal and EXIM cargo on international RoRo liners calling at Indian ports

The coastal shipping of automobiles through dedicated coastal RoRo vessels comes out to be economically unviable due to empty return costs for the vessels. Ministry shipping had taken two initiatives[43] in the past three years to promote coastal shipping of automobiles:

a) Relaxation of Cabotage Restriction for special vessels such as RoRo, Hybrid RoRo, Ro Pure Car Carriers, Pure Car and Truck Carriers, LNG Vessels and Over-dimensional or Project Cargo to allow foreign flagged vessels to undertake coastal shipping without requirement of license from DG shipping

b) Discount of 80% for 2 years in vessel related charges and cargo related charges, for coastal transportation of vehicles through RoRo ships

Although the interventions resulted in kick-starting the movement of cars on coastal route from Ennore port to Cochin & Kandla ports in 2016, the movement could not be continued for long mainly due to inherent unviability of a dedicated coastal RoRo vessel.

The other possibility to make the coastal movement of automobiles viable is to use the spare capacity of the RoRo liner vessels calling at multiple Indian ports for EXIM trade. These vessels can carry coastal automobiles without any significant increase in their operating costs as they are already calling at multiple ports on West coast and East coast of India for loading of export automobiles. For example, there were 12 international RoRo vessels in FY18 which called first at Ennore port followed by West Coast ports (Mumbai/Pipavav) for loading of export cars. While leaving from Ennore port, these vessels had more than 60% spare capacity available. However, this capacity could not be utilized for carriage of coastal cars as mixing of coastal and EXIM automobiles is currently not allowed. If mixing of EXIM and coastal automobiles is allowed, these RoRo vessel operators would be in a position to provide most competitive rates to coastal cargo owners to enable shift from Road/Rail modes. While there may be additional concerns of cargo owners (vehicle manufacturers) for shifting to coastal mode, such as additional lead times, need for a 3rd party logistics player to provide door-to-door movement, these concerns can be addressed by the market forces once the movement of coastal cargo in EXIM laden RoRo vessels is allowed.

[43] Ministry of Shipping (MOS) letter No. 16/(88)2016-PD-VII dated 20 September 2016; letter No. SR14020/5/2009-MG/CS-VoI.VII dated 2nd Sep 2015

Customs currently allow loading of non-containerized cargo on vessels[44] if clearly marked "For Coastal Carriage only". However, ambiguity exists whether this clarification is valid for automobiles if vessel already has EXIM automobiles on board. Further, shipping lines and port authorities have highlighted that there is a lack of clarity at customs offices at different ports and in practice mixing of coastal and EXIM cargo is not allowed. If the mixing is already allowed as per the existing rules, necessary clarification needs to be issued specifically for automobiles to all concerned officials to ensure that the order is implemented at all the ports.

3.1.3 Exemption of Customs and Central excise duty on bunker fuel consumed in coastal run of foreign Ro-Ro liners

Coastal movement of automobiles in foreign Ro-Ro vessels can be made more attractive through relaxation of custom and excise duty levy on bunker fuel

At present, coastal movement of automobiles on dedicatedly deployed Indian flagged vessels comes out to be unviable if return trip cargo is not available, However, the foreign Ro-Ro liner vessels calling at multiple Indian Ports can be utilized for carriage of coastal automobiles during their voyage from one Indian port to the other. Under the current guidelines, if a foreign vessel loads coastal automobiles along with the export/import automobiles, custom duty becomes applicable on imported bunker fuel and stores consumed by the vessel during the coastal run. This becomes a disincentive for carriage of coastal cargo as the custom duty is applied on the entire fuel consumed during the coastal run, and not pro-rated as per share of coastal & exim automobiles on-board. In addition, the process of custom duty calculations and payments is not efficient, which discourages shipping liners to load coastal automobiles.

Similar issue was faced by container vessels when carriage of empty containers alongwith exim containers was allowed between two Indian ports. This issue was resolved by Department of Revenue vide Notification No. 31/2014 dated November 11, 2014 by exempting Customs and Excise duty leviable on bunker fuels, namely IFO 180 CST and IFO 380 CST used in Indian flag vessels for transportation of EXIM and empty containers between two ports in India. The exemption was further extended by Department of Revenue vide Notification No. 46/2015 dated September 17, 2015 to Indian flag ships carrying a mix of EXIM, empty and domestic containers[45].

It is recommended that customs and excise duty on imported fuel may also be exempted for Ro-Ro vessels carrying a mix of coastal and exim automobiles during coastal run in India. Since, Ro-Ro liner vessels are specialized vessels and there is limited availability of Indian flagged Ro-Ro vessels to service coastal and exim automobile transportation demand of Indian automobile manufacturers, the proposed relaxation may be extended to both Indian flagged and foreign flagged Ro-Ro vessels.

3.1.4 Allow Use of EXIM Containers for Carriage of Coastal Cargo

Cost of repositioning empty domestic containers can be reduced considerably by allowing use of EXIM containers for domestic use

High empty container repositioning cost is one of the key issues in coastal shipping of container cargo impacting commodities such as foodgrain, fertilizer, cotton, or tiles. Because of limited availability of domestic containers at origin location and return cargo on most of the coastal shipping routes, logistics players need to reposition the empty containers to load port and in certain cases to cargo origin location, increasing the logistics cost of coastal shipping of container cargo.

Since there is a higher volume of EXIM containerized cargo from different parts of country than domestic containerized cargo, it becomes cheaper and more time efficient to reposition an EXIM container vis-a-vis a domestic container. Once coastal leg is complete, the EXIM containers can be repositioned to

[44] Circular 14/2016-Cus dated 27-04-2016
[45] Department of Revenue vide Notification No. 31/2014 dated November 11, 2014 and Notification No. 46/2015 dated September 17, 2015

nearby ports/ICD for onward export, saving the cost of repositioning empty containers back to origin location.

Customs had provided a temporary permission to - "use the imported containers for carrying domestic cargo during the stipulated period of 6 months or the extended period as may be allowed, pending re-export of the same[46]". While the permission may still be in effect, logistics players and port trust highlighted that authorities and logistics players are not aware of this circular, and in-practice the use of EXIM container for carrying domestic cargo is not allowed.

In view of promoting coastal shipping, customs needs to consider allowing the use of EXIM containers for carrying domestic cargo. If the permission granted earlier is still in effect, necessary clarification needs to be issued to all the concerned personnel informing them to allow such use of EXIM containers and the bond submitted by shipping line should be worded accordingly. This should also cover movement of containers on short sea shipping routes covering neighbouring countries of India.

3.1.5 Rationalization of Coal Mine Linkages with Power Plants

Any new assessment relooking at rationalization of linkages should take into account alternate modes of coastal shipping and inland waterway movement

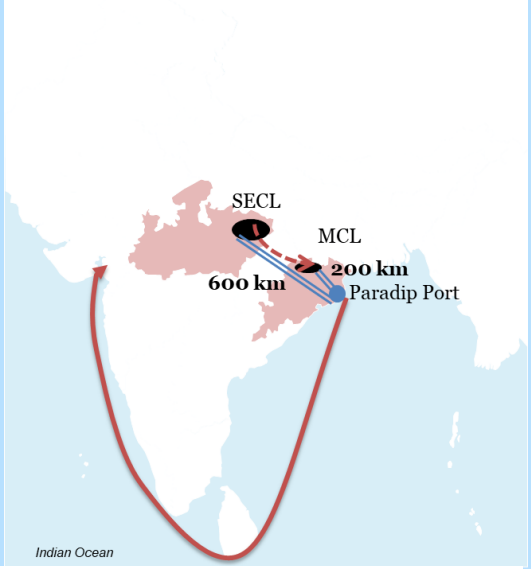
Historically, railway has been the primary mode of transport for movement of coal from mines to power plants. As a result, rationalization of coal linkages from logistics perspective have been done with a view to lower the railway freight. However, with government focusing on decongesting the existing rail/road mode by promoting use of coastal shipping/inland waterway which is a fuel efficient, cost effective and environmental friendly mode of transport, there is a need to re-look at existing coal linkages of coast based power plants. Rationalizing coal linkages based on multimodal movement involving coastal shipping/inland waterway can further reduce logistics cost for the power plants.

Changing linkages from SECL to MCL for west coast plants can reduce the first mile distance to about 200 km, making the coastal shipping cost lower than current rail cost

Certain thermal power plants located in Gujarat and Maharashtra have existing linkages with SECL which is about 600 km from Paradip port. Shifting the linkage from SECL to MCL will reduce the first mile distance to 200 km from mine to load port and thereby reducing the total cost of coastal shipping lower than current rail cost from SECL.

Total end-to-end cost of coastal shipping for movement from SECL to Wanakbori power plant (one of the power plants of Gujarat Urja Vikas Nigam Limited) is ~INR 550 per ton higher than the direct rail cost from SECL to the power plant. However, if the linkage were to change to MCL, coastal shipping cost from MCL to power plant becomes cheaper by ~INR 200 per ton than the existing rail cost from SECL to the power plant. Similarly other Gujarat/Maharashtra based power plants Gandhinagar, Ukai, Dhanau that have SECL linkages can be evaluated for shift to MCL by adopting rail-sea-rail route.

Figure 88: Coal linkage rationalization



Source: Study team analysis

Ministry of Coal while relooking at rationalization of linkages should take into account alternate modes of coastal shipping and inland waterway movement. Similarly, while evaluating opportunities and technical feasibility of swapping domestic coal for imported coal, logistics cost of multimodal coastal

[46] Letter F. No. 450/69/2000-Cus. IV, dated 30-10-2001

shipping/inland waterway movement should also be considered in order to evaluate most efficient alternative for logistics movement.

3.1.6 Rationalization of Origin Foodgrain Depots for Coastal Movement

Typically the distance to container depots from current originating grain depots (that serve coastal districts) ranges from 50-100 km compared with distance to rail goods shed which ranges from ~0-5 km, increasing the first mile cost of coastal movement. Realigning dispatches for coastal districts with grain depots closer to ICDs can reduce first miles costs. The study assessed ICDs in Punjab and Haryana, along with the FCI depots near them. The identified FCI depots can be utilized by FCI to dispatch foodgrains to Karnataka, Kerala and Tamil Nadu through coastal route via Gujarat.

Most of the FCI depots located along the ICDs in Punjab and Haryana have surplus foodgrain stock[47] and can be utilized for coastal shipping movement of foodgrains. A list of FCI depots closer to ICDs is provided in annexure 7.13.1.

3.1.7 Sharing of Last Mile Cost Saving from Port-based Foodgrain Warehouses with State

For port-based warehouse to serve far away revenue districts, both Ministry of Food and Public Distribution and state government should be taken on board

Developing port-based warehouse would reduce the inefficiency in the last mile transportation of foodgrain from unload port to end consumers (PDS) and would thereby reduce the overall logistics cost. While such arrangement of warehouse near the port instead of at the inland location would lower the overall logistics cost, the cost incurred by the state would increase. Moreover, FCI current policy restricts movement of foodgrain from one revenue district to another. This policy needs to be re-looked to allow movement to multiple coastal districts from a port-based warehouse.

In the current arrangement, FCI bears transportation costs till movement to destination FCI depot, which is typically located within the districts it is serving. Whereas, the responsibility of distribution of foodgrains from depot to end consumer lies with state government.

With port based foodgrain warehouse, FCI's movement cost will reduce more than the increase in cost of state government, resulting in reduction overall logistics cost in the system. The state would have to procure foodgrains from port-based warehouse which may be located farther from district instead of FCI depots located within the district, increasing the procurement cost for state. Therefore, to lower the cost burden on state government and encourage them to adopt port-based warehouse set-up to serve coastal districts, a mechanism needs to be developed by Ministry of Food and Public Distribution/FCI to share the cost saving from port based warehouse with the state. The table below highlights the extent of cost saving sharing would be required for serving district located 150- 200 km from a port.

Table 3: Cost saving for FCI and State from a port based foodgrain warehouse

Cost incurred by	Transportation leg	Distance	Cost (INR/MT)
Current system with FCI depots located at district locations			
FCI share	Unload port to FCI depot located inland	200 km	800
State share	FCI depot to end consumer (PDS shops)	50 km	300
	Total last mile cost		**1100**
Proposed port based warehouse system			
FCI share	Unload port to port based warehouse	5-10 km	50
State share	Port based warehouse to end consumer (PDS shops)	150-250 km	850
	Total last mile cost		**900**
Cost saving in logistics cost			*200*

[47] Interactions with FCI

Cost saving for FCI	*750*
Cost saving for State (negative saving)	*-550*

Source: Study team analysis

3.2 Improve Vessel Availability for Coastal Trade

One of the most important measure to improve coastal shipping sector in India is to ensure vessel availability for coastal shipping. The vessel availability of Indian flagged vessels can be ensured by addressing the cost elements related to financing and taxation regime in India, which are leading to high costs as compared to foreign-flagged vessels. The availability of foreign-flagged vessels can be ensured by addressing the specific cases for cabotage relaxation, especially for vessel types which are not available in Indian coastal fleet. The objective should be to ensure the availability of most cost-competitive coastal shipping solutions, either through Indian flagged fleet or foreign-flagged vessels so that logistics costs are reduced for the user industries.

3.2.1 Option 1: Addressing high cost elements impacting Indian-flagged vessels

Ministry of Shipping has undertaken several initiatives in the past years to promote coastal shipping. However, the size of the Indian shipping fleet in the last few years has not grown in line with the growth in coastal cargo. Having a level playing field for Indian & foreign flagged vessels will create opportunities for more Indian flagged vessel owners in the market, increasing availability of the vessels for coastal trade.

As on October, 2018 the total tonnage for Indian flagged vessels stands at ~19.39 million DWT. Only 8% (1.63 million DWT) of the tonnage capacity is being used for domestic trade. However, in terms of number of Indian flagged vessels, the share of coastal trade is about 67% of a total of 1,397 vessels, indicating that the coastal trade is served largely by the smaller vessels such as tugs and barges. The tonnage capacity in terms of large and efficient vessels engaged in the coastal trade

At present, there are many topical issues faced by the Indian flag vessels as compared to their foreign counterparts. Despite the cabotage rule and the provision of Right of First Refusal (RoFR) Indian flag owners are not able to offer competitive bids and lose business to foreign vessels, due to which new Indian vessels are not coming in the market, therefore restricting growth of the fleet for coastal trade.

One of the reasons for uncompetitive bids is due to unavailability of return cargo in most coastal routes, deploying a dedicated coastal vessel may not be a viable option, and therefore, foreign vessels are being utilized on such routes. Going forward, port-led development would create a viable circuits on coastal routes and to adequately serve the service requirements of such movements, a dedicated and scheduled services would be required, necessitating the need for developing the coastal fleet.

Another reason for uncompetitive bids by Indian flag owners, even on the routes where viable coastal circuits are present, is the lack of level playing field with foreign vessels. The key issues faced by Indian flag owners are mainly related to ship financing and taxation. There is a disparity in ship financing options available for an Indian flag vessel and a foreign flag vessel (both on coastal run in India); and in the direct and indirect taxation. These disparities increases the operating costs for Indian flags.

Pricing/ton charged to customer ($/ton) to render same Equity IRR for ship owner is ~20%[48] higher for Indian flagged vessel

Issue	Details
Short tenure loan	Indian vessels can avail debt for shorter tenure (6-8yrs) as against foreign vessels (~15yrs). Though some loans can be re-financed, the process and requirements

[48] Approach used for estimating the difference in bidding rate has been provided in *annexure 0*

set out by Indian lenders make it difficult even for large shipping companies to get refinancing. Shorter repayment period leads to increased cash depletion.

High interest rates

The interest rate in India on purchase of vessel (12–14%) than that of other countries (5-6%). Even on ECBs interest cost for Indian vessel owner comes out to higher owing to hedging costs.

Indian flag owners on coastal voyage mostly have rupee earnings. Thus, these shipping companies will need to hedge if they take a foreign currency loan. This indirectly increases the interest cost to 10–11%, putting Indian flag vessels at a disadvantage to foreign flags, which can avail shipping finance at ~5%.

Costlier bunker fuel in India

Higher pay-out due to higher base prices of bunker in India: Indian flags on coastal run have access to higher priced bunker at Indian ports. Foreign flag vessels on a coastal voyage in India use bunker purchased from foreign ports at lower prices. Even after paying custom duties on the quantum of bunker consumed on coastal voyage in India (and the similar rate of GST charged) the foreign flag owners effectively pay less for bunker consumed, resulting in lower operations cost.

Table 4: Fuel cost comparison India and Singapore

Indian flagged ship buying IFO in India	
Indian Rate	538
GST @ 5%	26.9
Total	565
Cost of IFO fuel in India is 565 USD/MT, as compared to 498 USD/MT in Singapore, making it costlier by ~13-15%	

Foreign flagged ship buying IFO outside		
Rate	450	
Customs duty @5%	22.5	5% @ Indian price
SWC @10% of duty	2.3	
Net total	474.8	
GST @5%	23.7	5% @ (Indian price + Custom duty)
Total	498	

Source: Industry interactions, study team analysis

Crew cost

Since there is a shortage of Indian seafarers and the seafarers demand compensation at par to foreign companies, Indian coastal shipping companies have to absorb the taxation cost. Seafarers on Indian flag and on coastal run are taxed under Indian income tax rules (if seafarer on Indian flag spends more than 183 days). However, in India, seafarers on a foreign flag vessel below a prescribed limit of 90 days are not considered residents and hence similar taxation is not applicable on seafarers. Thus, Indian flag vessel owners have to shell the extra amount equivalent to the tax deducted to maintain post-tax parity between seafarers on Indian flag and foreign flag vessels. This increases the net salary pay-out by ~35% for Indian flag vessel owners.

Various maritime nations either charge taxes to both their national flag and foreign flag crew or provide relief to national flag. In this way, parity is ensured between domestic and foreign vessels. Refer to annexure 7.13.2 for details of direct tax norms for resident and non-resident Indian sea farers

GST related

5% IGST applicability on the import of vessels under Indian flag:

Vessels entering Indian waters for the first time (imported into India) under the Indian flag need to pay 5% IGST on the cost of the vessel. However, vessels entering Indian waters for the first time (imported into India) under foreign flag are not liable to pay such 5% IGST on the cost of the vessel. Due to this, the Indian company has to raise additional equity to the extent of the IGST. No loan is available for payment of IGST, increasing the equity contribution and the cash outflow of the Indian company.

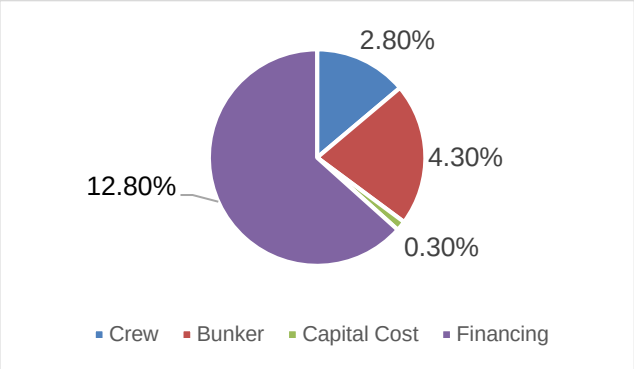
As ships are capital intensive, offsetting of IGST tax credit on revenue earned takes multiple years. Further, companies that are engaged in coastal as well as international shipping are unable to offset the tax credit.

Place-of-supply rules applicability for taking input credit for GST:

	Inability to claim tax offset if a firm is not registered in state where bunker supply given is a key issue. Shipping companies procure fuel, paints and spares at various ports. While ports where the items are procured is a place of delivery, the place of consumption is the place in which the principal place of business of the shipping company is situated. For instance, if a coastal shipping company takes bunkers, paints, spares or lubes at Chennai port for a voyage between from Mumbai and Kolkata in India, no input credit is available on GST paid on such purchases.
Other issues	**Stringent norms for longer training of cadets, adding to the cost to vessel owners:** The pre sea training period for Indian sea farers is stringent even compared with some of the whitelist countries such as UK. Indian norms prescribe 18 months training period for pre-sea cadets, while countries such as UK prescribe 12 months training period. The additional training period adds to the cost of Indian shipping companies without any differential advantage.

Due to above mentioned issues, in order to maintain same Equity IRR for Indian flag owner , an Indian flag owner needs to charge ~20% higher bidding rate. Difference in financing, crew costs & bunker account for almost ~95% of the increase in costs, resulting in increase in per ton bidding rate

Figure 89: Cost heads contributing to 20% higher bid rate for Indian flagged vessels



Source: Study team analysis

Interventions to rationalize additional costs borne by Indian flagged vessels have been explored to help create a level playing field and increase the competitiveness of the Indian flag

a) Developing a maritime development fund to enhance the credit availability at favourable terms in the maritime sector

Internationally, foreign currency bonds fund ship acquisition, whereas in India, the same is done through banks. As a result, foreign vessels avail a loan for 15 years, while the Indian vessel owners get a shorter loan duration of 6-8 years. Moreover, because of higher risk perception of sector by banks, players have to provide a collateral over and above the vessel. This discourages small ship owners to purchase a vessel. To provide longer tenor funds at a lower cost of borrowing, a specialised maritime development fund is required which would provide credit in favourable terms depending on the requirement of sector.

The fund could be initiated by government with the participation from multilateral/bilateral agencies and large financial institutions which lowers the cost of borrowing funds and allows disbursement at lower interest rate. Internationally similar maritime development fund have been set up to support maritime industries.

Malaysia has a 0.74 billion USD Maritime Development Fund to fund purchase of vessel, enabling operators to grow their fleet size

Fund Initiated by - Bank Pembangunan Malaysia Berhad, a wholly owned development financial institution by the Malaysian Government through Ministry of Finance in 2017

Purpose: To finance the acquisition of vessels; construction of shipyard infrastructure (including land and related machinery and equipment); construction of port; finance oil and gas related activities and services; finance working capital requirements.

Target group: Shipping, shipyard companies, companies involved in marine and oil and gas services

Loan tenure and interest rate: 12 years, 2%-6%, up to 90% loan to value ratio

Security: Bank guarantee, shareholder guarantee, mortgage on other assets, debenture on fixed/floating assets, assignment of contracts

Similarly, Denmark has established Danish Maritime Fund to strengthen and develop the Danish shipping and shipbuilding industry

b) Relaxation on Indian vessel to carry coastal cargo via foreign port/intermediate port while carrying both EXIM and Coastal cargo

Typical interest rate for Indian flag vessels is 12-14% as compared to 5-6% outside India. Borrowing cost for external commercial borrowings (ECBs) is also higher owing to hedging costs. The difference in interest cost can be partly reduced by earning in dollar amount and taking loan corresponding to that earnings. With 20% USD earning ~45% loan can be taken in USD, reducing the average interest rate to ~8.8%. For dollar earnings, Indian flag vessels should be allowed to carry both EXIM and coastal cargo via foreign ports and allow loading/unloading of EXIM cargo at those ports during coastal run.

Currently, customs permits Indian flag foreign going vessels operating in routes covering more than one Indian port to a port outside India and vice versa, to carry coastal containers along with EXIM cargo only between two Indian ports[49]. Therefore the Indian flag vessel is required to discharge all its coastal cargo at the last Indian port before proceeding to a foreign port. This inhibits the ability of Indian shipping companies to use their vessels efficiently and derive maximum utilization of the slots available on the vessel.

Customs should extend the scope of above mentioned circular to beyond containerized cargo and allow mixing of other commodities where coastal and EXIM goods can be segregated and marked for identification. Additionally, customs should permit Indian vessels carrying both coastal and EXIM goods between Indian ports to call at intermediate foreign ports such as Sri Lanka, Bangladesh in between the coastal run and undertake loading/unloading of EXIM cargo at these ports.

c) Reducing disparity in bunker fuel cost from Indian ports and foreign ports

For IFO 380, Indian flagged vessels plying only between Indian ports would need to pay ~14-15% more than foreign counterparts. This is primarily due to higher base price of bunker fuel at Indian ports vis-à-vis foreign ports. The difference prevails even after applying relevant taxes to domestic and foreign bunker. With the development of short sea shipping, the coastal vessels would be able to take bunker from neighbouring country ports. This might reduce the differential of bunker costs depending upon the IFO price available at neighbouring ports as compared to other international ports where foreign flagged vessels call as a part of their EXIM run. Further, the export price of IFO from Indian Oil companies should be looked at to understand the additional cost elements applicable for domestic sale leading to higher price. This might result in reducing the IFO price for domestic sale as well by ensuring parity with export price.

d) Proposing a representation before GST council to bring Indian and foreign vessels at equal footing

Vessels imported in India under Indian flag have to pay 5% IGST on capital cost of the ship, which takes a long time to offset, impacting the cash flow of Indian shipping lines. Furthermore, GST on operating expenses of the ship can only be claimed if the firm is registered in the state where expense has been made. To reduce the impact of IGST and ease in claiming of GST for operating expenses, representation has to be proposed to GST council on “Inverted Duty Structure” as in essence owner is unable to claim complete input credit and review the “Place of Supply” rule.

The cumulative effect of all these interventions/ recommendations implemented in conjunction will help in bringing parity in bidding rate with foreign flag vessels by reducing the costs by ~15%.

[49] Circular No.15/2002 dated 25th February 2002

3.2.2 Option 2: Relaxation of cabotage law

Section 406 & 407 of Indian Merchant Shipping Act, 1958 deals with Indian ships and chartered ships to be licensed and licensing of ships for coastal trade, respectively.

Section 407, Merchant Shipping Act, 1958: Licensing of ships for coastal trade in India

1. No ship other than an Indian ship or a ship chartered by a citizen of India 1 shall engage in the coasting trade of India except under a license granted by the Director General under this section.
2. A license granted under this section may be for a specified period or voyage and shall be subject to such conditions as may be specified by the Director General.
3. The Central Government may, by general or special order, direct that the provisions of sub-section (1) shall not apply in respect of any part of the coasting trade of India or shall apply subject to such conditions and restrictions as may be specified in the order.

Some of the commodities like Steel are dependent on foreign-flagged vessels calling at multiple ports in India, as Indian flagged vessels are costlier due to empty return costs involved. In such cases, existing cabotage laws restrict the availability of vessels for coastal movement. Therefore, licensing laws can be relaxed by the central government, as mentioned in sub-section 3 of Section 407 of the Act, thereby, promoting more foreign-flagged vessels to enter the market in India and improve vessel availability for coastal shipping.

Impact of above interventions on coastal shipping cost

The coastal shipping costs represented in commodity deep-dives can further be reduced by ~13 % - 22 % if the above interventions related to cost competitiveness of Indian-flagged vessels and availability of foreign-flagged vessels are implemented. The commodity-wise reduction in coastal costs is presented below:

Table 5: Impact on coastal shipment costs post cabotage relaxation / level playing field for Indian flagged vessels

Commodity	Vessel considered (Indian / foreign flagged)	Sample Route	Present estimated Coastal Cost		Cost post cabotage relaxation or level playing field for Indian vessels		Decrease in voyage cost
			Voyage Cost	Total Cost	Voyage Cost	Total Cost	
Steel	Foreign	Jamshedpur – Thane	850	3,296	*Same as before*	*Same as before*	*Not Applicable*
Food grain	Indian	Punjab – Hassan	493	3,886	406	3,780	18%
Coal	Foreign	Paradip – Hazira	511	2,109	*Same as before*	*Same as before*	*Not Applicable*
Fertilizer	Indian	Kakinada – Hooghly	549	2,020	480	1,941	13%
Cement	Indian	Kadapa – Jajpur	689	2,169	537	2,005	22%
Cotton	Indian	Rajkot – Tirupur	678	4,116	558	3,974	18%

Automobile	Foreign	Ennore – Kandla	7,684	15,534	*Same as before*	*Same as before*	*Not Applicable*
Salt	Indian	Jamnagar – Coimbatore	1,342	3,096	1,,113	2,848	17%

For commodities such as **automobiles** and **steel**, total logistics cost of movement already include chartering costs of foreign flagged vessels, as Indian vessels are unviable vis-à-vis rail and road costs due to empty return costs involved.

Although relaxing of license requirement will improve availability of the foreign flagged vessels for coastal trade in India, it might lead to further depletion of Indian fleet. Therefore, interventions are also needed to improve competitiveness of Indian vessels.

3.3 Level Playing Field with Other Modes

Coastal shipping mode is the most environment friendly and safer mode of transportation as compared to Railways and Road mode.

Table 6: Comparison of External Cost of Modes of Transport

Factors considered	**Rates Considered (Rs./TKm)**			**Source**
	Waterways	**Road**	**Rail**	
Air Pollution	0.03	0.202	0.0366	Planning Commission : TTS Study
Noise Pollution	Negligible	0.0032	0.0012	Permanent International Association of Navigation Congresses (PIANC)
Soil and Water Pollution	Negligible	0.005	NIL	PIANC
Accident cost	~0	0.062	0.001	Planning Commission : TTS Study

However, the externalities caused by other modes (such as high pollution, congestion) and accident costs are often not considered by stakeholders while making a modal choice. The direct costs (tariffs) and time sensitivity become the major decision-making criteria. This puts the coastal mode at a disadvantageous position as the positive impact of the mode is not translated into a cost differential as compared to other modes. Addressing this issue may require a larger discussion with the stakeholders including discussions between the concerned Ministries. Ministry of Shipping had proposed a direct modal shift incentive scheme[50] in 2016 which was not flagged off. It may be looked at to re-launch the scheme to ensure faster realization of coastal potential. This study, however, focuses on finding solutions which can increase the movement of coastal shipping without providing any additional subsidies. A few such intervention areas are highlighted below, which are currently leading to non-preference of coastal mode over Rail/road modes.

High GST rate in multimodal transportation

GST rate on multimodal transportation is 12%[51] while that on single mode of transport like road, rail or waterways is 5%. As coastal movement is mostly a multimodal movement, effectively, GST rate on railways is 5%, while for coastal movement, it becomes 12%. Multimodal GST rate becomes a cost in case of products where final product GST is low such as in Fertilizer where GST rate is 5%. Fertilizer players already have a surplus unutilized input tax credit because some of the inputs for fertilizer industry attracts 18% GST whereas the final output is taxed at lower 5% GST. The additional GST of 7% incurred by fertilizer players on multimodal transportation becomes an extra cost for the players, discouraging use of coastal shipping.

[50] http://pib.nic.in/newsite/PrintRelease.aspx?relid=137707
[51] IGST Notification No. 14/2018 dated 26/07/2018

Therefore, to ensure coastal shipping is not at a disadvantage, representation needs to be sent to GST council to reduce the GST on multimodal transportation of fertilizers to 5% as in essence players are unable to claim complete input credit due to higher input taxes.

Documentation for freight subsidy for fertilizer

Fertilizer has primarily been transported using railways and roads. The government recently extended the freight subsidy to multimodal movement involving coastal and inland waterways. Following this initiative, players such as IFFCO started using coastal shipping for movement of fertilizer. However, the process related to reimbursement of freight such as freight subsidy documentation is not streamlined for coastal movement. Currently for multimodal coastal movement, players need to prepare multiple bills to show costs for movement from plant up to destination rake point. Also, there is no mechanism of loading coastal mode bills on Department of Fertilizer portal, leading to delay in reimbursement of coastal shipping bills. The delay is reimbursement process discouraging small players to utilize coastal mode for movement of fertilizer.

Standard procedure for filling of reimbursement for all modes and fast tracking of reimbursement submission mechanism for coastal shipping in online system are required to encourage players to adopt coastal shipping mode. Standardized subsidy for players, independent of mode of transportation is being discussed with Department of Fertilizer, however, until the same is approved and implemented, online system should be made hassle free for coastal / multi-modal mode.

Multimodal contracts of PSU

Existing multimodal coastal shipping contracts of PSUs do not account for specificities of coastal shipping. The review of key clauses of recent PSU contracts for coastal shipping highlights issues detrimental to coastal shipping:

- **No minimum guarantee of cargo:** The operator deploys the vessel based on indicative volume provided in the contract. However, there are cases when actual volume provided was ~40% of indicative volume. If the volume of cargo is reduced significantly, it will lead to loss of the expected revenue and vessel will not be able to recover its fixed cost, impacting the viability of coastal movement.

- **Fuel price variation:** While the contracts provide an escalation clause for diesel, there is no such clause for the bunker fuel (IFO). As a result of this, while the road movement is protected against increase in fuel costs, there is no cover for vessels. Therefore, either the operator increases the contract price to factor in the risk of fuel price escalation or suffer losses in case of such increases.

- **Fixed transit period of delivering the cargo:** Fixed period starts when PSU issues stock transfer receipts. However, fixed period does not take into consideration the time required for vessel deployment. While truck or rake can be arranged at short notice, vessel takes time to be deployed. The delay in cargo delivery leads to penalty, impacting the profitability of transporter

- **Employer can alter, suspend or cancel the contract without obligation:** There is an uncertainty of project duration and vessel operators have to bear the costs of mobilisation / demobilisation. In case of coastal movement, the vessel mobilisation cost is significantly higher than other modes of transportation.

It needs to be ensured that the future contracts for multimodal transportation include the conditions which are conducive for the coastal shipping, adequately sharing risk between shipping lines and cargo owners. The public sector cargo owners should develop model-contracts through detailed discussions with the shipping lines and consequent review from respective ministries. It may be expected that private players would follow similar conditions once model contracts are finalized by the public sector units.

3.4 Impact of IMO 2020 Regulation and Interventions

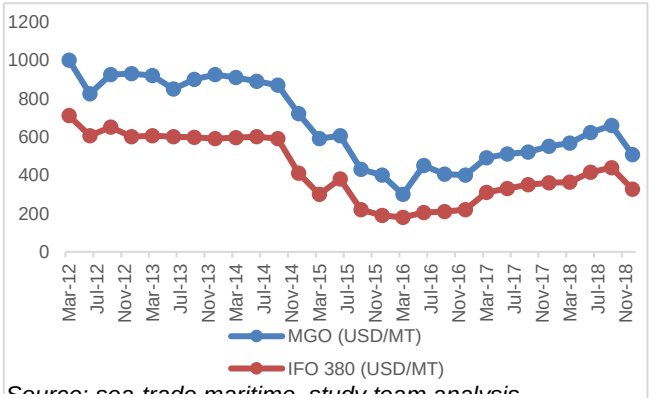
IMO 2020 regulation[52] will enforce ship operators to use 0.5% sulphur content fuel. Traditionally, Heavy Fuel Oil (HFO), a high sulphur content fuel (3.5%), is used to power vessels. The use of HFO resulted in emissions of harmful gases to the environment. IMO regulation will enforce ship owners to switch to costlier alternative such as marine gas oil (MGO) or ultra-low sulphur fuel oil (UFSO), increasing the operating cost of vessel and thereby reduce the cost competiveness of coastal mode vis-à-vis other transport modes.

EXIM shipping can pass on the increased operating costs to shipper; however, since coastal shipping is competing with other transport modes, passing increased operating cost may reduce the cost competiveness of coastal mode

Traditionally, the differential between cost of IFO and MGO has been ~USD 200/MT, with MGO contributing only ~15% of the shipping fuel share.

Increase in bunker costs by USD 200 per ton will increase the coastal shipping costs by 50 – 150 INR per ton, depending on the voyage days and vessel type. This increase in shipping costs will render some of O-D pairs unviable, reducing the competitiveness of coastal shipping vis-à-vis other transport modes which are not impacted by IMO regulations.

Figure 90: Fuel price trend (IFO and MGO)



Source: sea-trade-maritime, study team analysis

It is expected that with increase in supply of MGO/USFO post IMO 2020 regulations, the price gap between IFO and MGO may reduce. Moreover, availability of low sulphur fuel needs to be ensured at ports in India. A clarity on the availability and pricing of LSFO on Indian ports needs to be obtained from country's leading fuel suppliers such as IOCL and BPCL.

Figure 91: Impact of increase in price on certain key O-D pairs

Commodity	Cost saving with IFO	Cost saving with current	Cost saving post fuel price increase	Increase in coastal cost
Steel	Jamshedpur, Jharkhand – Thane, Maharashtra	353	239	114
	Durgapur, WB- Ahmedabad, Gujarat	77	-56	133
Cement	YSR Kadapa, AP – Jajpur, Odisha	278	217	61
	Nalgonda, AP – Hooghly, WB	614	557	57
Food grain	Ludhiana, Punjab - Kozhikode, Kerala	89	-14	103
	Vizianagaram, Andhra Pradesh - Kozhikode, Kerala	366	274	92

Study team analysis

An alternative to use the costlier bunker is to install abatement technology such as scrubbers or using LNG as fuel

Scrubbers is an equipment fitted in vessel exhaust system to prevent emission of harmful gases. Scrubbers allow vessel owners to use high sulphur fuel while meeting the emission restrictions of IMO and thereby prevent itself from incurring additional operating cost. However, there are certain challenges that are deterring vessel owners to install abatement technology.

- High capital cost of scrubber/LNG conversion: Scrubber equipment alone costs USD 1-7 million**.** Cost of installation, retrofitting costs, maintenance are additional.
- Scrubber is a bulky equipment. Retrofitting would require modification to ship designs, resulting in reduction in space for cargo
- Low availability of LNG fuelling stations

It is unlikely that an older vessel may opt for scrubber due to technical challenges and high equipment and additional retrofitting cost, which together is as high as cost of vessel itself. New vessels can be installed with scrubbers which would save the retrofitting cost and modification in existing ship design. Alternatively, use of LNG vessels can be encouraged by ensuring availability of LNG fuelling stations.

[52] http://www.imo.org/en/mediacentre/hottopics/pages/sulphur-2020.aspx

Interventions are required to sustain cost competiveness of coastal movement post IMO regulation

a) Support the retrofitting of scrubbers on existing vessels or support new vessels to have LNG fueling or scrubber technology installed by providing incentives

- Maritime Development Fund, discussed earlier, could be used to provide low interest long term loan for purchase of LNG vessel or vessels with scrubber technology installed or for retrofitting of scrubbers
- Additionally, rebate on tonnage tax can be considered as provided by countries such as Singapore

Countries such as Singapore are providing incentives for fleet modernization

- 20% rebate on annual tonnage tax if ships adopt scrubber technology or adopt energy efficient ship designs exceeding IMO's Energy Efficiency Design Index (EEDI); 50% rebate on tonnage tax if adopted both
- 50% rebate on tonnage tax if ships adopt LNG as an alternative arrangement to fuel oil

3.5 Remove disincentives for offering free storage period at port for coastal cargo

The shipping liners engaged in coastal shipping of containers have expressed requirement of extended free storage period at the port terminals. While the EXIM cargo is usual moved to CFS/ICDs for clearances and storage, usage of such facilities is likely to increase handling time and costs for coastal containers. Since the total logistics cost for coastal cargo needs to be competitive as compared to corresponding rail or road costs, multiple handlings for taking the cargo to another storage facility need to be avoided.

To assess the shipping liners' indicated preference of increase in free storage period, a sample assessment of container dwell time at Kandla port's container terminal, which is a key terminal for coastal container movement, was analysed. As seen in tables below the average dwell time for coastal containers has been around 5-7 days which is well above the free period time of 2-3 days.

Table 7: Average Dwell Time at Kandla Port Terminal (in days)

Category	FY 18	FY 19
Coastal – Import	4.7	6.9
Coastal – Export	5.0	5.0
EXIM – Import	2.5	3.0
EXIM – Export	5.0	5.0

Source: International Cargo Terminals & Infrastructure Pvt Ltd

Table 8: Dwell Time Charges at Kandla Port Terminal - For Import & Export Containers (in INR per TEU per day)

Time	Foreign – going	Coastal
First 2 days (Import) 3 days (Export)	Free	Free
3 - 6 days(I)/ 4-6 days (Export)	515	515

7 - 9 days	612	612
10 - 12 days	728	728
13 - 15 days	865	865
16 - 18 days	1,028	1,028
19 - 22 days	1,223	1,223
23 - 26 days	1,455	1,455
27 - 30 days	1,729	1,729
Thereafter	2,058	2,058

For the above case the typical terminal handling charges at the port for loaded coastal container in range of ~ INR 3600/TEU, taking a broad split of rail (30%) and road (70%) for last mile movement. Taking into account the average dwell time of ~5-6 days, an additional storage charge of ~ INR 1700/TEU (taking a 50:50 Export-Import mix) gets levied. Thus from liners perspective and finally as a cost to end user, the storage charge adds an additional ~45% cost to port related costs.

Certain port terminals have also expressed interest to provide the required number of free storage days for attracting the coastal cargo, especially, if their terminals are underutilized.

However, the major ports are restricted by TAMP guidelines to provide free storage period beyond the period indicated in the schedule of rates, even if spare capacity is available. Further, concessional tariff applicable on THC for coastal are not applicable on free storage across all ports

In addition to above, for the private terminals operating on PPP mode in major ports, the revenue share for storage period needs to be shared with the Government, even when the storage is provided at a discounted rate to user. This becomes a barrier for port terminals to attract coastal cargo due to additional cost burden.

An assessment of typical impact of offering such a discount is given below, which shows that offering an addition to day free storage by terminal for import can result in a 20% additional outgo on overall revenue share for terminal, which can significantly impact their margins.

Table 9: Impact Assessment of rebate on dwell time charges for import

Revenue from THC for a loaded 20 ft Container	3,600	INR
Average dwell time for coastal import (FY19)[1]	6.9	Days
Free period	2	Days
Chargeable dwell time	4.9	Days
Dwell time charges[2]	2,525	INR
Revenue accrued from storage in case free storage period by terminal is increased by 2 days (Total 4 days)	1490	INR
Total Revenue accrued	(3600+1490)=5090	INR

Revenue share paid @ 10%	10%* (3600+2525)=612.5	INR
Actual revenue share paid	612.5/5090=**12.0%**	

[1]Calculated for 20ft loaded inbound coastal container

[2]Dwell time charges for 3 to 6 days - INR 515/ container/ day

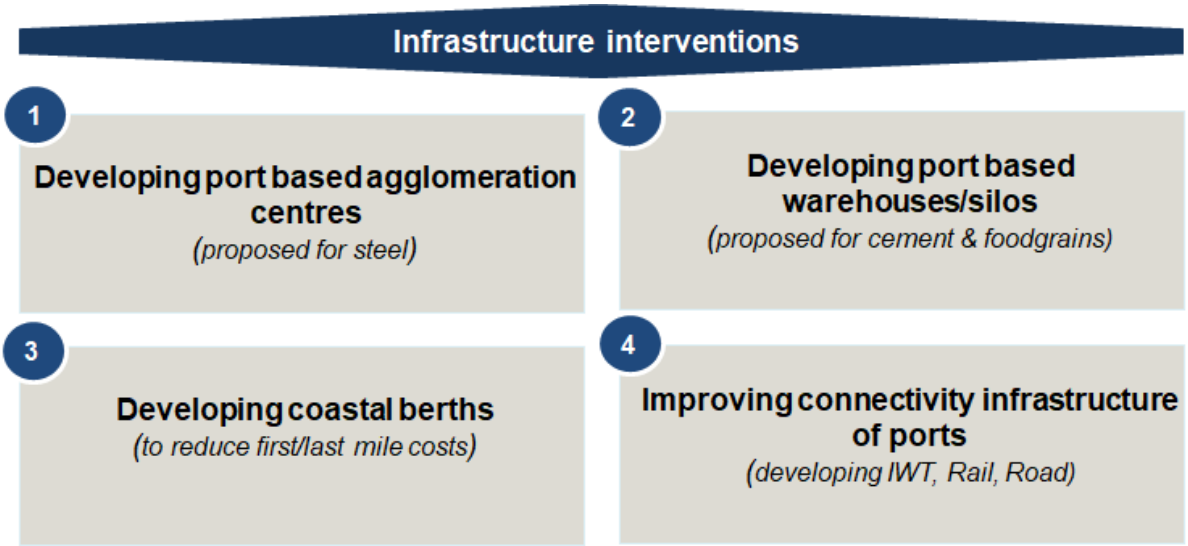
As seen from above, while there is a need for end user to have greater storage period, providing additional discount on account of free storage period becomes challenging for port terminal.

With this in view, it is recommended that

1. There needs to be greater flexibility provided to port terminals for evaluate economics for providing free storage space. Basis this a port wise review/revision of extending free storage days for coastal container in the range of historical average dwell time may be undertaken
2. In case, private terminals at Major ports look to offer discounts on free storage above and beyond the revised free storage period, then flexibility of revenue share being calculated on discounted tariff (with a ceiling) may be provided to terminal operators

4 Infrastructure Interventions

The Ministry of Shipping has launched the Sagarmala program in 2016, under which the infrastructure projects for port-led development have been identified[53]. The list includes new port developments, upgradation of existing ports as well as key connectivity projects required to ensure seamless connectivity to the ports. The program also mentions the setting up of future industries/production centres in coastal areas through development of coastal economic zones. All these projects are expected to help in building up of coastal shipping volumes as well. Additionally, based on commodity deep-dives conducted for the present study, there are certain infrastructure interventions required to make the coastal shipping viable for specific origin-destination pairs.



[53]http://sagarmala.gov.in/project/project-tracker?field_text_value=&field_state_value=&field_theme_tid=2352

4.1 Port Based Agglomeration Centres at Load Ports

4.1.1 Project Concept

Internationally, agglomeration centers have played a key part in the steel logistics infrastructure to optimize the logistics costs and provide market reach to steel players. Such centers house multiple trading companies, freight forwarders and logistics companies to provide a one-stop solution for the steel manufacturers looking for market access and logistics. Similarly, in India, such port based agglomeration centers need to be developed to promote coastal shipping of steel through agglomerating the cargo of individual players. The agglomeration of shipment quantities of different players can optimize the utilization of large EXIM vessels calling at east coast ports.

At port based agglomeration centers steel commodities of individual players will be aggregated to make suitable shipment size for loading the vessels. These centers would provide advantage of cost reduction through economies of scale in handling and storage of cargo. Moreover, cargo agglomeration will also provide smaller players with increased market access who are restricted to serve the regional markets only owing to high transport cost for small parcel size movement. Smaller players can combine their small parcel size with cargo of other players and take advantage of reduced transport cost due to economies of scale.

An ecosystem of third party players- freight forwarders need to be developed who will coordinate with various steel players present in the contributing steel clusters to ensure suitable shipment size and timely delivery of cargo.

Figure 92: Steel Logistics Park

Source: British steel – Italy steel park

Source: Steel Logistics Centre-Hagen

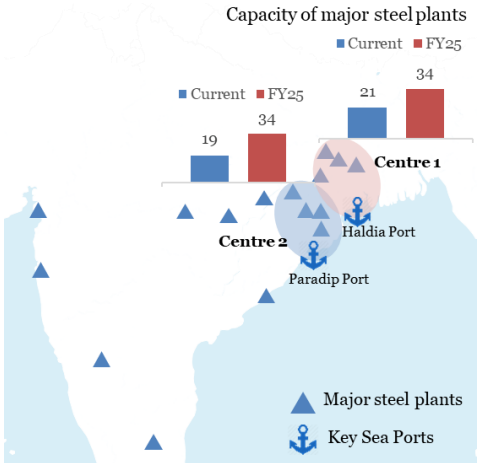
Any future production units can be planned at or near the agglomeration center which will allow steel players to take advantage of multiple transport options and economize the logistics cost for coastal transportation

4.1.2 Key Locations

Large steel clusters are located on east coast of India from where the steel cargo is currently moving to west through rail and road. These steel clusters are located within 150-350 km from the east coast ports of Paradip and Haldia. Developing steel agglomeration centers at or near the Paradip and Haldia port will allow steel players located in the steel clusters to utilize the coastal shipping mode. Players can send the large and small parcel of steel cargo through rail/road to these agglomeration centers.

Agglomeration center near Paradip port can cater to the steel cargo from clusters of Angul, Dhenkanal, Kalinganagar, and Rourkela in Odisha. Whereas, agglomeration center near Haldia Port can agglomerate the steel cargo from clusters of Jamshedpur, Bokaro and Durgapur.

Figure 93: Agglomeration Centers for Steel Plants near Coast



Source: Capex cmie, company annual reports

4.1.3 Investment Requirement and Development Timelines

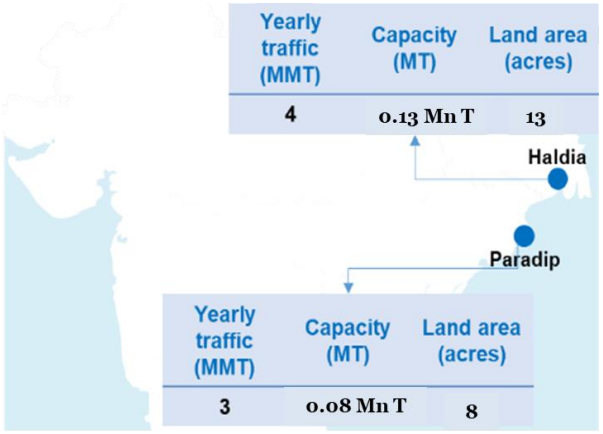
Agglomeration center at Paradip and Haldia expected to handle ~ 3 MMT and 4 MMT of steel annually by FY25, respectively

The key features of these centers would be:

- Rail based steel warehouse facility at ports
- Cargo consolidation
- Cargo sorting based on product type and players
- Value added service like packaging and labelling services for various of steel products

At Paradip port, an agglomeration facility of 84,000 MT capacity with a land area of 8 acres is required. And, at Haldia dock complex, an agglomeration facility of capacity 0.13 million MT with a land area of 13 acres is required.

Figure 94: Storage capacity and land area required



Source: Study team analysis

Internationally, the steel agglomeration centers are either developed by an anchor steel player (Jiulong Steel Logistics Park in Zhangjiagang, PRC) or by a steel logistics player on the backing of long term commitments from multiple steel players (DB Group Steel Logistics Centre Hagen, Germany). In Indian context, the proposed agglomeration centers may be set-up through government interventions (example by port authorities through PPP mode or by leading PSUs such as SAIL).

4.2 Port-Based Warehouses

Port based warehouses would be required for cement and foodgrain cargo. The port based warehouses would help in removing the inefficiencies in the first/last mile movement. Details of location, size, facilities and investment required for port based warehouses are discussed in this section.

4.2.1 Foodgrain Depots

4.2.1.1 Project Concept

Last mile movement of foodgrain from unload port to end consumers via destination foodgrain depot is inefficient, leading to higher coastal shipping costs. In the existing set-up of coastal movement, foodgrains are dispatched to grain depots, which are located inland, from unload ports and then moved to end consumers for consumption.

In case of port-based warehouses, foodgrains can be stored in grain warehouses at or near the port and then can be directly moved to end consumers without the requirement of first transporting the grains from port to FCI depots located inland and then to end consumers. This reduces the inefficient movement and brings down the overall last mile costs. The figures mentioned below describe the efficiency brought out by port based warehouse in more detail.

4.2.1.2 Key Locations

Coastal districts of Karnataka, Kerala and Tamil Nadu together constitute ~85% of coastal shipping potential of foodgrains in India. FCI foodgrain storage depots in these states suggests that FCI has storage capacity shortage in ~27 coastal districts that are within 200 km of a port in these 3 states

FCI's owned/hired foodgrain storage capacity in some of the coastal districts are not sufficient to meet the grain demand of the districts as per FCI storage norms[54]. FCI would be developing[55]/hiring additional warehouses to serve the storage requirement at these districts. It is proposed that instead of creating all the additional storage capacities in inland locations of districts, a port based warehouse can be developed for storing the foodgrain that can be potentially be shifted to coastal mode and serving the districts which have storage shortage. Existing FCI depots located in the coastal districts need not be to be shifted immediately; these warehouses can be replaced with port based warehouses when the lease/contract period expires.

Figure 95: Location of port based warehouses

Port based warehouse capacity required (MT)		
	Immediate	FY25
Mormugao	64,000	154,000
NMPT	101,000	172,000
Cochin	42,000	187,000
Tuticorin	45,000	66,000
Karaikal	45,000	79,000
Chennai	51,000	96,000

Since FCI would have ongoing contracts with existing warehouses, it is proposed that initially port based warehouse of capacity equivalent to lesser of storage shortage in districts and requirement for storage of coastal cargo could be developed near the ports. Estimation of warehouse size has been provided in annexure

Source: Study team analysis

4.2.1.3 Investment Requirement and Development Timelines

Typically, a foodgrain warehouse can handle 0.2 tons per sq. feet of built up area. Since, ports have additional land space for truck and rail movement, the warehouses can be developed with 75% area utilization. Therefore, if the FCI depot is expected to handle ~200,000 MT food grains in a year, it would need a built up area of ~160,000 sq. ft. and a land area of ~220,000 sq. ft. (5 acres)

To achieve viability land cost should be in range of INR 25-35 million per acre *(for example, warehouse in NMPT will result in IRR of ~15%).* If port land cost is higher, then the land has to be leased at a discounted rate for viability of warehouse. As per Land Policy clause 16.2 (h) of the ports, land can be allocated on nomination basis to government departments, CPCUs, SPSUs and a concession of up to 50% can be provided in cases where any CPSU/SPSU/Statutory Authority enters into JV with private party and the said CPSU/SPSU/Statutory Authority is the lead promoter and has the largest share-holding in the said JV.

Thus, **port land can be allotted at concessional rate** to government bodies including FCI and the additional revenue generated from port charges of foodgrain movement, can offset the higher lease rental from expensive port land, ensuring viability for FCI depot and generating equivalent revenue for the port through port charges.

Assuming the port land to be leased, warehouse development would require total investment of INR ~0.15 billion (excluding land costs). ~ INR 22 million would be spent in annual lease rental for land to develop 0.35 MMT warehouses in the 6 ports for immediate use (1-2 years).

The port based grain warehouse can be developed by state/central warehousing corporations, private players through PPP under Private Entrepreneurs Guarantee (PEG) scheme of FCI

4.2.2 Port Based Cement Silos

4.2.2.1 Project Concept

Movement of cement in break-bulk form results in low loading/unloading rate, increasing the turnaround time of the vessel. Higher turnaround time of vessel increases the voyage cost and thereby total coastal shipping cost. Movement of cement in bulk form would result in faster loading/unloading of cement at

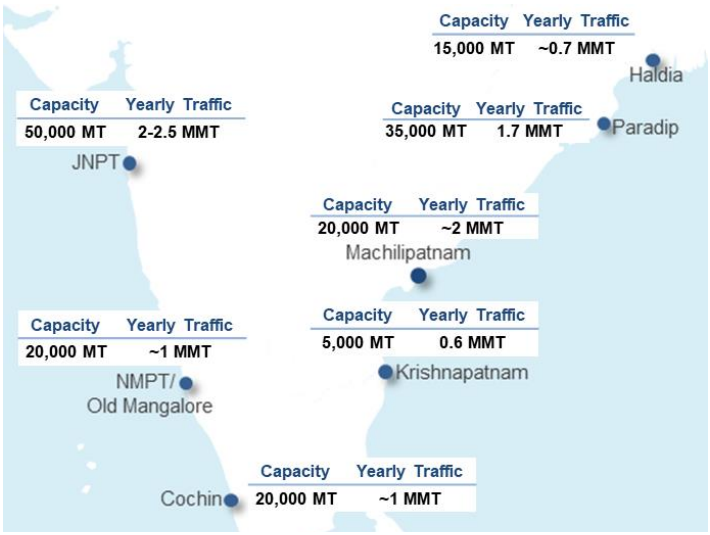
[54] As per the FCI norms, foodgrain depot storage capacity in a district should be at least 4 times the demand
[55] Since FCI generally does not undertake warehouse development activity, expect in certain areas of north east and other special areas, port based warehouse can be developed by Central Warehousing Corporation, state warehousing corporation or private players

ports provided that port has a silo infrastructure near berth. Bulk cement is moved from vessel to a silo near berth and vice versa through a fill pipe, increasing handling rate by 4 times compared with bulk/bulk (without silo near berth) handling rate. Port based cement silos would reduce vessel turnaround time and thereby the cost for movement through coastal shipping.

4.2.2.2 Key Locations

On the east coast, cement silos are required at load ports of Krishnapatnam and Machlipatnam which will serve the requirements of cement plants located inland in Kadapa and Nalgonda districts of Andhra Pradesh and Telangana, respectively. Further, these cement plants would require port based silos at unload ports of Paradip, Gopalpur, Haldia and Cochin to serve the destination markets of Odisha, West Bengal and Kerala, respectively.

Figure 96: Location of port based cement silos and capacities



Source: Study team analysis

The silo capacity required at unload port will be higher than load port for handling the same quantity of yearly traffic because players may store cement at unload port for longer duration than load port, depending on the demand at destination market.

On the west coast, large cements players in Gujarat such as Ambuja and Ultratech are already utilizing coastal shipping from their coast-based plants. There are other plants in Gujarat and Maharashtra coastline such as Sanghi cements, JSW cements which can utilize coastal shipping. Cement silos at unload port of JNPT, New Mangalore and Cochin would bring additional traffic from players already utilizing coastal shipping, and from other players who have their manufacturing facilities near the coast and would require silo facility at destination ports.

4.2.2.3 Investment Required and Development Timelines

For port based cement silos, the key facilities needed are-

- Packing plant with loading facilities and empty bag storage area (only at destination port locations)
- Bulk cement unloading hopper and silo feed pump
- Main sub-station cum load centre and compressor room
- Conveyer system from jetty to silo inlet
- Machinery from silo outlet to truck loading
- Approach road connecting with state highway/ national highway
- Other supporting infrastructure: administrative offices, security, parking, water and electric supply.

With these infrastructure, developing a 20,000 MT cement silo would require a capital investment of ~INR 0.80-0.85 billion (excluding the cost of land) and land area of ~2.5-3 acres.

To develop the proposed silos, estimated investment of ~INR 6.6 billion (excluding the cost of land) is required. Since port based cement silos are essential for viability of cement movement through coastal mode, development of silos should be prioritised.

Cement silos can be developed by the individual cement player with port trust providing land for silo development or can be developed by port trust on a PPP mode and leasing the facility to the cement players

4.3 Development of Coastal Berths

4.3.1 Project Concept

Coastal shipping being multimodal in nature is dependent on first/last mile costs for viability. In the existing set-up, even if the demand/production centres are closer to coast, the first/last mile distance

may not be short due to unavailability of terminal infrastructure closer to the centres. Therefore, in certain cases, the cargo needs to be unloaded at the ports which are not optimally located along the coast, and transported to consumption centres through road/rail, increasing the first/last mile costs and thereby coastal shipping costs. In order to reduce the first/last mile costs, coastal berths can be developed in the coastal locations nearest to the production/demand centres with the necessary handling infrastructure and storage area.

Further, the existing ports need to allocate sufficient berthing and storage capacities to cater to the potential coastal shipping traffic. Port may consider developing dedicated coastal berths with green clearance facilities to allow faster evacuation of coastal cargo.

4.3.2 Key Locations

The ports for handling potential coastal cargo have been identified in the map below. Apart from the existing ports which may need to augment their coastal handling infrastructure, additional coastal berths are required at the following four locations:

Coastal berth in Gujarat: Coastal berth in Gulf of Khambhat (Dholera or region above Dahej) reduces last mile distance to Ahmedabad cluster to ~100 – 150 km from existing 300-350 km from Kandla port. Proposed port of Dholera can be utilized for coastal berth development to reduce the dredging cost.

Coastal berth in Thane, Maharashtra: Coastal berth in Phalghar region in Thane district reduces last mile distance to 10-50 km from existing 130km from Mumbai/JNPT port to 10-50 km. Proposed port of Nandgaon can be utilized for coastal berth development to reduce the dredging cost.

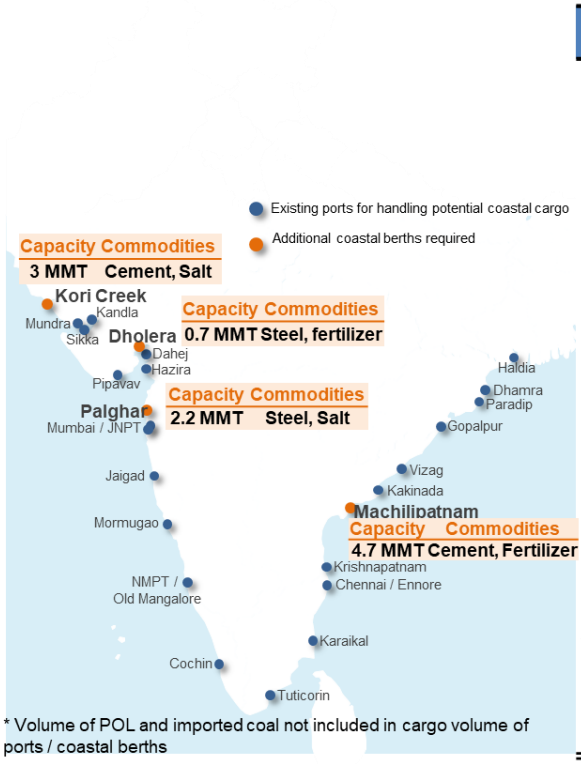
Coastal berth in Machilipatnam, Andhra Pradesh: Coastal berth in Machilipatnam in Krishna district reduces first mile distance from Nalgonda to 200 km from existing 400 km to Kakinada port. Proposed port of Machilipatnam can be utilized for coastal berth development to reduce the dredging cost.

Coastal berth in Kori Creek, Kutch, Gujarat: Coastal berth in Kori Creek in Kutch district reduces first mile distance for major cement and salt players in the region. A small port can be set up in Kori Creek for this cargo potential. Additionally, group captive jetty can be developed here, where captive jetty is used by multiple investors.

In addition to the above projects, the development of the following already planned coastal berths (projects sanction under Coastal Berth Scheme) need to be prioritized.

- Planned coastal berth at JNPT: A coastal berth of capacity 2.5 MMTPA is being developed at JNPT. The berth capacity can be expanded to handle 3-5 MMT of additional steel and cement cargo by FY25.
- Planned coastal berth at Old Mangalore port: Development of coastal berth needs to be prioritized. The planned berth can be made equipped to handle 0.8-1 MMT of cement cargo by FY25.

Figure 97: Location of Proposed Coastal Berths and Existing Ports for Handling Potential Coastal Cargo



Port / Coastal berth	Cargo volume (FY 25)	Key commodities
Kori Creek	3	Cement, Salt
Kandla / Mundra	17.5	Coal, Tiles, Foodgrain
Sikka	3.3	Coal
Dholera *(Coastal berth)*	0.7	Steel, Fertilizer
Dahej / Hazira	43	Coal, Cement
Pipavav	8	Cement
Palghar *(Coastal berth)*	2.2	Steel, Salt
Mumbai / JNPT	10	Cement, Steel
Jaigad	0.2	Fertilizer
Mormugao	1.3	Foodgrain, Fertilizer
NMPT / Old Mangalore	2.8	Cement, Foodgrain
Cochin	8.3	Tiles, Cement
Tuticorin	17	Coal, Cotton, Fertilizer
Karaikal	3	Foodgrain, Steel
Chennai / Ennore	25.6	Coal, Steel
Krishnapatnam	28.2	Coal, Cement
Machilipatnam *(Coastal berth)*	4.7	Cement, Fertilizer
Kakinada	1.0	Foodgrain, Fertilizer
Vizag	4	Coal, Steel
Gopalpur	0.3	Cement
Paradip / Dhamra	135	Coal, Steel
Kolkata / Haldia	9	Coal, Steel
Total	**~ 330 MMT**	

Source: Study team analysis

4.3.3 Investment Requirement and Development Timelines

Typically, a berth requires capital investment of INR 0.5 - 1.5 billion, depending on the need for capital dredging, breakwaters and level of mechanisation required. Existing minor ports/proposed ports can be utilized for coastal berth development to reduce the capital dredging cost.

Key facilities required at coastal berth

- General cargo berth of draft 11-12 m to handle Supramax vessel (~50,000 DWT)
- Dredging and breakwater depending upon the coastal site
- Storage infrastructure: covered warehouses for steel, fertilizer; silos for cement
- Approach road connecting with state highway/ national highway
- Other supporting infrastructure: administrative offices, parking, water supply,

To develop the proposed coastal berths, estimated investment of INR 2-3 billion (excluding the cost of land) may be required. A detailed project report (DPR) should be prepared for each location to assess the technical and financial viability. Since coastal berths would reduce the first/last mile cost of multimodal coastal movement which is essential for the viability, the development of berths should be prioritized.

The coastal berths can be developed by Major/Non-Major Ports/ State Maritime Board/ State Governments with financial assistance from "Coastal Berth Scheme" launched by the Ministry of Shipping

4.4 Connectivity Infrastructure

Infrastructure connecting ports/coastal berths to production or consumption centres is constrained with excessive dependency on a single mode, leading to congestion and higher first or last mile costs. There is a need to improve the port connectivity infrastructure for faster and smooth first/last mile movement of coastal cargo. Additionally, use of alternate modes such as inland waterways also need to be explored to ease out the burden on any single transport mode.

4.4.1 Key Connectivity Projects

Under the Sagarmala Programme, Ministry of Shipping identified several port connectivity projects for seamless and speedy evacuation of cargo. An assessment has been undertaken to identify the projects that need to be prioritized for coastal shipping movement from the various projects identified under Sagarmala Program. The table below provides a list of key connectivity infrastructure projects identified under Sagarmala Program that need to be prioritized.

In addition, other critical connectivity projects necessary for optimal use of coastal shipping identified during commodity deep-dive has been enlisted below.

Cost benefit analysis of proposed rail projects connecting Talcher to Paradip and Dhamra suggests that cost saving is much higher than the investment cost

The new rail projects are expected to decongest track capacity from Paradip and Dhamra port to Talcher; INR ~60 billion investment in rail infrastructure can result in logistics cost saving of ~ INR 370 billion from coastal coal movement of 110 MMT from east coast to south and west coast

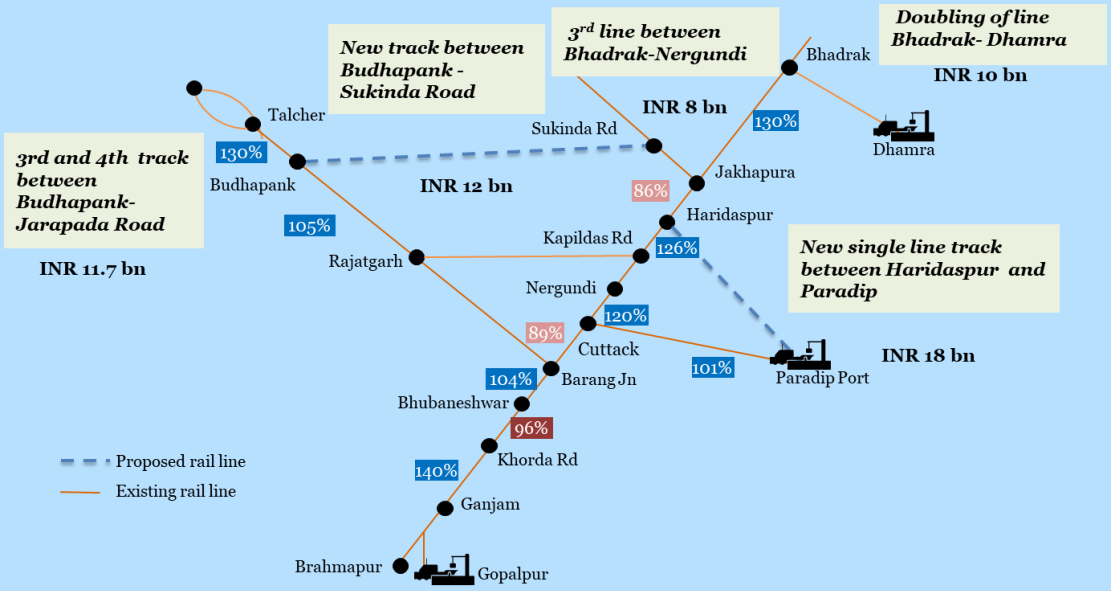
– Cost of setting up infrastructure from mines to port – INR 60 billion

– Total cost saving from coastal movement of coal- INR 55 billion yearly

– NPV Logistics cost saving across 10 years ~INR 370 billion

The cost saving shown above accounts for just 110 MMT of coastal movement of coal. In addition, the rail infrastructure will also handle imported coal volumes and steel cargo, hence the actual savings could be much larger. Moreover, since these projects have already been announced by Indian Railways, the funds for these projects would have been budgeted. Therefore, development of such projects could be prioritized as will enable coastal shipping of key commodities such as coal and steel.

Figure 98: Investment required for development of rail lines connecting Paradip and Dhamra port



Source: East Coast Railway Line capacity assessment, Sagarmala

Table 10: Key connectivity projects

Sl. No.	Project	Mode	Implementing agency	Project cost INR billion	Status	Commodities impacted	Connecting port	State
Projects identified under Sagarmala that need to be prioritized								
1	3rd and 4th line from Budhapank- Salegaon via Rajatgarh	Railway	Indian Railways	11.73	Under implementation	Coal, Steel	Paradip	Odisha
2	New Line from Angul to Sukhinda	Railway	Indian Railways	12.03	Under implementation	Coal, Steel	Paradip	Odisha
3	New Line from Haridaspur to Paradip	Railway	Indian Railways	18.44	Under implementation	Coal, steel	Paradip	Odisha
4	Third line from Sukhinda Road to Jakhapura	Railway	Indian Railways	0.56	Under implementation	Coal, Steel	Paradip	Odisha
5	Doubling of rail line from Bhadrak to Dhamra Port	Railway	Govt. of Odisha	10	DPR prepared	Coal	Dhamra	Odisha
6	Bhadrak - Nergundi 3rd Line	Railway	Indian Railways	8.43	Under implementation	Coal	Paradip	Odisha
7	Development of dedicated Machilipatnam Port Rail Connectivity from Pedana Station	Railway	Navyuga	0.4	DPR to be prepared	Cement	Machilipatnam	Andhra Pradesh
8	Development of 7.2Km green field road connecting NH 65 to Machilipatnam Port in the State of Andhra Pradesh.	Road	NHAI	4.58	DPR to be prepared	Cement, Fertilizer	Machilipatnam	Andhra Pradesh
9	Develop NW5 (Talcher to Dhamra and Paradip on Brahmani and Mahanadi Rivers) Phase-1 (from Pradip/Dhamra to Pankapal)	IWT	IWAI	14.62	DPR prepared	Steel, Coal	Paradip, Dhamra	Odisha
10	Develop NW4 (from Vijayawada to Galagali on Krishna river) Kakinada- Vijayawada - Muktyala, Vijayawada to Thada	IWT	IWAI	70.02	Under implementation	Cement	Krishnapatnam, Kakinada	Andhra Pradesh
Other critical projects identified during commodity deep-dives								
11	Talcher-Gopalpur port rail	Railway	NA	NA	Project conceptualization	Coal	Gopalpur	Odisha
12	Railway infrastructure connecting Hazira Port	Railway	NA	NA	Project conceptualization	Coal	Hazira	Gujarat

13	Last mile approach road for Palghar coastal berth	Road	NA	NA	Project conceptualization	Steel, fertilizer, foodgrain	Nandgaon	Maharashtra
14	Last mile approach road for Dholera coastal berth	Road	NA	NA	Project conceptualization	Steel, fertilizer, foodgrain	Dholera	Gujarat
15	Develop NW5 (Talcher to Dhamra and Paradip on Brahmani and Mahanadi Rivers) Phase-2 (from Pankapal to Talcher)	IWT	NA	NA	Project conceptualization	Steel, coal	Paradip	Odisha

Source: Sagarmala, Study team analysis

4.5 Prioritization of Infrastructure Projects

Infrastructure projects identified above has been prioritized based its readiness and strategic importance. The readiness of the projects is assessed based on the current stage of the projects- conceptualization, feasibility, detailed project report, procurement/implementation stage. The strategic importance of the projects is classified under- Short, medium and long term categories- based on its importance to enable coastal shipping movement.

Figure 99: Project prioritization framework

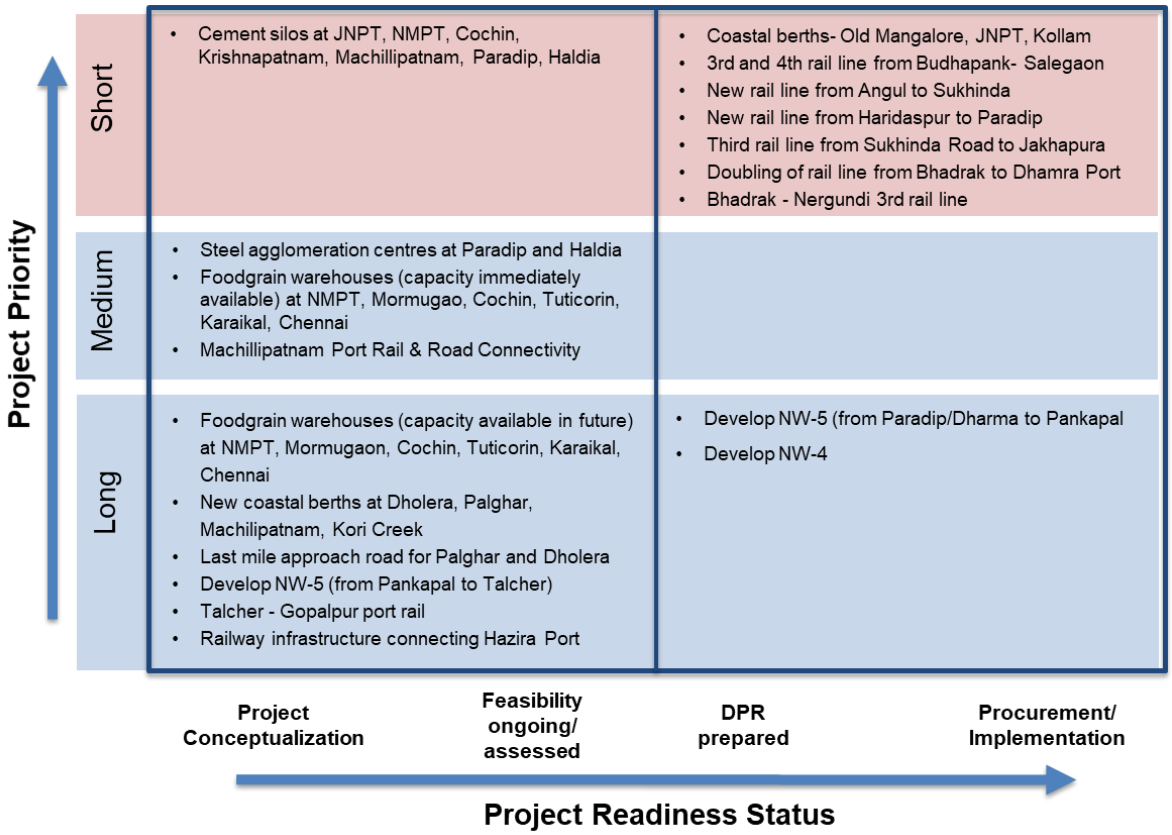


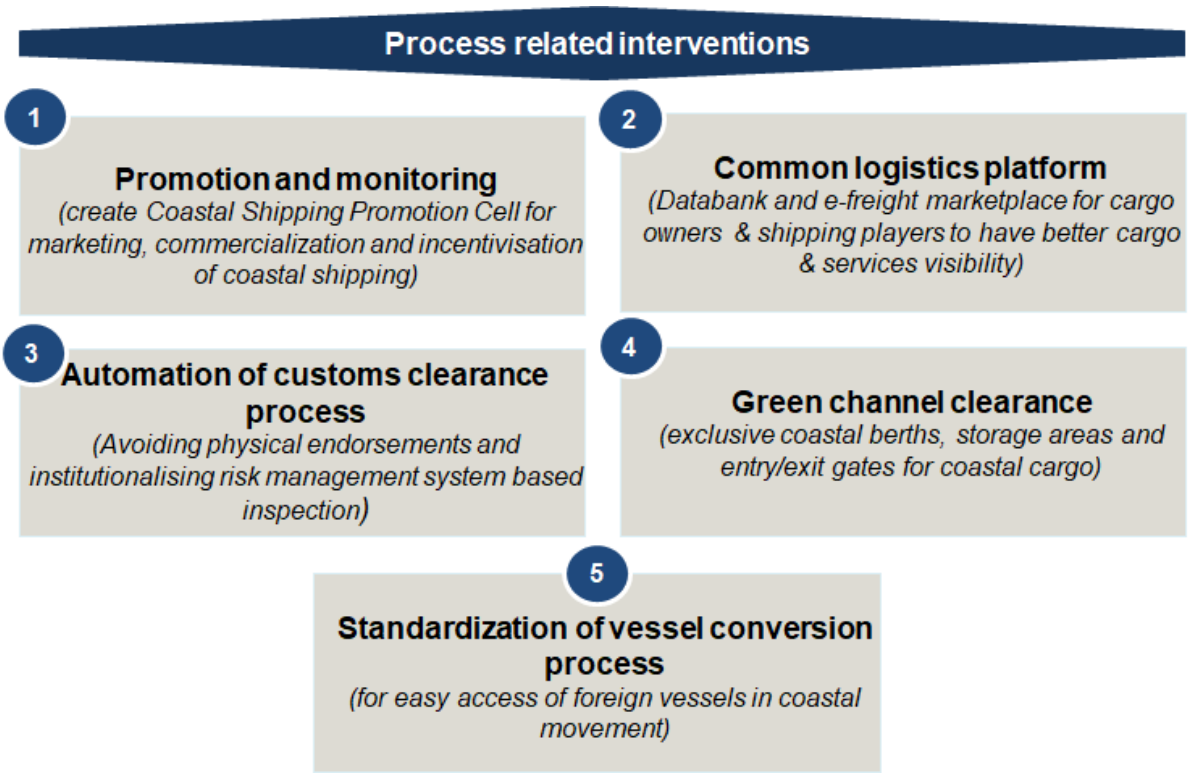
Table 11: Prioritization of infrastructure projects

Sl No	List of infrastructure projects	Funding source identified (Yes/No)	Project readiness status	Priority
A	**Port-based steel agglomeration centers (located at or near origin ports)**			
1	At or near the following ports – Paradip port – Haldia Port	No	Project conceptualization	Medium term
B	**Port-based foodgrain warehouses (FCI depots located at or near ports)**			
2	Capacity that can be immediately developed (based on current storage gap at coastal districts) at or near the following ports – New Mangalore, – Mormugaon, – Cochin, – Tuticorin, – Karaikal – Chennai	No	Project conceptualization	Medium term
3	Capacity that can be developed in future (after the expiry of contracts of existing depots at coastal districts) at or near the following ports – New Mangalore, – Mormugaon,	No	Project conceptualization	Long term

	– Cochin, – Tuticorin, – Karaikal – Chennai			
C	**Port- based cement silos (silos located along berth)**			
4	JNPT port	No	Feasibility ongoing	Short term
5	NMPT/Old Mangalore costal berth, Cochin, Krishnapatnam, Paradip, Haldia,	No	Project conceptualization	Short term
6	Machilipatnam	No	Project conceptualization	Short term
D	**Coastal berths**			
7	New coastal berths- – Dholera, – Palghar, – Machilipatnam – Kori Creek	No	Project conceptualization	Long term
8	Prioritize development of planned berth in Old Mangalore & Kollam	Yes	Under implementation	Short term
9	Prioritize development of planned berth in JNPT port- additional capacity can be added to handle cement and steel cargo	Yes	Under implementation	Short term
E	**Connectivity projects**			
10	3rd and 4th rail line from Budhapank-Salegaon via Rajatgarh	Yes	Under implementation	Short term
11	New rail line from Angul to Sukhinda	Yes	Under implementation	Short term
12	New rail line from Haridaspur to Paradip	Yes	Under implementation	Short term
13	Third rail line from Sukhinda Road to Jakhapura	Yes	Under implementation	Short term
14	Doubling of rail line from Bhadrak to Dhamra Port	NA	DPR prepared	Short term
15	Bhadrak - Nergundi 3rd rail line	Yes	Under implementation	Short term
16	Development of dedicated Machilipatnam Port Rail Connectivity from Pedana Station	Yes	DPR to be prepared	Medium term
17	Development of 7.2Km green field road connecting NH 65 to Machilipatnam Port in the State of Andhra Pradesh.	Yes	DPR to be prepared	Medium term
18	Develop NW5 (Talcher to Dhamra and Paradip on Brahmani and Mahanadi Rivers) Phase-1 (from Pradip/Dhamra to Pankapal)	No	DPR prepared	Long term
19	Develop NW4 (from Vijayawada to Galagali on Krishna river) Kakinada- Vijayawada - Muktyala, Vijayawada to Thada	No	Under implementation	Long term
20	Talcher-Gopalpur port rail	No	Project conceptualization	Long term
21	Railway infrastructure connecting Hazira Port	No	Project conceptualization	Long term
22	Last mile approach road for Palghar coastal berth	No	Project conceptualization	Long term
23	Last mile approach road for Dholera coastal berth	No	Project conceptualization	Long term
24	Develop NW5 (Talcher to Dhamra and Paradip on Brahmani and Mahanadi Rivers) Phase-2 (from Pankapal to Talcher)	No	Project conceptualization	Long term

5 Process Related Interventions

In parallel with the conducive policy environment and necessary infrastructure development, the ease of doing coastal shipping for both cargo owners and shipping companies need to be ensured. Given that the cargo owners have adequate familiarity about the availability, timeliness, pilferage risks, or cargo booking process associated with rail and road modes, a similar familiarity about the coastal shipping mode needs to be developed through making the information available in the public domain. A dedicated promotion cell may be established under Ministry of Shipping to act as a focal point for dissemination of useful information as well as reviewing the requests for incentivization from stakeholders. Further, the port and custom processes for coastal cargo need to be streamlined through addressing the present challenges faced by the shippers and shipping liners.



5.1 Promotion and Monitoring

Coastal shipping is still an unexplored territory for most of the industry players. Cargo owners, especially small players, are reluctant to utilize the coastal shipping mode in spite of cost advantages because of limited knowledge and understanding of the fitment of multimodal coastal shipping in their logistics chain. For optimal utilization of coastal mode, there is a need for focused and pro-active marketing and promotion effort to educate these players on the advantages of coastal shipping.

Create coastal shipping promotion cell within Ministry of Shipping for increasing awareness, knowledge dissemination, and commercialization of coastal shipping projects

A coastal shipping promotion cell should be established under the purview of Ministry of Shipping. The promotion cell will undertake active b2b meetings with the target groups such as cargo owners, shipping companies, logistics service providers, transport companies, terminal operators, industry associations, and ports, facilitating the on-ground movement of cargo through coastal shipping. Additionally, the agency will act as interface between authorities and industry, and organize communication between stakeholders, identify the bottlenecks, involve in research based on identified gaps and suggest suitable policy action for Ministry.

Promotional efforts of the cell can also include providing modal shift incentives and supporting players by taking a share of the risk in the start-up phase of a new service, similar to some international example such as EU's Marco Polo Scheme[56]. Evaluation of projects would be undertaken by promotion cell for ratifying modal shift from road rail to coastal.

Institutional structure of the Promotional Cell

The promotional cell should be headed by JS/Director under Ministry of Shipping and should have representation from Logistics Division, Railways, MoRTH, IWAI and State Maritime Boards so that support to multimodal proposals of user industries can be ensured. While the representatives of other Ministries may be involved for project specific review, Ministry of Shipping should continuously work towards marketing and promotion of coastal shipping

International examples of promotion cell for water transport and their functions

Germany: Short sea shipping and Inland Waterways Promotion center (SPC) established by Federal Ministry of Transport and Digital Infrastructure

- *Creates interface between federal authorities and industries; facilitates result-oriented policy making*
- *Provides free consulting services to forwarders to determine shift potential to waterway*
- *Increases awareness through participation in trade fairs, exhibitions*
- *Provides knowledge support to industry players with expert information and education opportunities*
- *Increases networking of water transport players and builds image of water transport*

Netherlands established "Dutch Inland Navigation Information Agency"

- *Acts as an intermediary for all queries and requests from media, shippers, scholars concerning inland navigation*
- *Offer consulting services to shippers/cargo owners, to assess whether inland navigation fits into their logistics chain*
- *Provide travel advice such as transhipment locations, container terminals and scheduled services for IWT of containers*
- *Build image and create awareness of inland navigation through slogans, advertisement and promotional campaigns*

Social media as a Marketing Tool- EU countries use social media regularly to:

- *Post information and updates regularly posted on social media accounts on forums like Facebook, Twitter, or YouTube;*
- *For discussions related to inland water transport LinkedIn groups have been formed;*
- *Updates on platforms specifically aimed at IWT sector, such as Shiplink (group of maritime entrepreneurs) for networking*
- *Publish monthly newsletter distributed to subscribers*

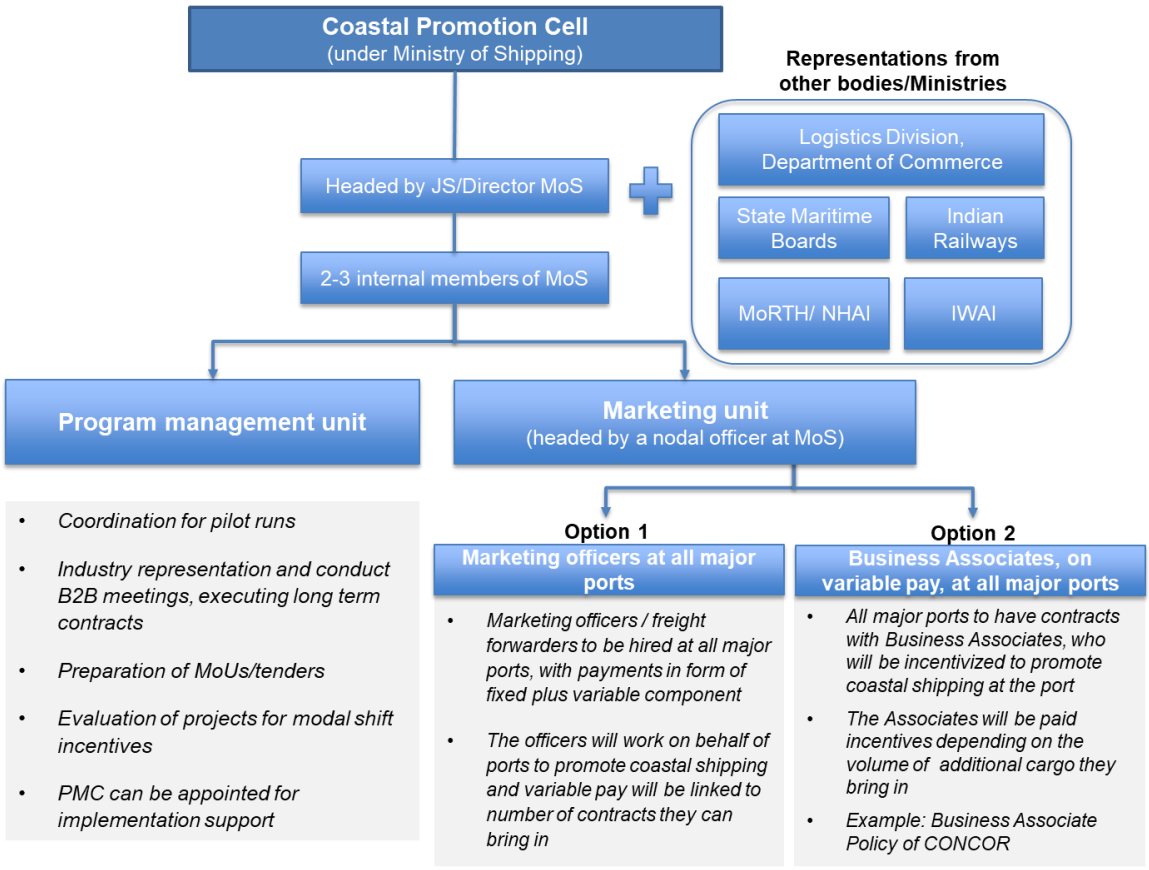
[56] A snapshot of various subsidies and supports provided under Marco Polo scheme is provided in annexure

through establishing a program management unit (PMU) under the promotion cell.

Program Management Unit

The PMU should be responsible for promotion of coastal shipping through acting as a single node for all communications, coordination, clarifications and outreach activities for implementation of coastal shipping related projects. The implementation of pilot runs should be prioritised for commodities and O-D pairs where viability exists but players are not utilizing coastal movement. Based on the finding of pilot runs, the PMU should co-ordinate for execution of long-term contracts between cargo owners and shipping liners. A consulting organisation can be appointed to run the PMU with clearly identified targets related to the interventions suggested across policy, infrastructure and other processes.The project management consultant[57] could also be given responsibility of capacity building of the promotion cell team which would be undertaking the marketing effort and project appraisal for granting incentive/subsidies under various schemes of government in the longer term.

Figure 100: Structure of Coastal Shipping Promotion Cell



Source: Study team assessment

The key tasks for the PMU should be to:

- Identify the viable business case for coastal shipping based on past studies and own assessment. Contact the shippers, trading clients, freight forwarders for possible modal shift cases
- Conduct meetings with shippers, trading clients, freight forwarders to understand existing logistics arrangement and develop a customised logistics solution based on interactions and feedback from potential shipper
- Plan and execute pilot run for commodities and O-D pairs which require minimal interventions. Prepare an MoU defining the responsibilities of parties involved and details of costs shared

[57] A broad scope and deliverable terms for consultancy services for implementation support and commercialization strategy is provided in annexure

- Facilitate and monitor the pilot movement to identify shortcomings and provide suggestions for improvement.
- Take written commitments from shipper to include coastal shipping as one of the options for cargo movement. Provide support to cargo owners/shippers in issuance of long term (at least 1 year) coastal shipping contract/tender.
- Program management for implementation of identified interventions across policy, infrastructure and other process improvements

Marketing Unit

The Marketing Unit can be set up in 2 ways, either through appointing Marketing Officers at all the major ports, on a fixed and variable pay, or contracting Freight Forwarders as Business Associates for individual ports, on a commission basis.

Option 1: Establish a network of marketing officers across ports to undertake on ground-marketing activities

Presently, the marketing or business development function at major ports is undertaken under the traffic department, with limited outreach efforts towards cargo owners and aggregators due to limited dedicated bandwidth availability.

Each of the major ports can engage in dedicated marketing efforts through hiring of marketing officers. The marketing officers at port level would interface with a nodal marketing officer at the ministry for any support (incentive, discounts, etc.) required from the ministry. The profile of the marketing officers should align with the task of attracting additional coastal cargo. As such, these officers should have proven experience of marketing in maritime space and good connects with industries and logistic service providers.

The remuneration structure for these officers may include a substantial variable pay component in addition to a fixed pay, subject to achieving a threshold cargo quantity.

Option 2: Contract with freight forwarders to work as Business Associates on behalf of the port and promote coastal shipping

Under this option, a few freight forwarders, basis their track record, may be empanelled as Business Associates for bringing in additional coastal cargo. These Business Associates will not act as permanent or contracted employees of the major ports, but will be paid a commission on the basis of additional coastal cargo they bring in for the port. The list of empanelled Business Associates may be reviewed from time-to-time to ensure that only high performing associates are retained. The business associates may be empaneled under different categories depending on volumes they bring in. Each category has minimum volumes they need to bring in annually, failing which, they will be downgraded. A frequency of reporting of these associates to the respective major ports may be set, for example, monthly, quarterly or half-yearly to present the opportunities they have worked on during this period.

However, this option may have a limitation that segregation of the existing cargo and new cargo brought in by the Business Associates might be a challenge in order to decide the commission for the business associates. This challenge can be avoided by excluding some of the major commodities, such as coal and POL, which are already carried on coastal mode for majority of the viable routes and where business associates have a limited role to play as the cargo owners are concentrated and usually approach the port directly. The remaining commodities for which the cargo owners are fragmented will benefit from the services of the business associates and hence, the business associates need to be incentivised to increase the share of such commodities in coastal movement.

5.2 Development of Common Logistics Platform for Cargo Owners and Shipping Players

Create coastal shipping data bank to increase visibility of coastal shipping in logistics e-market place and to encourage modal shift

A coastal shipping logistics data bank needs to be created to increase the visibility of coastal shipping. Data bank would contain real time information such as port-wise vessel availability and its route, contact of service provider, charter rates and historical information based on past movement such as average time taken for movement, delay and cost.

Ensure integration of coastal shipping data bank with the integrated logistics data bank/portal planned by Logistics division (MoC)

To achieve the objective of improving logistic infrastructure, government and other agencies are working towards creation of transparent and comprehensive information portals or single window systems, in related as well as specific facets of infrastructure, such as transportation, custom clearances and tax structures. There are several ICT enabled systems that function in India across various elements of logistics system such as.

- Indian railways operate Freight Operating Information System to keep records of rake movement
- Port Communication System is a centralized hub for Indian ports for electronic flow of trade related information
- E-way bill system has been built to improve logistics efficiency by facilitating faster inter and intra state movement of goods and curb tax evasion of GST
- Indian Customs Electronic Commerce/Electronic Data interchange Gateway provides e-filling services, e-payment, on-line registration for IPR, Document Tracking status at Customs EDI, and online verification of licenses to clients of Customs Department

However, these systems work in silos and limit usage of information sets by relevant government agencies and industry players. Having a common logistics platform will enable effective data capturing and utilization and provide a comprehensive and transparent picture to service providers as well as the end consumers.

Logistics wing of Department of Commerce in its draft National Logistics Policy has proposed setting up of two integrated logistics platforms:

- **Logistics Data and Analytics Centre**: provides a single portal to track and report relevant metrics across logistics chain to enable data driven decision-making for infrastructure projects
- **National Logistics e-marketplace**: a single window portal involving various logistics service providers and government agencies. It will help to simplify the documentation process by eliminate the need for submission of documents at multiple places. The portal is also proposed to enable price discovery, route optimization, in-transit tracking, timely delivery assurance, statutory clearances.

Integrating coastal shipping data in the common logistics platform developed by Department of Commerce will enable shippers to effectively and optimally utilize the coastal shipping mode.

5.3 Automation of Customs Clearance Process

The current process of customs clearance for coastal cargo has scope for improvement as the process is time consuming and cost-inefficient for both customs and cargo owners. Some of the prominent issues are:

- The Custom clearance of coastal cargo is done through manual filing and physical endorsement of Bill of Coastal Goods document; the electronic clearance process through ICEGATE system used for clearance of EXIM cargo is not currently utilized for coastal cargo
- Currently, there are multiple instances of physical inspection of coastal cargo instead of a sample based inspection and no risk management system (RMS) intelligence based inspection system is used

While the entire documentation and process for custom clearance of EXIM cargo is undertaken through the ICEGATE system, the same for coastal cargo is done manually at present. As the country is making

deliberate steps towards increasing the share of coastal cargo, it would become important to capture the coastal cargo movement details in the ICEGATE system for ease of tracking and tracing by customs. This would help the cargo owners as well as eliminate the need for physical filing and physical endorsement on BoCG. Once the coastal cargo is captured in the ICEGATE system, the existing risk management module available in ICEGATE can be extended to coastal cargo owners as well so that the need for 100% physical inspection of cargo is eliminated. The ICEGATE portal would also need to be integrated with the E-way bill (NIC portal) so that duplicity of documents and process in filing bill of coastal goods is removed.

Below mentioned are the details of clearance processes steps that need to be eliminated/ modified during coastal run in order to create a more efficient process[58]:

1. **E-way bill to be modified to capture the details Bill of Coastal Goods; No manual filing of BoCG required**

The existing E-way bill for costal leg needs to be modified to capture BoCG related details. Once the modified E-way fill is filled by CHAs, the relevant details would be fed to the ICEGATE portal through integration of E-way bill (NIC portal) and ICEGATE portal

2. **Endorsement of bill of coastal goods at port of loading**

The requirement of physical endorsement of bill of coastal goods at customs freight station/ port customs will be eliminated after the integration of NIC portal with ICEGATE portal. The ICEGATE server will update the bill of coastal goods on the handle of the officer of port of loading for verification purpose.

3. **Inspection of coastal goods on port of loading based on customs intelligence/ RMS update**

Customs officer, at the port of loading, will inspect the goods in case of any intelligence of clandestine removals, malpractices, and broken container seals. In any other case, direct clearance may be allowed. Further, the existing Risk management system based inspection approach used for EXIM cargo can be extended to the coastal cargo through the ICEGATE portal, reducing the need for physical inspection.

4. **Delivery of bill of coastal goods to receiving agent at port of discharge**

ICEGATE server will transmit the bill of coastal goods directly to the NIC portal. The requirement of physical transfer of bill of coastal goods to the receiving agent will be eliminated and the receiving agent will able to access the bill of coastal goods simply by logging into the NIC portal with his unique ID.

5. **Submission, verification and endorsement of bill of coastal goods at port of discharge.**

Currently, bill of coastal goods is submitted to the officer of the port of discharge. The officer verifies the document and subsequently endorses the same. After the integration of NIC portal with the ICEGATE portal, ICEGATE server will update the bill of coastal goods on the handle of the officer of port of discharge. Officer can review the document on its handle and can allow the discharge of cargo. The detailed as is process, the suggested modifications and preliminary back-end process for integration of E-way bill (NIC portal) and ICEGATE portal has been provided in the annexure.

Therefore, considering the benefits of automation process in simplifying and bringing the efficiency in the customs clearance process, the customs should

- **Digitize and automate of coastal cargo customs clearance process incorporating RMS intelligence based inspection approach (similar to EXIM cargo clearance)**
- **Integrate NIC portal (E-way bill) with ICEGATE portal for eliminating any duplicity of documents.**
- **Review the proposed changes in architecture for integration of NIC portal and ICEGATE.**

[58] A more detailed customs process, and requirements for integration of NIC portal with ICEGATE portal is provided in annexure

5.4 Green Channel Clearance

To facilitate seamless movement of coastal cargo at major ports, Ministry of shipping introduced green channel clearance guidelines for major ports. Under the guidelines, major ports need to earmark exclusive coastal berths, storage areas and gates for coastal cargo outside the custom bonded area of the ports. Additionally, government also introduced guidelines to provide priority berthing to coastal vessels at major ports without the need to pay additional charges for such services.

The implementation of the above guidelines across all the major ports needs to be ensured[59]. To encourage the shippers to shift to coastal shipping and improve the share of coastal shipping in modal mix, it is imperative that the green channel clearance and priority berthing facilities to be provided in full at all major ports.

5.5 Vessel Conversion

Usage of foreign vessels for coastal movement is critical for some commodities and O-D pairs to ensure viability. This requires conversion of the vessels for coastal leg and reconversion after the coastal leg for foreign movement. Currently, the conversion process is not standardised across ports and has issues which need to be resolved to ease out the process. The interventions suggested by the shipping agents to ease the vessel conversion process are presented below for consideration of customs and DG shipping.

5.5.1 Requirement of Importation/Exportation of Vessels for Vessel Conversion

Customs based at specific ports, namely, Mumbai, Hazira, and Dahej insists upon carrying out importation of the vessel even if a ship owner completes all the required formalities to convert a vessel from foreign run to coastal run, for transporting cargo parcels between Indian Ports. Similarly, if any vessel is converted to coastal run at any other given Indian Port and requires to be re-converted to foreign run either at Mumbai, Hazira or Dahej, customs insists upon carrying out exportation / importation of the vessel. At Mormugao Port, if a vessel is to convert for one short voyage, customs do not insist upon importation, however if a vessel is converted for a term, importation is mandatory.

Customs at Mumbai, Hazira, Dahej insist to carry out importation formalities in respect of conversion of vessel i.e. filing of manifest for vessel by declaring vessel as goods and subsequently filing of bill of entry for the vessel in lieu of Custom Notification 16/2012-Cus dated 13.06.2012 and Public Notice 106/2017 dated 18.08.2017 issued by Principal Commissioner of Custom (G) Mumbai.

Moreover, Mumbai customs does not permit to revert the vessel to foreign run unless importation carried out at Port of Conversion and necessary documents made available. Further for reversion of the vessel, agents need to carry out exportation formalities for passing Re-Export Shipping Bill as per Notification No.85/2017 –customs dated 14.11.20 Condition 102. However, Circular No. 58/97 dated 06.11.1997 is the proper guideline for filing of Bill of Entry and payment of duty on bunkers/stores in the case of conversion of the vessel. Since there is no requirement of payment of duty on the vessel in terms of the said circular, IGM and Bill of Entry for vessel should not be filed for import of the vessel.

Therefore, customs need to provide waiver from filing Bill of Entry for foreign vessel running on each coastal voyage and prescribe standard terms and practices without ambiguity.

5.5.2 Duty on Bunkers from Last Indian Port of Call

Currently, if a vessel sails from any Indian Port in foreign run and requires to be converted to coastal run at next Indian Port, then customs insists upon duty payment on bunker consumption from last Indian Port. For example- a vessel completes unloading at Vizag, and sails to Paradip in foreign run without conversion. Thereafter, at Paradip, the vessel gets converted and loads coastal cargo for onward

[59] Status of green channel clearance at Major Ports is provided in annexure

transportation to another Indian Port, then the customs require the vessel owner to pay duty on bunker consumed for sailing from Vizag to Paradip when the vessel is still in foreign run.

Since, the DG License for coastal run is issued basis first Indian Load-Port and not last Indian Port of call, if any, the vessel undertaking journey from foreign cargo unload port to coastal cargo load port is classified as vessel in foreign run.

Considering the above classification, there is a contradiction between Custom Preventive Manual guidelines and section 87 of Customs Act. As per Custom Preventive Manual guidelines, “Ship stores and equipment-liability to import duty on transference from foreign trade to coasting trade”, duty on stores would be charged from the date the vessel has completed the discharge of foreign cargo at the first Indian Custom port of arrival for the subsequent costal run. However, this provision is in contradiction of Section 87 of the Custom Act 1962, according to which “any imported stores on board a vessel or aircraft (other than stores to which Section 90 applies) may, without payment of duty, be consumed thereon as stores during the period such vessel or aircraft is a foreign-going vessel or aircraft.”

Customs should provide necessary clarification on the applicability of Section 87 of the Customs Act on the said case and requested to exempt the duty on bunkers for vessels sailing from past India port to initial coastal load port.

5.5.3 Co-loading of EXIM and Coastal Cargo

Bulk/liquid vessels on foreign run unloading EXIM cargo at multiple Indian Ports are not permitted to carry coastal cargo in between the voyage. Customs does not permit co-loading of coastal cargo with EXIM cargo on bulk/liquid vessels in foreign run. Suppose a vessel in foreign run calls at JNPT port and Tuticorin port to unload part cargo of 5000 MT in each port. If a shipper has some cargo, say 4,500 MT to transport from JNPT to Tuticorin, the vessel is not allowed to load such cargo at JNPT.

This issue also impacts the movement of project cargo. Project cargoes are of high value and importance, and due to non-availability of Indian flag self-geared tonnage, Shippers have to wait for an empty foreign flag vessel which could sometimes be a long time which in turn affects the project timeline causing high penalties.

The facility of co-loading of EXIM and coastal cargo is provided for vessels carrying container cargo and some break-bulk cargo such as fertilizer, and agri-commodities[60]. Customs should allow such co-loading on bulk vessels, liquid vessels and project cargo vessels (provided that the coastal cargo can be clearly segregated) as it will allow vessel owners to utilize the empty space and will directly assist the Indian shippers to save logistics cost on coastal leg across the country.

5.5.4 Bunker Sampling During Vessel Conversion

Customs, while converting a vessel, insists upon sampling of bunkers. Customs approved laboratories take extremely long time in submitting their report which eventually keeps files pending and increase the interest liability, if any. Such insistence from customs delays the process and adds to the cost.

As per Circular NO.58/97 dated 06.11.1997 Para 6 of Annexure A, in case of fuel oils, sample of F.O, HSD, Lube Oil are taken for test by preventive officer at the time of conversion of the vessel which is to be forwarded to a Custom authorized chemical laboratory. The result should be obtained by the assessing department within a period of one week. However, in most of the cases the final assessment is delayed for want of lab test report and in some ports such as Kolkata the final assessment is pending for more than one year as the customs doesn’t have adequate facility for testing parameter (HSD).

[60] As per Circular No.15/2002 – customs, dated 25.02.2002, Indian flag foreign going vessels operating in routes covering more than one Indian port can carry container carrying coastal goods along with container carrying import/exported goods. Further for promotion of trade and ease of doing business in India, a foreign flag ship is not required to obtain a license from the Director General of Shipping for engaging in Coastal trade of India for carriage by sea of fertilizers, as per General Order No.3 of 2018 issued on 22.06.2018 by Govt. of India, Ministry of Shipping.

It should be considered that vessel owners would not use sub-standard bunkers to their own ships, which can cause damage to the vessel. Also, vessel owners take bunkers after carrying out sample testing. Moreover, bunkers are normally supplied by approved vendors, whose creditability is tested and confirmed. Considering the sufficient checks already in place to prevent the use of sub-standard bunkers, requirement of customs to again undertake bunker sampling may not be required.

Customs should formulate SOP of surveys conducted to ascertain consumption of the fuels during coastal runs to remove any ambiguity and inefficiency. This SOP will help in setting a standardized process to be followed across ports in India.

5.5.5 Time Taken for Assessment of Final Bill of Entry (B/E) During Reversion from Coastal to Foreign Run

Assessment of final Bill of Entry at the time of reversion of vessel from coastal to foreign run takes a long time, ranging from 5/6 months to a year. According to customs circular number 58/97 dated 6th November 1997, wherein, under para 3, it is clearly stipulated that the assessment may be finalized within 15 days of reconversion from coastal to foreign run.

Customs should issue necessary notification to concerned officials to adhere to the timeline provided in customs circular number 58/97 dated 6th November 1997.

5.5.6 SOPs for Conversion and Reversion of Vessels

SOPs for conversion and reversion to foreign going to be made simpler to eliminate time delays and costs. Information on consumption on bunkers and other duty-free items should be basis survey report. Master's declaration/statement should be made acceptable. With existing guidelines and rules being followed by shipping agents, there is no need for authorities to board the ship. All ports are ISPS compliant and MIS declarations by Master to be very strictly dealt with. Whistle blower policy to be encouraged to ensure compliance.

6 Roadmap and Action Plan

In the previous sections, the interventions required for promotion of coastal shipping have been detailed. In this section, the action plan has been laid out highlighting the priority of interventions, expected timelines and responsible authorities for implementation of action. This action plan will act as a step-wise guide to Ministry of Shipping for implementing the interventions spread across policy, infrastructure, process and institutional changes, as discussed in the preceding chapters.

6.1 Create a Coastal Shipping Promotion Cell within Ministry of Shipping

As a first step, Ministry of Shipping should constitute a coastal shipping promotion cell as described in section 5.1. The JS/Director heading the cell should appoint 2-3 officers for running the cell. A program management unit (PMU) should be set up by the officers through recruiting a consultancy organisation in order to manage the implementation of all the interventions suggested in the report with clearly defined milestones for the consultancy agency. In addition to the PMU, a marketing team may also be constituted with a nodal officer at the MoS and other marketing officers at the port trusts. These officers may be from freight forwarding background who have the linkages with industries and shipping liners to bring cargo on coastal mode. These officers should have a substantial variable pay component in relation to the additional cargo they bring on the coastal mode.

It is expected that recruitment of program management consultant (PMC) can be completed in 2-3 months' timeframe, post which all the other interventions can be taken care by the PMC.

6.2 Initiate Pilot Movements with PSUs and Major Industry Players

Next step is to initiate pilot runs across the potential viable commodities and O-D pairs. PMC should coordinate with PSUs and other industry players for pilot runs and develop business case for incentivising the temporary costs associated with one time movement (such as vessel mobilisation/demobilisation cost), providing free storage period at ports and priority berthing. Based on the commodity deep-dives, some of the key commodity-wise O-D pairs for which pilot run could be initiated are listed below.

- **Steel**: East to West coast movement of steel agglomerating cargo from SAIL, TATA, JSPL and Bhushan steel plants
- **Fertilizer**: Wooden vessel movement of fertilizer from fertilizer plants (IFFCO, Kribhco, GSFC) in Gujarat to Maharashtra
- **Fertilizer**: Coastal plus IWT barge movement from Odhisha (IFFCO, Paradip Phosphate Limited) to locations along NW-1 (downstream locations in West Bengal where LAD of 2.5-5 m available)
- **Foodgrain**: Container movement from Punjab/Haryana to southern states for FCI
- **Coal**: Thermal coal movement from MCL to west coast power plants
- **Sugar**: Short sea movement of sugar (in break bulk form) from Uttar Pradesh to Bangladesh via Kandla port
- **Salt**: Break bulk movement of salt from Mithapur, Gujarat (Tata Chemicals) to Maharashtra, Kerala
- **Auto**: Container movement of cars using rake system from Ennore (or Kattupalli if existing container service is utilized) to Kandla/Mundra

6.3 Implementation of Policy Changes

Institutionalize Maritime Development Fund

A specialized Maritime Development Fund needs to be established for availability of low cost-long tenure financing in maritime sector, particularly for purchase of vessels. Coastal Shipping promotion cell, with support from PMC, could initiate the work on formalizing the fund.

- **Conceptualization of the fund**: Define the scope of the fund with regard to coverage area, fund corpus, sources of fund, disbursement mechanisms and criteria. The key areas the fund should cover
  - Low cost long tenure loan for purchase of vessel

- Incentives to cover additional operating cost (due to regulatory changes such IMO 2020 regulation)
- Incentives for fleet modernization (installation of scrubber/LNG kit)
- Incentives for pilot run (covering the one-time cost for pilot run)
- Modal shift incentives, like EU's Marco Polo scheme, if provided could also be included

– **Reach out to funding institutions:** Multilateral/bilateral agencies which can provide funding at low cost could be contacted

Representation to different government authorities for key policy level interventions

To implement various policy changes, representation need to be sent to different government bodies. The coastal shipping promotion cell can reach out to these bodies and follow up for the interventions required:

Customs:

– Allow mixing of EXIM and coastal cargo on foreign RoRo vessels

– Allow use of EXIM containers to carry coastal cargo

– Allow domestic fleet to carry both EXIM and coastal cargo from foreign ports

Food Corporation of India:

– Coordinate with FCI and state bodies in developing a cost saving sharing mechanism with state governments for movement of foodgrains from port based warehouses to end consumers.

– Rationalization of origin FCI depots closer to ICDs for coastal movement (***based on discussion with study team, FCI has already identified depots near ICDs at origin location to be utilized for coastal movement***)

Ministry of Coal:

– Rationalization of coal linkages in future considering waterway as a possible logistics mode

Department of Fertilizer:

– Standard procedure for filling of reimbursement for all modes and fast tracking of reimbursement submission mechanism for coastal shipping in online system

GST Council:

– Lower the GST rates for multimodal to be on par with single mode of transportation

– Credit availability to offset high cost of IGST on capital costs of vessels

– Review of "Place of Supply" rule for domestic fleet, enabling them to claim tax offset

Ministry of Finance:

– Ensure parity of income tax (payable on coastal crew wages) for Indian and foreign vessels

Ministry of Petroleum/Oil PSUs

– Reduce disparity in bunker fuel costs at Indian ports and foreign ports

DG Shipping:

– Relax the existing manning norms which mandate engagement of Indian crew on foreign vessels post expiry of license period of 30 days for coastal voyage

PSUs:

– Develop model coastal shipping contracts through detailed discussions with the PSU cargo owners shipping lines and consequent review from respective ministries

6.4 Implementing Process Changes

Coordination with different bodies such as Customs, Department of Commerce, major ports required to implement the process changes. The PMC under the coastal shipping promotion cell needs to coordinate with these agencies to implement the following changes:

Customs:

- Automate the coastal cargo customs clearance process with inspection based on customs intelligence
- Integrate NIC portal with ICEGATE portal
- Standardize and simplify the process of foreign vessel conversion and reversion (detailed list of interventions provided in section 5.5)

Major ports:

- Ensure proper implementation of all elements of providing green channel clearance to coastal cargo with priority berthing facilities

Logistics division, Department of Commerce

Coastal Shipping Promotion Cell to develop coastal shipping logistics databank gathering data from all the ports

- Integrate the coastal shipping logistics databank with e-marketplace and integrated Logistics Planning and Performance Monitoring Tool (LPPT) being developed by Department of Commerce

6.5 Prioritizing Infrastructure Projects

PMC, in collaboration with port authorities, various ministries and state governments needs to prioritize and fast track the development of suggested infrastructure projects. The prioritization framework based on importance and readiness of the project has been discussed in section 4.5. The key project categories are:

Coordinate with Ministry of Steel/ steel players for development of port based agglomeration centres

- Conduct stakeholder workshops at steel clusters near Paradip and Haldia port to understand the requirements of industry players for agglomeration of cargo

Coordinate with individual cement manufacturers for development of port based silos

- Reach out to cement manufacturers to understand their requirements to develop port based silos and provide necessary support from ports in allocation of land

Coordinate with FCI for development of port based warehouses

- Collaborate with FCI and ports for development of port based warehouse. The activity to be undertaken post discussion with state government on cost saving sharing mechanism from port based warehouses

Coordinate the development of coastal berths

- Evaluate potential financing model in collaboration with respective state maritime boards/ port trusts for construction of the identified coastal berths

Prioritize the development of connectivity infrastructure to ports and coastal berths

– Coordinate with railways, NHAI, IWAI to expedite the ongoing port connectivity infrastructure projects identified under Sagarmala Program and to start assessment of connectivity projects identified in this study (the list of projects provided in section 4.4.1).

6.6 Market Outreach

The promotion cell will have the responsibility to increase the visibility of coastal shipping and build a positive image of coastal shipping to attract new players. As part of market outreach activities, the promotion cell will

– Conduct focused workshops with involvement from industry groups, shipping players

– Act as interface between the industry and authorities, facilitate communication between them, and suggest suitable policy action plans to the Ministry for resolving the issues faced by industry players

– Send representations to different government authorities and ministries

Table 12: Action plan

Sr no	Category	Sub-category	Action Step	Primary Responsibility	Secondary Responsibility	Timeline (Months)											
						1	2	3	4	5	6	7	8	9	10	11	12
A1	**Promotion & Marketing initiatives**	**Constitution of promotion cell**	Institutionalize the promotion cell under MoS with representations from Logistics division, Railways, MoRTH & IWAI	Ministry of Shipping	Logistics division, Ministry of Commerce												
A2			Hire program management consultancy (PMC) for operationalizing the promotion cell	Ministry of Shipping													
A3			Hire Marketing officers / Business Associates (freight forwarders) for on-ground conversion of coastal shipping volumes	Port Authorities	Ministry of Shipping												
B1	**Initiating pilot movements for identified commodities**	**Steel**	Meeting and coordination with Ministry of Steel and key steel players (SAIL, JSW, TATA, Bhushan, small steel players from Kalinganagar, Jamshedpur, Durgapur clusters) for pilot movement	Ministry of Shipping	Ministry of Steel/ Steel players												
B2		**Fertilizer**	Coordinating with major fertilizer plants (*e.g. IFFCO, KRIBHCO)* for container / wooden boat movement to Maharashtra	Ministry of Shipping	Department of Fertilizer / Fertilizer Player(s)												
B3		**Fertilizer**	Coordinating with IWAI & key plants in Odisha for IWT barge movement along NW-1 to West Bengal	Ministry of Shipping	IWAI / Fertilizer player(s)												
B4		**Foodgrain**	Coordinating with FCI & CONCOR for containerized movement from Punjab to Southern states	FCI/CONCPR	Ministry of Shipping												
B5		**Coal**	Coordinating with Ministry of Coal and MCL mines for movement of coal to west coast power plants	Ministry of Coal	Ministry of Shipping												
B6		**Sugar**	Coordinating with Indian Sugar EXIM Corporation for short sea movement from UP to Bangladesh via Kandla port	Indian Sugar EXIM Corporation	Ministry of Shipping												
B7		**Salt**	Co-ordinating with Salt manufacturers in Gujarat & wooden	Ministry of Shipping	Salt manufacturer												

Sr no	Category	Sub-category	Action Step	Primary Responsibility	Secondary Responsibility	Timeline (Months)											
						1	2	3	4	5	6	7	8	9	10	11	12
			boat association for movement from Gujarat to Maharashtra		(s)/ wooden boat association												
C1	**Implementing policy changes**	**Institutionalization of Maritime Development Fund**	Conceptualization of Maritime Development Fund	Ministry of Shipping	Logistics division, Ministry of Commerce												
C2			Securing funding for the MDF through discussions with Multilateral institutions/Ministry of Commerce	Ministry of Shipping	Logistics division, Ministry of Commerce												
C3		**Representation to authorities**	Allow mixing of EXIM and coastal cargo on RoRo vessels	Customs	Ministry of Shipping												
C4			Allow use of EXIM containers for carriage of coastal cargo	Customs	Ministry of Shipping												
C5			Allow mixing of EXIM & coastal cargo for short sea shipping to neighboring countries	Customs	Ministry of Shipping												
C6			Develop last mile cost sharing mechanism between state government and FCI	FCI/State Governments	Ministry of Shipping												
C7			Re-align origin foodgrain depots for coastal movement	FCI													
C8			Rationalize coal mine linkages with power plants	Ministry of Coal	Ministry of Shipping												
C9			Develop standard procedure for filling of reimbursement for all modes	Department of Fertilizer													
C10			Reduce the GST rate in multimodal transportation	GST Council													
C11			Credit availability to offset high cost of IGST on capital costs of vessels	GST Council													
C12			Relax "Place of Supply" rule for coastal vessels	GST Council													
C13			Relax existing manning norms / cabotage restrictions for coastal steel movement to ensure availability of foreign vessels	DG Shipping													

Sr no	Category	Sub-category	Action Step	Primary Responsibility	Secondary Responsibility	Timeline (Months)											
						1	2	3	4	5	6	7	8	9	10	11	12
C14			Develop model multimodal contract with conditions conducive for coastal shipping	Promotion Cell													
C15			Exempting Customs and Central excise duty on coastal run of Foreign Ro-Ro vessels	Customs													
C16			Increase number of Free Days for storage of Coastal Containers	TAMP	Ministry of Shipping												
D1	**Implementing Process changes**	**Representation to Customs**	Automate the coastal cargo customs clearance process with inspection based on customs intelligence	Customs													
D2			Integrate NIC portal with ICEGATE portal	Customs													
D3			Standardize the process of foreign vessel conversion for coastal movement	Customs													
D4		**Green Channel Clearance**	Ensure proper implementation of green channel clearance and priority berthing for coastal cargo	Port Trusts													
D5		**Common Logistics Platform**	Develop coastal shipping databank	Ministry of Shipping	Logistics division, Ministry of Commerce												
D6			Integrate the databank with the overall logistics databank and Integrated Logistics Planning and Performance Monitoring Tool (LPPT)	Logistics division, Ministry of Commerce	Ministry of Shipping												
D7			Develop e-freight marketplace for coastal shipping and integration with e-freight marketplace for logistics sector	Logistics division, Ministry of Commerce	Ministry of Shipping												
E1	**Prioritizing Infrastructure projects**	**Port based steel agglomeration center**	DPR for development of steel agglomeration centre at Paradip port	Port Authority/Ministry of Shipping	Ministry of Steel												
E2			DPR for development of steel agglomeration centre at Haldia port	Port Authority/Ministry of Shipping	Ministry of Steel												

Sr no	Category	Sub-category	Action Step	Primary Responsibility	Secondary Responsibility	Timeline (Months)											
						1	2	3	4	5	6	7	8	9	10	11	12
E3		**Port based cement silo**	DPR for development of cement silos at select ports	Port Authority/Ministry of Shipping													
E4		**Port based foodgrain depot**	DPR/Contracting for Development foodgrain depot at Mormugao port	FCI	Port Authority												
E5			DPR/Contracting for Development foodgrain depot at NMPT port	FCI	Port Authority												
E6			DPR/Contracting for Development foodgrain depot at Cochin port	FCI	Port Authority												
E7			DPR/Contracting for Development foodgrain depot at Tuticorin port	FCI	Port Authority												
E8			DPR/Contracting for Development foodgrain depot at Karaikal port	FCI	Port Authority												
E9			DPR/Contracting for Development foodgrain depot at Chennai port	FCI	Port Authority												
E10		**Coastal berths**	DPR for development of coastal berth at Dholera, Gujarat	Port Authority/State Maritime boards	Ministry of Shipping												
E11			DPR for development of coastal berth at Palghar, Maharashtra	Port Authority/State Maritime boards	Ministry of Shipping												
E12			DPR for development of coastal berth at Machilipatnam, Andhra Pradesh	Port Authority/State Maritime boards	Ministry of Shipping												
E13			DPR for development of coastal berth at Kori Creek, Gujarat	Port Authority/State Maritime boards	Ministry of Shipping												
E14		**Connectivity infrastructure**	Prioritize development of key connectivity projects as per section 1.4 of the report	Respective project owners	Ministry of Shipping												
F1	**Promotion & Marketing initiatives**	**Market outreach**	Information dissemination, meetings with stakeholders, development of business plans for build-up of coastal volumes and undertaking all other marketing related activities	Promotion Cell													

7 Annexure

7.1 Definitions

For the purpose of the assignment, the following interpretations have been considered for coastal, short sea and inland water movement:

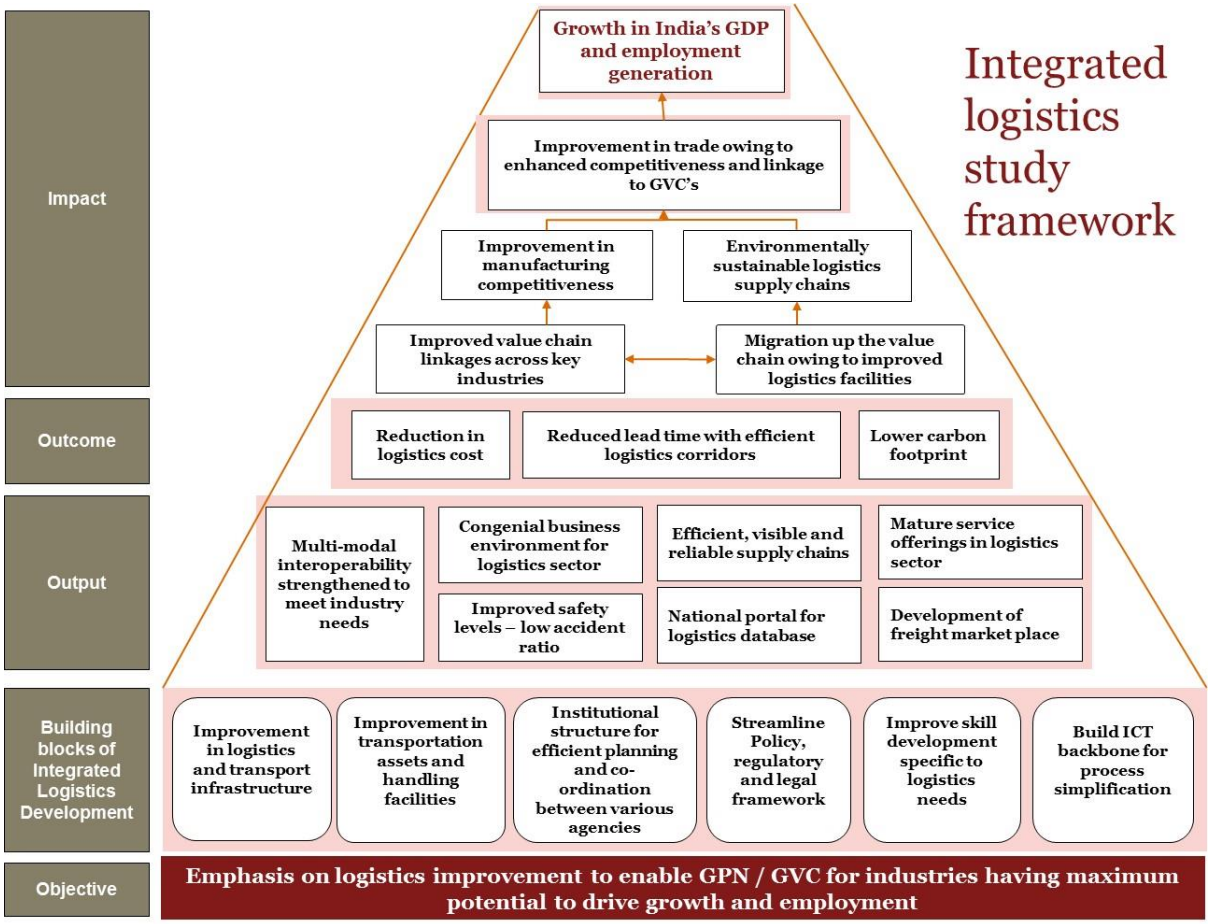
- **Coastal movement:** Refers to the movement between two locations within India using Indian coastline
- **Short sea shipping:** Refers to shipping commodities over short distances, usually to neighbouring countries, using the coastal region i.e. within 20 nautical miles of the coast. Movement between India and Bangladesh through IBP route will be accordingly considered as short sea shipping for this study.
- **Inland water transport (IWT):** Goods movement along the National Waterways (NW) declared under the National Waterways Act 2016[61]. Additionally, IWT also includes trade with Bangladesh through waterways along routes specified under the Protocol to Inland Water Trade and Transit (PIWTT)[62].
- **Sagarmala[63]:** The in-principle approval for the Sagarmala Program was granted by Government of India in March 2015. The prime objective of the Sagarmala project is to promote port-led development and to provide infrastructure to transport goods to and from ports quickly, efficiently and cost-effectively. The Sagarmala initiative is conceptualised around the following 4 components:
  - Port Modernization and New Port Development: De-bottlenecking and capacity expansion of existing ports and development of new greenfield ports
  - Port Connectivity Enhancement: Enhancing the connectivity of the ports to the hinterland, optimizing cost and time of cargo movement through multi-modal logistics solutions including domestic waterways (inland water transport and coastal shipping)
  - Port-linked Industrialization: Developing port-proximate industrial clusters and Coastal Economic Zones to reduce logistics cost and time of EXIM and domestic cargo
  - Coastal Community Development: Promoting sustainable development of coastal communities through skill development and livelihood generation activities, fisheries development, coastal tourism etc.

[61] National Waterways Act, 2016- The act contains declaration of certain inland waterways to be national waterways and also provides for the regulation and development of the said waterways for the purposes of shipping, navigation and related matters; 111 national waterways have been declared under this act.
[62] The protocol addresses mutually beneficial arrangements between Bangladesh and Indian governments for the use of waterways for commerce between the two countries, and for passage of goods between the two countries and to third countries through respective territories under mutually agreed terms
[63] Sagarmala, Ministry of Shipping, Government of India

7.2 Introduction

7.2.1 Integrated Logistics Framework

Figure 101: Integrated logistics framework



7.2.2 Initiatives Taken by Government to Promote Coastal Shipping

Government of India initiatives to promote water based transportation

The **Sagarmala Program** aims to increase the modal share of water based transport from the current level of ~6% to 12% by 2025, through port-led economic development. It focuses on the development of transport and logistics infrastructure as well as skill and capacity building.

The **Jal Marg Vikas Project (JMVP)**, approved by Government of India in January, 2018, envisages capacity augmentation of National Waterways (NW) -1 by development of fairway with 3 meters depth between Varanasi and Haldia (Phase-I) covering 1,380 km, and construction of multi-modal terminals and navigational locks at strategic locations. This would provide an impetus for cargo movement by inland water transport (IWT) mode as well as encourage coastal and IWT routes with Haldia as the gateway for coastal traffic.

Agreement on coasting shipping between India and Bangladesh aims to increase the co-operation between the two countries to encourage the coastal movement for bilateral trade as well as aid the domestic trade between the North-Eastern states and the rest of India.

Protocol on inland water transit and trade between India and Bangladesh addresses mutually beneficial arrangements between the two countries to promote the use of waterways for bilateral trade, and for passage of goods to third countries through respective territories under mutually agreed terms. The protocol routes also connect the North-Eastern states of India to the rest of India through Haldia/Kolkata.

Agreement on coastal shipping among Bangladesh, India, Myanmar, Nepal, Sri Lanka and Thailand refers to the Draft Agreement between the **BIMSTEC** member countries, for co-operation in the field of maritime commercial navigation, to contribute to the growth of economic and commercial relations among BIMSTEC countries.

Approved relaxation and concessions for promoting coastal shipping/ inland water transport in India:

Table 13: Relaxation and concession for promoting coastal shipping/ inland water transport

Date	Circular	Commodity
Jan 2005	Port/vessel related charges for coastal vessels shall not be more than 60% of foreign vessels	All commodities except thermal coal, POL (including crude oil), iron ore and iron ore pellets [64]
July 2015	Provision of Green channel for clearance of coastal cargo from existing berths	All commodities[65]
September 2015	Relaxation of Cabotage Restriction for special vessels such as Ro-Ro, Hybrid Ro-Ro, Ro Pure Car Carriers, Pure Car and Truck Carriers, LNG Vessels and Over-dimensional or Project Cargo	Automobiles, LNG, Project Cargo[66]
March 2016	Relaxation of cabotage restriction for container trans-shipment port	Containers[67]
August 2016	Central scheme for providing financial support to Major/ Non Major Ports/ State Governments for creation of infrastructure to promote movement	All commodities[68]

[64] Tariff Authority for Major Ports, Notification dated 19th October, 2015

[65] Press Information Bureau dated 27th July, 2015 on Green Channel for Clearance of Coastal Cargo

[66]General Order dated 2nd September, 2015 on Relaxation of cabotage restriction for special vessels such as RO-RO, Hybrid RO-RO, RO Pure Car Carriers, Pure Car and Truck Carriers, LNG vessels and Over- Dimensional, Cargo or Project Cargo, Carriers

[67] General Order dated 7th March, 2016 on Relaxation of cabotage restriction for container transshipment port

[68] Central sector scheme for providing for providing financial support to Major/ Non-major ports/ State Governments for creation of infrastructure to promote movement of cargo/ passengers by sea/ national waterways

	of cargo/ passengers by sea/ National Waterways	
September 2016	Discount of 80% for 2 years in Vessel related charges and cargo related charges, for coastal transportation of vehicles through Ro-Ro ships	Automobiles[69]
October 2017	GST reduced from 18% to 5% on marine fuel oil for all vessels	Bunker Oil[70]
May 2018	Foreign flagged ships no longer need license from Director General of Shipping to engage in coastal shipping. They just need to submit information about vessel and commodities, 24 hours prior to departure.	Ships, engaged in coastal shipping of[71] 1. Transportation of EXIM laden containers for transshipment 2. Transportation of empty containers
May 2018		Agricultural, fisheries, animal husbandry and horticultural commodities[72]
June 2018		Fertilizers, at least 50% of the cargo[73]
In consideration	Right of First Refusal (ROFR - Indian company can match the lowest bid quoted by a foreign company), will be maintained when state-run companies complete their shipping arrangements via a tender. Otherwise, the ROFR will not be applicable. If the government or the public sector decide to hire ships on time-charter, ROFR will be retained. However, if they hire ships from the spot market or on voyage charter, ROFR will not apply.	All commodities[74]

7.3 Port Wise Coastal Traffic Data for FY 17 and FY 18

Table 14: Port wise coastal traffic data for FY 17 and FY 18

Mormugao Port				
Commodity	Outbound - FY 17 (Thousand MT)	Inbound - FY 17 (Thousand MT)	Outbound - FY 18 (Thousand MT)	Inbound - FY 18 (Thousand MT)
POL	-	618	4	616
Iron Ore	87	-	445	-
Coking Coal	-	117	-	334
Steel Slabs	37	-	159	-
Containers	19	70	8	58

[69] Press Information Bureau dated 21st September, 2016- Major Boost for Coastal Transportation of Vehicles Through Ro-Ro Vessels

[70] Press Information Bureau dated 11th October, 2017 on GST rate structure for Petroleum and Oil Sector

[71] MoS GO dated 21st May, 2018 on Relaxation under Section 407 of the Merchant Shipping Act, 1958, for coastal movement of (a)EXIM Transshipment Containers and (b)Empty Containers

[72] MoS GO dated 22nd May, 2018 on Relaxation under Section 407 of the Merchant Shipping Act, 1958, for coastal movement of agriculture, horticulture, fisheries and animal husbandry commodities.

[73] MoS GO dated 22nd June, 2018 on Relaxation under Section 407 of the Merchant Shipping Act. L958, for coastal movement of fertilizers

[74] Based on news articles, and pointers highlighted by industry

Steel Coils	79	4	53	10
Others (Bentonite, Machinery, Raw Petroleum Coke)	1	3	-	24
Total	**224**	**811**	**669**	**1042**
New Mangalore Port				
Commodity	Outbound - FY 17 (Thousand MT)	Inbound - FY 17 (Thousand MT)	Outbound - FY 18 (Thousand MT)	Inbound - FY 18 (Thousand MT)
Crude Oil	-	2767	-	3657
Iron Ore	444	1212	793	2158
POL	2094	404	1686	421
Cement	-	378	-	397
Other Break Bulk	-	33	-	41
Other Liquids	131	12	16	21
Containers	-	287	-	-
Others (Dry bulk, coking/ other coal, edible oil, Met Coke)	70	237	38	195
Total	**2739**	**5329**	**2532**	**6890**
JNPT				
Commodity	Outbound - FY 17 (Thousand MT)	Inbound - FY 17 (Thousand MT)	Outbound - FY 18 (Thousand MT)	Inbound - FY 18 (Thousand MT)
Crude Oil	1420	-	1420	0
High Speed Diesel	15	947	-	918
Naphtha	25	264	25	264
Motor Spirit	-	116	-	116
Paraxylene	113	-	113	0
Others (Aromatic Feed Stock, fuel)	0	76	15	76
Total	**1573**	**1404**	**1573**	**1374**
Kamrarajar Port (Ennore)				
Commodity	Outbound - FY 17 (Thousand MT)	Inbound - FY 17 (Thousand MT)	Outbound - FY 18 (Thousand MT)	Inbound - FY 18 (Thousand MT)
Coal	-	14464	-	16015
POL	-	2029	-	2403
Automobile	-	146	-	-
Others (Containers, Steel, Project Cargo)	-	7	-	103
Total	**0**	**16646**	**0**	**18521**
Cochin Port				
Commodity	Outbound - FY 17 (Thousand MT)	Inbound - FY 17 (Thousand MT)	Outbound - FY 18 (Thousand MT)	Inbound - FY 18 (Thousand MT)
Diesel High Speed	571	447	1549	355
Cement	-	818	-	791
Motor Spirit	54	288	217	511
Crude Oil	50	795	40	485
Fuel Oil	228	243	76	235

Naftha Low Aerated	57	-	270	-
Salt	-	105	-	94
Others(Steel, Sulphur Acid, Bauxite, Clinker, Iron Hydroxide, Petroleum Coke, Jet Petrol, Automobile)	2	51		68
Total	**962**	**2748**	**2152**	**2539**
Tuticorin Port				
Commodity	Outbound - FY 17 (Thousand MT)	Inbound - FY 17 (Thousand MT)	Outbound - FY 18 (Thousand MT)	Inbound - FY 18 (Thousand MT)
Coal	-	4613	-	6269
Industrial Acid	291	-	-	144
Clinkers	-	35	-	113
Caustic Soda Lye	79	-	69	-
Furnace Oil	-	79	-	54
Iron And Steel Materials	-	25	-	27
Petroleum Coke	-	78	-	26
Salt In Bulk	-	32	-	22
Others (Soda Ash, Stone aggregate, diesel oil, fertilizers, Machineries, cement)	1	12	7	12
Total	**371**	**4874**	**76**	**6667**

Source: Port data

7.4 Major Ports' Port Wise Coastal Traffic Data for FY 19

S.No.	Name of Port	Cargo handled (FY-19)
1	Kolkata	2.6
2	Haldia	16.3
3	Paradip	38.2
4	Vizag	17.0
5	Ennore	19.1
6	Chennai	4.9
7	Tuticorin	10.3
8	Cochin	10.9
9	NMPT	7.7
10	Mormugao	2.8
11	Mumbai	26.6
12	JNPT	4.9
13	Kandla	12.7
Total		**174 MMT**

7.5 Commodity Wise Coastal Traffic Data for FY 19

S. No.	Commodity	Cargo volume (Million MT)		
		Non-major ports	Major Port	Total
1	POL Crude	6.6	22.7	**29.3**
2	POL Products	16.5	36.3	**52.9**
3	LPG / LNG	-	0.9	**0.9**
4	Edible Oil	0.1	0.4	**0.5**
5	FRM-Liquid	-	0.2	**0.2**
6	Iron Ore Pellets/ Fine	26.6	22.4	**49.0**
7	Other Ores	0.4	0.6	**1.0**
8	Thermal Coal	3.6	53.0	**56.6**
9	Coking Coal	5.5	3.2	**8.7**
10	Other Coal	7.0	2.0	**9.0**
11	Fertilizer	0.2	0.03	**0.3**
12	FRM-Dry	-	0.1	**0.1**
13	Food Grains exclude Pulses	0.02	-	**0.02**
14	Cement	9.7	3.6	**13.3**
15	Iron and Steel	3.5	2.1	**5.6**
16	Project Cargo	0.1	0.02	**0.1**
17	Building material	1.0	-	**1.0**
18	Container (Tonnes)	1.5	15.4	**16.9**
19	Others	9.2	11.3	**20.5**
Total		**91.6 MMT**	**174.1 MMT**	**265.7 MMT**

7.6 Land and Storage Infrastructure at Key Major Ports

Table 15: Land and Storage infrastructure

Ports	Land Details				Storage			
	Total Land area (acres)	Land area available alongside birth for creating silo infrastructure for storage of cement (acres)	Cost of Land		Capacity of silo infrastructure available with the Port	Cost of Silo infrastructure (Capacity and land required)		Available capacity of warehouse (for storage of food grains, fertilizer, steel)
			Land Available with Port (Rs. million/ acre)	Land within 5 km of port area (Rs. million/ acre)		Land (Acre)	Cost (Rs billion)	
NMPT	40	No area available alongside birth	35.2 (one time premium)	21.6 (one time premium)	15,000 MT (M/s Ambuja Cement) 18,000 MT (M/s Ultratech Cement)	2.04 (M/s Ambuja Cement) 3.7 (M/s Ultratech Cement)	0.08 (M/s Ambuja Cement) 0.18 (M/s Ultratech Cement)	10,260 sqm (Transit Sheds) 19,050 sqm (Overflow Sheds) 53,212 sqm (Outside Port Compound Wall but inside the Notified area
Mormugaon	546.6	20	60 (one time premium)	120 (one time premium)	4000 MT		0.4 (SWPL) 4 (M/s AMPTPL)	16,000 sqm (inside custom bound area) 4,000 sqm (outside custom bound area)
Mumbai Port	17 acres (covered) & 56 acres (open) in Indira Dock	0.45 acres along berth 10 ID and 0.74 acres near the berth	-	-	0	0	0	2,28,788 sqm (Open Area) 70,269 sqm (Closed Area)
JNPT	790.7	9.9	-	Rs 312/ sqm (Land lease rent)	-	-	-	-
Ennore		Not Identified	7.47 (one time premium)					
Cochin	12.3	13.3	2.2 – 2.7 (annual lease rent)	2.2 – 2.7 (annual lease rent)	20,000 MT (Ambuja Cements) 24,000 MT (UltraTech	2.7 (Ambuja Cements) 4.32 (UltraTech	0.85 – 1.1 (Utilization 40% - 60%)	25,000 MT (Fertilizer Raw Materials) 18,000 MT (Food

			110 (one time premium)	2050 (one time premium)	Cements) 16,000 MT (Zuari Cements) 24,000 MT (Penna Cements) Malabar Cements (yet to be constructed)	Cements) 5.9 (Zuari Cements) 2.7 (Penna Cements) 6.9 (Malabar Cements)		Grains) 7,000 MT (Finished Fertilizers, MOP) 7,000 sqm (Steel) 15,000 MT (Finished Fertilizers)
Tuticorin	110	Not Applicable	**Annual lease rent** 0.5 (Service) 1 (Industrial) 1.53 (Commercial)	**Guideline value** 16.7 (Service) 36.4 (Industrial) 3 (Commercial)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Chennai	Unpaved - 100 acre Paved - 28 acre Covered - 15 acre	No area available alongside berth		291 – 481 (Land adjacent to port boundary)	No silo developed	-	-	15 acre with 70% utilization in last 3 years
Dindayal Port Trust	410 acres open area, 41 acres of warehouses (65% utilized)	Not Applicable	-	-	Not applicable	Not Applicable	Not Applicable	41 acres (65% utilized)

Source: Port data

Table 16: Port-wise assessment of infrastructure development and land availability

Port	Foodgrain FCI Depots	Cement Silos	Coastal cargo berths
Mumbai / JNPT	Not required	~7-8 acre land is needed to develop 50,000 MT capacity cement silos. Land is available alongside the berth as well as in the port area, which can be utilized for the cement silos.	JNPT is developing a coastal berth of 2.5 MMMTPA capacity; in future capacity of the berth can be increased to handle additional 3-5 MMTPA of cement and steel cargo
Mormugao	To develop FCI depot of 154,000 MT, ~34 acre land is needed. However, land cost at port is	Not required	In case, suitable land for FCI depot is unavailable near Mormugao port, the traffic can be diverted to upcoming coastal berth at Karwar port. The berth will have to be

	high[75], resulting in unviability of the depots. Therefore, locations outside port area (within 10-15 km) need to be identified. Alternatively, location near upcoming coastal berth at Karwar port can also be utilized.		equipped to handle containers and warehouse need to be developed nearby.
NMPT	~37 acre land is required to develop depot of 170,000 MT capacity. However, land cost is high for project viability, therefore, location outside port area (within 10-15 km) need to be identified	Ambuja, Ultratech have existing silos of 33,000 MT at the port. Additional 20,000 MT silos need to developed, which require 3 acre land. However, port doesn't have land available along the berth. Alternatively, coastal berth being developed at Old Mangalore port can be utilized for cement cargo.	Coastal berth is proposed at Old Mangalore port, which can be equipped to handle cement cargo of ~0.8 – 1 MMT volume.
Cochin	~ 40 acre of land is required to develop warehouse of 180,000 MT capacity, as needed by FCI. However, required land area is unavailable with the port, for which nearby locations need to be explored.	Port has existing silos of 84,000 MT capacity and need 20,000 MT for additional cement cargo. This will require 3 acre of land alongside the berth, which is available with the port.	
Chennai	~ 21 acre land is required to develop warehouse of 96,000 MT capacity. However, land cost is high for project viability, therefore, location outside port area (within 10-15 km) need to be identified	Not required	Chennai port is developing a coastal berth of 1 MMTPA capacity; in future capacity can be increased to handle additional 2-2.5 MMTPA capacity to handle steel cargo
Tuticorin	~ 14 acre land is required to develop warehouse of 66,000 MT capacity, which is available with the port at reasonable cost to achieve viability of the warehouse.	Not required	Port has 7 multipurpose general cargo berth, 1 coastal clean cargo berth which can be utilized for handling coastal cargo

[75] Land cost should be less than 70 lakhs per acre for viability of food grain warehouse. Detailed assumption for estimation of threshold land cost provided in 7.8.6

7.7 Steel

Table 17: State-wise steel production and production of large players

State- production (MMTPA)	Large Plants	Production (MMTPA)
Odisha – 18	JSPL Angul	2.5
	Bhushan Steel	3.6
	TATA Kalinganagar	2.4
	SAIL Rourkela	2.9
Jharkhand – 16	SAIL Bokaro	3.5
	TATA Jamshedpur	9.8
West Bengal – 8	SAIL Asansol	2.7
	SAIL Durgapur	2.0
Chhattisgarh- 16	JSPL Raigarh	1.0
	SAIL Bhilai	3.7
Andhra Pradesh- 5	RINL Vizag	4.5
Tamil Nadu- 3	JSW Salem	0.8
Karnataka- 12	JSW Vijayanagar	9.5
Maharashtra- 9	JSW Dolvi	4.0
	JSW Kalmeshwar	0.5
Gujarat- 6	ESSAR steel	5.6
	Total	**60**

Source: Company annual reports, Indian Mineral Yearbook

Table 18: Small and large players in East India

State	Cluster	Large Players	Small Players	
Odhisha	Kalinganagar	TATA Kalinganagar	• Neelanchal Ispat • Visa Steel • Mesco Steel	• IDCOL • KJ Ispat • Dinabandhu Steel
	Dhenkanala	Bhushan Steel, Dhenkanal	• Scaw Industries • Aarti Steel • BRG Iron and Steel	• Viraja Steel Ltd • Maheshwari Ispat • MGM Steel
	Angul	JSPL Angul	• Nalco Steel • Sree Metaliks	• Monnet Ispat
	Rourkela	SAIL Rourkela		
	Odisha Total	**11.4 MMT**	**6.6 MMT**	
Jharkhand	Jamshedpur	TATA Jamshedpur	• Usha Martin • AML Steel Ltd • Adhunik Alloys and Power Ltd.	• Tinplate Co. India • Goel Sponge Ltd • BMW Industries
	Bokaro	SAIL Bokaro	• Umi Special Steels Ltd • Bihar Foundry and Castings Ltd	
	Jharkhand Total	**14.3 MMT**	**1.7 MMT**	
West Bengal	Durgapur	SAIL Durgapur, SAIL Asansol	• Adhunik Corpn Ltd • Durgapur Metaliks • Shyam Steels Ltd	• Rupa and Co. Ltd. • Super Smelters • Vikash Metal
	Kolkata		• Ashirwad Steels Ltd • Kamdhenu Ltd • RS Ispat	• Skipper Ltd. • Mahalxmi TMT • Nirmal Wires
	Kharagpur		• Rashmi Metaliks • Rashi Metals Ltd	• Tata Metaliks • Shamom Ispat
	West Bengal Total	**3.6 MMT**	**4.4 MMT**	

Source: Capex database, Company reports

Table 19: Finished steel- Region-wise rail volume movement (MT)					
Origin /Destination	***North***	***West***	***East***	***Central***	***South***
North	0				
West		2			
East	10	4	11	1	3
Central	1	1	2	0	2
South	1	2	0	0	5

Source: Railway data

Table 20: Finished steel- Region-wise road volume movement					
In MMT	***North***	***West***	***East***	***Central***	***South***
Steel Consumption	29	15	22	8	23
Steel Production	5.5	15	42.5	12	22
Rail movement inwards	12	6	3	0.5	4.8
Rail movement outwards	0	0.5	17	6.5	3.9
Deficit/Surplus that needs to be ***moved inter zone on road***	***-11.5***	***5.5***	***6.5***	***-2***	***0***

Source: Study team analysis, Primary interactions with major players

7.8 Foodgrain

7.8.1 Existing Coastal Routes

Table 21: FCI Coastal Movement

Route	Details
Mangalore to Lakshadweep Islands	Movement of around 10,000 MT rice
Andhra Pradesh to Andaman and Nicobar Islands:	Movement of around 30,000 MT rice
Andhra Pradesh to Kerala	This route has seen a steep decline of 85% from FY15 (~1,00,000 MT) to FY17 (~14,000 MT). Recently a FCI awarded a tender for 5000 MT per month movement of food grain on this route
West Bengal to Tripura via Bangladesh	FCI moved ~10,000 MT raw rice in FY16 and ~2,000 MT in FY17 through coastal shipping, but the costs were higher than railway
Andhra Pradesh to Tripura via Bangladesh:	Movement undertaken due to railway gauge conversion work, pilot movement was done in FY15, where 10,000 MT raw rice was moved to North East but the movement was not continued as the coastal movement to North east was costlier than railway movement.

Source: FCI website, primary interactions

7.8.2 Comparison of Break Bulk and Containerised Movement

For OD pair Punjab – Kerala, railway movement is INR ~1,000/MT cheaper than coastal container movement

Table 22: TLC comparison for break-bulk and containerized movement

Ludhiana/Patiala, Punjab – Thrissur, Kerala		
	Break Bulk Movement from Patiala to Thirussur	**Container Movement from Ludhiana to Thirussur**
Description	**INR Per MT**	**INR Per MT**
First mile	2,300	1,816
Load Port handling	282	158
Fixed cost – vessel (including return cost)	510-783	346
Bunker – steaming	315	225
Bunker – port stay	91	19
VRC Kandla	43	39
VRC Cochin	37	38
Disport handling	354	111
Last mile	530	530
Container rent	-	37
Jumbo bag	150	-
Empty container return to Kandla	-	216
Service provider margin and other cost	150	200
Total cost through coastal movement	**4,750-5050**	**3750**

- Vessel size –
  - Break Bulk: 12,000 MT/ 9,000 GT;
  - Container: 1700 TEUs, assuming ~70% loaded
- Last mile distance – 90 km
- Movement from origin FI depot to destination FCI depot

All rail route	
Patiala/Ludhiana to Thrissur	**INR 4050/MT**

Source: Study team analysis

7.8.3 FCI Depots Closer to ICDs

A list of FCI depots closer to ICDs that can be utilised for coastal shipping

Table 23: FCI depots closer to ICD

State	Hub depot	ICD	Distance of ICD from Hub depot (km)
Punjab	FSD Ahmadgarh	ICD Sahnewal	26
		ICD Dhandarikalan	30
		ICD Kanech	29
		ICD Chawapail	34
		ICD Kila Raipur, Ludhiana	11
Haryana	Pasina Kalan	ICD Jattipur	3
	Faridabad	ICD Ballabgarh	6
	Khatauli	ICD Dappar	25

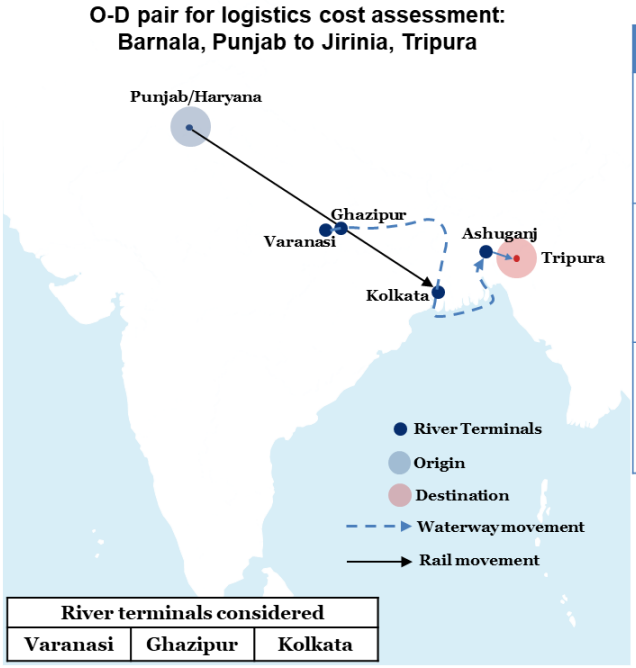
Source FCI

Interaction with FCI suggests that depots within 15 km from these hub depots can be utilized for coastal shipping movement

7.8.4 IWT Movement of Foodgrain from Punjab/Haryana to North East

FCI dispatched 2.9 MMT of food grain to North-East, out of which 2.4 MMT was from Punjab and Haryana

Figure 102: Multimodal IWT movement from Punjab/Haryana to North East



Option	Movement details
First mile: Rail movement	• Barnala, Punjab to river terminal by rail
Waterway Movement	• From river terminal to Ashuganj- inland waterway movement via IBP route
Last mile: Road movement	• Truck movement from Ashuganj river terminal to Jirinia, Tripura

Source: Study team analysis, primary interactions

High first mile cost of movement impacting the viability of coastal movement

Figure 103: TLC analysis for IWT movement of food grain from Punjab to North East via Kolkata

Total logistics cost

River terminal	Rail Cost	Multi-modal waterway movement
With empty cost		
Kolkata	3,680	6200
Varanasi	3,680	9200
Ghazipur	3,680	8400
Without empty cost		
Kolkata	3,680	**5145**
Varanasi	3,680	6100
Ghazipur	3,680	5800

Costing based on planned LAD scenario (with night navigation aids) with improvements in jetty infrastructure for all terminals- *Discharge rate of 800 tons per day, no delay due to jetty infrastructure, 16 hrs of navigation*

High first mile cost impacting the viability of inland waterway movement

Option	Cost
First mile: Rail movement from Barnala to Kolkata	2800
Load terminal- handling and terminal charges	230
Fixed cost vessel	360
Bunker cost- steaming	900
Bunker cost- terminal stay	60
IWT user charges	20
Unload terminal- handling and terminal charges	250
Last mile: Road movement from Ashuganj to Jirinia	375
Cost of jumbo bags	150
Total cost	**5145**

Figures in INR/MT

Source: Study team analysis

7.8.5 Foodgrain Warehouse Storage Gap

Figure 104: Storage gap in coastal states

Coastal State	No. of coastal districts within ~200 km of a port	Districts with shortage* in storage capacity	Quantum of shortage (in MT)
Karnataka	9	8	~ 9,000 – 32,000
Kerala	14	5	~ 4,000 – 37,000
Tamil Nadu	20	14	~ 5,000 – 60,000

** Storage requirement estimated assuming stock requirement of 4 times the demand in the district as per FCI norms*

Source: Study team analysis

7.8.6 Port Based Warehouse- Foodgrain

Table 24: Location of port based warehouse

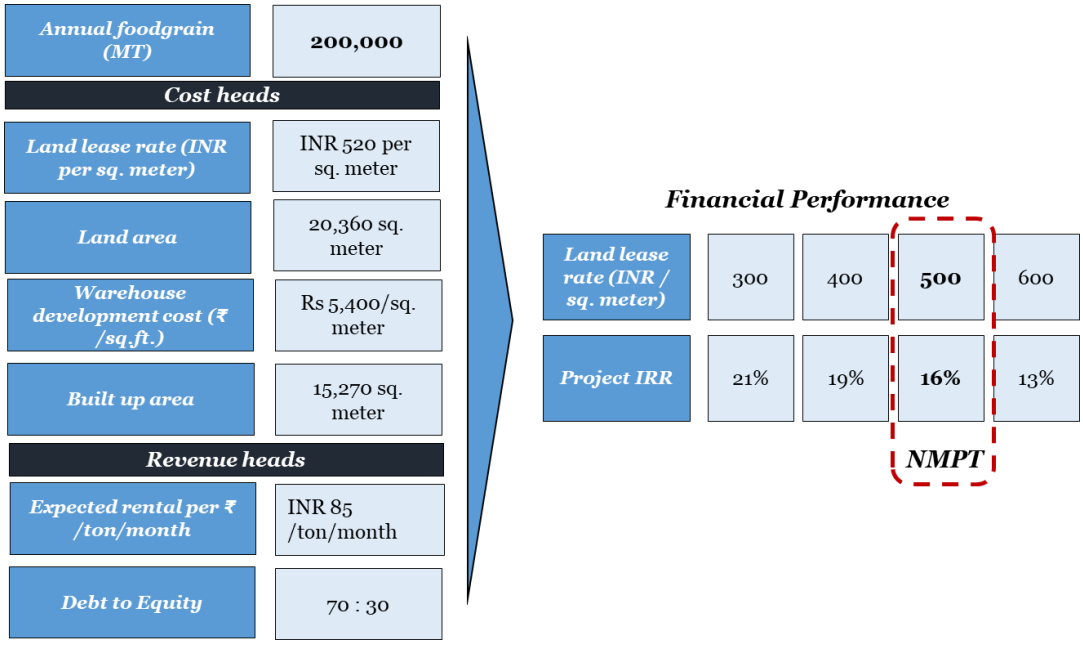
Sl. No.	Location of warehouses near Port/coastal berth	Coastal districts in proximity	Coastal traffic FY25 (Monthly in MT)	Port based warehousing capacity required by FY25 (MT)	Port based warehousing that can be immediately developed (MT)
1	Mormugao	Belgaum, Uttar Kannada, Dharwad	38,000	154,000	64,000
2	NMPT	Shimoga, Udupi, Chikamagalur, Hassan, Kodagu, Dakshin Kannada, Kasargod	43,000	172,000	101,000

3	Cochin	Alappuzha, Idduki, Kottayam, Ernakulam, Kottayam, Thrissur, Pathanamthitta, Kollam, Thiruvananthpuram, Kannur, Kozikhode, Malappuram, Palakkad, Wayaand	47,000	187,000	42,000
4	Tuticorin	Kanyakumari, Thootukudi, Tirunelveli	16,500	66,000	45,000
5	Karaikal	Ariyalur, Nagapattinam, Perambalur, Thanjavur, Tiruchirappalli, Tiruvarur, Cuddalore, Viluppuram	20,000	79,000	45,000
6	Chennai	Chennai, Kanchipuram, Tiruvallur, Tiruvannamalai, Vellore	24,000	96,000	51,000
	Total		**188,000**	**754,000**	**348,000**

Source: FCI, Study team analysis

7.8.7 Land Policy for Major Ports

Land lease rate in NMPT is INR ~520 per sq. meter; Warehouse of annual capacity 200,000 MT built in NMPT can generate IRR ~16% Source: Study team analysis



To achieve viability land cost should be in range of INR 25-35 million per acre (for example, warehouse in NMPT will result in IRR of ~15%). If port land cost is higher, then the land has to be leased at a discounted rate for viability of warehouse.

7.9 Coal

State wise total potential coal movement through coastal mode for existing power plants have been mentioned below. The TLC for coastal movement have been calculated from MCL mine.

7.9.1 Gujarat

Total coal requirement for domestic/ blended coal thermal power plants is ~24 MMT.

All the power plants mentioned below have potential for coastal shipping

Figure 105: Power Plants in Gujarat

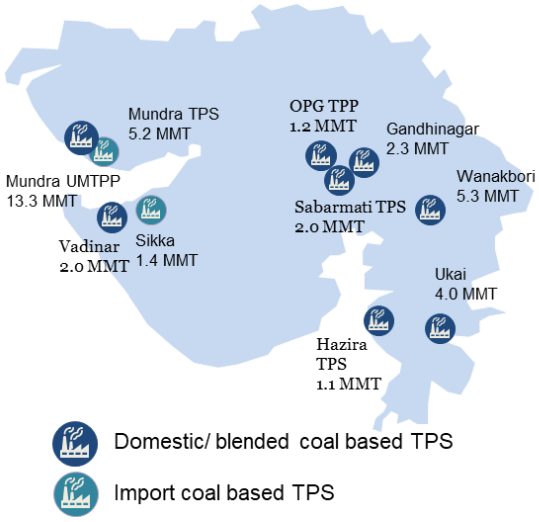


Table 25: TLC comparison of power plants in Gujarat

Thermal Power Station	Quantity (MMT)	Rail mode Coal cost + TLC (INR/MMT)	Coastal mode (MCL) Coal cost + TLC (INR/MMT)
Gandhinagar TPS	3.5	4,750 (SECL)	4,550
Wanakbori TPS	8.5	4,750 (SECL)	4,400
Ukai TPS	3.3	4,250 (SECL)	4,150
Mundra TPS	2.8	4,950 (MCL)	3,700
Vadinar TPS	2.0	4,950 (MCL)	3,800
Hazira TPS	1.1	4,450 (SECL)	3,850
Sabarmati TPS	2.0	4,750 (SECL)	4,350
OPG TPP	1.2	4,950 (SECL)	3,800

Source: Study team analysis

7.9.2 Maharashtra

Figure 106: Power Plants in Maharashtra

Power Plants located within 500 km from nearest port have been incorporated in the adjacent figure. Due high last mile cost for plants located far from nearest port, TLC of coastal mode will not be viable. However, the excluded power plants have been incorporated in power plant list (Table _)

For Maharashtra, 2.5 MMT of coal movement can be shifted to coastal mode with shift in intake from SECL to MCL mine.

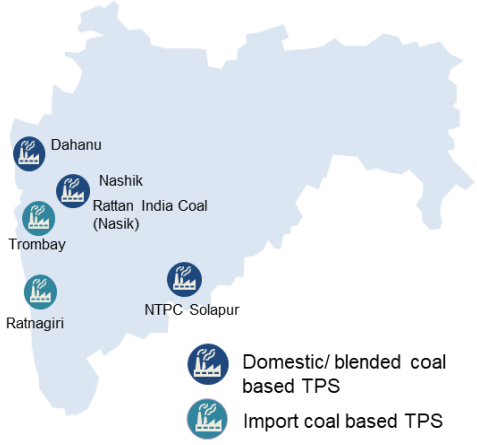


Table 26: TLC comparison of power plants in Maharashtra

Thermal Power Plant	Quantity (MMT)	Rail mode coal cost + TLC (INR/MMT)	Coastal mode (MCL) Coal cost + TLC (INR/MMT)
Dahanu TPS	2.45	4,600 (SECL)	4,200
Nasik TPS	1.6	3,600 (WCL)	4,800
Rattan India Coal	5.4	3,600 (MCL)*	4,800
NTPC Solapur	2.5	4,450 (MCL)	4,750

**Linkage data not available, least ARR TLC considered*
Source: Study team analysis

7.9.3 Karnataka

Total coal requirement for domestic/ blended coal based power plant in Karnataka is 11.8 MMT. Raichur TPS and Yemaras have a total of 2.6 MMT MCL linkage which can be shifted to coastal movement. Logistics cost through WCL and SCCL mines are lesser.

Figure 107: Power Plants in Karnataka

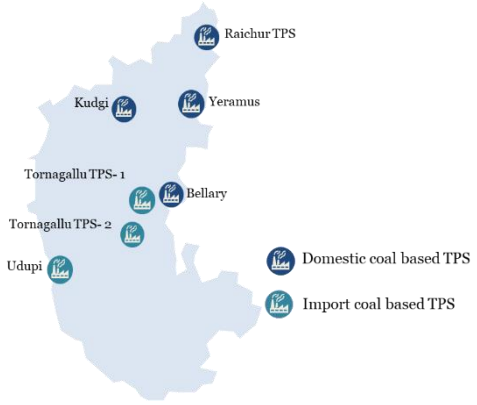


Table 27: TLC comparison of power plants in Karnataka

Thermal Power Plant	Quantity (MMT)	Rail mode coal cost + TLC (INR/MMT)	Coastal mode (MCL) Coal cost + TLC (INR/MMT)
Raichur TPS	4.9	4,750 (MCL)	4,700
Bellary	1.7	4,600 (MCL)	4,700
Yermaras TPS	1	4,700 (MCL)*	4,650
Kudgi	4.2	5,300 (MCL)*	4,850

**Linkage data not available, least ARR TLC considered*
Source: Study team analysis

7.9.4 Tamil Nadu

Potential coastal movement of coal to Tamil Nadu amounts to ~25 MMT. Power plants having linkage with MCL mines. TLC for movement of coal from MCL to power plants in Tamil Nadu indicates that the coastal shipping is substantially cheaper than rail mode

Figure 108: Power Plants in Tamil Nadu

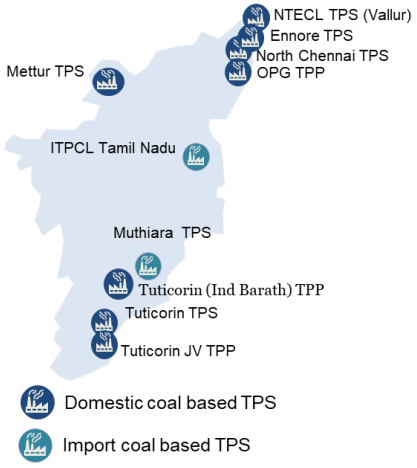


Table 28: TLC comparison of power plants in Tamil Nadu

Thermal Power Plants	Quantity (MMT)	Rail mode coal cost + TLC (INR/MMT)	Coastal mode (MCL) Coal cost + TLC (INR/MMT)
Mettur TPS	5.2	4,850 (MCL)	4,400
Tuticorin TPS	4	5,100 (MCL)	3,300
North Chennai TPS	6.7	4,450 (MCL)	3,350
NTECL TPS	4.6	4,500 (MCL)	3,350
Tuticorin TPP	1.5	5,100 (MCL)	3,300
Tuticorin JV TPP	3.2	5,100 (MCL)	3,300
Ennore Power Station	0	4,450 (MCL)	3,450

Source: Study team analysis

7.9.5 Andhra Pradesh and Telangana

Power plants in Andhra Pradesh and Telangana which are located closer to port and away from mine move coal through coastal mode. Power Plants like Painampuram TPP, SGPL TPP and Damodaran Sanjeevaiah TPS shows less TLC coast cost then direct rail movement. Total ~16 MMT of coal can be moved through coastal mode

Figure 109: Power Plants in Andhra Pradesh and Telangana

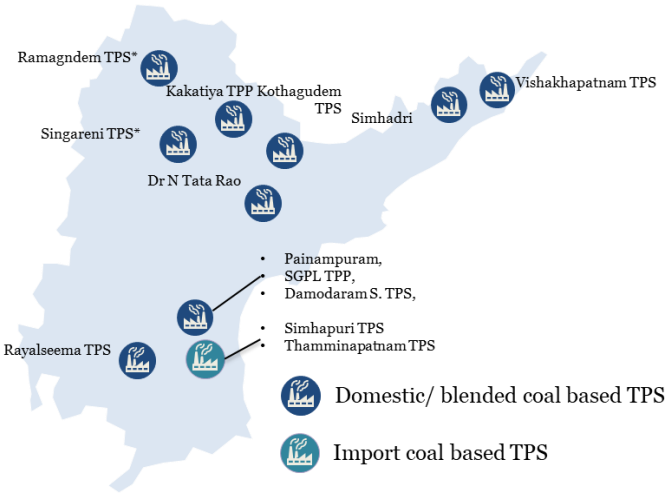


Table 29: TLC comparison of power plants in Andhra Pradesh and Telangana

Thermal Power Plants	Quantity (MMT)	Rail mode coal cost + TLC (INR/MMT)	Coastal mode (MCL) Coal cost + TLC (INR/MMT)
Dr N. Tata Rao TPS	6.8	3,800 (MCL)	4,100
Rayalseema TPS	1.9	4,550 (MCL) 4,000 (WCL)	4,300
Sri Damodaran Sanjeevaiah TPS	4.4	4,250 (MCL)	3,500
Kothagudem TPS	6.6	4,100 (MCL)	4,400
NTPC Simhadri	7.1	3,250 (MCL)	3,700
Painampuram	4.3	3,100 (SCCL)	3,600
SGPL TPP	5.7	3,100 (SCCL)*	3,600
Vizag TPS	0.4	3,250 (MCL)	3,700
Ramagundem	0.2	2,800 (WCL)*	4,750

**Linkage data not available, least ARR TLC considered*
Source: Study team analysis

Total potential coastal movement for existing power plants is estimated to be ~69 MMT at existing PLF. Coal requirement for power plants operating at 80% PLF is estimated to reach ~80 MMT.~43 MMT coal will be required to move through coastal mode for upcoming power plants till 2025.

The viable power plants are listed below.

Table 30: Potential coastal movement of coal of existing power plants

Existing Power Plant	State	Capacity (MW)	Coal requirement @ existing PLF (million MTPA)	Coal requirement @ 80% PLF (million MTPA)
WANAKBORI TPS	Gujarat	1470	8.5*	5.9
Ukai TPS	Gujarat	1110	3.2*	4.4
Gandhi Nagar TPS	Gujarat	630	3.5*	2.5
Sikka TPS	Gujarat	240	1.2*	1.2*
Mundra TPS Stage III	Gujarat	1980	2.3*	7.9
Vadinar TPS**	Gujarat	512	2.1	2.1
Hazira TPS**	Gujarat	270	1.1	1.1
Sabarmati TPS**	Gujarat	422	1.3	1.7
OPG TPP**	Gujarat	300	1.2	1.2
Dahanu TPS*	Maharashtra	500	2.5*	2.0
Painampuram TPP*	Andhra Pradesh	1320	4.3	4.3
SGPL TPP**	Andhra Pradesh	1320	5.7	5.3
Damodaram Sanjeevaiah TPS	Andhra Pradesh	1600	4.4	6.4
RAYALASEEMA TPS, Kadapa*	Andhra Pradesh	1650	1.9	1.9
Raichur TPS*	Karnataka	1720	2.6	2.6
Yermarus TPP*	Karnataka	1600		
Tuticorin TPS	Tamil Nadu	1050	4.0	4.2
Tuticorin (JV) TPP - NTPL	Tamil Nadu	1000	1.6	4.0
Tuticorin (P) TPP - Ind Barath	Tamil Nadu	300	0	1.2
Mettur TPS	Tamil Nadu	1440	5.2	5.8
North Chennai TPS	Tamil Nadu	1830	6.7	7.3
Vallur TPP	Tamil Nadu	1500	4.6	6.0
OPG TPP**	Tamil Nadu	138	0.6	0.6
		Total	68.5	79.6

Source: Study team analysis

**Current MCL/SECL linkage considered; Sikka TPS is import based – only linkage quantity considered*
*** Linkage data not available – quantity required @ 80% PLF considered*
^ Quantity calculations are for G12 grade of coal

Table 31: Potential coastal movement of coal of upcoming power plants (till 2025)

Upcoming power plants (till 2025)	State	Capacity (MW)	Coal requirement @ 65% PLF (million MTPA)	Coal requirement @ 80% PLF (million MTPA)
Nagai TPP	Tamil Nadu	300	1.0	1.2
Edlapur TPS	Karnataka	800	2.6	3.2
Dondaicha TPS	Maharashtra	3300	10.7	13.2
Dahej TPS	Gujarat	2640	8.6	10.6
Wanakbori TPS	Gujarat	800	2.6	3.2
Ennore SEZ STPP	Tamil Nadu	1320	4.3	5.3
Ennore TPS	Tamil Nadu	660	2.1	2.6
Upper Super Critical TP	Tamil Nadu	800	2.6	3.2
Udangudi TP - I	Tamil Nadu	1320	4.3	5.3
North Chennai Super Critical TPP -III	Tamil Nadu	800	2.6	3.2
Ennore Power Station-II	Tamil Nadu	600	1.8	2.4
		Total	43.4	53.4

Source: Study team analysis

7.9.6 Impact of Grade Slippage from G11 at SECL to G12 at MCL

Plants in Gujarat have linkage with SECL mines and get G11 grade of coal. However, this grade of coal is mined in very small quantity at MCL. So there is a possibility of grade slippage for these plants if they

shift linkage from SECL to MCL mines. This will require more coal to be transported to generate same amount of electricity. An impact of this increase has been tabulated in the table below and cost comparison is done based landed cost in terms of Rs per Kwh. It can be seen that for most of the plants coastal movement through MCL is cost effective than rail movement through SECL. In a few cases though, cost through coastal mode is at par or slightly less than rail route through SECL. However, in such cases also, reduction in congestion will make a strong case for shift in linkage. Information regarding availability of G11 or better grade at MCL could not be sourced. In case, MCL is able to supply G11 or better grade of coal, it will make coastal movement highly attractive.

Power Plant	SECL Linkage (million MT)	Rail route SECL Landed cost (Rs/ Kwh)	Coastal route MCL Landed cost in (Rs/ Kwh)	Difference in landed cost (Rs/ Kwh)	Difference in landed cost (%)
Wanakbori TPS	8.52	2.54	2.56	0.02	0.8%
Gandhinagar TPS	3.46	2.57	2.61	- 0.04	- 1.6%
Ukai TPS	3.24	2.31	2.38	- 0.07	- 3.0%
Mundra TPS	2.32	2.41	1.92	0.49	20.0%
Dahanu TPS	2.45	2.49	2.42	0.07	2.8%
Sabarmati TPS	1.34	2.67	2.67	0.00	0.0%
OPG TPS*		2.80	2.29	0.51	18.2%
Essar Hazira TPS*		2.51	2.30	0.21	8.4%

**Linkage information not known*

Power plants located in coastal states are listed below

Table 32: List of power plants in coastal states

Power Plants	Status	State	Type	Monitored Capacity (MW)	Quantity required (MMT)	Coal requirement @ 80% PLF (million MTPA)
SIMHADRI	Existing	Andhra Pradesh	Domestic/ Blended	2000	7.1	8.0
DAMODARAM SANJEEVAIAH TPS, Knam	Existing	Andhra Pradesh	Domestic/ Blended	1600	4.4	6.4
Dr. N.TATA RAO TPS, Vijaywada	Existing	Andhra Pradesh	Domestic/ Blended	1760	6.8	7.0
RAYALASEEMA TPS, Kadapa	Existing	Andhra Pradesh	Domestic/ Blended	1050	2.6	4.2
RAYALASEEMA TPS, Kadapa	Expansion/ Shutdown	Andhra Pradesh	Domestic/ Blended	1050	2.6	4.2
VIZAG TPP	Existing	Andhra Pradesh	Domestic/ Blended	1040	0.5	4.2
SGPL TPP	Existing	Andhra Pradesh	Domestic/ Blended	1320	5.7	5.3
PAINAMPURAM TPP	Existing	Andhra Pradesh	Domestic/ Blended	1320	5.9	5.3
THAMMINAPATNAM TPS	Existing	Andhra Pradesh	Imported coal	300	0.1	1.2
SIMHAPURI TPS	Existing	Andhra Pradesh	Imported coal	900	0.2	3.6
RAMAGUNDEM - STPS	Existing	Telangana	Domestic/ Blended	2663	0.2	10.7
KAKATIYA TPS	Existing	Telangana	Domestic/ Blended	500	2.2	2.0
KAKATIYA TPS	Expansion/ Shutdown	Telangana	Domestic/ Blended	500	2.2	2.0
KOTHAGUDEM TPS	Existing	Telangana	Domestic/ Blended	1440	4.4	5.8
SINGARENI TPP	Existing	Telangana	Domestic/ Blended	1200	4.5	4.8
AKRIMOTA LIG TPS	Existing	Gujarat	Lignite	250	0.0	1.0

BHAVNAGAR CFBC TPP	Existing	Gujarat	Lignite	500	0.0	2.0
KUTCH LIG. TPS	Existing	Gujarat	Lignite	290	0.0	1.2
SURAT LIG. TPS	Existing	Gujarat	Lignite	500	0.0	2.0
WANAKBORI TPS	Existing	Gujarat	Domestic/ Blended	800	0.0	3.2
MUNDRA UMTPP	Existing	Gujarat	Imported coal	4000	13.3	16.0
SIKKA REP. TPS	Existing	Gujarat	Imported coal	240	0.7	1.0
SIKKA REP. TPS	Expansion/ Shutdown	Gujarat	Imported coal	240	0.7	1.0
MUNDRA TPS Stage III	Existing	Gujarat	Domestic/ Blended	1980	2.8	7.9
MUNDRA TPS	Existing	Gujarat	Imported coal	2640	3.7	10.6
Vadinar TPS	Existing	Gujarat	Domestic/ Blended	512	0.0	2.0
Hazira TPS	Existing	Gujarat	Domestic/ Blended	270	0.0	1.1
Sabarmati TPS	Existing	Gujarat	Domestic/ Blended	422	2.0	1.7
UKAI TPS	Existing	Gujarat	Domestic/ Blended	1350	4.0	5.4
UKAI TPS	Expansion/ Shutdown	Gujarat	Domestic/ Blended	1350	4.0	5.4
GANDHI NAGAR TPS	Existing	Gujarat	Domestic/ Blended	870	3.1	3.5
GANDHI NAGAR TPS	Expansion/ Shutdown	Gujarat	Domestic/ Blended	870	3.1	3.5
OPG TPP	Existing	Gujarat	Domestic/ Blended	300	0.0	1.2
SALAYA TPP	Existing	Gujarat	Imported coal	1200	0.0	4.8
RAICHUR TPS	Existing	Karnataka	Domestic/ Blended	1720	4.9	6.9
BELLARY TPS	Existing	Karnataka	Domestic/ Blended	1000	1.0	4.0
BELLARY TPS	Expansion/ Shutdown	Karnataka	Domestic/ Blended	1000	1.0	4.0
YERMARUS TPP	Existing	Karnataka	Domestic/ Blended	1600	1.0	6.4
KUDGI STPP	Existing	Karnataka	Domestic/ Blended	2400	4.2	9.6
TORANGALLU TPS(SBU-I)	Existing	Karnataka	Imported coal	260	0.8	1.0
TORANGALLU TPS(SBU-	Existing	Karnataka	Imported coal	600	1.5	2.4
UDUPI TPP	Existing	Karnataka	Imported coal	1200	3.0	4.8
NASIK TPS	Existing	Maharashtra	Domestic/ Blended	630	1.6	2.5
DAHANU TPS	Existing	Maharashtra	Domestic/ Blended	500	2.3	2.0
NASIK (P) TPS	Existing	Maharashtra	Domestic/ Blended	270	0.0	1.1
NASIK (P) TPS	Expansion/ Shutdown	Maharashtra	Domestic/ Blended	270	0.0	1.1
TROMBAY TPS	Existing	Maharashtra	Imported coal	1400	3.4	5.6
TROMBAY TPS	Expansion/ Shutdown	Maharashtra	Imported coal	1400	3.4	5.6
JSW RATNAGIRI TPP	Existing	Maharashtra	Imported coal	1200	4.7	4.8
KHAPARKHEDA TPS	Existing	Maharashtra	>500 km	1340	4.0	5.4

KORADI TPS	Existing	Maharashtra	Domestic/ Blended	2400	4.7	9.6
AMARAVATI TPS	Existing	Maharashtra	>500 km	1350	3.2	5.4
BELA TPS	Existing	Maharashtra	>500 km	270	0.2	1.1
BHUSAWAL TPS	Existing	Maharashtra	Domestic/ Blended	1210	4.5	4.8
BUTIBORI TPP	Existing	Maharashtra	>500 km	600	1.4	2.4
CHANDRAPUR(MAHARASHTRA) STPS	Existing	Maharashtra	>500 km	2920	7.5	11.7
DHARIWAL TPP	Existing	Maharashtra	>500 km	600	2.2	2.4
GEPL TPP Ph-I	Existing	Maharashtra	>500 km	120	0.0	0.5
GMR WARORA TPS	Existing	Maharashtra	>500 km	600	2.2	2.4
LANCO VIDARBHA TPP	Existing	Maharashtra	>500 km	0	0.0	0.0
MAUDA TPS	Existing	Maharashtra	Domestic/ Blended	2320	6.9	9.3
MIHAN TPS	Existing	Maharashtra	>500 km	246	0.0	1.0
PARAS TPS	Existing	Maharashtra	Domestic/ Blended	500	2.0	2.0
PARLI TPS	Existing	Maharashtra	>500 km	1170	2.2	4.7
NTPC Solapur	Existing	Maharashtra	Domestic/ Blended	1320	0.0	5.2
SHIRPUR TPP	Existing	Maharashtra	>500 km	150	0.0	0.6
TIRORA TPS - Blended	Existing	Maharashtra	Domestic/ Blended	3300	10.2	13.2
WARDHA WARORA TPP	Existing	Maharashtra	>500 km	540	0.9	2.2
TUTICORIN TPS	Existing	Tamil Nadu	Domestic/ Blended	1050	4.0	4.2
TUTICORIN (JV) TPP	Existing	Tamil Nadu	Domestic/ Blended	1000	1.6	4.0
TUTICORIN (P) TPP	Existing	Tamil Nadu	Domestic/ Blended	300	0.0	1.2
METTUR TPS	Existing	Tamil Nadu	Domestic/ Blended	1440	5.2	5.8
NEYVELI (EXT) TPS	Existing	Tamil Nadu	Lignite	420	1.2	1.7
NEYVELI TPS- I	Existing	Tamil Nadu	Lignite	600	1.6	2.4
NEYVELI TPS(Z)	Existing	Tamil Nadu	Lignite	250	0.6	1.0
NEYVELI TPS-II	Existing	Tamil Nadu	Lignite	1470	4.7	5.9
NEYVELI TPS-II EXP	Existing	Tamil Nadu	Lignite	500	0.6	2.0
VALLUR TPP	Existing	Tamil Nadu	Domestic/ Blended	1500	4.6	6.0
NORTH CHENNAI TPS	Existing	Tamil Nadu	Domestic/ Blended	1830	6.7	7.3
OPG TPP	Existing	Tamil Nadu	Domestic/ Blended	300	0.0	1.2
ENNORE POWER STATION	Existing	Tamil Nadu	Domestic/ Blended	450	0.0	1.8
ENNORE POWER STATION	Expansion/ Shutdown	Tamil Nadu	Domestic/ Blended	450	0.0	1.8
MUTHIARA TPP	Existing	Tamil Nadu	Imported coal	1200	1.1	4.8
ITPCL TPP, Cuddalore	Existing	Tamil Nadu	Imported coal	1200	3.0	4.8
THAMMINAPATNAM TPS	Upcoming 2025	Andhra Pradesh	Imported coal	300	0.1	1.2
KOTHAGUDEM TPS - VII	Upcoming 2025	Telangana	Domestic/ Blended	800	0.0	3.2
Bhadradri Power Station	Upcoming 2025	Telangana	Domestic/ Blended	1080	0.0	4.3
Dahej TPS	Upcoming 2025	Gujarat	Domestic/ blended	2640	0.0	10.6
Wanakbori TPS	Upcoming 2025	Gujarat	Domestic/ blended	800	0.0	3.2

Edlapur Thermal power Station	Upcoming 2025	Karnataka	Domestic/ Blended	800	0.0	3.2
Dondaicha TPS	Upcoming 2025	Maharashtra	Domestic/ blended	3300	0.0	13.2
NASIK (P) TPS	Upcoming 2025	Maharashtra	Domestic/ Blended	270	0.0	1.1
PARAS TPS	Upcoming 2025	Maharashtra	Domestic/ Blended	500	2.0	2.0
BHUSAWAL TPS	Upcoming 2025	Maharashtra	Domestic/ Blended	1210	4.5	4.8
Nagai Thermal Power Plant	Upcoming 2025	Tamil Nadu	Domestic/ Blended	300	0.0	1.2
SEPC TUTICORIN TPS	Upcoming 2025	Tamil Nadu	Imported coal	525	0.0	2.1
NEYVELI NEW TPS	Upcoming 2025	Tamil Nadu	Lignite	0	0.0	0.0
Ennore SEZ STPP	Upcoming 2025	Tamil Nadu	Domestic/ blended	1320	0.0	5.3
Ennore TPS	Upcoming 2025	Tamil Nadu	Domestic/ blended	660	0.0	2.6
Upper Super Critical TP	Upcoming 2025	Tamil Nadu	Domestic/ Blended	800	0.0	3.2
Udangudi TP - I	Upcoming 2025	Tamil Nadu	Domestic/ blended	1320	0.0	5.3
North Chennai Super Critical Thermal Power Project - III	Upcoming 2025	Tamil Nadu	Domestic/ Blended	800	0.0	3.2
ENNORE POWER STATION-II	Upcoming 2025	Tamil Nadu	Domestic/ Blended	600	0.0	2.4

Source: CEA, Study team analysis

7.10 Fertilizer

7.10.1 TLC Comparison for Container and Break Bulk Movement of Fertilizer

Container movement of fertilizers is cheaper than break bulk by ~350-500 INR/MT

Table 33: Comparison of break bulk and containerized movement of fertilizer

IFFCO, Kandla, Gujarat- Hassan, Karnataka		
	Break Bulk Movement	**Container Movement**
Description	**INR Per MT**	**INR Per MT**
First mile	150	150
Load Port handling	230	108
Fixed cost – vessel (including return cost)	457-656	264
Bunker – steaming	251	341
Bunker – port stay	79	29
Vessel Related Charges Kandla	0*	33
Vessel Related Charges NMPT	17	16
Disport handling	275#	81
Last mile	900	900
Container rent	-	31
Jumbo bag	150	-
Empty container return to Kandla	-	171
Other cost (documentation)	-	36
Service provider margin	106-122	93
Total cost through coastal movement	**2,600-2,800**	**2,253**

- Vessel size –
  - Break Bulk: 12,000 MT/ 9,000 GT;
  - Container: 700 TEUs, assuming ~90% loaded
- First mile distance: ***4 km***
- Last mile distance – ***200 km***
- *Break bulk movement at Kandla from IFFCO Kandla captive Jetty- Loading to main vessel anchored at outer harbour through barges
- #includes 20 days storage

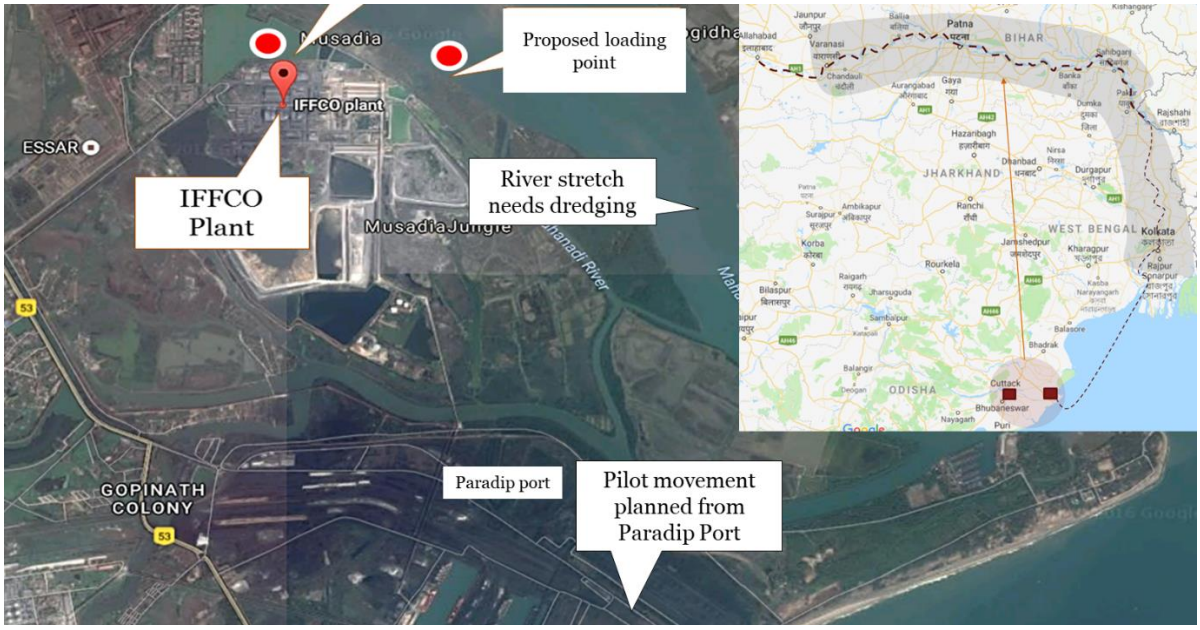
All rail route	
IFFCO Kandla to Hassan	**INR 3,126/MT**
1,884 km	

Source: Study team analysis

7.10.2 Coastal Plus IWT Movement of Fertilizer

Movement to downstream locations of NW-1 (in West Bengal) viable with current infrastructure

Since the river stretch connecting proposed IFFCO jetty to Bay of Bengal needs to be dredged, pilot movement can planned from Paradip port.



Source: Study team analysis

Table 34: TLC assessment for movement from IFFCO Paradip to locations in West Bengal along NW-1

River terminal	Direct Rail Cost	Multi-modal waterway cost			
		Current LAD and Jetty infrastructure		Planned LAD and improvement in jetty infrastructure*	
		From Paradip port	From IFFCO Jetty	From Paradip Port	From IFFCO Jetty
Tribeni	**1900-2200**	**1900-2000**	**1700-1800**	**1700-1800**	**1300-1350**
Hazardwari	**2200-2250**	2700-2850	2500-2700	**2000-2200**	**1600-1800**

Source: Study team analysis

Figures in INR/MT.

*Assuming direct movement of inland vessel (after strengthening it for movement within 5 nautical miles of the coast) from Paradip port to IWT terminal on NW-1. *Improvement in jetty infrastructure: Handling rate of 800 MT/day from 200 MT/day in current scenario*

- With current LAD along NW-1 and jetty infrastructure available in terminals, direct inland vessel movement is cheaper than direct rail movement for certain locations (downstream locations along NW-1 where LAD is 2.5-3 m)
- Multi-modal waterway movement cost can further be reduced if the movement were to happen from proposed IFFCO jetty

7.11 Cement

Total logistics cost for railway movement in clinker and break bulk form

Railway movement of clinker to the grinding unit near consumption centres is cheaper than break bulk movement by ~300-400 INR/MT. This is primarily due to the fact that 1 MT cement requires only 70% clinker and remaining 30% raw material can be easily sourced from areas nearby the grinding unit, which reduces the movement of clinker to grinding unit by ~70%.

Table 35: Cost comparison of clinker and break-bulk movement in railway for Kadapa to Jajpur route

Costs (INR/MT)	Clinker movement	Costs (INR/MT)	Break bulk movement
Loading at cement plant	50	Loading at cement plant	100
Rail freight	2000	Rail freight	2,050
Unloading at grinding unit	50	Unloading at grinding unit	100
Intercarting	100	Intercarting	50
Total clinker movement cost **(A)**	**~2,200**	Unloading at warehouse	100
Loading at grinding unit (B)	**100**		
Road freight to warehouse (C)	**300**		
Unloading at warehouse (D)	**100**		
Warehouse cost *(not included if silos present)*	**50**	Warehouse cost *(not included if silos present)*	50
Total Cost (INR/MT) ((70% of A)+B+C+D)	**~2,100**	**Total Cost (INR/MT)**	**~2,450**

Total logistics cost for coastal movement in containerized break bulk and bulk form with silos located away from port

Coastal movement is cheaper for complete bulk movement as compared to containerized movement primarily due to empty return costs in container movement, even though the coastal leg of container movement is cheaper than moving cement in specialized bulk vessels. Therefore, for the coastal movement, bulk movement is the preferred option.

Table 36: Cost comparison in bulk and break bulk movement through coastal mode

Costs (INR/MT)	Break Bulk movement (Containerized)	Bulk movement with first mile as clinker
First mile	1100	500
Port handling	350	250
Vessel fixed cost	150	800
Bunker fuel	100	350
Vessel related charges	50	150
Last Mile	600	550
Empty Return	300	*Included*
Other costs	160	150
Total Cost (INR/MT)	**2,800**	**2,700**

Total logistics cost for different options of movement through coastal mode

	First mile	Coastal voyage	Last mile
Break Bulk			
Bagged cement in containers	End-to-end container movement		
Bulk movement			
Option 1:	End-to-end bulk cement movement with silos located far from port (bagging at destination)		

Bulk cement movement			
Option 2: Bulk cement movement with port based silos	End-to-end bulk cement movement but with storage in port based silos, reducing vessel waiting time at ports (bagging at destination)		
Option 3: First mile clinker and bulk cement movement	Clinker movement to load port; grinding at load port	Bulk cement movement	Storage at port based silos at unload port and bagged cement distribution thereafter
Option 4: Clinker and last mile cement movement	Clinker movement	Clinker movement	Clinker grinded at grinding unit near unload port and bagged cement movement thereafter

Table 37: Cost comparison for different modes of coastal shipping for route: Kadapa to Jajpur

	Break-Bulk	Bulk			
Costs (INR/MT)	Break Bulk movement (Containerized)	Option1 : Bulk cement movement	Option 2: Bulk cement movement with port based silos	Option 3: First mile clinker and bulk cement movement	Option 4: Clinker and last mile cement movement
First mile	1100	1000	1000	500	450
Port handling (both ports)	350	250	350	350	400
Voyage costs	300	1300	700	700	450
Last Mile	600	550	600	550	650
Container Empty Return	300	-	-	-	-
Other costs	160	150	100	100	70
Total Cost (INR/MT)	**2,800**	**~3,300**	**2,750**	**2,200**	**2,000**

Total rail movement cost from Kadapa to Jajpur- 2450 (INR/MT)

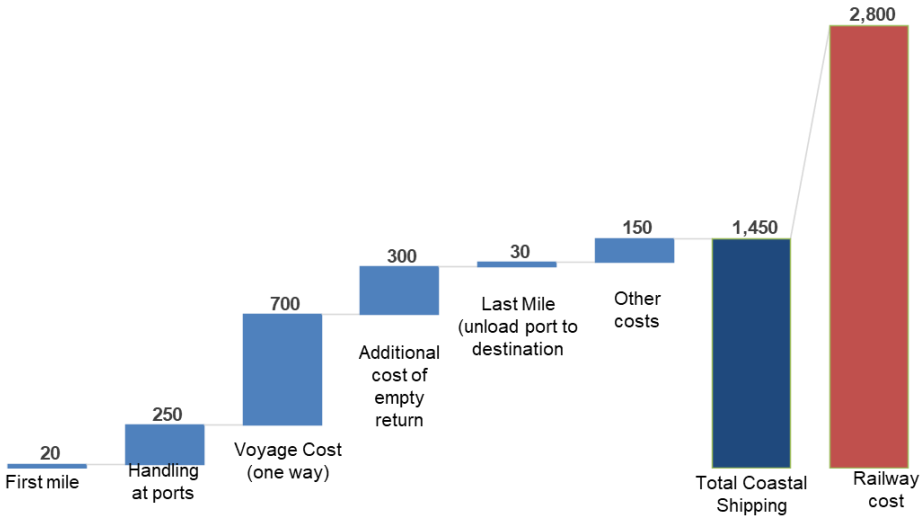
Both option 2 and option 3 would require a port based silo infrastructure at unload port; option 3 would also require setting up of a grinding unit with silo near load port.

7.12 POL

The existing domestic movement of crude reveals that movement via coastal turns out to be ~50% cheaper than rail transportation.

An OD pair analysis for the existing Mumbai-Chennai route for crude has been exhibited below.

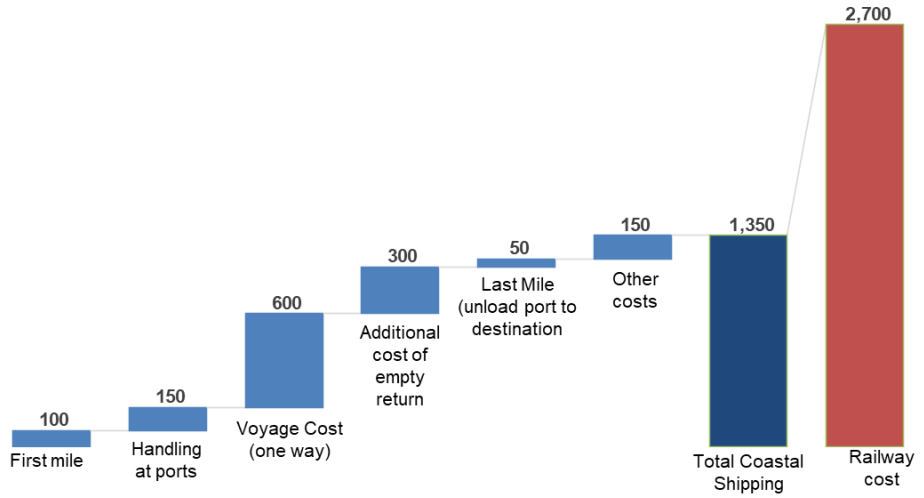
Figure 110 Cost analysis - coastal transportation from Mumbai to Chennai (with empty return, Rs/ton)



Source: Study team analysis

O-D analysis conducted for existing movement of POL products from Mumbai to Kamrajar suggests that coastal shipping has a 50% cost advantage over rail transportation.

Figure 111 Cost analysis - coastal transportation from Mumbai to Kamarajar (with empty return, Rs/ton)



Source: Study team analysis

The typical vessels used for coastal shipping of POL products are in the 40,000-50,000 DWT range. However, recently few 100,000 DWT tankers have entered the coastal feet. Using a 100,000 DWT vessel increases coastal shipping's advantage over rail to 65%.

The first mile and last mile costs are low due to the use of pipelines between refineries/marketing terminals and berths at ports.

7.13 Policy Interventions

7.13.1 List of ICDs and FCI Depots Near the ICDs for Coastal Movement

Figure 112: List of ICDs and FCI depots near them

State	Hub depot	ICD	Distance of ICD from Hub depot (km)
Punjab	FSD Ahmadgarh	ICD Sahnewal	26
		ICD Dhandarikalan	30
		ICD Kanech	29
		ICD Chawapail	34
		ICD Kila Raipur, Ludhiana	11
Haryana	Pasina Kalan	ICD Jattipur	3
	Faridabad	ICD Ballabgarh	6
	Khatauli	ICD Dappar	25

Source: FCI

7.13.2 Direct Tax Norms for Resident and Non-Resident Indian Sea Farers

- The seafarer's taxability in India shall depend upon their residential status. The Individuals are considered residents if they meet one of the following condition
    - They reside in India for 182 days or more during the financial year (1 April to 31 March).
    - They reside in India for 60 days or more during the financial year and have resided in India for at least 365 days during the preceding four FY.
- The period of 60 days in second condition is liberalized for a seafarer being a crew member of Indian Ship - as 182 days. Thus, a seafarer being a citizen of India who has left India in as a member of the crew of an Indian ship is considered as 'resident in India' if he/she resides in India for 182 days or more in a FY. However, where such seafarer is leaving India as a part of crew of foreign ship, the period of 60 days shall continue to apply.
- Further, the salaries received by non-resident individual in connection with their employment on a foreign ship is not taxable in India where their total stay in India does not exceed 90 days in a FY.
- Moreover, vide a circular, the CBDT has clarified that the remuneration received by a non-resident seafarer for the services rendered outside India on a foreign going ship (with Indian flag or foreign flag) shall not taxable in India, merely because it has been credited in the NRE account maintained with a bank in India. Thus, Indian citizen seafarer either on Indian ship or foreign ship shall not be required to pay taxes India, if they are outside India for more than 183 days.
- If the seafarer is in India for more than 183 days either at Indian flag ship or foreign flag ship, he/she shall be taxable in India. There is no differential treatment for this in India.
- Various maritime nations either charge both their national flag and foreign flag crew taxes or provide relief to national flag. In this way, parity is ensured between domestic and foreign vessels.

Table 38: Taxation on crew wages for coastal voyage

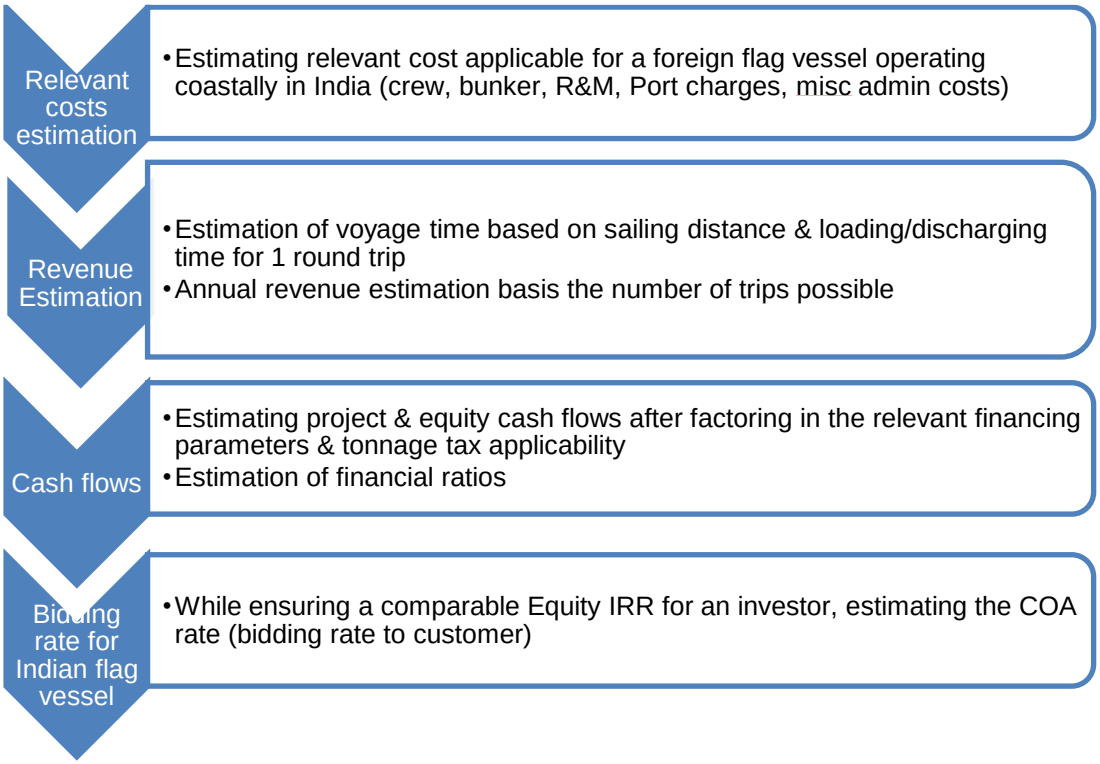
Sl. No.	Countries	On Coastal (within country)	
		For Residents	For Non-Residents
1	Brazil	Yes	Yes
2	Canada	Yes	
3	Cyprus	No	No (at Cyprus flagged ship)
4	Denmark	No	No
5	Estonia	Yes	Yes
6	Luxembourg	Yes	Yes
7	Sri Lanka	No	
8	Sweden	Yes	Yes
9	Turkey	No	

Source: Various country reports

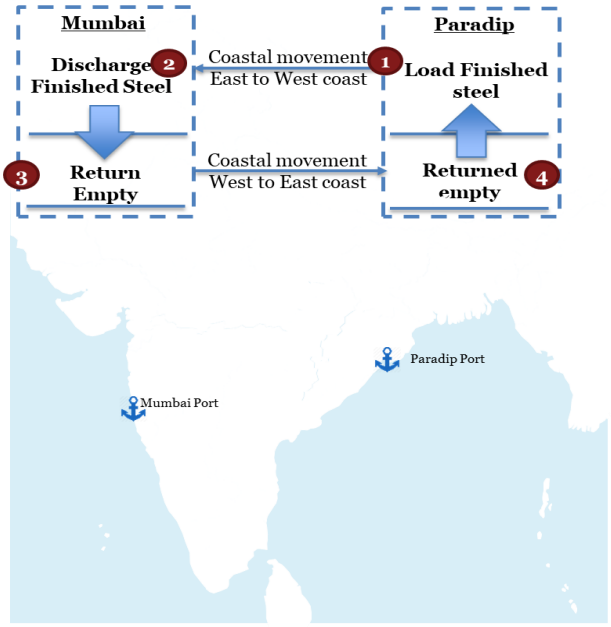
7.13.3 Shipping Model Approach

– To quantify the impact of all the above variables, the study team developed a shipping model which will compare the competitiveness of an Indian flag with a foreign flag vessel on coastal run. The model ascertains a long term bidding rate that an Indian flag vessel will have to quote against a foreign flag in order to render the same Equity IRR to an investor. The following is the approach adopted to ascertain the comparative bidding rate.

Figure 113 Approach to arrive at bidding rate



– The most prevalent movement today, i.e. one laden movement and ballast return has been analysed. For e.g. consider the case of an Indian flag vessel deployed on Paradip - Mumbai route on continuous run carrying 18,000 tonnes of finished steel from East to West and returning empty on return leg. A foreign flag vessel can do the same movement while returning from South East Asia, carrying cargo to West Coast India and then returning to the Middle East or beyond.



Source: Study team analysis

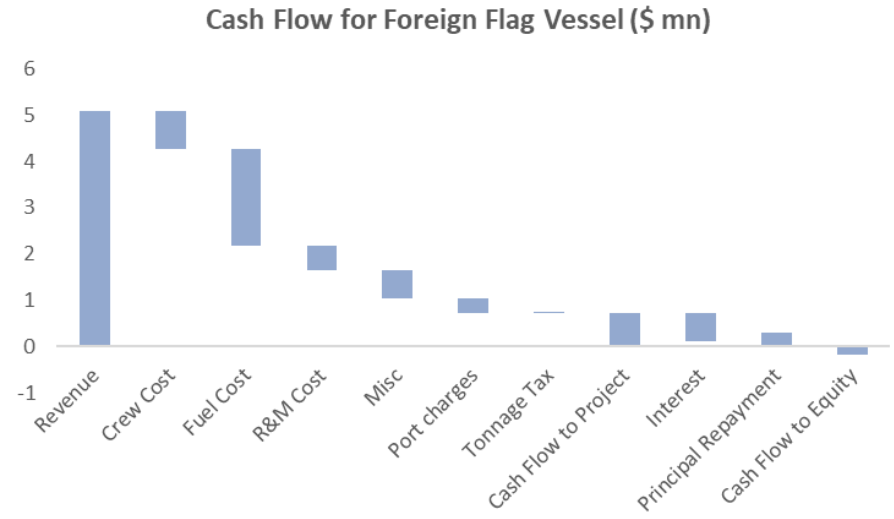
– In the as-is scenario an Indian flag owner has to bid ~20% higher in order to maintain the same Equity IRR as that of a foreign flag vessel.

Year 3 Pricing/ton ($) charged to customer

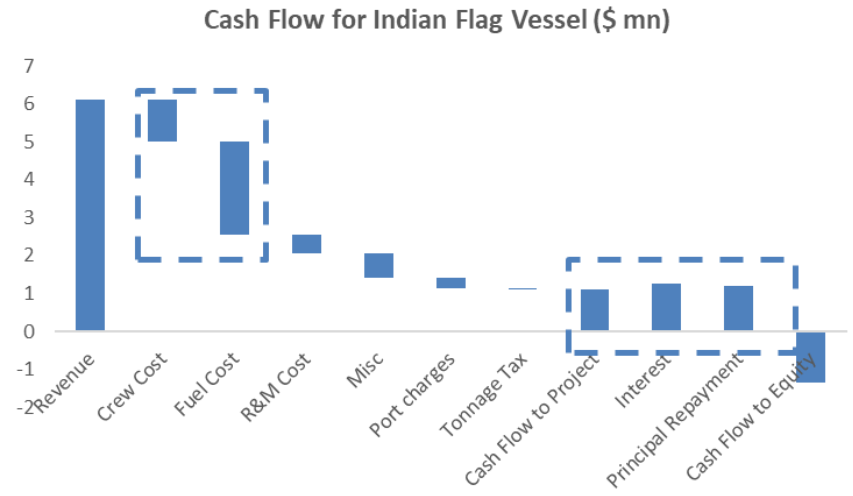
Foreign Flag		Indian Flag
100	→	120 %

– Cost of operations for an Indian flag and a foreign flag were calculated on a single voyage. To factor in the effect of long term financing cost, a vessel life cycle model was developed to ascertain the bidding rate, both for a foreign flag and an Indian flag vessel. This model quantifies the impact of additional costs attributable to Indian flagged vessels on account of financing, direct and indirect tax and bunker duties. Over the life cycle of a vessel, foreign flags could do the same movement as Indian flags with a 20% less freight rate. Moreover, the foreign flag vessel will require less Equity infusion in the initial few years. For example, in Year 3 the cash flows for both vessel owners would be as follows.

Figure 114 Cash flows in Year 3 for foreign and Indian flag vessels



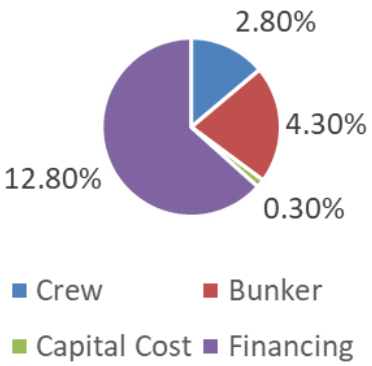
Source: Study team analysis



Source: Study team analysis

Difference in financing, crew costs and bunker account for almost ~95% of the increase in costs, resulting in increase in per ton bidding rate.

Figure 115 Percentage contribution in differential bidding rate



Source: Study team analysis

– Interventions to rationalize additional costs borne by Indian flagged vessels have been explored to help create a level playing field and increase the competitiveness of the Indian flag. Various interventions/ recommendations have been proposed to address the above mentioned issues and their impact has been quantified in terms of bidding rate.

7.14 Process Intervention

Introduction of Risk Management System based Inspection approach for Coastal Cargo

Customs officers may perform inspection of coastal cargo on sample basis and complete/ 100 percent inspection may be eliminated. Sample size of inspection may be selected on below parameters:

a) **Profile of CHA, logistic service provider, consignor and consignee** - Risk management system will evaluate the profiles of CHA, logistic service provider, consignor and consignee and check for any past precedents available in relation to non-compliances/ malpractices, etc.

b) **Volume/ tonnage of the cargo transactions over a specific period** – Trust based clearance can be allowed to the cargo transported in bulk quantities and on regular basis.

c) **Number of bill of coastal goods filled within a prescribed time period** – Consignments of regular consignor, i.e. consignor filing a prescribed number of bill of coastal goods on regular basis can allowed to be cleared on trust basis/ sample check.

d) **Category/ type of goods –** Goods like defense material, specified chemicals and drugs, etc. that are sensitive in nature should be selected for customs verification.

e) **AEO status holders, status holder, etc. -** Consignments of AEO status holder, star houses, etc., may be allowed the facility of trust based clearance.

Requirements for the convergence of NIC portal with ICEGATE portal.

The integration of E-way bill (NIC portal) and ICEGATE portal will reduce the manual intervention of Indian Customs at various stages of coastal goods movement. In addition, it will improve the efficiency of Customs clearances by eliminating the duplicity of documents and processes.

Below mentioned are the details of clearance processes steps that needs to eliminate/ modify during coastal run.

1. CHA will no longer require to share a copy of bill of coastal goods with LSP for purpose of transfer the goods from CFS to port. LSP can suo-moto login into the NIC portal and can access the bill of coastal goods and can arrange the truck as per the details filled therein.

2. **Endorsement of bill of coastal goods at port of loading**

   The requirement of physical endorsement of bill of coastal goods at customs freight station will be eliminated after the integration of NIC portal with ICEGATE portal. The ICEGATE server will update the bill of coastal goods on the handle of the officer of port of loading for verification purpose.

3. **Inspection of coastal goods on port of loading based on customs intelligence/ RMS update**

   Customs officer, at the port of loading, will inspect the goods in case of any intelligence of clandestine removals, malpractices, broken container seals, etc. In any other case, direct clearance may be allowed.

4. **Delivery of bill of coastal goods to receiving agent at port of discharge.**

   ICEGATE server will transmit the bill of coastal goods directly to the NIC portal. The requirement of physical transfer of bill of coastal goods to the receiving agent will be eliminated and the receiving agent will able to access the bill of coastal goods simply by logging into the NIC portal with his unique ID.

5. **Submission, verification and endorsement of bill of coastal goods at port of discharge.**

Currently, bill of coastal goods is submitted to the officer of the port of discharge. The officer verifies the document and subsequently endorses the same. After the integration of NIC portal with the ICEGATE portal, ICEGATE server will update the bill of coastal goods on the handle of the officer of port of discharge. Officer can review the document on its handle and can allow the discharge of cargo.

Requirements for the convergence of bill of coastal goods with E-way bill.

Currently, E-way bill Part-B is updated at the port of discharge before the sailing of the vessel. According to the proposed model, E-way bill part-B will be updated for coastal run right before the entrance of the cargo in the CFS.

Presently, only bill of lading details are filled on portal for updating part-B of E-way bill under multi-vehicle transport system by ship. NIC portal needs to be re-program to capture the details/ fields of bill of coastal goods on the E-way bill part B. A separate module needs to be develop on NIC portal that will integrate with ICEGATE server for the execution of abovementioned process change.

Fields/ details of bill of coastal goods required in the E-way module are mentioned in below table:

S. No.	Field Details	Remarks
1	Consignor's name	Auto-populate from Part A
2	Consignor's address	Auto-populate from Part A
3	Date of presentation	To be added
5	a) Name of vessel b) Rotation No. c) Year	To be added
6	Port of loading	To be added
7	Master or Agent	To be added
8	Colour	To be added
9	Port at which goods to be discharged	To be added
10	Packages details: a) Number and description (in words and figures) b) Marks and numbers c) Quantity and weight d) Description of goods e) FOB value f) Remarks whether inland goods or foreign merchandise g) Grand total of packages ((in words and figures)	To be added
S. No.	Field Details	Remarks
1	Consignor's name	Auto-populate from Part A
2	Consignor's address	Auto-populate from Part A
3	Date of presentation	To be added
5	d) Name of vessel e) Rotation No. f) Year	To be added
6	Port of loading	To be added
7	Master or Agent	To be added
8	Colour	To be added
9	Port at which goods to be discharged	To be added

7.14.1 International Example for Modal Shift Incentive

EU's Marco Polo program adopts a holistic approach: Subsidizes direct mode-shift, interoperability through technology, innovation

EU's Marco Polo Program

- *Aimed to ease road congestion and pollution by promoting a switch to greener transport modes; Offers a fixed rate of subsidy: of €2 per 500 tons/km. with a minimum subsidy threshold of €250,000; the upper limit of eligible costs is 35%- 50%*

Type of subsidies:

- ***Direct mode shift:*** *e.g.- mode shift from road to rail and ship to move over-size shipments, i.e. rotor blades, tower sections, etc of wind turbines and parts from Germany to Portugal, as well as to installation sites throughout Europe;*

- ***Common learning:*** *e.g- European web platforms and training concepts for inter-modal inland waterway transport (EWITA) created latest training concepts and e-learning platforms for intermodal inland waterway transport for Danube and Rhine corridors.*

- ***Catalyst actions:*** *e.g- Ecological Transport Service (ETS) introduced scheduled container transport system on the River Elbe, with IT platform for local replacement road services when part of the river is not navigable; "Also conducted standardization, to make vessels and barges of Germany, Czech and Poland compatible with each other and with the equipment and installations"*

- ***Traffic avoidance:*** *e.g- Sirius2 Crating used innovative packing and palletising systems to avoid the transport of empty bottles by road between a bottled water production plant in France and logistics platforms in Germany*

Direct mode shifts accounted for 80% of funding; Program fostered use of technological innovations for multi-modal integration

7.14.2 PMC Scope for Implementation Support and Commercialization Strategy

1. Identification of viable O-D pairs
    - Identify the cases for viable O-D pairs based on past studies
    - Identify the shippers, trading clients, freight forwarders to be contacted for modal shift

    For example:

    Fertilizer: 8-10 business case providing minimum modal shift: 1-1.2 MMT. Key players: IFFCO, KRIBHCO, SPIC, GFL, PPL

    Steel: 5-6 business case providing minimum modal shift: 1-1.5 MMT. Key players: TATA, SAIL, JSPL, Bhushan

2. Conduct B2B meetings and develop complete logistics solution
    - Conduct meetings with shippers, trading clients, freight forwarders to understand existing logistics arrangement
    - Develop a customised logistics solution based on interactions and feedback from potential shipper

3. Plan and execute pilot runs
    - Create an MoU defining the responsibilities of parties involved and details of costs sharing
    - MoS may provide: free storage area, priority berthing, vessel mobilisation and demobilisation cost, any other temporary costs involved in one time movement
    - Facilitate and monitor the pilot movement to identify shortcomings and provide suggestions for improvement.

4. Long term commitment from shippers

   - Take written commitments from shipper to include coastal shipping as one of the options for cargo movement
   - Support in in issuance of long term (at least 1 year) contract/tender

Table 39: Deliverable and payment terms for consultancy services

S No.	Deliverable	Time-Line (From the date of contract)	Payment
1	Business case development for 8-10 fertilizer players	1st month	15%
2	Reach out and MoU development for Pilot- at least 5 pilots (6% payment per pilot)	3rd month	30%
3	Post pilot feedback report highlighting key requirements from Ministry/Ports that need to be addressed for long term movement	5th month	15%
4	Long term contract (at least 1 year) 5 contracts each with contracted volume of at least 100,000 ton per annum per firm (Fertilizer) (payment shall be made against each successful agreement. 8% payment of contract amount for each case up to a maximum of 40% of the contract amount) Or 1 or more contract with annual volume greater than 7,00,000 tons (Lumpsum payment shall be made once contract with above threshold is in place)	7th month	40%

7.15 Clarifications required in customs circular no. 8/2019

Sr. No.	Issue	Clarification Needed
1	Allowing carriage of coastal cargo from one Indian port to another Indian port via foreign port.	Customs is requested to clearly mention (as done for EXIM/empty containers) whether the vessel carrying coastal vehicles and other non-containerized cargo is allowed to carry EXIM cargo while on coastal run.
2	Mixing of EXIM and coastal cargo on Ro-Ro vessels.	Customs is requested to clearly mention that vessels carrying coastal vehicles and other non-containerized cargo are allowed to carry EXIM cargo as well while moving from one Indian port to another to avoid any ambiguity in interpretation by port customs officers and industry players
3	Need for automation of custom clearance process for coastal cargo and integration of e-way bill (NIC portal) and ICEGATE portal	Issue not addressed in the circular

4	Requirement of Importation/Exportation of vessels for vessel conversion	Issue not addressed in the circular
5	SOPs for conversion and reversion of vessel	Issue not addressed in the circular
6	Duty on Bunkers from last Indian Port of Call	Issue not addressed in the circular
7	**Co-loading:** Bulk/liquid vessels on foreign run unloading EXIM cargo at multiple Indian Ports are not permitted to carry coastal cargo in between the voyage	Issue not addressed in the circular
8	Bunker sampling during vessel conversion	Issue not addressed in the circular
9	Time taken for Assessment of Final Bill of Entry (B/E) during reversion from coastal to foreign run	Issue not addressed in the circular
10	Duty on edible consumable provisions	Issue not addressed in the circular
11	Uniform Transshipment procedure for Indian flag coastal vessels.	Issue not addressed in the circular
12	Uniform valuation of vessels by customs at the time of filling Bill of Entry.	Issue not addressed in the circular


ADB