पत्तन, पोत परिवहन
एवं जलमार्ग मंत्रालय
MINISTRY OF
PORTS, SHIPPING
AND WATERWAYS
सत्यमेव जयते

Transnational Connectivity:
Shaping Future Strategic Ties | India Maritime Week 2025

IMEC and EMC
The Future of Global Connectivity

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Directorate General of Shipping

29th September 2025 | Mumbai

The Imperative of Transnational Connectivity

In an era marked by geopolitical realignments and the quest for sustainable development, connectivity has emerged as a critical component of global economic strategy as well as global supply chains.

The India-Middle East-Europe Economic Corridor (IMEC), launched at the 2023 G20 Summit, is a transformative multimodal initiative connecting Asia, the Arabian Gulf, and Europe.

EU's Global Gateway aims to put in place resilient infrastructure partnerships around the world, with an emphasis on equitable prosperity, digital transformation, and sustainability.

Geo Political Uncertainty

1. Impact of Blockage of Suez Canal

Fig: Red Sea Shipping Crisis

2. Impact of Russia-Ukraine War on Maritime Trade & Shipbuilding

Disrupted Black Sea Routes

- Grain, metals, and bulk cargo shipments rerouted or delayed
- Longer transit times, higher freight costs

Sanctions & Export Controls

- Restrictions on Russian oil, metals, and technology
- Compliance risk for shippers & buyers
- Need to diversify sourcing and trading partners

Fuel & Insurance Instability

- Volatile bunker fuel prices increase operating costs
- Higher war-risk premiums and shipping insurance rates
- Some routes avoided, leading to global supply chain stress

3. Impact of US Tariff War on Maritime Trade & Shipbuilding

Strategic & Financial Implications

- Risk of retaliatory tariffs disrupting global supply chains
- Shipping companies may face overcapacity or rerouting challenges
- Financing for newbuilds and fleet expansion becomes riskier

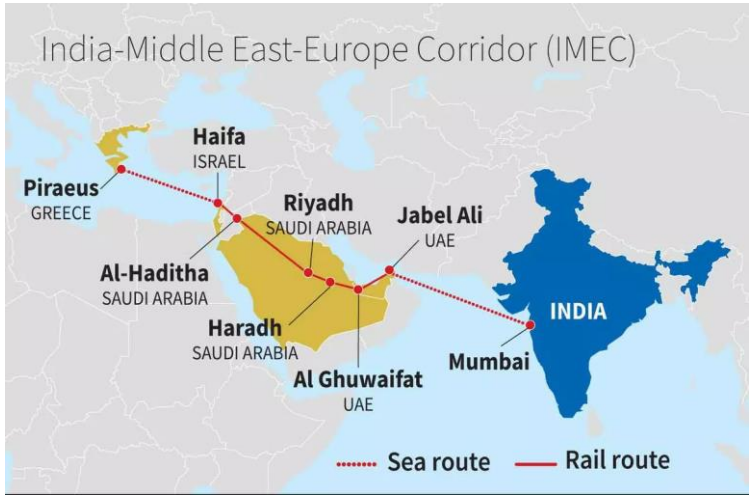
Geo Political Uncertainty

Geopolitical Importance of Chabahar

Chabahar Port is located on Iran's southern coast by the **Gulf of Oman**. It serves as India's access point to Afghanistan and Central Asia, bypassing Pakistan. The port counters **China's Gwadar Port in Pakistan**, part of the **China-Pakistan Economic Corridor (CPEC)**. Chabahar is also a key node in the **International North-South Transport Corridor (INSTC),** linking Mumbai to Moscow through Iran and Azerbaijan.

India's Investment

- India Ports Global Limited (IPGL) operates the Shahid Beheshti Terminal at Chabahar.
- The $120 million investment focuses on modernising port infrastructure and enhancing cargo handling.



Challenges

- Concern of US with Iran: Potential risk of sanctions
- Houthi-Red Sea Crisis

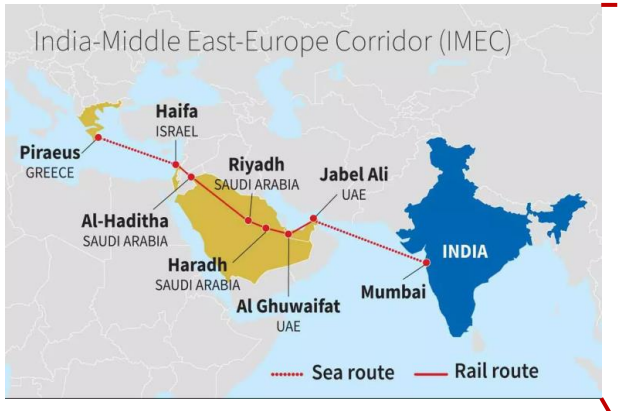
Economic Benefits

- Connect with the resource-rich Central Asian markets
- Diverse Trading Routes
- INSTC to save 30% in cost and 40% in transit time

India-Middle East-Europe Economic Corridor (IMEC) Project

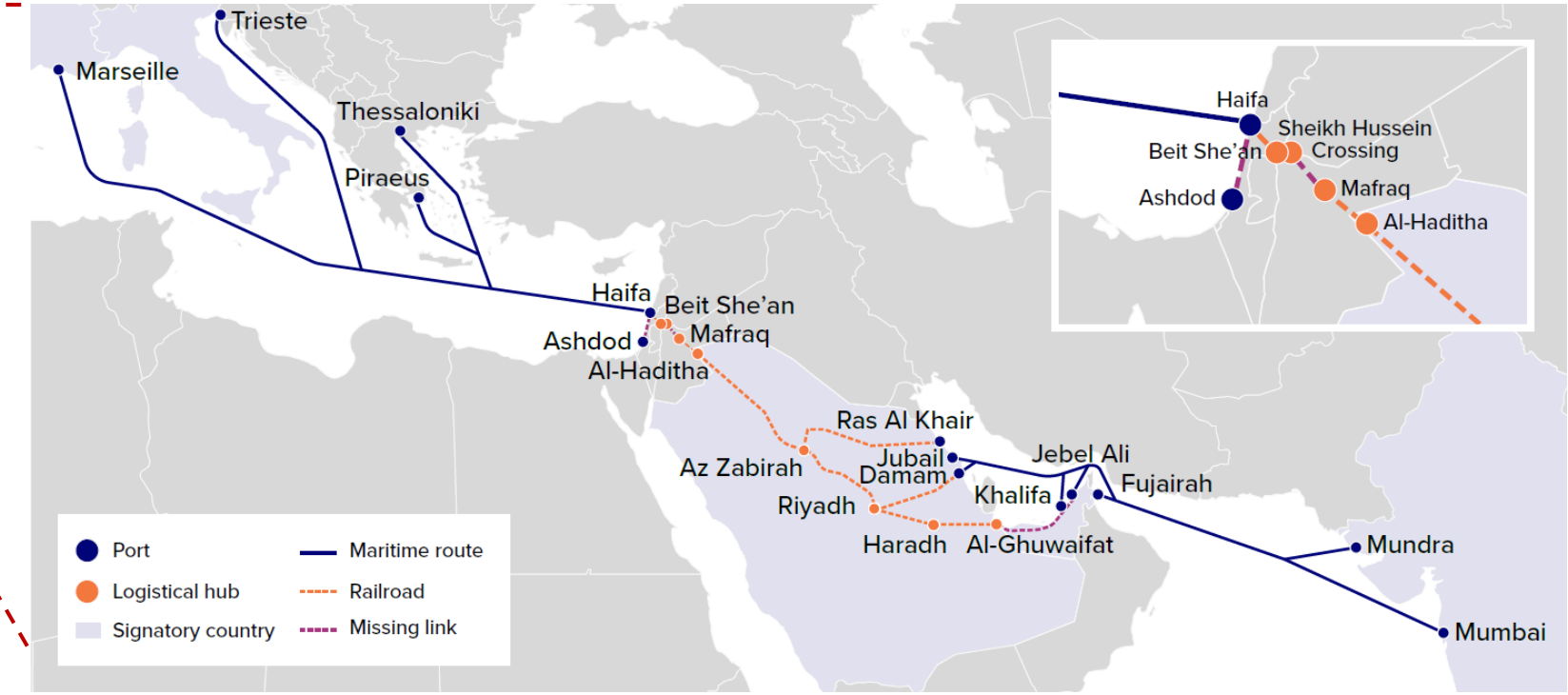
- Positioned as a major regional integration and connectivity initiative promoting rules-based, market-driven infrastructure across Eurasia.
- Provides a credible alternative to **China's Belt & Road Initiative (BRI)**.

India-Middle East-Europe Economic Corridor (IMEC) Project



The IMEC Project was announced at the G20 Summit (2023), the IMEC aims to connect India, the Middle East, and Europe through a network of railways, roads, and ship-to-rail links.

It includes two corridors: **the East Corridor linking India to the Arabian Gulf,** and **the Northern Corridor connecting the Gulf to Europe.**



The project will also feature an electricity cable, a hydrogen pipeline, and a high-speed data cable, fostering regional integration across Asia, Europe, and the Middle East.

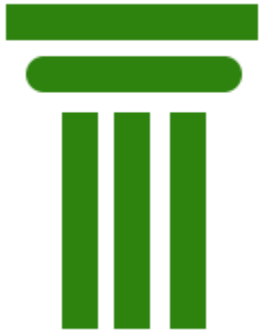
IMEC's Core Pillars

The India-Middle East-Europe Economic Corridor (IMEC) features three pillars that integrate existing and future infrastructure.

01

Transportation

40% reduction in transit time from Asia to Europe



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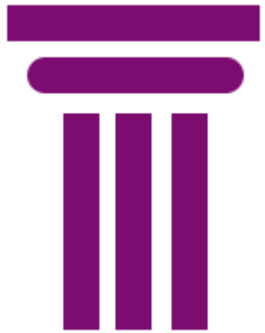
Energy

Interconnected energy and electricity infrastructure across continents



03

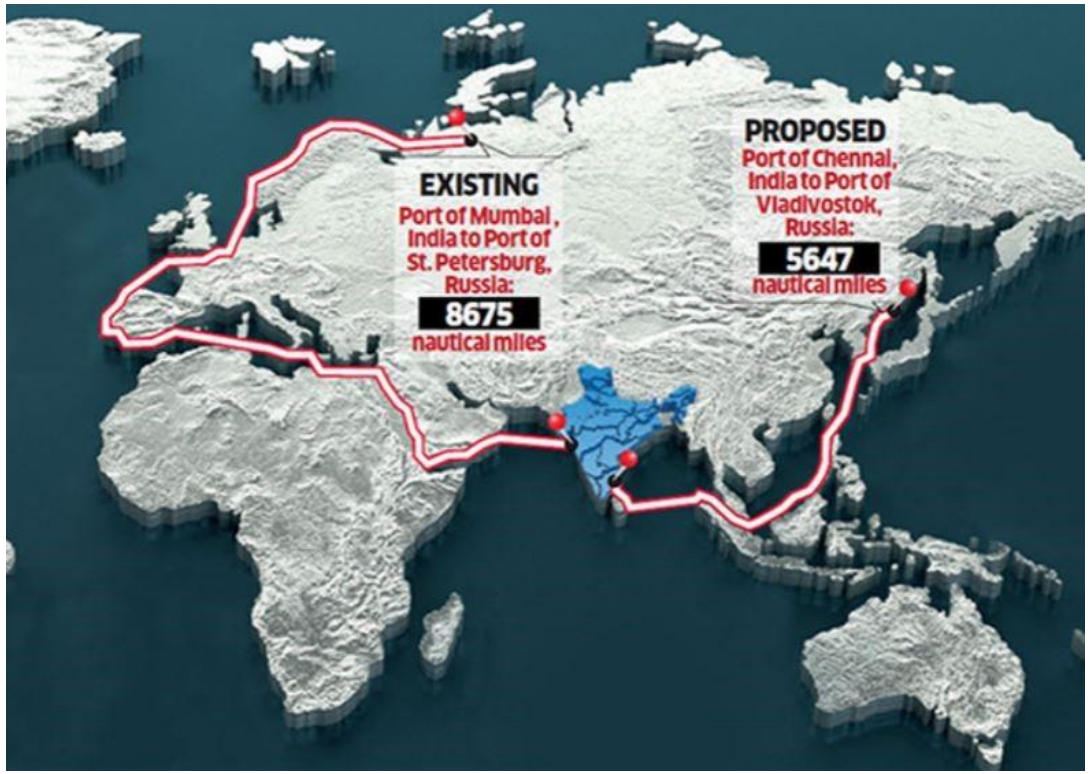
Digital

New fiber-optic cables and cross-border digital infrastructure

Chennai-Vladivostok Eastern Maritime Corridor (EMC)

The **Chennai-Vladivostok Eastern Maritime Corridor (EMC)** is a sea link connecting the **east coast of India (Chennai Port)** with **ports in the far-east region of Russia (Vladivostok Port).**

The Chennai-Vladivostok corridor is aligned with other initiatives, such as the **Northern Sea Route** and the **International North-South Transport Corridor (INSTC).**



Advancing India's Act Far East Policy

- The EMC **boosts India's access to Russian resources** and strengthens its position in the Pacific trade network
- It promotes trade with **East Asia, ASEAN, and Russia**, facilitates multimodal transport, and supports infrastructure development.

EMC has reduced the shipping distance from 8,675 nautical miles (via the traditional **St Petersburg-Mumbai route** through Europe) to **5,600 nautical miles**, cutting transit time from over 40 days to just **24 days.**

Diversification of Trade

Strategic Importance: Vladivostok is the **largest Russian port on the Pacific Ocean**, and the corridor passes through the **South China Sea** and strengthens India's strategic presence **addressing China's dominance** in the region.

INSTC and Northern Sea Route

Aspect	INSTC	Northern Sea Route (NSR)
Mode	Multimodal: Ship, rail, road	Maritime
Route Length	~7,200 km	~5,600 km (Arctic route)
Transit Efficiency	40% faster than Suez Canal	Up to 40% shorter distance than traditional routes
Cost Efficiency	~30% lower freight costs	Potential fuel savings, but higher risk
Operational Status	Partially operational, expanding traffic	Seasonal use, increasing but limited
Geopolitical Risks	Lower, established political cooperation	High, Arctic sovereignty and environmental concerns
Environmental Impact	Moderate, existing infrastructure	High, fragile Arctic ecosystem at risk

INSTC and Northern Sea Route

The first **Russian cargo consignment** to India in 2024 via the **International North–South Transport Corridor (INSTC)** marks a significant milestone in promoting multimodal connectivity and trade diversification between Eurasia and South Asia.

Dimension	Impact
Geoeconomic	Offers a **shorter, cost-effective alternative** to traditional maritime routes (Suez Canal).
Infrastructure Integration	Boosts **port, rail, and logistics cooperation** among Russia, Iran, and India.
Energy & Resource Flows	Facilitates faster shipment of **oil, fertilizers, and industrial goods.**
Sanction-Resilient Trade	Helps Russia and India **bypass Western-controlled routes and sanctions constraints.**
Regional Partnerships	Strengthens **India–Iran–Russia** strategic alignment within **Eurasia.**

Melting Arctic ice is opening new trade routes — but the **Northern Sea Route (NSR)** is far from the **"green"** corridor Moscow promotes.

Environmental & Climate Risks	Political & Strategic Realities
Myth of the "Green Route": Shorter path ≠ cleaner route. Ships emit **black carbon** that accelerates Arctic warming.	**Geopolitical Tool:** Russia uses NSR to **project power** and market it as a **Suez Canal alternative.**
Fragile Ecosystems: Oil spills, noise pollution, and invasive species threaten biodiversity.	**Fossil Fuel Dominance:** In 2024, **84% of NSR cargo = oil & gas.** The Arctic fuels Russia's war economy.
Safety Concerns: Harsh conditions, **poor spill-response infrastructure**, and a **shadow fleet** of unregulated tankers heighten disaster risks.	**Weak Oversight:** Russia's Arctic protection and governance trail behind its industrial expansion.

IMEC and EMC

Operational Overview

Investment gap: ≈ $5B (mainly in Jordan, Israel, and Saudi logistics hubs)

Capacity: 46 trains/day; **1.5M TEUs annually**, scalable to **3M TEUs** with double-stack rail and port integration

Transit time: ↓40% (≈12 days), saving **$5.4B annually** on Asia–Europe trade

Economic Impact

Source: Atlantic Council

India: +5–8% export valuation; ≈ **$21.85B** in added exports/year

Boosts **market access**, **supply chain security**, and **regional competitiveness**.

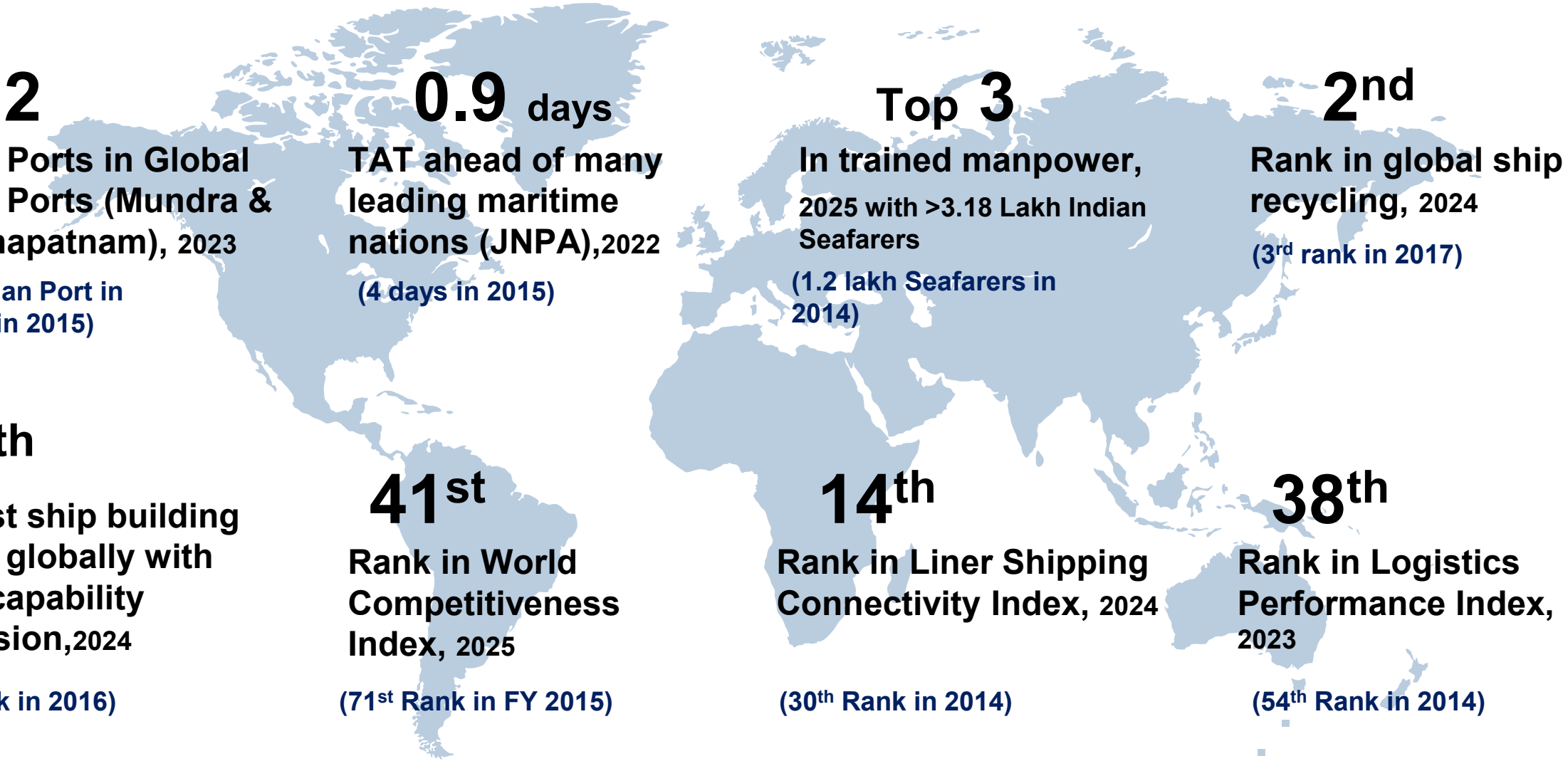
Synergies Between IMEC and the Global Gateway

Both initiatives advance sustainable, secure, and efficient connectivity linking Asia, the Middle East & Europe.

Theme	IMEC Focus	Global Gateway Focus	Synergy Outcome
Sustainable Infrastructure	Rail, port & trade corridors reducing emissions	€300B fund for green & quality infrastructure	Joint green corridors, hydrogen & power grids
Digital Connectivity	High-speed data links India–Gulf–EU	Secure global digital networks	Enhanced data flow, AI & blockchain collaboration
Trade Route Optimization	New rail-sea route bypassing Suez	Resilient global supply chains	Seamless Asia–Europe trade via Gulf hubs
Energy Transition	Renewable power & hydrogen pipeline vision	Financing clean energy in Africa & beyond	Integrated green energy markets
Geopolitical Alignment	Strengthening India–Gulf–EU ties	Supports EU Indo-Pacific & BRI alternative	Stronger trilateral cooperation framework
Multilateral Cooperation	8 signatories incl. Gulf states	“Team Europe” PPP approach	Shared financing & sustainability standards

“India as the natural connector between Asia, West Asia, Africa, and Europe.”

Global Competitiveness (2014-2024)



2

Indian Ports in Global top 30 Ports (Mundra & Visakhapatnam), 2023

(No Indian Port in Top 30 in 2015)

0.9 days

TAT ahead of many leading maritime nations (JNPA),2022

(4 days in 2015)

Top 3

In trained manpower, 2025 with >3.18 Lakh Indian Seafarers

(1.2 lakh Seafarers in 2014)

2nd

Rank in global ship recycling, 2024

(3rd rank in 2017)

16th

Largest ship building sector globally with rapid capability expansion,2024

(23rd Rank in 2016)

41st

Rank in World Competitiveness Index, 2025

(71st Rank in FY 2015)

14th

Rank in Liner Shipping Connectivity Index, 2024

(30th Rank in 2014)

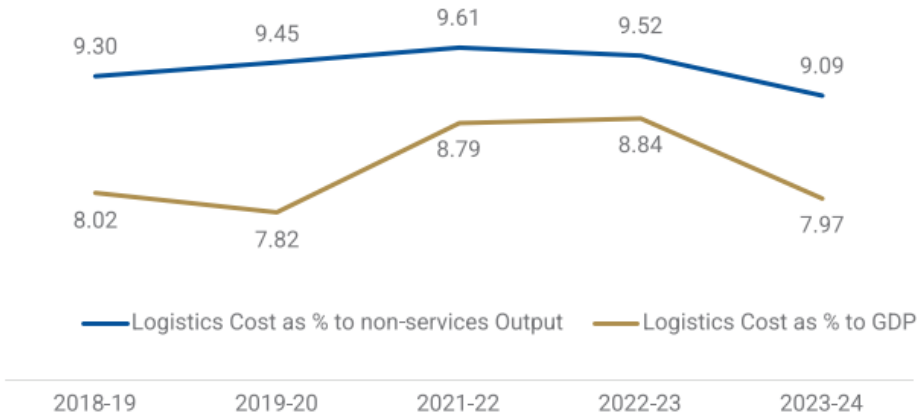
38th

Rank in Logistics Performance Index, 2023

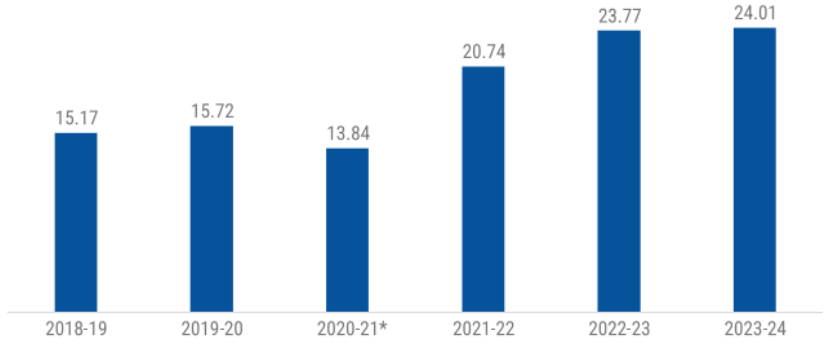
(54th Rank in 2014)

India as the natural connector between Asia, West Asia, Africa, and Europe.

Time Series of Total Logistic Cost Metrics



Time Series of Total Logistic Cost as an Absolute Value in Lakh Crores



* COVID Year
- Logistics Cost Components: Transportation by all modes, Warehouse & Storage, Material Handling by all modes
- Data Source: Supply and Use Tables, National Accounts Statistics, MoSPI; NCAER Industry Survey

Agility Emerging Markets Logistics Index 2025 Rank 2: India

Ranking	Country	Domestic Logistics Opportunities	International Logistics Opportunities	Business Fundamentals	Digital Readiness	Overall	Change
1	China	8.58	9.65	6.37	8.47	8.58	0
2	India	7.59	7.49	6.03	5.76	6.94	0
3	UAE	5.53	5.90	8.53	6.55	6.31	0
4	Saudi Arabia	5.61	6.07	7.45	5.82	6.08	2
5	Malaysia	5.26	5.78	7.72	6.41	6.04	-1
6	Indonesia	6.16	6.12	5.85	5.41	5.94	-1
7	Mexico	5.49	6.45	5.61	5.25	5.77	+2
8	Qatar	5.36	4.92	6.97	6.25	5.64	-1
9	Thailand	5.05	5.86	5.94	5.82	5.61	+1
10	Vietnam	5.09	5.81	6.01	5.37	5.52	-2

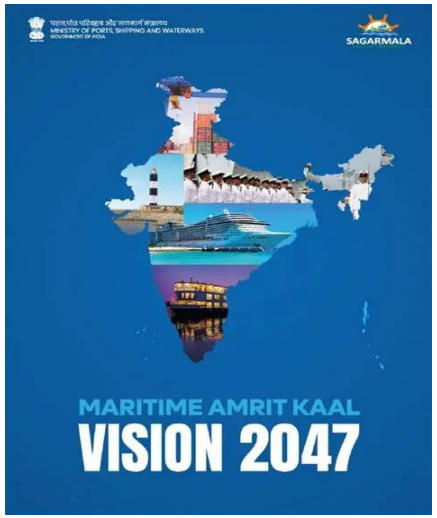
Source: Rankings - Agility Emerging Markets Logistics Index 2024

India’s preparedness for transnational connectivity

India's Vision for the Maritime Sector

Maritime India Vision (MIV) 2030

- Position India Globally in the Top 10 Shipbuilding, repair nations
- Production Targets: Increase from current 30k GT to 500k+ GT annually by 2030
- Investment: INR 20,000+ Crores
- Employment Generation: 1,00,000+ additional jobs (direct and indirect)



Maritime Amrit Kaal Vision 2047

- Advanced phase targeting Top 5 global position in shipbuilding and maintaining 1 position in ship recycling
- 69% Indian-Built Ships Share (up from current 5%)
- 300+ Strategic Initiatives across 11 key maritime areas
- Financial Assistance: 20-30% assistance for green vessels (including retrofitting)

National Enablers of International Corridors – 1. Blue Economy

Contribution of the Blue Economy

Towards Viksit Bharat 2047

India and its Blue Economy

95%
By trade volume

65%
By trade value

India's Infrastructure Leverages

12
Major Ports

200+
Non-major Ports

11,098 km
Total length of India's coastline

India's Vessel Advantage

India has 1,520+ merchant vessels with 13 mn+ GT capacity

India ranks 18th globally in flag registration and 19th globally in carrying capacity

India is emerging as the leader of the Blue Economy in the world with multiple initiatives focusing on infrastructure, business and the overall economy

- Port-led Development
- Ports for Prosperity
- Policy reforms driving EoDB, modern infrastructure and multi-modal logistics

Indian Maritime Sector Overview

Ports

- Total Ports In India
  i. Major Ports: **12**
  ii. Other than Major Ports: **200+**
- Total Cargo Handling Capacity: **2,762** MTPA
- Total Cargo Traffic Handled: **1,600** MTPA

Shipping

- Indian flagged vessels: **1,549**
- Seafarers: **3.18 lakh**
- Lighthouses: **200+**
- Over **18 lakh** tourist footfall in last year

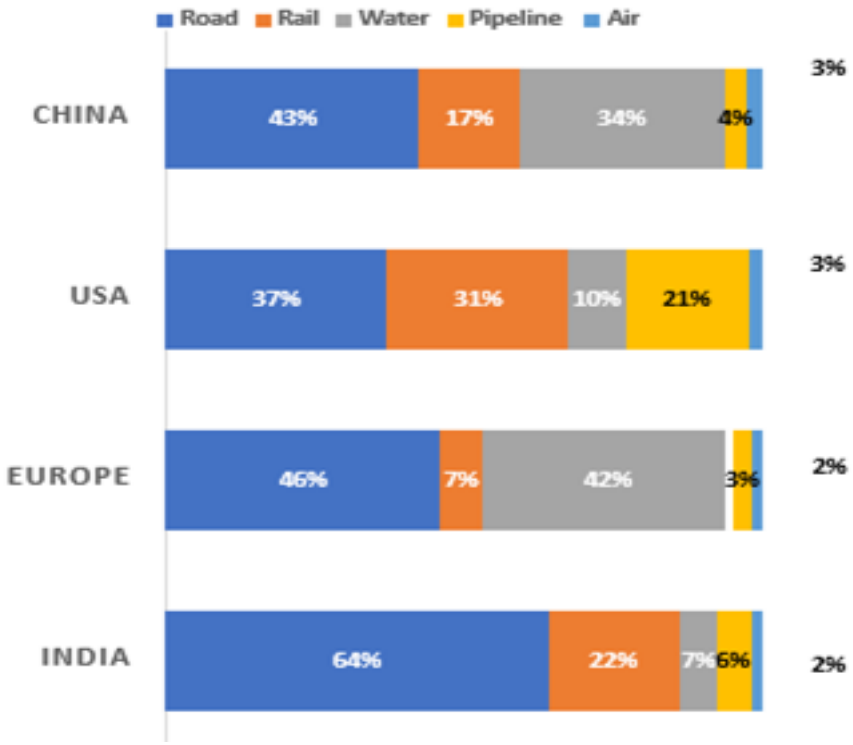
Waterways

- No. of operational National Waterways (NWs): **29 (Length 4,862 km)**
- Cargo handled **146** MTPA
- Cargo growth in the past decade: **359%**

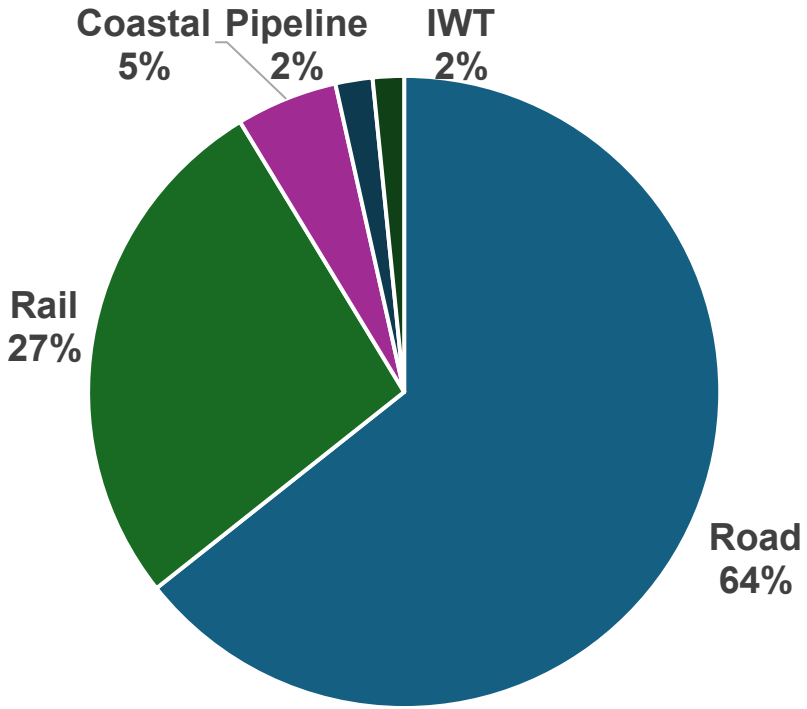
MMTPA: **Million Metric Tonnes per Annum** || DWT: **Dead Weight Tonnage** || GT: **Gross Tonnage**

Modal Share of Transport

Global Modal split of Freight Transport by tonne km



Modal Share of Transport - Major Ports



Logistic Cost per tonne per km

Road:
₹3.78

Rail:
₹1.96

Air:
₹72

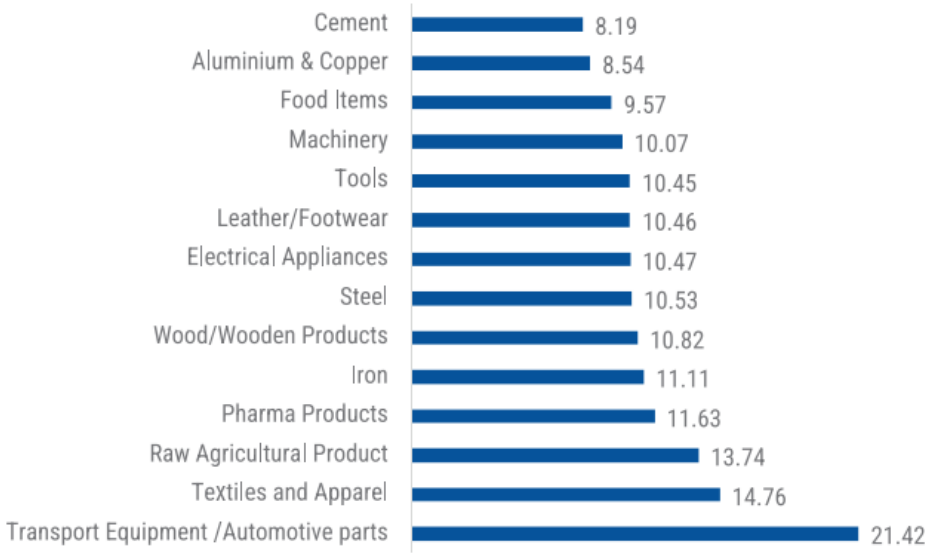
Waterways (average):
₹2.30

Coastal:
₹1.80

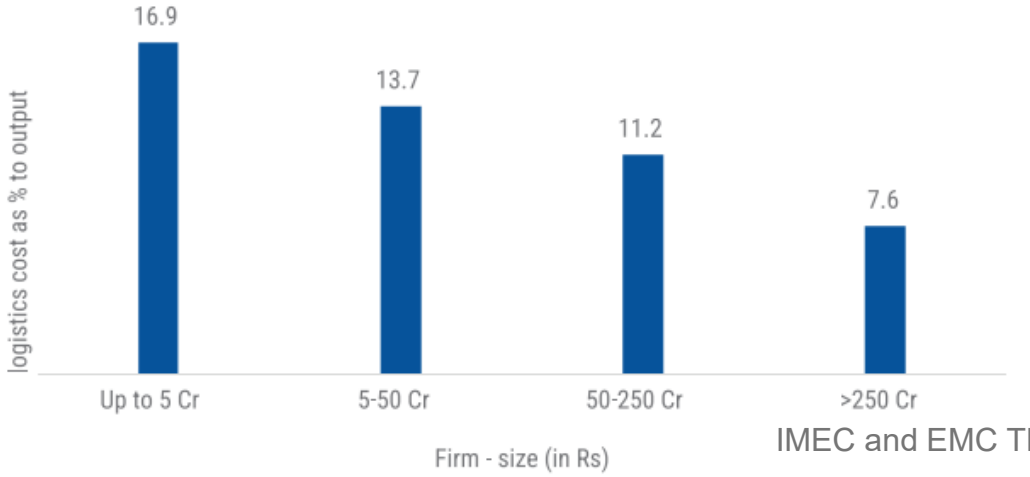
Inland:
₹3.30

India's Logistic Landscape – Logistic Cost

Logistics Cost (as per cent of output) by Product Type



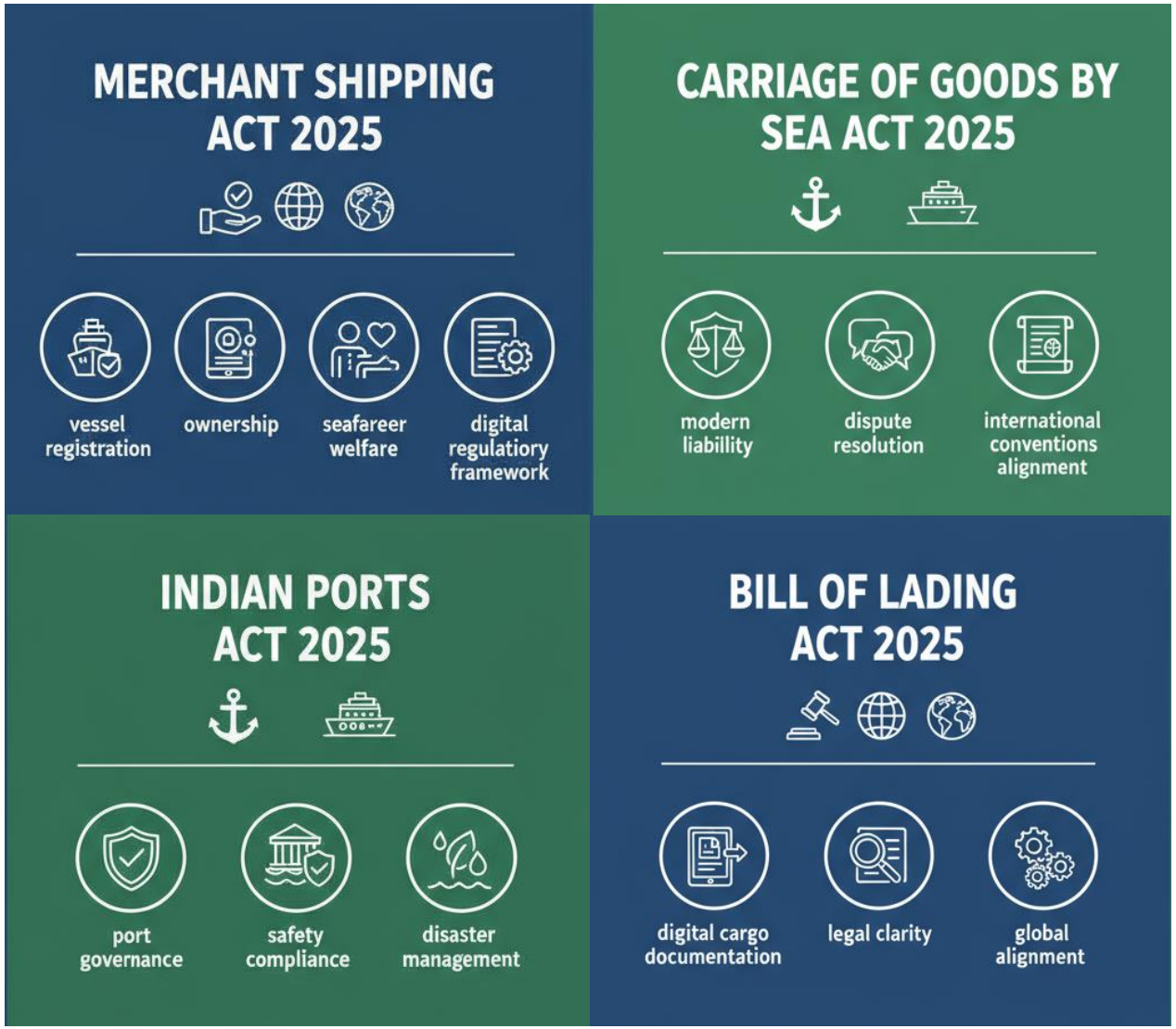
Logistics Cost (as per cent of output) by Firm-size



Factors Impacting Logistics Costs in India

1. Operational factors: shipment type (FTL vs LTL), backhaul availability, negotiation power.
2. Market dynamics: multiple freight rates for same route due to fragmentation.
3. Intermediary layers: brokers, consolidators increase end-user costs beyond base tariffs.
4. Hidden costs: port congestion, delays at ICDs, CFSs, borders cause inefficiencies.
5. Cargo handling variations: factory vs warehouse stuffing affects documentation and costs.
6. Informal transporters outside GST network complicate pricing transparency.
7. Diverse accounting practices among shippers, 3PLs, transporters hinder cost comparison.
8. Fragmented landscape: national averages mask true cost variability in the supply chain.

Regulatory & Institutional Initiatives 2025



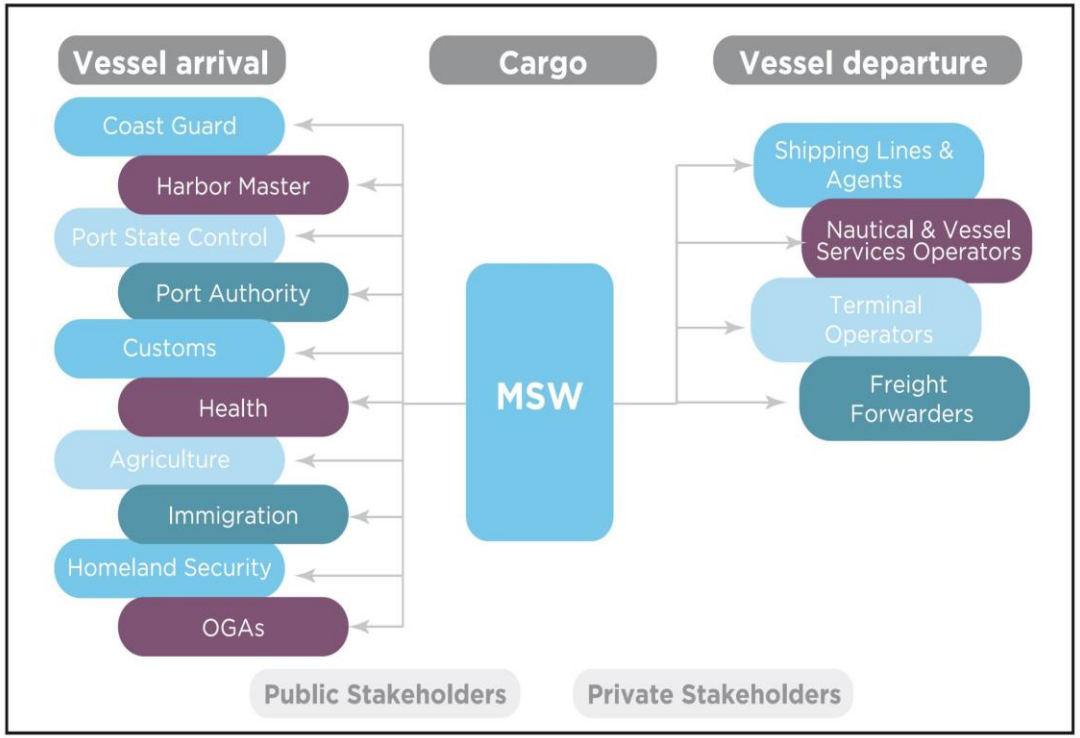
Maritime Single Window

The Maritime Single Window (MSW) is a digital platform designed to streamline and simplify the submission of maritime-related documentation for ships arriving at or departing from ports, as per IMO's mandate.

It serves as a single-entry point where ship-owners, operators, and agents can electronically submit all the required information (FAL forms) to various authorities involved in maritime operations.

Maritime single window came into force from 01.01.2024. The implementation of the MSW aligns with the international maritime organization (IMO) and its facilitation (FAL) convention, which mandates the electronic exchange of information related to ship arrivals, departures, and cargo movements.

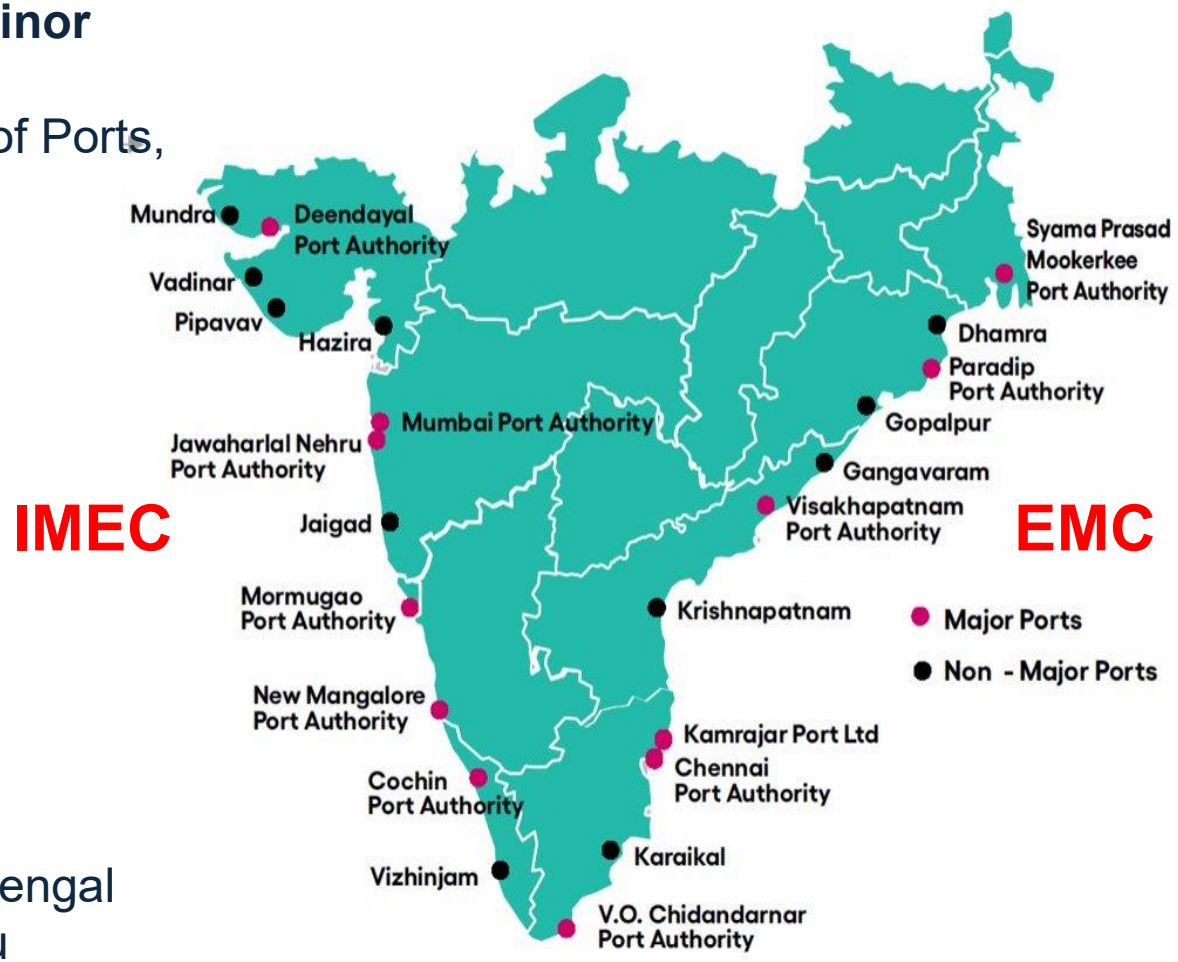
By digitalizing the submission and processing of regulatory documents, MSW significantly reduces manual intervention, thereby increasing the speed and accuracy of port clearances and promotes ease of doing business.
Upgradation is being pursued and has been mentioned in the upcoming slides.



12 Major Indian Ports

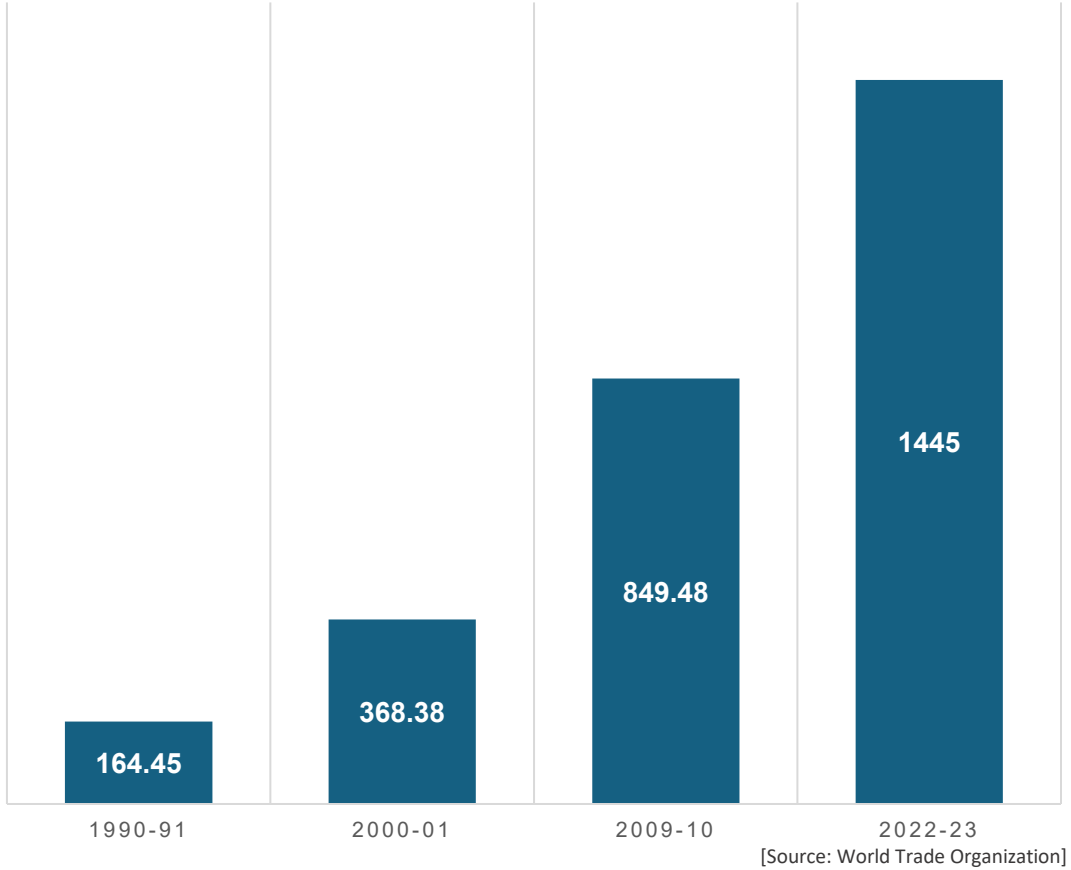
India currently has **12 major ports** and around **200+ minor (non-major) ports Major Ports of India (12)**
Here are the **12 major ports** overseen by the Ministry of Ports, Shipping & Waterways:

1. **Chennai Port** – Tamil Nadu
2. **Cochin Port** (Kochi) – Kerala
3. **Deendayal Port** (Kandla) – Gujarat
4. **Jawaharlal Nehru Port** (JNPT, Nhava Sheva) – Maharashtra
5. **Kamarajar Port** (Ennore) – Tamil Nadu
6. **Mormugao Port** – Goa
7. **Mumbai Port** – Maharashtra
8. **New Mangalore Port** – Karnataka
9. **Paradip Port** – Odisha
10. **Haldia Dock Complex** – West Bengal
11. **Syama Prasad Mookerjee Port** (Kolkata) – West Bengal
12. **V. O. Chidambaranar Port** (Tuticorin) – Tamil Nadu

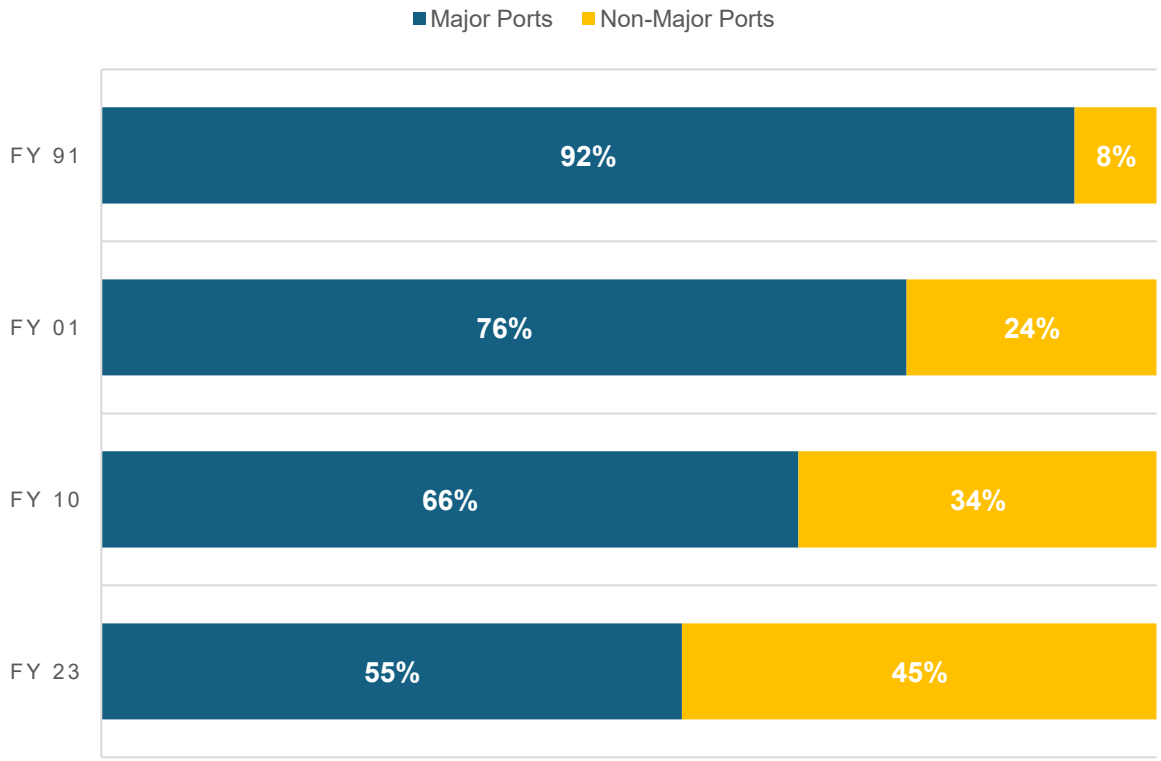


Cargo through Indian Ports

Decreasing share of Major Ports as compared to Non-Major Ports over the years

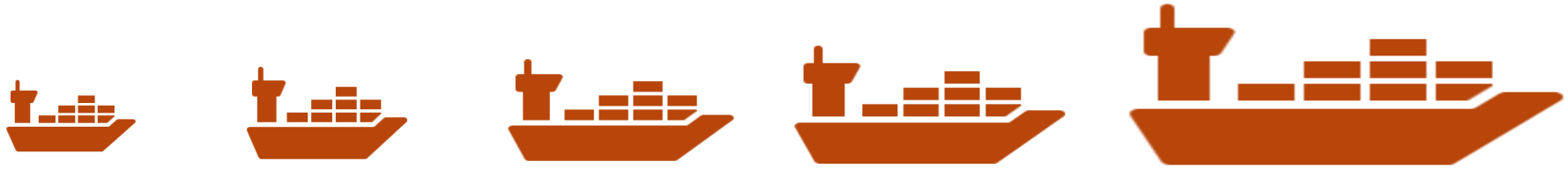


[Source: World Trade Organization]



Cargo Handled in MMT

The Mega Future



Panamax (3000-4500 TEUs) | Post Panamax (6000-8000 TEUs) | VLCS (11000-15000 TEUs) | ULCS (18000-21000 TEUs) | MGX 24 (21000-24000 TEUs)

The 'Mega' Future – Era of Mega Ports & Mega Ships

Global Shipping Shift

- Rise of **Ultra Large Container Vessels (ULCVs)** – >20,000 TEU capacity
- Increasing reliance on **fewer but larger ports** for global trade

⚓ **Mega Ports**

- Equipped with **deep draft berths** (>18m) & **automated terminals**
- Strategic hubs handling **trans-shipment & global supply chains**
- Examples: **Shanghai, Singapore, Rotterdam, JNPT (India)**

🚢 **Mega Ships**

- Reduce cost per container, improve fuel efficiency
- Require **advanced port infrastructure** & **digital logistics systems**
- Drive competition for **bigger cranes, deeper channels, and hinterland connectivity**

📈 **Implications**

- **Consolidation** of trade routes around fewer mega hubs
- Push for **smart, green, and resilient port infrastructure**
- Reshaping of **global maritime security & geopolitics**

Source: UNCTAD Review of Maritime Transport 2023, Drewry Shipping Consultants 2024, MIV 2030 (Maritime India Vision 2030, Ministry of Ports, Shipping & Waterways), World Shipping Council

India’s Connectivity Readiness

Coastal Shipping

Coastal shipping is the movement of goods and passengers along a country's coast using sea routes, offering a cost-effective and eco-friendly alternative to road and rail transport.

- **India's Potential**
  - 11,099 km coastline & 14,000 km navigable waterways.
  - Underutilised compared to road & rail.

- **Trends & Growth**
  - Coastal cargo in 2023–24: **187.22 million tonnes** (+1.97%).
  - Major commodities: POL, crude, containers, iron ore.
  - Paradip & Deendayal Ports lead in volumes.

- **Coastal Shipping Reforms**
  - **Coastal Shipping Bill, 2025**: modern legal framework, aligned with global cabotage standards.
  - Targets **230 million tonnes by 2030**.
  - National Coastal & Inland Shipping Strategic Plan + National Database for Coastal Shipping.
  - Supports **Atmanirbhar Bharat & Viksit Bharat 2047** vision.

Benefits of Maritime Shipping

- **Most Carbon-Efficient Mode**
  - Shipping has the lowest CO_2 emissions per tonne-km compared to road, rail, and air.

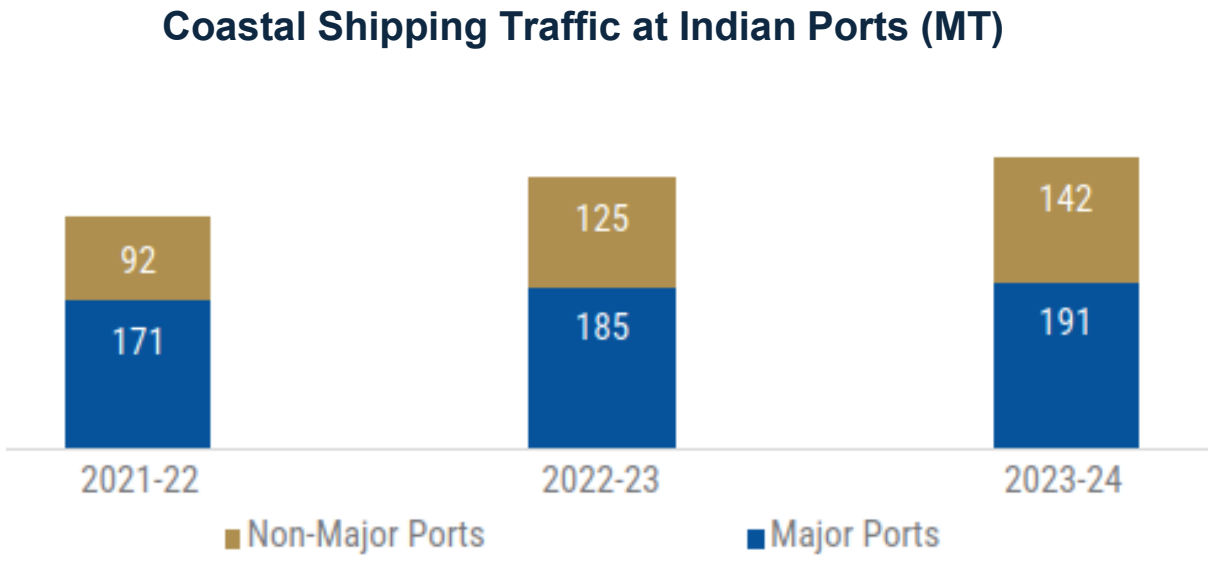
- **Reduced Pollution & Congestion**
  - Shifting freight from trucks/trains to ships cuts urban air pollution.
  - Less congestion on highways and rail networks.

- **Green Logistics**
  - Supports low-carbon supply chains and climate commitments.
  - Essential for achieving India's net-zero & IMO 2050 targets.

- **Large-Scale Impact**
  - Moving bulk cargo by sea reduces fossil fuel consumption.
  - Coastal shipping = key enabler of Blue Economy + Green Economy transition.

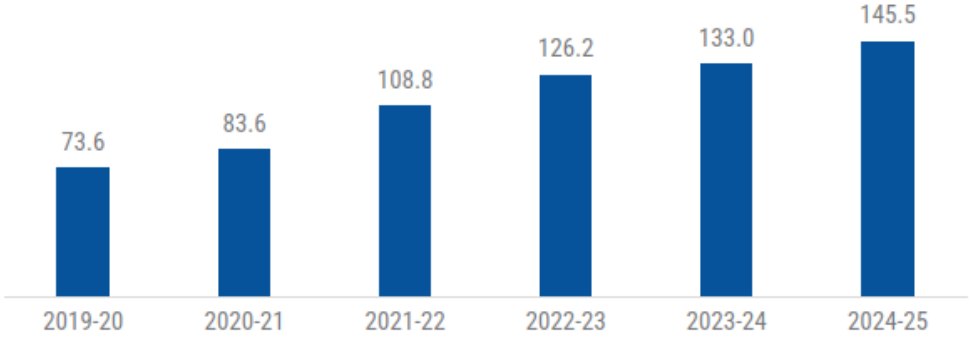
Coastal Shipping - Traffic

1. Coastal shipping is in its early stages but showing promising growth.
2. Traffic increased 26% from 264 million tonnes in 2021-22 to 333 million tonnes in 2023-24.
3. Non-major ports saw 54% growth; major ports grew by 11% during this period.
4. Government aims to scale coastal cargo to 1,300 million tonnes by 2047 under Maritime Amrit Kaal.
5. Recent policies and dedicated coastal berths promote sustainable and efficient domestic shipping.
6. Key commodities include petroleum, oil, lubricants, coal, cotton, tiles, soda, ash, wheat, and containerized cargo (especially on the west coast).
7. Challenges include limited handling capacity and vessel availability.
8. Greater push from government and private sectors can unlock huge sustainable and economic potential.



Inland Waterways

Cargo Movement Through IWT (million MT)



Key Inland Waterways

NW-1 (Ganga – Haldia to Allahabad):

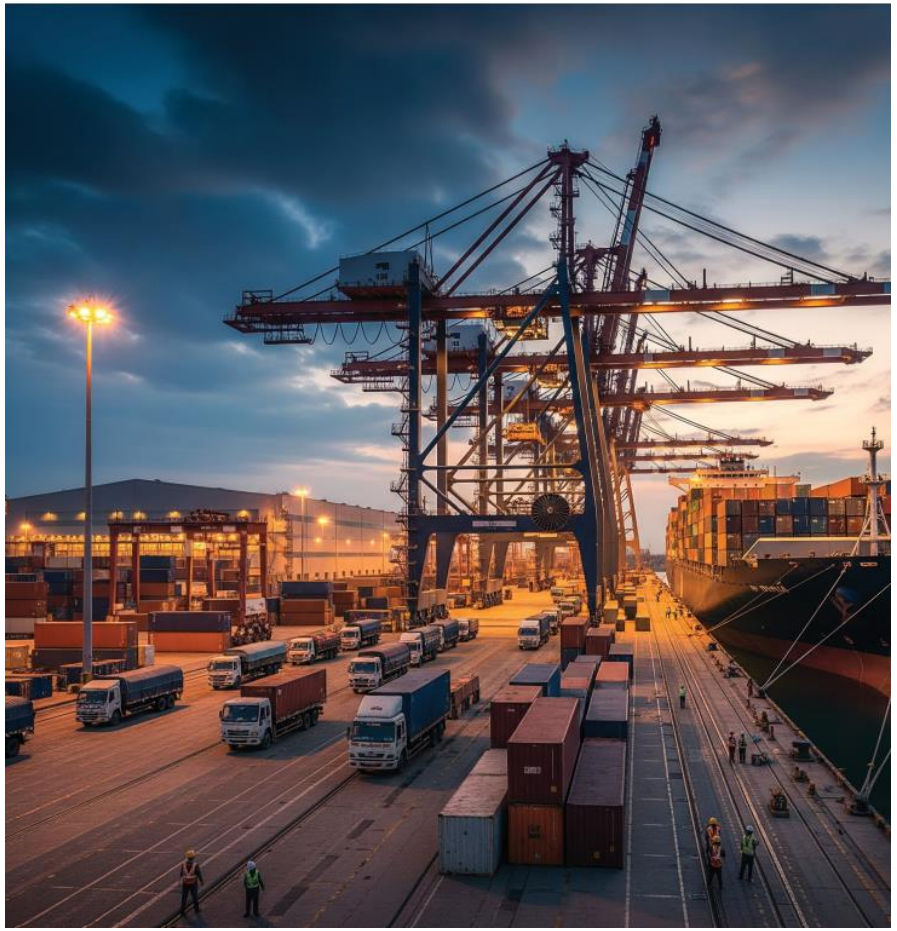
- Majority (~90%) cargo movement involves lighterage operations at Kolkata, transferring cargo to smaller vessels via port's outer reaches.
- Minimal actual long-haul cargo movement upstream due to draft restrictions and infrastructure limitations.

NW-2 (Brahmaputra – Dhubri to Sadiya):

- Limited cargo movement because of shallow depths beyond Narayanganj, causing vessels to run aground and incur losses.
- Navigation is considered safe only up to Chandpur; beyond that, operators lack reliable depth info.
- High risks and uncertain conditions reduce usage for long-haul cargo.

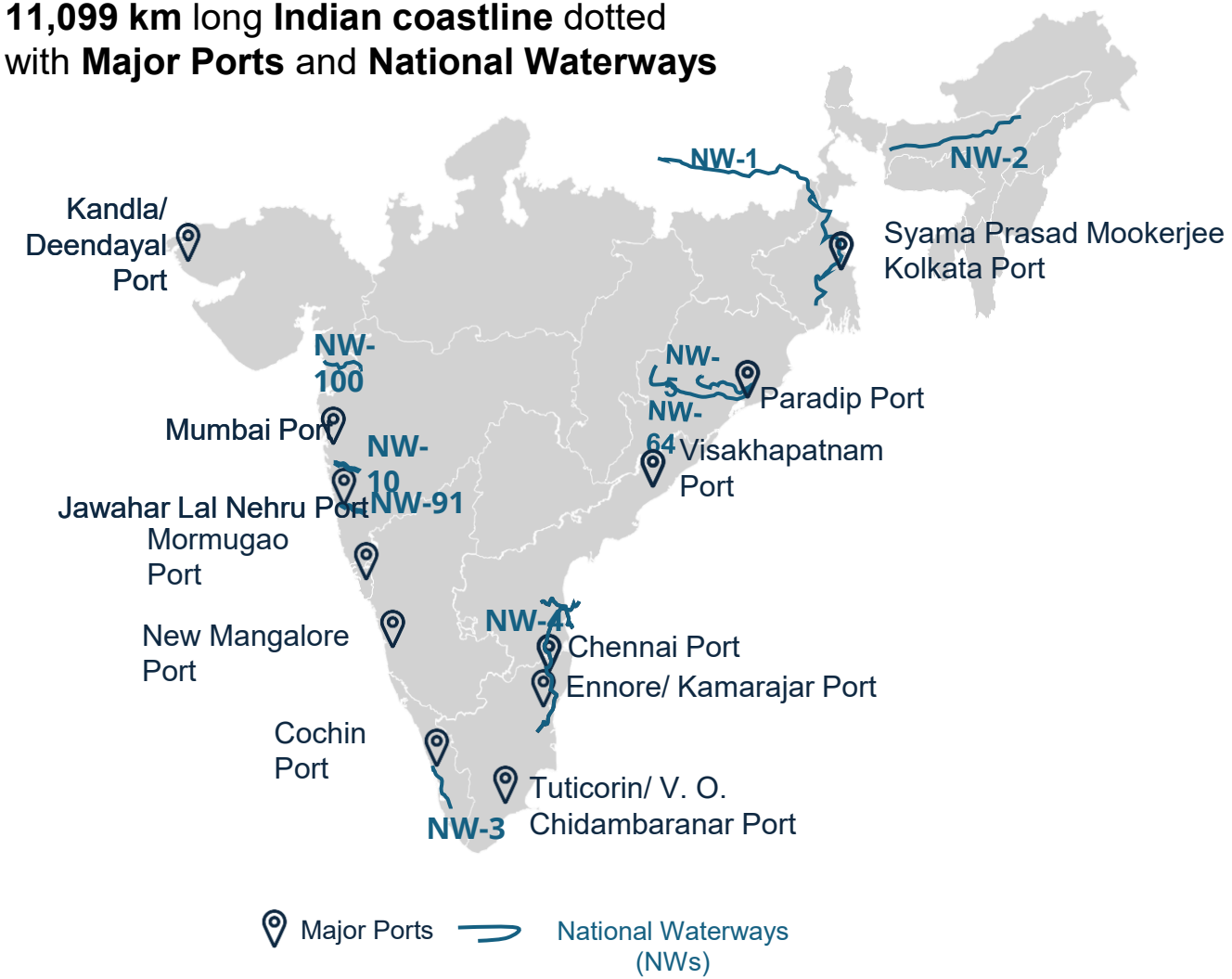
NW-3 (West Coast Canal – Kerala):

- Short, mostly horizontal waterway serving regional transport in Kerala.
- Serves as local cargo route due to limited length and stable road network. Remains niche, not a large-scale cargo corridor.



Multi Component Ecosystem for Indian Maritime Sector

11,099 km long **Indian coastline** dotted with **Major Ports** and **National Waterways**



Key components of the Indian Maritime Sector

EXIM Ports	55
Non- EXIM Ports	23
Total cargo handling ports	78

Cargo type	Cargo handled-Ports MMT (FY25)
Coastal	331
Overseas	1,262
Total	**1,593**

Ship type	No. of Ships (FY24)	Capacity Mn GT (FY24)
Coastal	1,056	1.6
Overseas	489	11.8
Total	**1,545**	**13.5**

Number of Waterways	Cargo handled MMT (FY25)
111 (29 operational)	**145**

Water Transport - Challenges

Limited Network Coverage:

- Despite efforts under initiatives like the Jal Marg Vikas Project, only a few waterway routes are currently operational at scale. This severely restricts viable. OD pairs for cargo movement, limiting the commercial attractiveness of this mode.

Cargo Consolidation Requirements:

- For vessels to be economically viable, cargo loads typically need to be consolidated up to 300–400 tonnes or more. This requires extensive warehousing and holding infrastructure near terminals, which adds to costs and demands significant coordination among shippers and transporters.

First- and Last-Mile Dependencies:

- Waterways are not a door-to-door solution. Cargo must be trucked to the loading terminals and again from the unloading point to the final destination. This intermodal dependency dilutes cost advantages, especially where road infrastructure is weak or distances are long.

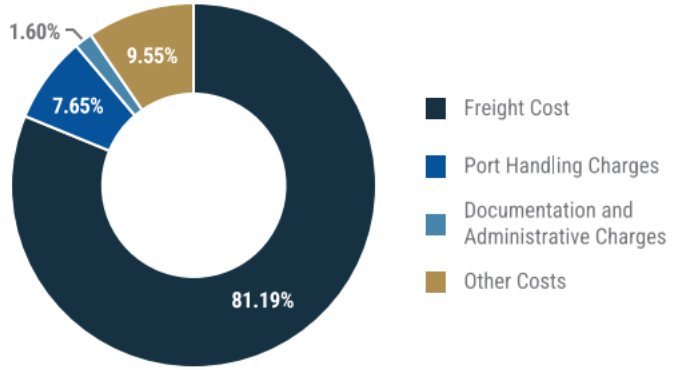
Limited Vessel Availability and Low Frequency:

- A shortage of suitable vessels on inland and coastal routes constrains service frequency and routing flexibility. As a result, scheduling becomes uncertain, and freight costs can increase due to the need for chartering or waiting for vessel availability.

Slower Transit Times:

- Compared to road or even rail, cargo movement via waterways tends to take longer, especially on routes with multiple locks, tidal dependencies, or seasonal water level variations. This higher transit time affects supply chain reliability, particularly for time-sensitive cargo.

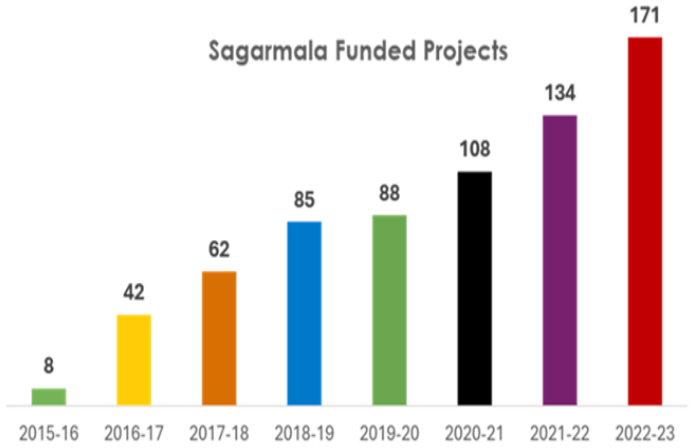
Water Transport: Cost Break-up, per cent

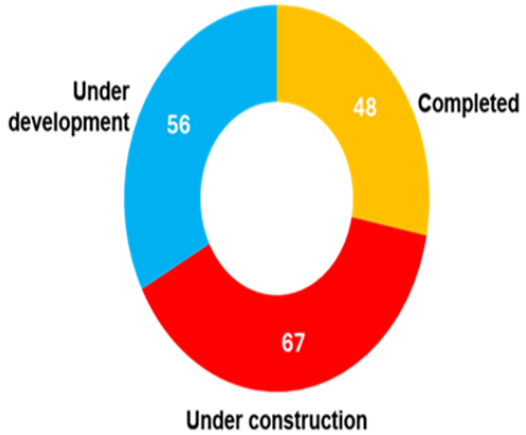


Freight costs dominate inland waterway logistics at 81.19%, followed by port-handling (7.65%), documentation (1.6%), and other costs (9.55%) including insurance, vessel delays, and navigation charges.

Operational inefficiencies, **especially on cross-border and tidal routes, significantly inflate overall logistics expenses.**

Sagarmala Program - Port Led Development



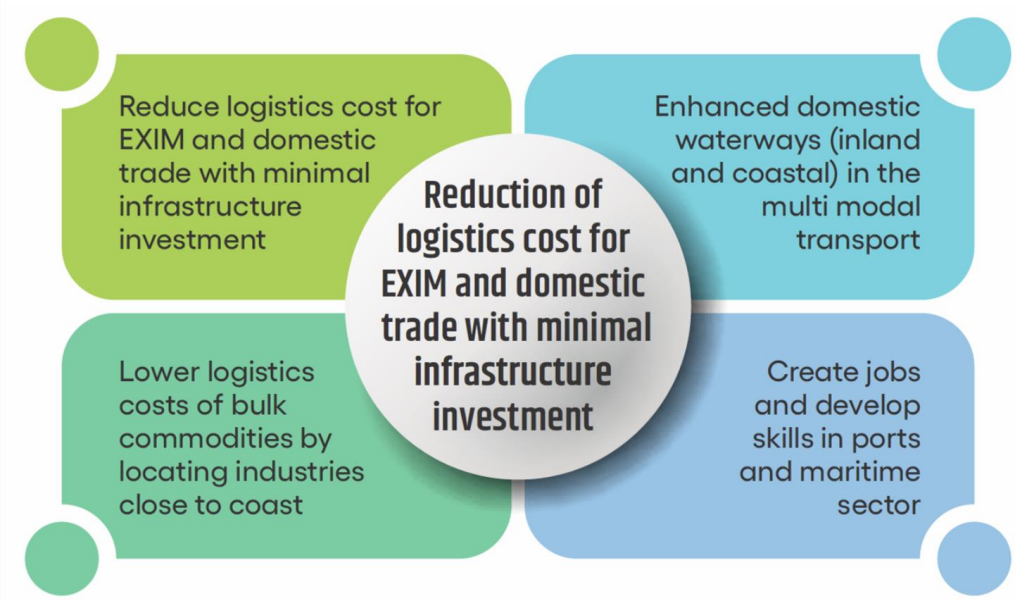


Total cost of 171 projects: 10,968 Cr.

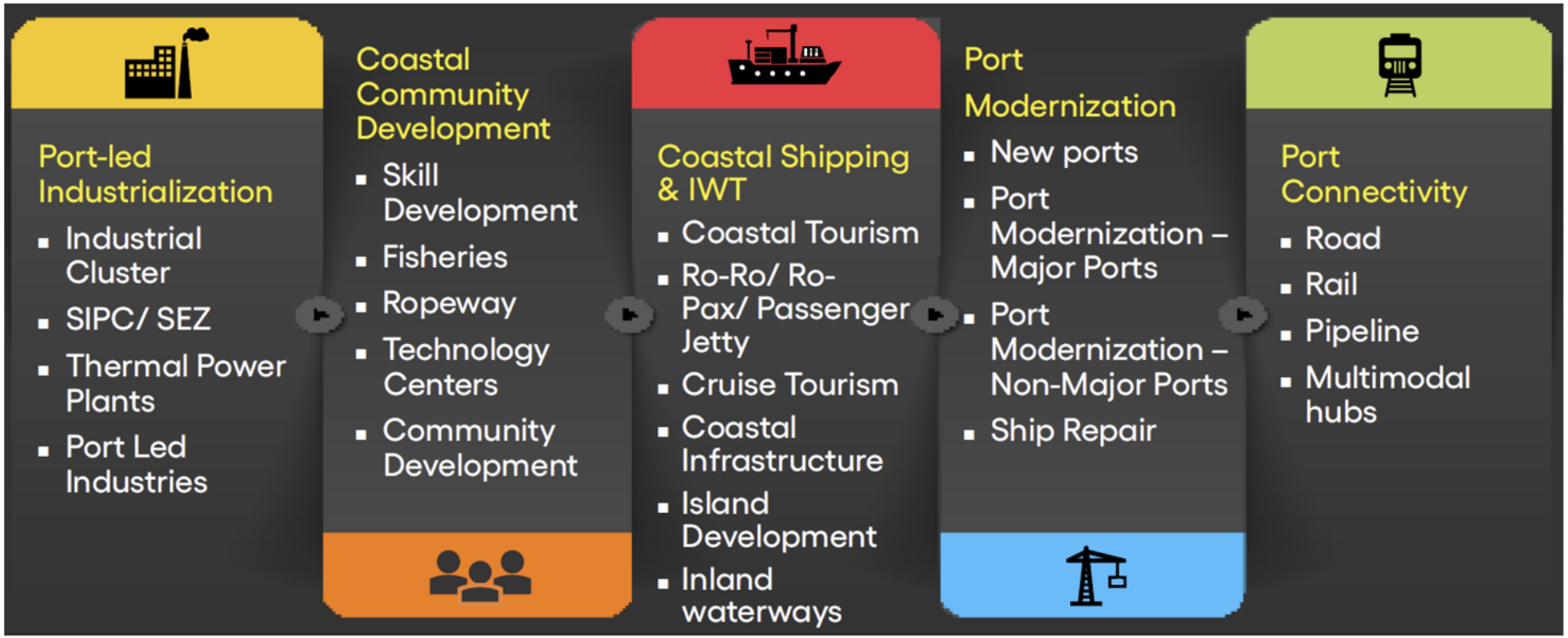
63	38	18	14	38
RoRo- RoPax/ Passenger facilities	Fisheries & Coastal infra	Rail & Road dev.	Cruise & Coastal tourism, Island & Community dev.	Port modernization & Skill dev.

59 Locations

37	22
Passenger jetties	RoRo- RoPax jetties



Sagarmala Program - Port Led Development



GatiShakti Portal Workflow - MoPSW

MoPSW Portal

Layers and Data Base

Ports database

Port Performance Modules (13)

Major Ports (13)

Maritime Boards (11)

IWAI

Source: PM Gatishakti -Compendium Vol-2_10x10

GatiShakti – Case Study 1

GatiShakti Edge and Approach: Tuna Tekra Container Terminal

Tuna Tekra's container terminal faced major reclamation challenges in the coastal area, which required careful evaluation of reclamation volumes and areas.

The PM GatiShakti National Master Plan (NMP) portal enabled integrated project planning, aligning road and rail connectivity with the regional network and facilitating critical coastal land assessments.

Strategic blueprint from NMP ensured precise waterfront alignment and optimal land reclamation, supporting effective infrastructure and connectivity.

Rail-road connectivity for freight was aligned with GatiShakti principles, in consultation with the Ministry of Railways and Ministry of Road Transport and Highways.

The Expected Impact

The terminal will accommodate larger vessels (up to 21,000 TEUs), boosting efficiency and reducing port congestion and cargo handling costs.

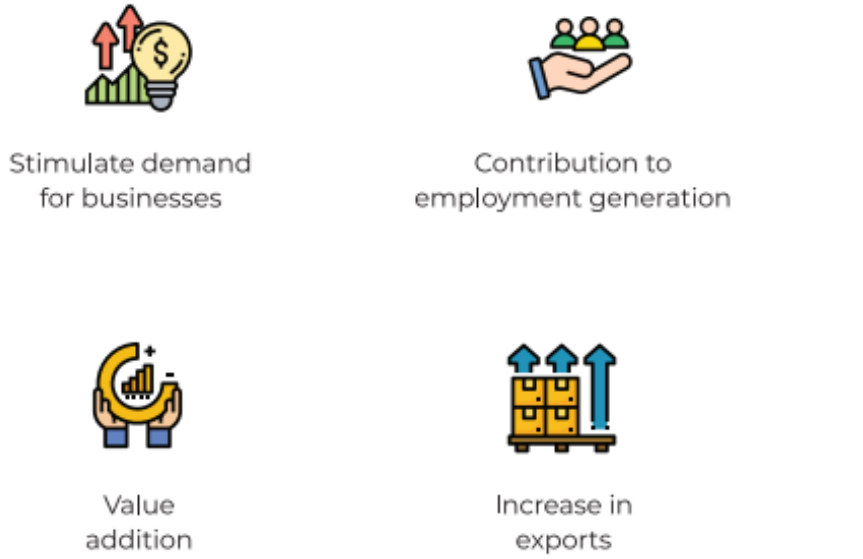
With capacity augmentation, DPA aims to handle over 200 million metric tons of cargo per year, positioning DPA as a leading major port in India, crucial for substantial growth and prominence.

Two Additional Terminals to be constructed at Gujarat's Kutch District by Deendayal Port Authority

1. **Terminal for Cargo Handling**
2. **Terminal for Multi Cargo Handling**

Source: PM Gatishakti -Compendium Vol-2_10x10

GatiShakti – Case Study 2



The proposed Dighi Port Industrial Area – DPIA, occupies 170 km location in Raigad District, Maharashtra

Source: PM Gatishakti -Compendium Vol-2_10x10

GatiShakti Edge and Approach: Enhancing Dighi Port Connectivity

In Maharashtra's Raigad District under the Delhi-Mumbai Industrial Corridor (DMIC), there was a need to improve road connectivity for better last-mile access to the Dighi Port Industrial Area (DPIA). Using the GatiShakti framework, detailed master planning and design engineering were conducted for Raigad. The National Master Plan (NMP) assessed infrastructure gaps and prioritized improvements. During implementation, the GatiShakti Portal identified road network enhancements, including relocating gas pipelines, telecom cables, and utilities.

Key interventions:

1. Widening a 14 km stretch of NH753F from Pune to Margaon from 2 to 4 lanes.
2. Strengthening Margao-Dighi Port road under Comprehensive Port Connectivity Plan (CPCP).
3. Rail connectivity is planned via the Roha-Dighi Port rail project aligned under Railway GatiShakti Cargo Terminal Policy.

The Expected Impact

1. Stimulates demand for ancillary businesses across Maharashtra.
2. Generates approximately 1,15,000 direct and indirect employment opportunities.
3. Creates about 60,000 direct industrial jobs.
4. Enhances value addition and export potential for the entire state.
5. Strengthens integrated connectivity for efficient pedestrian, freight, and logistics movement.
6. Expected to create a positive multiplier effect on the regional economy.

National Enablers of International Corridors
3. Green Shipping

Sustainable Corridors & Green Trade

Green Shipping – The Big Picture

- Shipping is the **backbone of global trade** – carrying 80% of goods worldwide.
- But it's also a **major polluter**, contributing ~3% of global CO_2 emissions.
- Green Shipping = *making ships, ports, and supply chains cleaner, smarter, and future-ready.*
- It's not just about compliance — it's about **staying competitive in a low-carbon economy.**
- **Vision & Commitments:**
  - Aligned with *Maritime India Vision 2030 & Maritime Amrit Kal Vission 2047*.
  - Supports IMO's **Net Zero 2050** ambition.
  - Anchored in India's **Panchamrit Pledge** – 500 GW non-fossil capacity by 2030, Net Zero by 2070.

"The future of shipping is green — by necessity, not by choice."

Green Shipping Initiatives

NPSC metrics include **Green Port Index (GPI), Port Readiness Level (PRL), Smart Port Shore Power Index (SPSPI), Environmental Ship Index (ESI), and GHG Emissions Inventory** to benchmark sustainability and readiness of Indian ports

With the Hong Kong Convention now in force, India leads globally with 115 compliant yards at Alang.

Structured Roadmap for decarbonization

Guidelines for LNG, Biofuels, Methanol, Ammonia

Structure to rate ships on their environmental performance, linked to age norms.

Use of clean shore electricity by ships while berthed at port, reducing fuel burning.

Green Shipping – Why the shift is urgent?

- **Rising Emissions:** Without action, shipping emissions could rise **90–130% by 2050**.
- **Regulatory Push:** IMO Revised Strategy → **Net Zero by 2050**; EU ETS & FuelEU already enforcing stricter rules.
- **Economic Push:** ESG financing & green supply chain demands.
- **Public Health:** Cleaner shipping reduces air pollution in port cities.

Green Ports
Driving Sustainable Maritime Growth

- Concept of Green Ports
- Ports designed & operated with minimal environmental impact.
- Integration of clean energy, efficiency, and circular economy practices.

- Key Initiatives in India
- Harit Sagar Guidelines (2023): National framework for green port development.
- Proposed National Port Sustainability Code (NPSC): Metrics for emissions, energy, waste, and community impact.
- Onshore Power Supply (OPS): Cut ship emissions at berth by connecting to shore electricity.
- Waste & Plastics Management: Port reception facilities for MARPOL Annex V compliance.

- Benefits
- Reduces GHG emissions & pollution.
- Improves air quality in port cities.
- Promotes India's Blue Economy & Green Economy transition.
- Aligns with IMO decarbonisation goals & India's Viksit Bharat 2047 vision.

Sustainability in Shipping

Green Shipping Roadmap :

- *National Green Shipping Policy (NGSP):* India's decarbonization roadmap..
- *Planned IOCE-SMarT:* Indian Ocean Centre of Excellence for Sustainable Maritime Transport.
- *Harit Sagar Guidelines 2023:* Sustainable Port development and carbon emission reduction.

Fuel Transition: Phased adoption of LNG, biofuels, methanol, ammonia, hydrogen.

- Carbon Neutral Ports: All Major Ports targeted carbon neutral by 2047.
- Carbon Intensity Reduction: ~ 30% per ton cargo by 2030; ~ 70% by 2047
- Renewable Energy Push: >60% share at ports by 2030; >90% by 2047.

Circular Economy: 5R principles (Refuse, Reduce, Reuse, Repurpose, Recycle), Green Reporting Initiative, Ship Recycling Act (2019), HKC entry into force (2025), Green Steel Recovery

- Sustainability Index of Ships (SIS) links **age norms to actual performance.**

"The future of shipping is green — by necessity, not by choice."

GHG Emission Scope at Ports

Scope 1 : Direct Emissions

- From port owned/controlled sources
- Diesel generators, cranes, dredgers, tugs, vehicles, fuel machinery

Scope 2 : Indirect Emissions (Purchased Electricity)

- Power consumed but generated elsewhere (state grid)
- Lighting, pumps, reefer containers, terminal operations
- Coal-based power grid

Scope 3 : Other Indirect Emissions (Value Chain)

- Ships at berth using auxiliary engines
- Trucks, trains, barges transporting cargo
- Business travel, investments, waste treatment

Green Tug Transition Program

To replace/retrofit conventional diesel-powered tugs with *green tugs* powered by **alternative fuels** (like LNG, methanol, hydrogen, or hybrid-electric systems).

- At least **50% of all tugs in major ports to be green tugs by 2030**.
- 100% transition by 2047

Current Status

~ 400 + tugs are operating in Indian Waters (Coastal & Offshore Tugs)
~ 45% of tugs are 20 + years
~ 20% of tugs are 30 + years

Problem

Older tugs generate higher emissions and operate with lower efficiency compared to modern green tugs.

Opportunity and Way Forward

- Replacing / retrofitting old fleet
- Deployment of hybrid & green-fuel powered tugs
- Incentivize adoption of LNG, Methanol, Hydrogen & Electric tugs

Green Shipping – The Road Ahead

- **Build green fuel bunkering hubs** (LNG, Biofuels, Methanol, Ammonia, Hydrogen).
- **Green Port Initiatives:**
  - Renewable energy adoption & shore-to-ship power.
  - Waste & effluent management systems.
  - *Green Port Index* → benchmarking environmental performance.
  - Incentives: **priority berthing & green channel clearance** for eco-ships.
- **Mobilize green finance** → ESG bonds, carbon credits, global climate funds.
- **Invest in technology** → R&D on Hydrogen, Ammonia, Digital twins.
- **Set benchmarks** → Green Port Index & NPSC to track and encourage eco - performance.

"India has the chance to steer global shipping towards a greener horizon."

Awareness through Coastal State Workshops

Coastal State Workshops

Coastal state workshops are proposed to be organized to advance welfare, ship recycling, shipbuilding, and repair initiatives in collaboration with State Maritime Boards.

The Coastal State Workshops will be structured around five key pillars-

i. **Pillar 1** – Coastal Maritime Casualty Response and Disaster preparedness

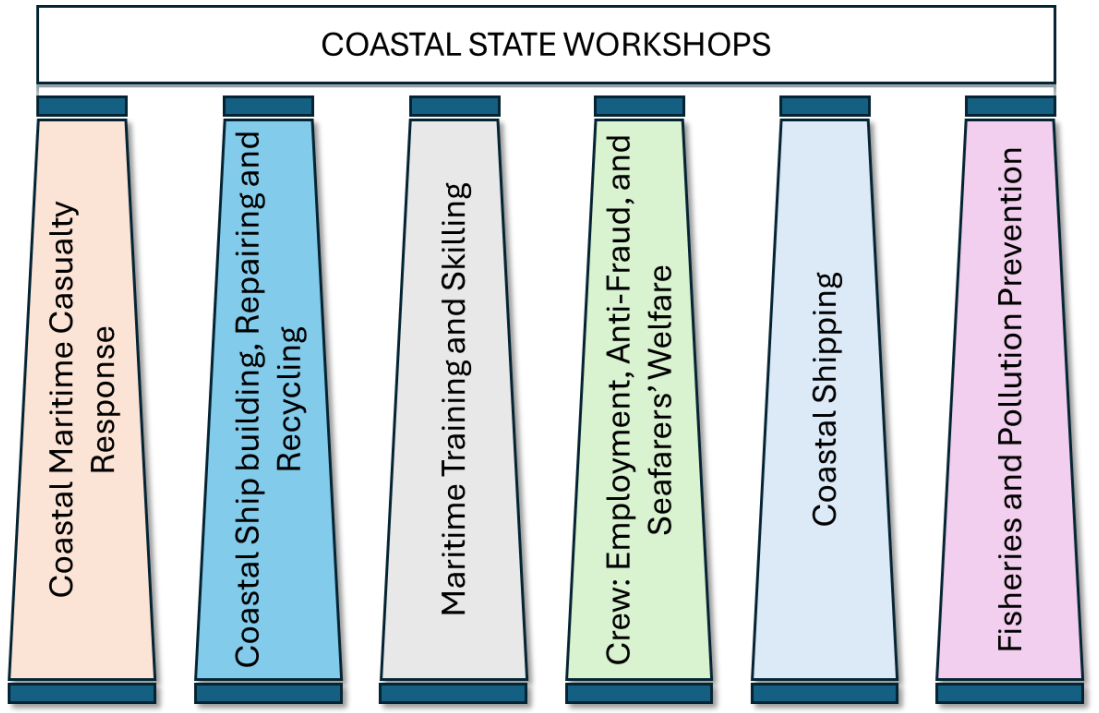
ii. **Pillar 2** – Coastal States- Opportunities in Ship building and Ship Repairing and Ship Recycling

iii. **Pillar 3** – Coastal States – Maritime Training and Skilling and prevention of fraud and cheating in Maritime Training admissions

iv. **Pillar 4** – Employment opportunities in Maritime Domain for Coastal States- Prevention of cheating and fraud in Crewing and Dissemination of seafarer's rights and duties and model code of conduct for seafarer and arrangements for 24 X 7 Grievance Redressal

v. **Pillar 5** – Coastal Shipping and Opportunities

vi. **Pillar 6** – Fisheries and Pollution Prevention



Thank You

संगच्छध्वं
संवदध्वं
सं वो मनांसि
जानताम्।

"Move together,
speak together,
may your minds
be in harmony."
(Rigveda 10.191.2)