SAGARMALA
THE BIG PICTURE

Port Modernisation

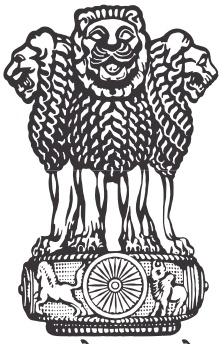
Port Connectivity

Port Led Industrialisation

Coastal Community Development

SAGARMALA
PORT-LED PROSPERITY

Ministry of Shipping
Government of India
www.shipping.gov.in



SAGARMALA

"Ports to Prosperity"

The Big Picture
Sep 2016

Sagarmala: Revolutionising logistics in India through port led development

1. Issues and challenges in the Indian Logistics sector

Logistics costs account for a significant part of the Indian non services GDP. Total logistics cost is estimated at Rs 25 lakhs crores, or 19% of GDP. This compares to 10-12% for comparable countries as shown below.

S No	Country	Logistics Cost as % of GDP
1	India	19%
2	China	12.5%
3	Indonesia	15.72%
4	UK	13.43%

(1)

The current logistics system in India falls far short of international standards in terms of cost, efficiency, sustainability and safety. Poor logistics eventually contribute to higher cost of doing business and higher prices for goods and services in the economy. For example for power plants located in the hinterland (more than 1000 km from coal mines) the cost of coal transportation alone could contribute 30-35% of total cost of power produced. In addition, the long and variable lead times result in shippers having to hold higher inventories to compensate for uncertainty in transit times. The environmental footprint of the existing logistics system is extremely high given heavy reliance on carbon intensive modes such as roads. Safety is another major concern, as total deaths on roads and railways in India are estimated at 175,000 annually.

The modal mix of Indian logistics is skewed towards road, accounting for 55% of the tonne-kms (as compared to more economical and environment-friendly modes such as railways and waterways/coastal shipping). The modal split in India currently in Bn ton KMs (BTKM) is as below:

S No	Mode	BTKM	Share	Cost (Rs/Ton KM)
1	Road	3.28	54.36	2-3
2	Rail	2.99	32.65	1.2-1.5
3	Waterways	0.99	6.00	0.2 – 0.3
4	Pipelines	0.54	6.99	0.1 – 0.15

(2)

In World Bank's Logistics Performance Index (LPI) India's ranking has improved from 47th in 2014 to 35th in 2016. However, India still lags behind leading emerging economies such as Malaysia, China, Turkey and South Africa.

The table below shows the investment in various modes of infrastructure in the 10th and 11th plans (FY 2002 to 2011 at 2006-07 prices)$_3$

Source : (1) World Bank, (2) for coal (excluding pipelines) assuming a distance of 2000 km, (3) Niti Aayog

S No	Mode	Investment	(Rs. lakh crore) Share
1	Road	4.06	43.54%
2	Rail	3.03	32.50%
3	Ports	0.64	6.83%
4	Pipelines	1.60	17.13%

While substantial progress has been made in the past decade in developing logistics infrastructure in India, the sector suffers from several structural challenges.

- Skewed Railways tariff structure for goods resulting in move to road transport even over longer lead distances
  - Existing infrastructure bottlenecks do not allow for most efficient modes and routes to be adopted – e.g. lack of adequate road and rail connectivity to ports results in under-utilization of port capacity; lack of multimodal logistics facilities hinders smooth intermodal transfer; industrial clusters in hinterland states face delays and variability in cargo evacuation times to ports
- Manual and cumbersome processes and regulations add to delays in transportation
- Variable quality of road infrastructure and choke points result in average speeds by road of 20 km/hr implying that trucks move only 200-250 kms in a day, resulting in longer lead times
- Industrial planning not linked to port infrastructure: the siting and master planning of industrial clusters and zones (often with high EXIM content) has not been done keeping in mind proximity to ports. For example export containers in India travel 4 to 5 times the distance between production centres and ports compared to China.

2. Sagarmala as a game changer

Sagarmala is an ambitious national initiative aimed at bringing about a step change in India's logistics sector performance, by unlocking the full potential of India's coastline and waterways. The vision of Sagarmala is to reduce logistics cost for both domestic and EXIM cargo with optimized infrastructure investment. Sagarmala aspires to reduce logistics costs for EXIM and domestic cargo leading to overall cost savings of INR 35,000 to 40,000 cr. per annum. Some of this will be direct cost savings, while others are savings from inventory-handling costs resulting from time (and reduced variability) in transportation of goods, particularly containers. These cost savings apply to current industrial capacities as well as future coast proximate capacities for energy, material, marine and discrete industries that could come up through port-linked industrialisation. In addition, Sagarmala aspires to reduce carbon emissions from transportation sector by 12.5 MT/annum.

The concept of "port led development" is central to the Sagarmala vision. Port-led development focuses on logistics intensive industries (where transportation either represents a high proportion of costs, or timely logistics are a critical success factor). These industries can be structurally competitive if developed proximate to coast/waterways. They would be supported by efficient and modern port infrastructure and seamless multi modal connectivity. The population in adjoining areas would be sufficiently skilled to participate in economic opportunities on offer. The synergistic and coordinated development of the above four components, namely logistics

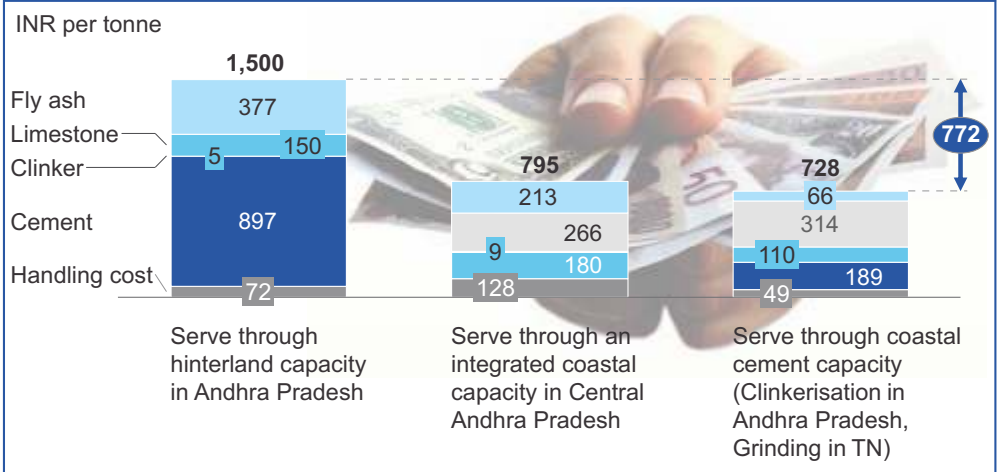
intensive industries, efficient ports, seamless connectivity and requisite skill-base - leads to unlocking of economic value. The exhibit below illustrates the advantage of port based manufacturing in the case of cement.

EXHIBIT 1

Cost of logistics for setting up coastal cement plants

EXAMPLE

Cement logistics cost for serving limestone demand in Chennai beyond 2020



Coastal cement plants provide logistics cost saving of ~INR 700-800 per tonne

In addition, existing industrial capacities situated in the hinterland can significantly benefit from the focus in Sagarmala on enhancing connectivity to key ports.

This vision can have a potentially transformative impact on India's logistics competitiveness and the wider economy. Key areas of impact are presented below.

EXHIBIT 2

Impact from Sagarmala – 2025

INR 4 lakh cr	Infrastructure investment mobilisation Port modernization: **~65,000** INR crores Connectivity: **~220,000** INR crores	**Double**	Share of waterways – inland and coastal – in modal mix from 6%
INR 35,000-40,000 cr[1]	Logistics cost saving per annum Optimise modal mix for existing capacities: **~21,000-27,000** INR crores Reduce time to export by 5 days: **5,000-6,000** INR crores	**USD 110 bn**	Boost to exports
40 lakh	New direct jobs, and 60 lakh indirect jobs		

1 Savings from coastal shipping of coal – 17,000 to 18,000 Cr
Savings from coastal shipping of steel, cement, food grains and fertilisers – 11,500 to 13,500 Cr
Savings from modal shift and time and variability reduction of containers – 7,000 to 9,000 Cr

3. Key opportunity areas and recommendations in Sagarmala

Based on the above comprehensive studies, the following were the key findings and opportunities for improvement

Opportunity 1: Save Rs 35-40000 cr per annum by optimising India's logistics modal mix

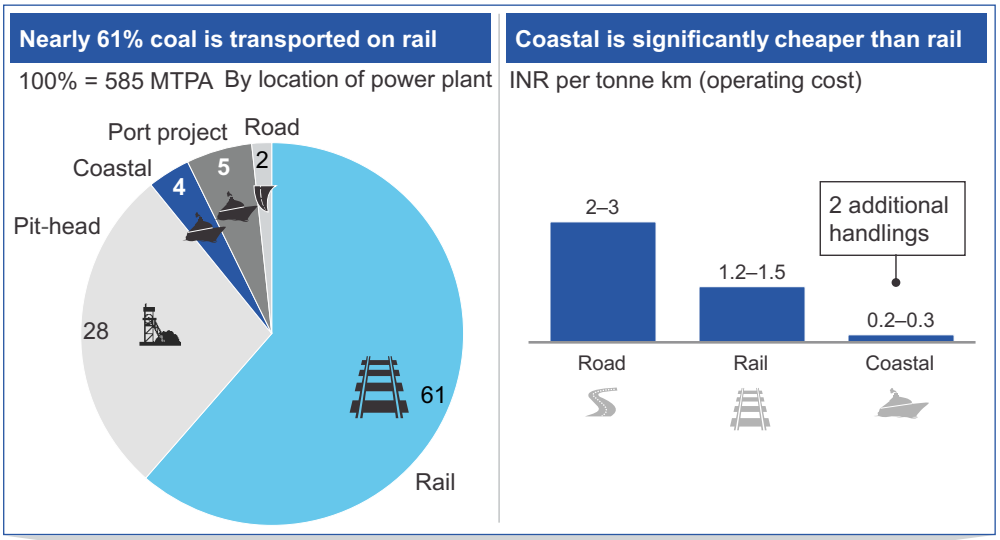
The cost per tonne kilometre of moving cargo by sea or inland waterway routes can be 60 to 80 per cent lower than by road or rail. However the modal share of coastal shipping and inland waterways remains low. The study found significant potential for moving raw materials and finished products using coastal shipping and inland waterways instead of rail or road.

For example, coastal shipping can play a significant role in lowering the delivered cost of domestic thermal coal. It is estimated that for power plants located 800 to 1,000 km away from coal mines, the cost of coal logistics can contribute up to 35 per cent of the cost of power at the bus bar. Coastal power plants in Andhra Pradesh and Karnataka are currently receiving coal from Mahanadi Coalfields by railways, but could save significantly by taking coal on the rail-sea-rail (RSR) route. It is estimated that 100 to 130 mn tonnes of coal could move through the RSR route to these plants by 2020, resulting in annual savings of over INR 10,000 cr to the power sector. In addition, up to 50 mn tonnes could be moved coastally for non-power thermal coal users (for example, cement, steel, aluminium plants). Other commodities such as steel, cement, fertilisers and food grains could also be moved coastally to the extent of about 60 mn tonnes by 2025. Further, about 20 mn tonnes of petroleum products could be moved coastally from refineries in Gujarat and Odisha to demand centres in Tamil Nadu and Andhra Pradesh. In addition, an estimated 60 to 70 mn tonnes of cargo can also be moved over inland waterways (with focus on NW1, NW2, NW4 and NW5) by 2025.

An illustration of the current modal mix for coal and the potential benefit of coastal shipping is indicated below:

EXHIBIT 3

Share of coastal shipping in freight mix of bulk cargo



SOURCE: Sigma insights

An emphasis on coastal shipping to complement road and rail transport can have multiple benefits: coastal shipping is 80% cheaper on per tonne-kilometre basis compared to rail, and this strategy could deliver Rs 30000-40000 crores logistics savings per annum; potential additional investment of over Rs 20,000 crores on expanding road and railways could be deferred; coastal shipping is also more environment-friendly with significantly lower emissions per tonne kilometre.

Key recommendations

S No	Key recommendation	Details	Responsible Ministry
1	Enhance port infrastructure ■ ■	■ Create coastal shipping port infrastructure through berth expansions Develop a new outer harbor port at Paradip Expand receiving ports such as Tuticorin and development of NW 5 in Odisha	Shipping
2	Put in place key enablers	■ Incentivize modal shift through suitable policy package and exemption of taxes (with help from Ministry of Finance) ■ Create new business models of logistics integrators that can provide end to end service to power consumers	Shipping
3	Rationalize coal linkages	■ Ensure future coastal power plants are given coal linkage only from MCL	Coal
4	Address issues relating to railways	■ Integrate railway handling charge by combining the first and last legs movement of rail movement in the Rail-Sea-Rail option (i.e from mine to dispatch port and receiving port to power plant) ■ Enable development of proposed Heavy Haul railways from Talcher coal fields to Paradip ■ Ensure connectivity to western ghat ports through strategic rail linkages such as the Hubli Ankola Line and Hubli Mormugao via Castle Rock	Railways
5	Develop inland waterways	■ Develop 5 strategic waterways (NW 1, NW 2, NW 4 and NW 5) as pilots to kick start movement of cargo through India's rivers	Shipping
6	Create customer buy-in	■ Encourage power plants near the coast to switch to coastal mode	Power

Step change through Sagarmala

Proposed interventions	Impact
■ Coal moved through coastal route to increase from 24 MTPA in FY 2016 to 80 MTPA by FY 2020	■ Annual logistics cost INR 35-40,000 savings of Crore
■ Other commodities moved through coastal route to increase from 51 MTPA in FY 2016 to 85 MTPA by FY 2020	■ Cost of power reduced by Rs 0.50 per unit of generation
■ Share of inland waterways and coastal shipping in modal mix to increase from 6% to 12%	

Opportunity 2: Significantly improve export competitiveness by optimising time/cost of container movement

The total cost of EXIM container movement in India is significantly higher compared to other countries. The transit time is highly variable (7 to 17 days), making it difficult for exporters to plan container logistics and to commit to tight deadlines to their customers. The high transit time results in higher levels of inventory along the supply chain. Some of the root causes of sub-optimal container movement include:

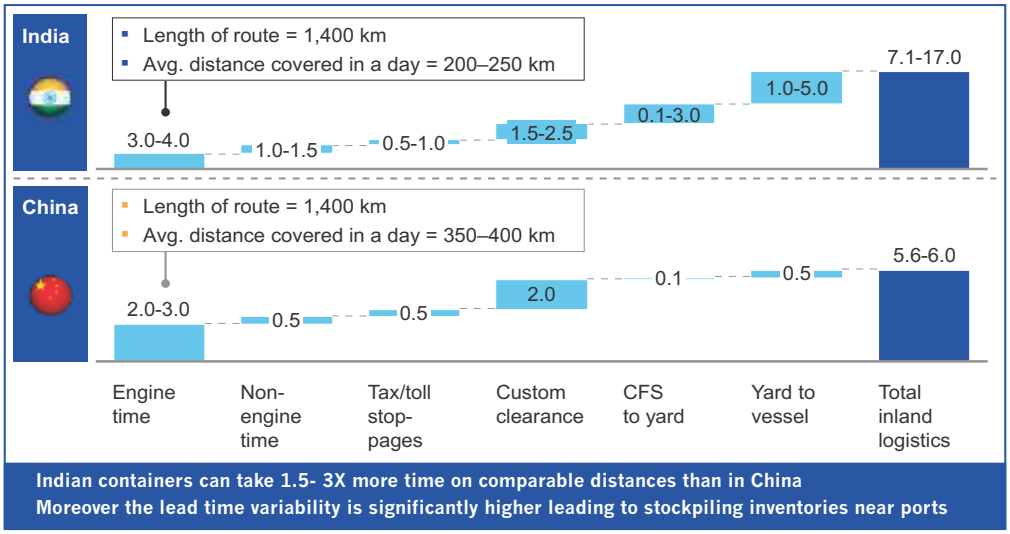
- Skewed modal mix: Container movement of above 500 km by road instead of railways. Road has more than 80 per cent share of traffic while railways has less than 20 per cent share
- Complicated and time consuming procedures for customs and interstate border formalities
- Infrastructure bottlenecks at ports, roads and Inland Container Depots (ICDs) resulting in overall lower speed of transit
- Last mile connectivity issues for both Major and Non-Major Ports

EXHIBIT 4

Comparison of end-to-end time of transporting a container in India and China by road on similar routes

Days/TEU

BOTTOM UP ANALYSIS FOR ROAD TIME



Indian containers can take 1.5- 3X more time on comparable distances than in China
Moreover the lead time variability is significantly higher leading to stockpiling inventories near ports

1 Ocean distance = 6,658 NM

SOURCE: Interviews with Truck companies, CTOs, Freight forwarders, Importers, Exporters, Port management; World Bank

Key recommendations

S No	Key recommendation	Details	Responsible Ministry
1	Address port side bottlenecks	■ Create additional capacity by setting up new satellite ports (e.g. developer Vadhavan Port to decongest JNPT) ■ Debottleneck gate processes by leveraging technology such as scanners and OCR readers	Shipping
2	Make container road transport more efficient	■ Develop 10 freight friendly expressways on container intensive stretches ■ Implement last mile connectivity projects through Bharatmala to enhance evacuation efficiency, especially for non-major ports	Road Transport and Highways
3	Enhance share of railways in modal mix	■ Rationalize railway tariff in order to enhance share of container traffic ■ Create of Multimodal logistics hubs at strategic container generating hinterland regions ■ Implement innovative routing of container freight trains by leveraging a milk run service	Railways and CONCOR
4	Streamline customs processes	■ Streamline customs procedures to reduce end to end container lead time (e.g electronic submission of forms, submission of Form 13 at port gate)	Finance
5	Address bottlenecks at state borders	■ Implement GST expeditiously	Finance

Step change through Sagarmala

Proposed interventions	Impact
■ Container lead time from Factory in northern hinterland to vessel in JNPT to go down by 5 days ■ Share of rail in container traffic movement to go up from 18% to 25%	■ Annual logistics cost savings of Rs 7000-9000 Crore

Opportunity 3: Optimise capital expenditure of Rs 1 lakh crore by building the right port capacities at the right places

Indian ports lag best in class international ports (such as Singapore, Antwerp, Rotterdam) in terms of scale, efficiency and draft. Out of the top 10 ports in the world today (in terms of cargo handled), 7 are Chinese ports while no Indian port features in the top 30. The level of mechanisation is significantly lower in Indian ports as a result of which the average turn-around time for a vessel in India is 4.5 days while in China it is 1 day. Over 25% of India's container traffic is trans-shipped through international hubs such as Colombo, Singapore and Salalah. A comparative overview of India versus China and US with regard to the port sector is presented below:

EXHIBIT 5

Comparison of India and China on a few port-related KPIs

	India	China	US
Average turn-around time *(Days)*	4.5	1	1.2
Number of shipyards[2]	7	70	45
Number of ports in global top 20	0	9	2
Container traffic *(mn TEU)*	11	185	44
Average annual growth in container traffic[1] *(mn TEU)*	0.5	10	0.4
Contribution of waterways in domestic transportation[3]	<1%	24%	6%
Port capacity stock *(% of GDP)*	1	3	10

1 Over 2008-2012
2 That can make more than 120 mts long ships
3 Includes both Coastal Shippingand Inland Waterways

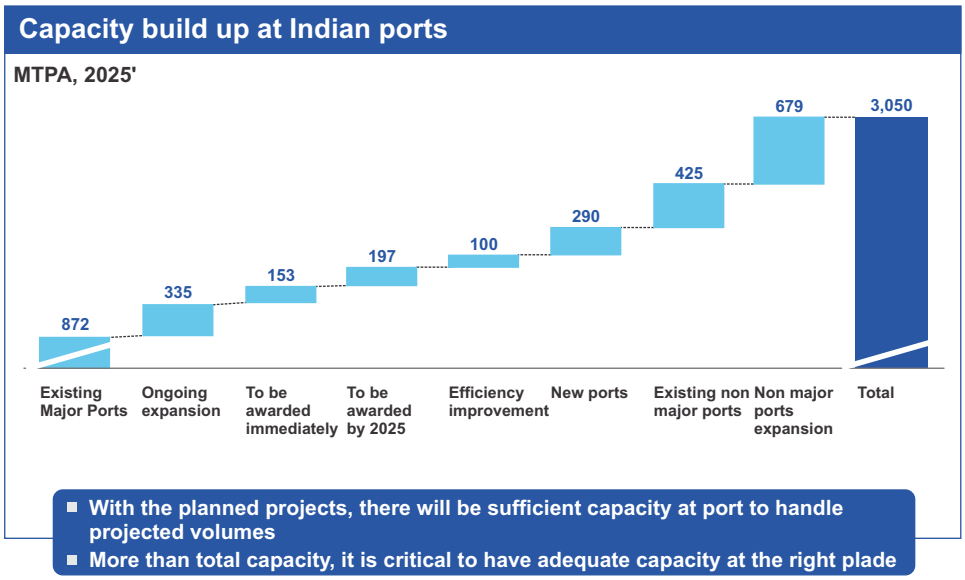
SOURCE: Expert discussion, World Bank, Lloyd's List, OECD, Port technology, Clarksons

The dual regulatory structure of major ports (under Central Government) and private/non major ports (under State Government) has resulted in imbalance of capacity creation. As an example currently ports such as JNPT are severely congested while container terminals in other ports are under-utilised. This has also resulted in stranded investments made under PPP route in cases where either port capacity has been created in locations without adequate traffic potential, or ports are not linked to industrial hinterland with adequate road and rail connectivity.

Within Sagarmala, a comprehensive planning of the entire coastline has been done in order to anticipate the future requirement of port capacities and identify locations for creating the capacities based on optimisation of end to end costs. The proposed build-up of port capacity is shown below:

EXHIBIT 6

Capacity build up at the ports to meet the 2025 demand



1. All data is for Major Port except as mentioned : Total is for Major and Non Major Ports put together

Key recommendations

S No	Key recommendation	Details	Responsible Ministry
1	Ramp up port infrastructure	■ Develop 4-5 mega ports (100 million tonnes or 10 million TEUs capacity) over the next 10-15 years including transitioning some non-major ports to "mega port" status ■ Ensure ports are developed every 100-150 kms along the coastline ■ Create 640 MTPA of capacity and mechanize major ports	Shipping
2	Ensure adequate connectivity to support additional port capacity	■ Enhance port connectivity through over 100 road and railway projects	Railways; Road Transport and Highways

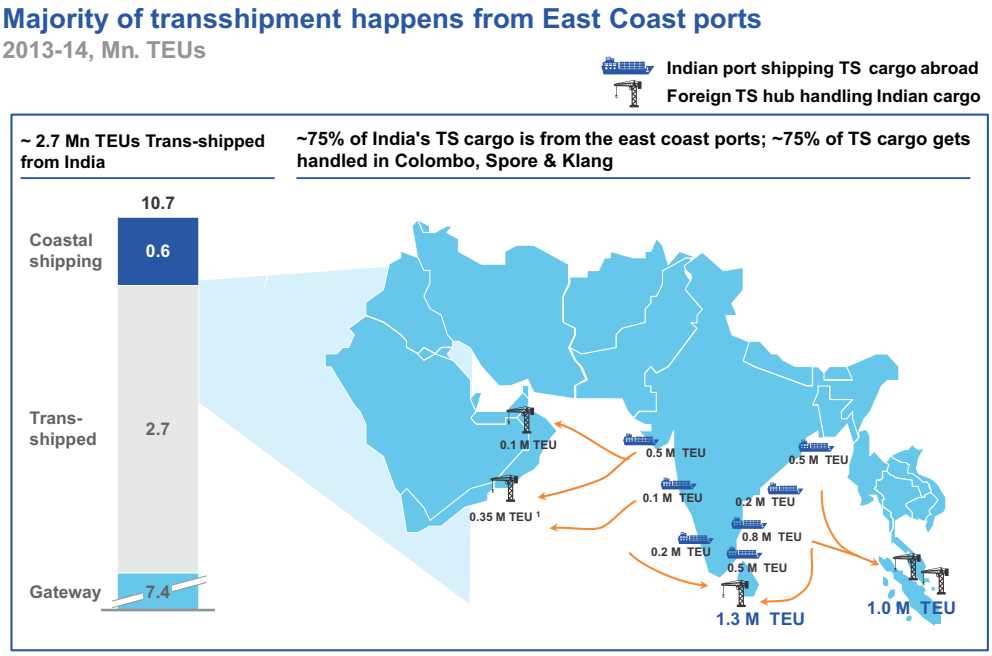
Step change through Sagarmala

Proposed interventions	Impact
■ Port capacity in the country to increase from 1.55 bn tons per annum to 3 bn tons per annum	■ Rs 1 lakh crore of investment ■ Significant improvement in India's Logistics Performance Index

Opportunity 4: Transforming India into a global force in container transhipment

India currently does not have a true international transshipment port. Ports in JNPT and Mudra have strong network of mainline sailings but the transshipment element is small. On the other hand a bulk of India's transshipment is handled by port such as Colombo, Singapore and Klang.

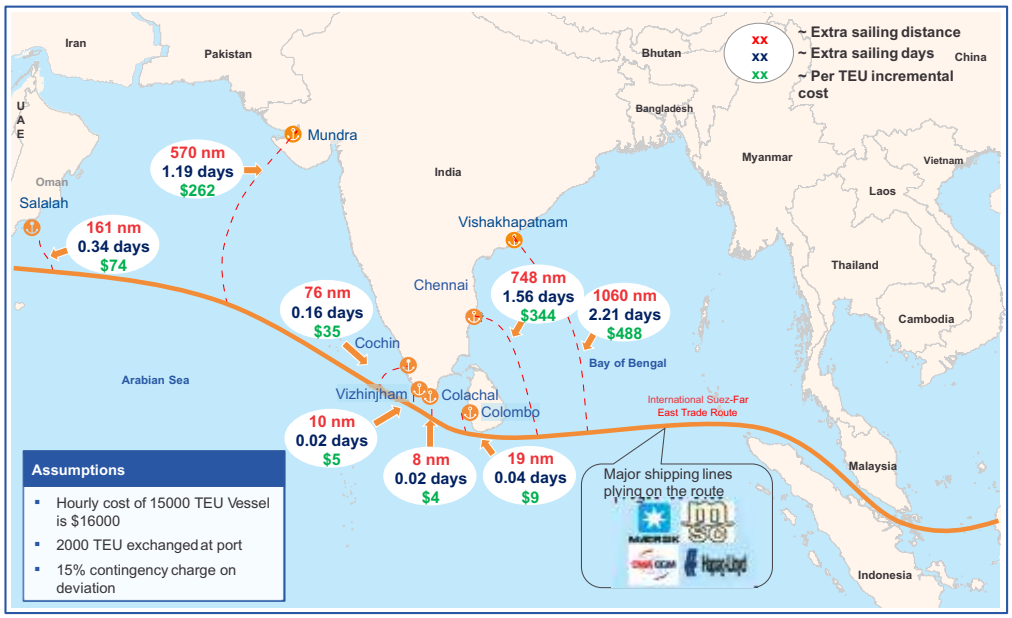
EXHIBIT 7



The reason for this is that India lacks a port with key characteristics that are essential for a true transshipment port. In the current context, the location of the port needs to be at a minimum deviation from the trunk route between China and Europe via the Suez Canal. The large size of vessels carrying the bulk of this trade cannot afford even small deviations from the shortest route. While the ports of Cochin and Tuticorin have built container terminals they have been unable to attract transshipment volumes for this reason. In addition the location needs to have draughts deep enough to accommodate large container vessels. Finally customs and other processes need to be match world class levels of competitiveness.

EXHIBIT 8

Deviation from main sailing route is the key determinant for Transshipment hub location



SOURCE: AECOM

2 such ports are being developed in India – a Major Port at Enayam in Tamil Nadu by the Ministry of Shipping and a Non Major Port Vizhinjam in Kerala which is being developed by the Government of Kerala through PPP mode.

Key recommendations

S No	Key recommendation	Details	Responsible Ministry
1	Create world class container ports	■ Develop 2 new international transshipment ports at Enayam (Tamil Nadu) and Vizhinjam (Kerala)	Shipping
2	Ensure best in class port processes	■ Imlpment reforms in port processes (customs, gate processes and security) for meeting world class benchmarks	Finance (Customs)
3	Ensure connectivity to proposed ports	■ Develop freight friendly expressways from proposed ports to key hinterlands such as Bangalore, Tuticorin, Trichy, Madurai etc.	Road Transport and Highways

Step change through Sagarmala

Proposed interventions	Impact
■ International transhipment volumes to go up from < 0.5 mn TEU to 1.3 mn TEU by 2025	■ Annual logistics cost savings of Rs 1000 Crore

Opportunity 5: Improve export competitiveness by developing port proximate discrete manufacturing clusters

The weighted average of distance between the manufacturing hinterlands and the port for India is 700 to 800 km compared to 150 to 300 km in China. Even though India fares better than China in transportation cost for a comparable distance, the longer hinterland to port distance leads to higher costs for exporting/importing a container in India. International experience suggests that India can leverage export-oriented/import-substituting discrete manufacturing for creating economic activity in coastal areas. Port-based or port-proximate manufacturing can play a pivotal role in supporting this initiative. This study identified focus sectors for port-based or port-proximate manufacturing. Six sectors - electronics, furniture, automotive, apparel, leather and footwear and food processing - offer high potential. These sectors can have strong port linkages in terms of value-to-weight ratio and time sensitivity.

Key recommendations

S No	Key recommendation	Details	Responsible Ministry
1	Develop discrete manufacturing clusters	■ Set up 14 discrete manufacturing clusters across automotive, apparel, leather, electronics, food processing and furniture industries line ministries	Commerce (DIPP); Respective and State Governments
2	Implement CEZ programme	■ Implement the Coastal Economic Zones initiative identified as part of Sagarmala ■ Set up dedicated 2-3 member cell in DMICDC to take forward the CEZ program ■ Enter into Shareholders agreement with 4 states for which pilot Coastal Economic Units (CEUs) have been identified	Commerce (DIPP)
3	Set up port based CEUs	■ Prepare detailed master plans for all the 14 Coastal Economic Zones ■ Develop 2 of the 4 CEUs by leveraging port land at JNPT and Kandla	Shipping

EXHIBIT 9

Proposed discrete industry clusters

CEZ	Industry cluster – bulk proposed	Rationale
Gaud	▪ Leather and footwear	▪ State govt. support on leather park; existing small scale industry focus on consolidation
Kachchh	▪ Furniture	▪ Existing industry; high timber throughput at Kandla
Malabar	▪ Furniture	▪ Existing industry; consolidation ▪ Dependency on imported wood
North Konkan	▪ Furniture ▪ Leather and footwear ▪ Apparel ▪ Electronics	▪ Existing industry ▪ Existing industry ▪ **Apparel:** Cotton producing state; minimize logistics between states ▪ **Electronics:** Dependence on imports of raw materials; co-relation with auto
Poompuhar	▪ Leather and footwear	▪ Consolidation of existing industry
Saurashtra	▪ Apparel ▪ Automotive	▪ **Apparel:** Cotton producing state; minimize logistics between states ▪ **Auto:** Consolidation at Sanand
South Konkan	▪ Food processing	▪ Food producing states
VCIC Centre	▪ Electronics	▪ **Electronics:** Dependence on imports of raw materials; co-relation with auto
VCIC North	▪ Apparel ▪ Food processing	▪ **Apparel:** Cotton producing state; minimize logistics between states

Step change through Sagarmala

Proposed interventions	Impact
■ Port based industrial zones to be expanded from < 25,000 acres currently to over 100,000 acres by 2025 through 14 Coastal Economic Zones	■ Incremental exports of USD 110 bn by 2025

Opportunity 6: Lowering logistics costs of bulk commodities by locating future industrial capacities near the coast

For industries in which logistics costs of bulk raw materials, intermediates or finished goods form a significant component of the cost of goods sold, locating future capacities at or near coastal locations could be a lever for designing efficient supply chains. Some examples of such industries include oil refining (especially in India where 75 to 80 per cent of crude oil is imported), power, cement/clinker, steel (and raw materials like pellets). Future capacities could be developed in competitive coastal locations either close to end markets or close to raw material sources. This could reduce the overall logistics costs and eventually the cost of the end product.

Key recommendations

S No	Key recommendation	Details	Responsible Ministry
1	Cement clusters	■ Set up cement manufacturing clusters in Gujarat and Andhra Pradesh	State Governments
2	Gas based petchem clusters	■ Set up 3 Gas based petchem clusters in Karnataka, Andhra Pradesh and Gujarat	Chemicals and fertilizers; Petroleum and Natural Gas
3	Power clusters	■ Set up 3 power clusters in Tamil Nadu, Andhra Pradesh and Maharashtra	Power
4	Steel clusters	■ Set up 2 steel clusters in Tamil Nadu and Maharashtra	Steel
5	Refineries	■ Set up greenfield refinery in Maharashtra	Petroleum and Natural Gas
6	Maritime clusters	■ Set up 2 maritime clusters in Gujarat and Tamil Nadu	Shipping

EXHIBIT 10

Proposed bulk industry clusters

CEZ	Industry cluster – bulk proposed	Rationale
Dakshin Kanara	▪ Gas-based petchem clusters	▪ Reduce import dependence; established at upcoming greenfield refinery locations
Kachchh	▪ Cement ▪ Gas-based petchem clusters	▪ **Petchem:** Reduce import dependence; established at upcoming greenfield refinery locations ▪ **Cement**: Limestone reserve
Mannar	▪ Refinery and petchem clusters	▪ Reduce import dependence
North Konkan	▪ Power	▪ 40% saving on logistics cost; established coastal shipping model in relevant states
Poompuhar	▪ Power	
South Konkan	▪ Refinery and petchem clusters ▪ Steel	▪ Reduce import dependence; established at upcoming greenfield refinery locations
Suryapur	▪ Marine cluster	▪ Already established shipyards; steel industry and auto cluster
VCIC North	▪ Cement ▪ Gas-based petchem clusters ▪ Power	▪ **Petchem:** Reduce import dependence; established at upcoming greenfield refinery locations
VCIC South	▪ Gas-based petchem clusters ▪ Marine cluster ▪ Steel	▪ **Petchem:** Reduce import dependence; established at upcoming greenfield refinery locations ▪ **Marine & Steel :**Already established shipyards; proposed steel cluster & existing auto cluster

Step change through Sagarmala

Proposed interventions	Impact
■ Expand number of port based bulk clusters in identified sectors from less than 5 to over 15 by 2025	■ Annual savings of Rs 1000 per ton in logistics cost

Opportunity 7: Ensuring economic wellbeing of coastal communities

Sagarmala will equip and empower coastal communities to benefit from the various opportunities emerging from the Program. To equip coastal youth with the right training, a skill building program will be rolled out at scale covering 1 mn youth from coastal districts

The program will also improve the lives of coastal communities by improving infrastructure for traditional livelihoods such as fishing and leveraging the coast and waterways to enable improved transport and access.

These initiatives will result in 500,000 jobs for coastal communities and significantly improve access and livelihoods for all coastal communities. A summary of initiatives aimed at coastal communities is presented below:

EXHIBIT 11

Coastal community development

Key recommendations

S No	Key recommendation	Details	Responsible Ministry
1	Community development fund	■ Set up Rr 100 Crore community development fund to improve livelihoods of coastal communities	Shipping
2	Island and lighthouse development	■ Develop islands and lighthouses	Shipping
3	Skill development	■ Implement programs for skill development for coastal communities	Skill Development and Entrepreneurship
4	Innovative coastal projects	■ Provide funding for innovative projects such as fishing harbours, Ro-Ro and Ro-Pax services	States

Step change through Sagarmala

Proposed interventions	Impact
■ Increase dedicated funding for coastal communities from minimal levels currently to Rs 100 Crore per annum	■ Create 40 lakh direct jobs and 60 lakh indirect jobs in coastal areas
■ Increase number of cruise tourists from 115,000 presently to over 1 mn by 2020	■ Additional tourism revenues of Rs 5,000 Crore per annum

Impact on Non-coastal states

While the core focus of the program is naturally on the coastal states, there are a number of ways in which non-coastal states will also benefit from the Sagarmala programme. Some of these include:

- Most of the proposed port connectivity projects are aimed at providing port access to non-coastal hinterland states
- Recommendations to cut down transit time – especially in containers – would also lead to significant benefits to non-coastal states
- Inland waterways can provide cost effective transport as well as sea access to some of the landlocked hinterland states
- A number of multimodal hubs have been planned, mostly in non-coastal states
- Some industrial clusters have also been proposed in non-coastal states (e.g., Leather Cluster in Uttar Pradesh and Furniture Cluster in Assam)

5. Prominent projects under Sagarmala

Sagarmala includes over 400 projects and initiatives totalling INR 400,000 crores of investment which will deliver the opportunities outlined above. These have been grouped into four pillars, namely Port Modernisation, Connectivity, Port-led industrialisation and Coastal Community Development.

EXHIBIT 12

Sagarmala would be delivered through ~ 400 projects over 20 years including a bunch of pioneering and iconic projects…(1/2)

- **5-6 Mega ports** including 2 international transshipment ports
  - Vadhavan port in Maharashra
  - Paradip outer harbor
  - Sagar port in West Bengal
  - Enayam and Vizhinjam international transshipment Ports in Tamil Nadu and Kerala respectively
  - Belekeri (Karnataka), Durgarajapatnam (Andhra Pradesh) and Sirkazhi (Tamil Nadu) being evaluated
- **4-5 strategic rail corridors**
  - Pioneering heavy haul railway from Talcher to Paradip
  - Connectivity through western ghats to Mormugao and Belekeri ports through Hubli-Ankola Link and Hubli – Mormugao link via Castle Rock
  - Spur lines to connect up western DFC to Gujarat ports of Mundra and Pipavav
- **10 freight friendly expressways**
  - Ahmedabad – Mumbai
  - Ahmedabad – Mundra
  - Ahmedabad – Pipavav
  - Hyderabad – Machipatnam
  - Hyderabad – Mumbai
  - Bangalore – Tiruchirapalli - Enayam
  - Bangalore – Chennai
  - Bangalore – Mangalore
  - Durgapur – Kolkata

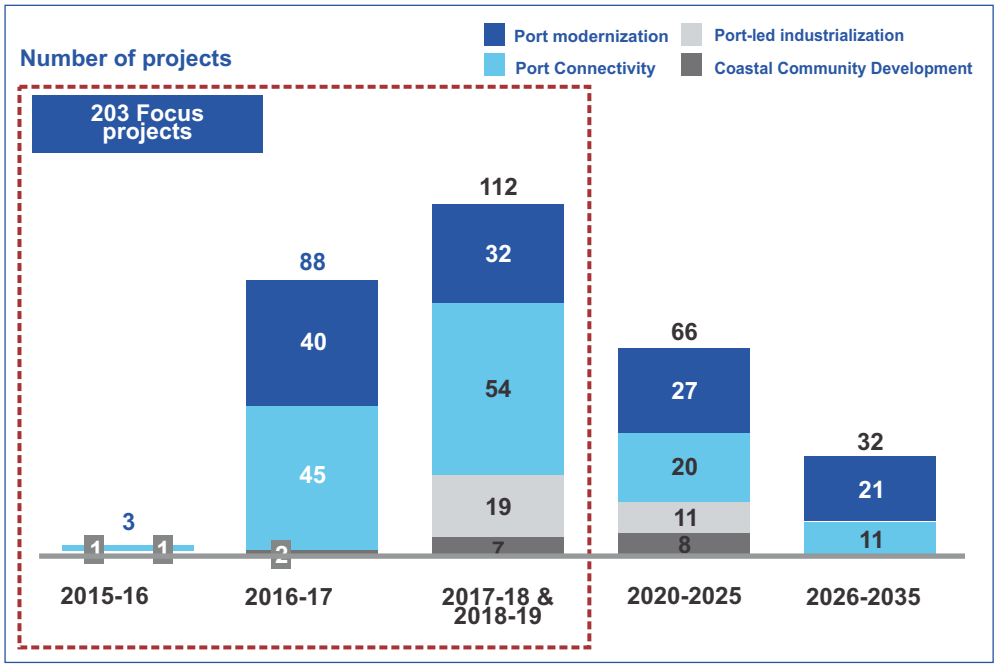
EXHIBIT 13

Sagarmala would be delivered through ~ 400 projects over 20 years including a bunch of pioneering and iconic projects…(2/2)

- **4 Inland Waterways**
  - NW 1 (Ganga from Vaarnasi to Kolkata)
  - NW 2 (Brahmaputra)
  - NW 4 (Krishna from Amaravati to Machlipatnam)
  - NW 5 (Brahmani from Talcher to Paradip and Dharma)
- **15 bulk and 14 discrete manufacturing clusters** and **4 pilot CEUs**
  - Bulk clusters in power, steel, cement, petchem and refinery sectors
  - Discrete clusters in apparel, automotive, leather, electronics, food processing and furniture
  - 14 CEZs across 8 coastal states
  - 4 Pilot CEUs in Kandla, JNPT, Ennore and Amaravati
- **2 Marine Clusters**
  - One each in Gujarat (Bhavnagar and GIFT City) and Tamil Nadu (Ennore) focusing on ancillary industries for shipbuilding and maritime services
- **Marine tourism**
  - 2 cruise tourism ports in Mumbai and Kochi
  - Redevelopment of port land in Mumbai
- **Ro-Ro and Ro-Pax terminals**
  - Gogha to Dahej across Gulf of Khambat
  - Mandwa in Alibaug

EXHIBIT 14

Year wise split of projects



1 Projects in 2015-16 have not been awarded so for are kept in the year 2016-17

As per the guidance of the Cabinet Note, the projects under Sagarmala will be implemented by respective line Ministries. The split of projects by implementing agency for projects to be taken up in the first wave until FY 2019 ("Focus Projects") is shown below:

Projects and year wise investment required by implementing agency

	No. of projects	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
Port Trust	89	-	4,927	11,822	14,997	10,894	12,592	7,066	2,475	418	**65,191**
IPRCL	22	-	518	2,681	5,471	2,656	-	-	-	-	**11,326**
India Railways	6	0	894	1616	1178	1767	2170	2790	2325	0	**12740**
NHAI	37	-	3,277	4,340	20,433	30,970	48,233	24,072	360	-	**1,31,685**
MoPNG	2	-	-	-	5,200	7,800	10,400	15,600	13,000	-	**52,000**
CONCOR	2	-	-	-	34	77	60	-	-	-	**170**
DIPP	13	-	-	-	4,268	6,714	6,785	10,178	8,482	-	**36,426**
MoTourism	2	-	-	-	42	78	-	-	-	-	**120**
IWAI	3	-	-	500	1,002	1,377	2,003	2,005	629	-	**7,515**
Other Projects	24	-	2,122	4,306	3,998	4,440	159	80	67	-	**15,172**
	200	**-**	**11,738**	**25,265**	**56,623**	**66,773**	**82,401**	**61,790**	**27,337**	**418**	**3,32,345**

The financing of Sagarmala projects will also be undertaken by their respective implementing agencies. However the actual investment could come through central and state government sources as well as PPPs and private investment. The break up of various project categories by source is as follows:

Investment by Agency and funding source

	Total	PPP	State*	Central Ministry
Port Trust	65,191	30,846	3,074	31,272
NHAI	1,31,685	46,090	-	85,595
Indian Railways	12,740	-	-	12,740
IWAI	7,515	-	-	7,515
MoPNG	52,000	-	-	52,000
CONCOR	170	-	-	170
IPRCL - Port Trust	11,326	-	-	11,326
DIPP	36,426	7,285	7,285	21,856
Ministry of Tourism	120	-	-	120
State	15,172	3,034	7,586	4,552
	3,32,345	**87,255**	**17,945**	**2,27,145**

Project category wise and agency wise funds requirement

		Total project cost	PPP	State	Central	Comments	To be funded by Central Government	To be funded by State Government (mainly towards land)
Port Trust	Port Modernization - Major Ports	26,054	13,478		12,576	Based on PPP/Non PPP given by AECOM	48%	
Port Trust	New Ports	30,737	15,368.50	3,073.70	12,295	50% PPP	40%	Assumed: 10% of the project cost is towards the land
Port Trust	Last Mile Road projects	440	-		440	0% PPP	100%	
Port Trust	Internal Port Road Projects	824	-		824	0% PPP	100%	
Port Trust	Internal Port Rail Projects	60	-		60	0% PPP	100%	
Port Trust	Port Rail Connectivity Projects	1,690	-		1,690	0% PPP	100%	
Port Trust	Port Road Connectivity Projects	386	-		386	0% PPP	100%	
Port Trust	CEU	5,000	2,000		3,000	40% PPP	60%	Port land
Indian Railways	Port Rail Connectivity Projects	12,740	-		12,740	0% PPP	100%	
Indian Railways	Internal Port Rail Projects	-	-		-	0% PPP		
NHAI	Last Mile Road projects	874	306		568	35% PPP (60% is civil cost out of which 60% is PPP)	65%	
NHAI	Internal Port Road Projects	200	70		130	35% PPP (60% is civil cost out of which 60% is PPP)		
NHAI	Port Road Connectivity Projects	15,111	5,289		9,822	35% PPP (60% is civil cost out of which 60% is PPP)	65%	
NHAI	Expressways Projects	1,15,500	40,425		75,075	35% PPP (60% is civil cost out of which 60% is PPP)	65%	

IWAI	Inland Waterways Projects	7,515	-		7,515	0% PPP	100%	
MoPNG	Refineries	52,000	-		52,000	0% PPP	100%	
CONCOR	Multi Modal Hubs	170	-		170	0% PPP	100%	
IPRCL - Port Trust	Last Mile Road projects	-	-		-	0% PPP		
IPRCL - Port Trust	Internal Port Road Projects	-	-		-	0% PPP		
IPRCL - Port Trust	Port Road Connectivity Projects	350	-		350	0% PPP	100%	
IPRCL - Port Trust	Port Rail Connectivity Projects	10,172	-		10,172	0% PPP	100%	
IPRCL - Port Trust	Internal Port Rail Projects	804	-		804	0% PPP	100%	
DIPP	Discrete Cluster Projects	33,926	6,785	6,785.20	20,356	20% PPP	60%	Assumed: 20% is land cost Cluster Projects
DIPP	CEU	2,500	500	500	1,500	20% PPP	60%	Assumed: 20% is land cost
Ministry of tourism	Tourism Projects	120	-		120	0% PPP	100%	
State	Projects	15,172	3,034.40	7,586.00	4,552	0% PPP	30%	Assumed: 20% is land cost to be funded by state and other 30% for project implementation. 20% proejcts (cost wise can be PPP able.
	Total	**3,32,345**	**87,255**	**17,945**	**2,27,145**			

6. Delivering the Sagarmala Vision: Implementation framework and government imperatives

Implementing a project of such scale and achieving the desired impact calls for many interventions at the regulatory level and coordination between multiple stakeholders. There are three key heads of government imperatives for Sagarmala:

- A cost effective funding plan for implementing the program including a robust environment for Public Private Partnerships
- Transparent business friendly and stable regulations policy
- Setting up the right institutional architecture for delivering the Sagarmala program and the CEZs.

Financing and PPPs

More than 400 projects, including projects under construction, have been identified under the Sagarmala programme for Port-led development in the country, requiring an investment of roughly INR 4.5 lakh crore.

Innovative methods are needed to ensure that the financing cost of this massive investment is optimized. One such example is the use of dollar-denominated loans by major ports. Major Ports enjoy a part of their revenue in dollars and can therefore raise foreign currency loans at a significantly lower cost without having to hedge it. This has can raise over Rs 16,000 Crore of low cost financing across all the major ports.

An important source of financing will be PPPs. While PPPs have driven a lot of activity in the ports sector, the ecosystem is still nascent. Certain shifts are necessary to develop a conducive ecosystem for PPPs:

- Provide flexibility for reviewing cargo to be handled in case of uncontrollable down-cycles
- Ensure selection processes are modified to select good quality consultants (e.g., QCBS, T1)
- Ensure land & key clearances are in place before award (e.g., Environmental clearance)
- For projects with dependency on external connectivity, explore conversion to PPP after the project is in place
- Review TAMP and explore options for mitigation to common light touch regulatory regime.

Regulations and policy

Regulations are an important ingredient in the mix of enablers needed for the success of the programme. For example, the taxes levied on coastal shipping make it around 30 per cent costlier than comparable shipping costs in other countries. Some of the important regulatory interventions needed are as follows:

- To maximise the potential of coastal shipping, bunkering and service taxes levied on coastal shipping need to be moderated
- Customs processes need to reduce manual intervention and specify separate scrutiny and clearances for EXIM and coastal cargo

- The port-land allocation policy should be transitioned from an H1 (highest-price bidder) to an integrated development - the lease price can be benchmarked with the nearest industrial development zone, giving weightage to the contribution to throughput, the investments made and the employment generation potential.

Organization, governance and institutional architecture

As per the Cabinet Note, the Sagarmala Program will be executed by respective line ministries and state governments. This makes the institutional aspects of the programme immensely complex. Therefore a strong organization and institutional framework will be a vital determinant of success.

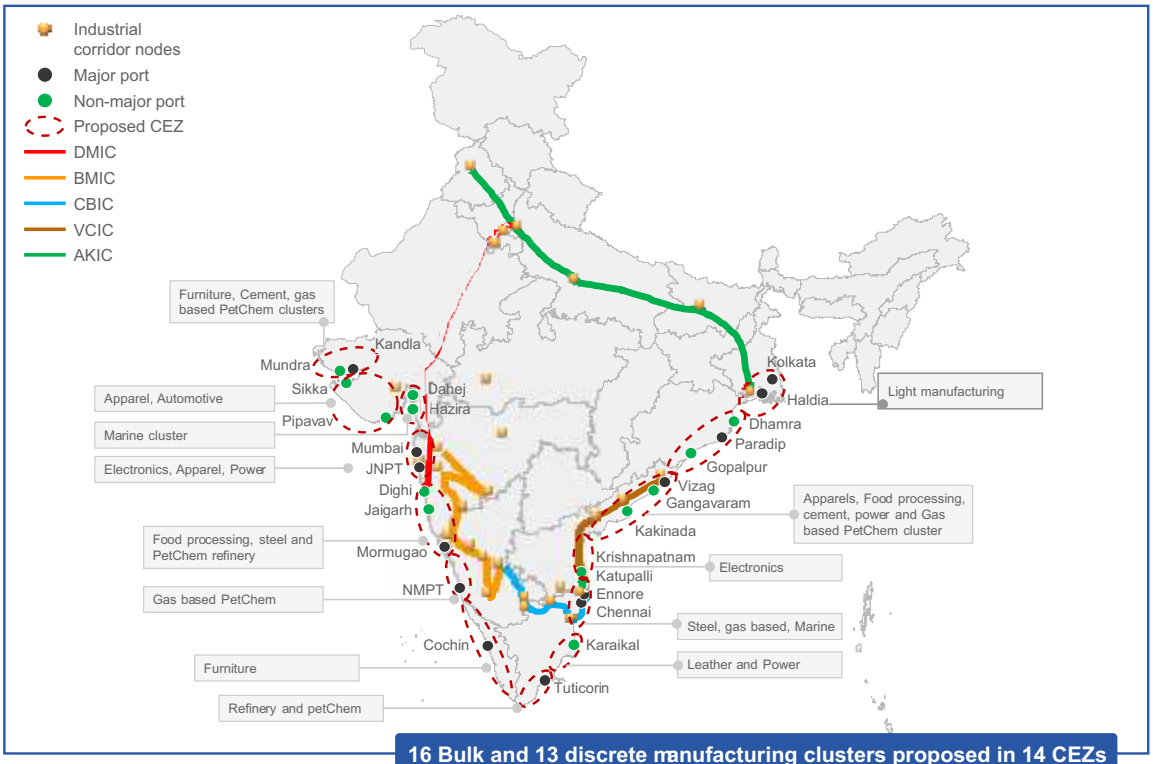
Coastal Economic Zones

Sagarmala envisages the creation of Coastal Economic Zones (CEZs) in order to ensure that the envisaged projects are planned and executed in a coordinated manner. Each CEZ would cover a length of 300-400 km of coastline, and incorporate up to 4 ports. A total of 14 CEZs have been identified along the coastline and initial perspective plans created for each CEZ.

The 14 CEZs are outlined in the exhibit below

EXHIBIT 15

Proposed CEZ's, industrial corridors and proposed industrial cluster



SOURCE: Make in India website; team analysis

To set up the CEZ program for success suggested that:

- Master planning of all 14 Coastal Economic Zones should be taken up. In addition four pilot Coastal Econonomic Units (CEUs) should be developed to ground the initiative
- The Coastal Economic Zones (CEZ) programme should be spearheaded by the NICDA, to kick start the program – in the interim it shall be curated by DMICDC through a 2-3 member CEZ cell. It is proposed that the CEZ Cell be eventually transitioned to a CEZ Development Corporation
- A marketing cell, dedicated to marketing industrial and infrastructure projects, should be created within the ambit of the Ministry of Shipping. It can operate with a lean team and work through a geography-based model. An external marketing consultant can be brought on board on a retainer basis to create a roadshow and branding theme for the programme.

Sagarmala Development Corporation

To fast-track the journey to achieving the objectives of Sagarmala, the Sagarmala Development Company (SDC) has been incorporated. The company shall be under the administrative control of the Ministry of Shipping, which will monitor the implementation of projects identified under the National Perspective Plan (NPP) and provide experts in the field of technical, financial and project restructuring to various stakeholders, including the partner states/maritime boards.

The SDC shall

- Create a road map of projects identified through the National Perspective Plan and prepare a coherent development strategy to develop the port sector in India
- Augment capacity to cater to increased cargo traffic at the ports through improved efficiency, mechanization and building new terminals, and building six to eight greenfield ports
- Liaise with various central line ministries to facilitate effective administrative coordination in order to ensure all identified projects are completed within a time bound manner
- Complete all residual projects in the minimum time period through participation by Sagarmala Development Company.

Implementation themes

To sharpen the focus of development, 9 implementation themes are suggested. These themes cut across silos of project typologies and ministerial jurisdiction with firm view to achieve specific outcomes. These themes are as follows:

- Enhancing share of coastal shipping and domestic waterways from 6% to 12% in the modal mix
- Enhancing railway share of container traffic from 18% to 25%
- Increasing port capacity by 2X by 2025 with deep draughts and full mechanization
- Transforming container movement on road through creation of world class “freight friendly” corridors that are end to end integrated from factory to port via Multimodal Hubs
- Establishing India as a global container transshipment hub
- Leveraging port economics and scale to set up mega bulk manufacturing clusters in 5 industries

- Accelerating Make in India through discrete manufacturing clusters delivered through the Coastal Economic Zone regime
- Coastal community development initiative to empower coastal communities to benefit from growth
- Accelerating growth in India's marine tourism through world class cruise ports and tourism infrastructure development at home ports.

APPENDIX

Approach adopted for Sagarmala

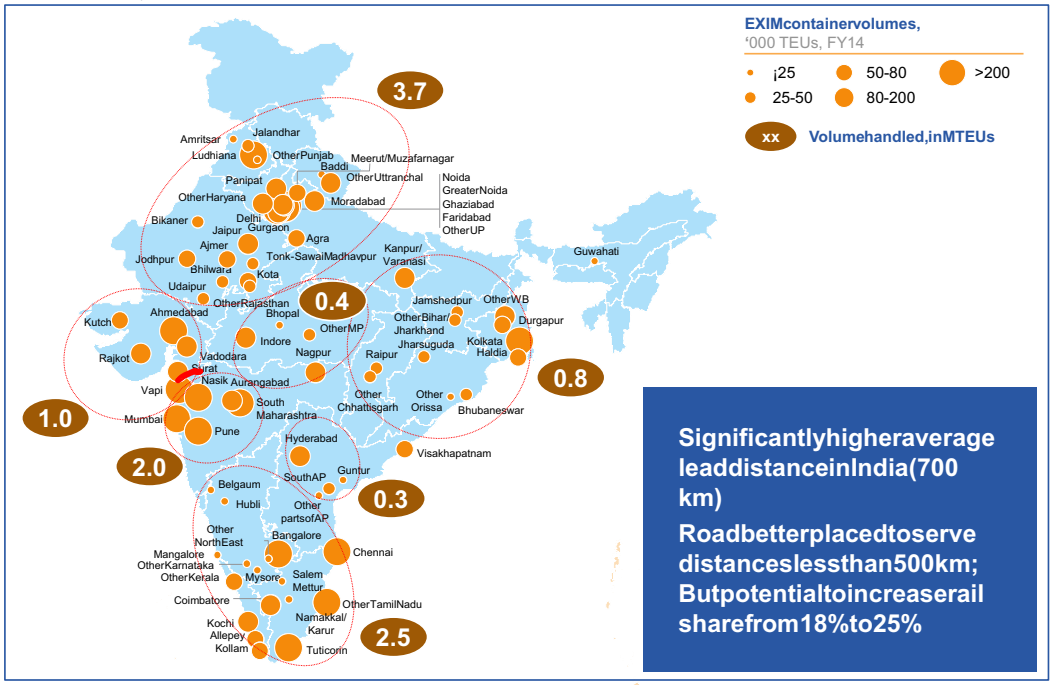
Sagarmala lays out an ambitious vision of Port-led development for India. It is a first of its kind exercise for developing an integrated and comprehensive plan for leveraging India's coastline and waterways. The Sagarmala National Perspective Plan has been created through an intensive process of analysis, international benchmarking, financial/economic modelling and extensive consultation with a wide range of stakeholders. Key elements of the approach include:

- A detailed assessment of commodity flows which contribute 85% of port traffic in India, including thermal coal, coking coal, iron ore, crude and POL products, LPG, LNG, fertilisers, foodgrains, cement, chemicals and containers. For each commodity, current and future trends of supply/demand were studied along with projections in 10, 15 and 20 year timeframes. A detailed mapping of logistics flows between origin and destination points (OD study) was done in order to identify current and future anticipated bottlenecks as well as opportunities for streamlining and rationalising logistics costs. The exhibit below provides a snapshot of the analysis of the container traffic

EXHIBIT 16

EXIMcontainervolumes

Million TEUs,FY'14



SOURCE: APMT;IPAstatistics;Stakeholderinterviews

- A comprehensive multimodal logistics model for India was developed based on the detailed OD flows by commodity. The model incorporates road, railway, coastal and inland waterway movements. The outputs of the model includes identification of logistics bottlenecks which will need augmentation, location of future multimodal logistics hubs, and overall port capacity planning for specific segments of the coastline
- International benchmarking was done of Port-led industrial development models being followed successfully in other countries such as China, South Korea, Taiwan, Singapore, Indonesia, Brazil and Morocco. Similar initiatives in India such as in Gujarat were also studied. The opportunities for pursuing Port-led industrialisation in the Indian context were identified, evaluated and prioritised
- Extensive engagement with stakeholders through a series of workshops and discussions are being carried out to validate the findings. These include industry level working groups (e.g. for Coal, POL, Steel, Fertilisers) with the participation of relevant line ministries, PSUs, private sector players and industry associations. Key ministries such as DIPP, Coal, Railways, MoPNG and Skills have been consulted. States continue to be part of the journey through multiple rounds of discussions e.g. Maharashtra, Andhra Pradesh, Gujarat and Odisha. The Port sector including major as well as non-major ports have been part of the discussions.

SAGARMALA

PORT-LED PROSPERITY

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