PLANET GANGES

THE CRUCIBLE | RESEARCH PAPER

Built Into the Sea

India's maritime and port infrastructure: how the country builds, runs and pays for the system through which almost all its trade moves by sea.

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Executive summary

The question this paper answers

What does it take to build, run and pay for the maritime infrastructure through which India trades, and where does it still fall short?

1,668 MT	58%	0.06%	35.4%
cargo handled at Indian ports in FY26	of India's rated port capacity used in FY25	India's share of global shipbuilding output in 2024	India's share of global ship recycling in 2025, the largest

Nearly 95 per cent of India's trade by volume, and about 70 per cent by value, moves by sea. The fuel in our vehicles, the coal in our power plants, the fertiliser on our farms and the phones in our hands all travel on ships, through ports and along routes that most people never see. This paper explains that system from the ground up for readers with no prior knowledge of it.

Maritime infrastructure is more than ports. It is a connected system of ships that carry cargo, routes on which they sail, ports where sea meets land, links that carry cargo inland, yards that build, repair and recycle ships, and the people, services, rules and institutions that hold it together. India is strong in some parts of this system and weak in others, and that imbalance is the central finding of the paper.

The gateways are the strongest part. Indian ports handled about 1,668 million tonnes of cargo in FY26, a third more than five years earlier. Twelve major ports owned by the Centre and about 68 cargo-handling ports regulated by the states share the load almost equally, and Gujarat alone handles two in every five tonnes. Petroleum, coal and containers make up seven in every ten tonnes, and each needs a very different kind of port. Capacity has been added faster than cargo, so only about 58 per cent of rated capacity was used in FY25.

The ships and yards are the weakest part. India's fleet of 1,592 vessels carries only a small share of the country's own trade, which means most freight earnings go to foreign shipping lines. Indian shipyards build about 0.06 per cent of the world's new ships and repair less than 1 per cent. Yet India is the world's largest recycler of old ships, with 35.4 per cent of global activity in 2025, and its seafarers make up about 12 per cent of the global workforce. The country supplies the crews and breaks up the ships, but owns and builds few of them.

The routes are changing fast. Cargo on National Waterways rose from 84 million tonnes in FY21 to 218 million tonnes in FY26. Vizhinjam, India's first deep-water transshipment port, is beginning to bring back container traffic that was handled at foreign hubs, where about 75 per cent of India's transshipment had been taking place.

How the system works explains these outcomes. Public authorities own the waterfront while private operators run much of the handling. Cargo owners and shipping lines, not ports, decide where cargo goes, based on depth, speed, connectivity and total cost. Much of the delay sits outside the port itself:

export cargo at seaports waited about 158 hours after customs clearance in 2025, against about 30 hours for the clearance itself. Well-used ports earn high margins, while ships and yards have struggled to compete without state support.

The next generation is being built now: Vadhavan, a Rs 76,220 crore deep-water port; a Rs 69,725 crore package to revive shipbuilding; new waterways; and five new maritime laws passed in 2025. For leaders whose business depends on the sea, the lessons are clear. Maritime decisions outlast strategies, capacity on paper differs from capacity in use, depth and connectivity decide relevance, and dependence on foreign ships, yards and hubs is a risk that becomes visible only in a crisis.

1. India's maritime system

1.1 Why it matters

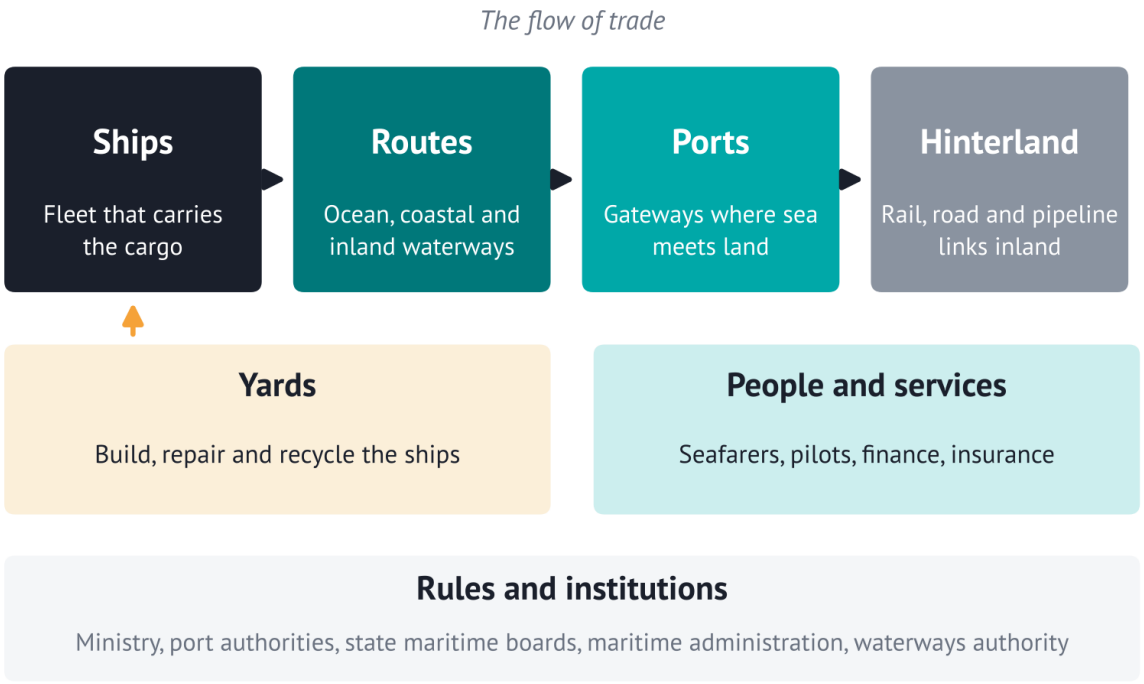
Think of four things you used this morning. The petrol in your vehicle began as crude oil discharged from a tanker at an offshore mooring off Gujarat or Odisha. The cooking gas at home came in through a gas terminal on the west coast. The electricity may have come from coal shipped into Paradip, and the phone in your hand most likely came ashore in a container at Mundra or Nhava Sheva. Each of these crossed the sea on a ship, entered through a port and travelled inland by pipeline, rail or road.

India has a coastline of about 11,098 kilometres, including its islands, and its trade moves overwhelmingly by sea: nearly 95 per cent by volume and about 70 per cent by value. Maritime infrastructure is therefore part of the country's economic foundation, as essential as power plants or highways, even though it rarely enters public conversation unless something goes wrong.

1.2 What "maritime" covers

The word maritime describes everything connected with using the sea for trade and transport. Ports are one part of it. The full system has six parts, and this paper is organised around them.

Exhibit 1. **India's maritime system**



Source: Planet Ganges Research.

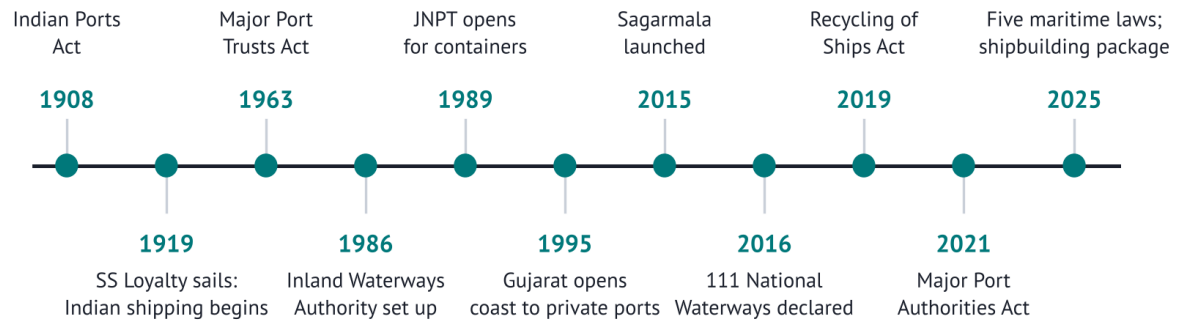
Ships carry the cargo. Routes, across the ocean, along the coast and up rivers, connect ports to each other and to the hinterland. Ports are the gateways where cargo moves between sea and land. Links inland carry it onwards by rail, road and pipeline. Yards build, repair and finally recycle the ships. People and services, from seafarers and pilots to financiers and insurers, keep the system moving, and a set of rules and institutions governs all of it.

The parts depend on each other. A deep port is of little use without ships that call at it; a large fleet is a burden without yards to maintain it; and neither works without links that move cargo inland.

1.3 How the system was built

India's maritime system grew in layers over more than a century. Each layer answered the needs of its time, and each is still visible today.

Exhibit 2. Milestones in India's maritime infrastructure



Source: Ministry of Ports, Shipping and Waterways; Gazette of India; Government of Gujarat; Inland Waterways Authority of India.

The oldest ports, Mumbai, Kolkata and Chennai, were colonial gateways built inside crowded cities to move raw materials out, and the Indian Ports Act of 1908 governed every port for over a century. Indian-owned shipping began in earnest with the voyage of the SS Loyalty in April 1919, now marked as National Maritime Day. After Independence the Centre built a national system of major ports, including Kandla, now Deendayal, and Jawaharlal Nehru Port, which opened in 1989 for containers.

From the 1990s private capital transformed the estate. Gujarat announced India's first state port policy in 1995, inviting private developers to build ports along its coast; Mundra received its first ship in 1998 and is now the country's largest port. The major ports began leasing terminals to private operators. Rivers were brought into the system as well: the Inland Waterways Authority of India was set up in 1986, and the National Waterways Act of 2016 declared 111 waterways.

The last decade has been one of policy and new law. The Sagarmala programme, launched in 2015, made port-led development national policy. The Recycling of Ships Act, 2019 set standards for ship recycling, the Major Port Authorities Act, 2021 gave each major port greater autonomy, and in 2025 Parliament passed five maritime laws that replaced legislation dating back to colonial times. The same year the Centre approved a Rs 69,725 crore package to revive shipbuilding.

1.4 Scope of this paper

This paper treats the maritime system as infrastructure: the physical assets, who builds and runs them, and how they pay for themselves. It uses Indian data throughout. Naval facilities, fishing harbours and cruise tourism are left out, and trade policy appears only where it shapes infrastructure.

Financial years run from April to March, so FY26 means April 2025 to March 2026. Cargo is measured in million tonnes (MT) and port capacity in million tonnes per annum (MTPA). Ship size is measured in gross tonnage (GT), a measure of a ship's internal volume.

Words you need to read this paper

Berth: the place where a ship ties up to load or unload. A **terminal** is a self-contained operation inside a port, usually for one type of cargo, with its own berths and equipment.

Draught: the depth of a ship's hull below the waterline. A port must be deeper than the draught of the ships it serves.

Dredging: removing silt and sand from the seabed or riverbed to create or keep depth.

Single point mooring: a floating buoy offshore, linked to land by an undersea pipeline, where large tankers discharge crude oil.

Hinterland: the inland region a port serves.

Transshipment: moving containers from one ship to another at a hub port, usually from a large ocean-going ship to a smaller feeder ship.

TEU (twenty-foot equivalent unit): the standard measure of container volume. A forty-foot container counts as two TEU.

Gross tonnage (GT): a measure of a ship's internal volume, used to count fleet size and shipyard output.

Flag: the country in which a ship is registered and whose laws apply on board.

Major port: a port owned by the central government and run by a port authority. A **non-major port** is regulated by a coastal state, often developed by a private company.

Concession: a long-term contract, often for 30 years, under which a private company builds and runs a terminal on public land and pays the owner a royalty or a share of revenue.

Landlord port: a port whose authority owns the land and common infrastructure and leases terminals to private operators.

Captive jetty: a berth built by an industrial company, such as a refinery or steel plant, for its own cargo.

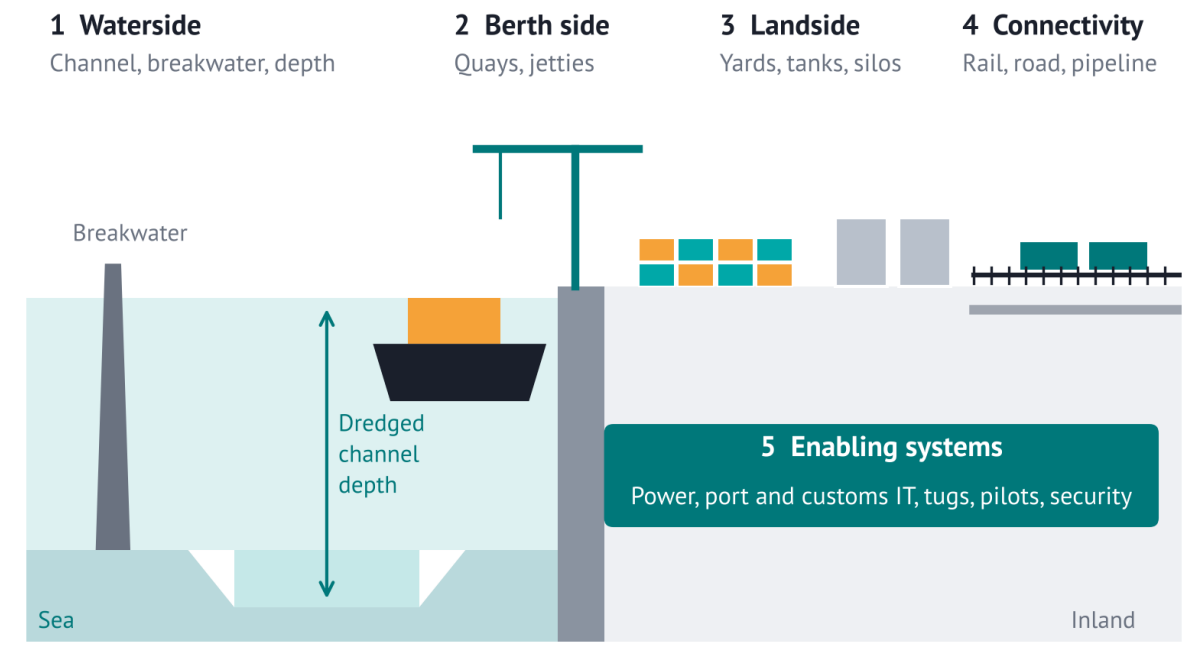
Capacity utilisation: cargo handled as a share of rated capacity.

2. Ports: the gateway

2.1 What a port is made of

A port is five layers of infrastructure stacked from the sea to the hinterland. A ship enters through the first, ties up at the second, has its cargo stored in the third, and the cargo leaves through the fourth, all coordinated by the fifth.

Exhibit 3. The five layers of port infrastructure



Source: Planet Ganges Research.

The waterside layer decides the most and is the least visible. A ship needs water deeper than its draught, and larger ships, which carry each tonne more cheaply, sit deeper. A port's depth therefore sets the size of ship it can receive and, with it, the trade it can win. Depth comes either from nature or from dredging, and at river ports the silt keeps returning, so the dredging never stops. Kolkata and Haldia, upstream on the Hooghly, show the cost of this: in FY25 the Kolkata Dock System handled 7,440 tonnes for every day a ship spent at its berths, against 38,703 tonnes at Paradip on the open coast.

The other layers matter as much. The number and equipment of berths decide how many ships can be worked at once. Yards, tanks and silos decide how long cargo can wait, and congestion often appears here first. Rail, road and pipeline links decide how far inland a port can reach, and much of what is called port congestion actually starts outside the port gate.

Capacity, the most quoted number in the sector, is a planning figure worked out from berths, equipment and productivity norms. A port can exceed it for a while, or fall short of it for years if ships do not come or cargo cannot leave. It is also specific to cargo: capacity built for coal cannot serve containers.

2.2 Cargo shapes the port

What a port handles decides the depth it needs, the berths it builds, the equipment it buys and the links it depends on. Indian port cargo falls into five broad families.

Exhibit 4. Five families of cargo and what each needs from a port

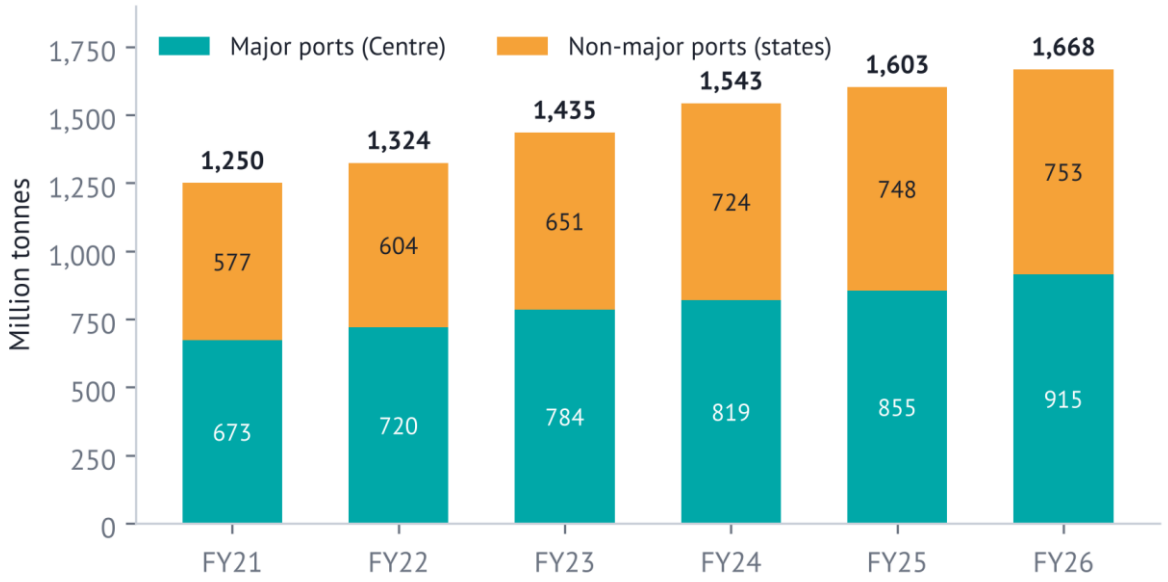
Cargo family	Examples	Berth and handling	Storage	Typical link inland
Liquid bulk	Crude oil, petroleum products, LNG, LPG, chemicals	Jetties or single point moorings, pipelines, loading arms	Tank farms, LNG and LPG terminals	Pipelines to refineries and depots
Dry bulk	Thermal and coking coal, iron ore, fertiliser, foodgrains, cement	Mechanised berths, grab cranes, conveyors, ship loaders	Open stockyards, silos, covered sheds	Rail rakes, conveyors to plants
Containers	Manufactured goods, components, consumer products, chilled food	Container berths with ship-to-shore cranes	Container yards, freight stations	Rail and road to inland container depots
Vehicles	Cars, two-wheelers, tractors, machinery that can be driven	Roll-on roll-off (Ro-Ro) berths with ramps	Parking yards	Car-carrier trucks and rail wagons
Break-bulk and project cargo	Steel coils, machinery, turbines, timber: items too large or irregular for containers	General berths with heavy-lift cranes	Open and covered storage	Specialised trucks and rail

Source: Planet Ganges Research.

These differences are why a coal berth cannot simply become a container terminal. The cranes, yard surface, dust control, rail sidings and operating skills are all different, so converting a berth means rebuilding it. A port that bets on the wrong cargo can be left with idle berths for years.

India's ports handled about 1,250 million tonnes in FY21 and about 1,668 million tonnes in FY26, a rise of roughly a third. Major ports carried about 915 million tonnes of the FY26 total and the state ports about 753 million tonnes.

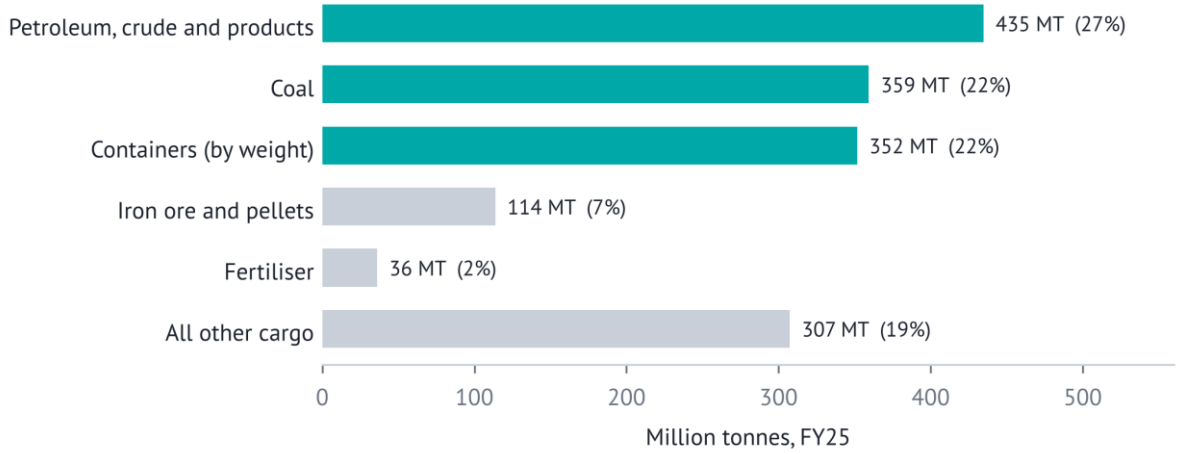
Exhibit 5. **India's port cargo rose by about a third in five years**



Source: Ministry of Ports, Shipping and Waterways, Update on the Indian Ports Sector (31 March 2025) for FY21 to FY25 (FY25 provisional); monthly cargo reports for March 2026 for FY26.

Three streams dominate. In FY25 petroleum, meaning crude oil and refined products, made up about 27 per cent of all cargo, coal about 22 per cent and containers about 22 per cent. Most people picture containers when they think of ports, but petroleum and coal together carry about half the tonnage. About 21 per cent of all cargo was coastal, moved by sea between Indian ports, much of it coal and petroleum shipped from east coast ports to power plants and refineries further along the coast.

Exhibit 6. **What India's ports moved in FY25, all ports**



Source: Derived from Ministry of Ports, Shipping and Waterways, Update on the Indian Ports Sector (31 March 2025), commodity tables for major and non-major ports.

2.3 The port estate today

The estate has two tiers. Twelve major ports, owned by the Centre and run by port authorities, handled about 55 per cent of India's cargo in FY26. The states regulate 217 notified non-major ports through maritime boards and port directorates, of which about 68 handle cargo. The word major describes legal status, not size: Mundra, a state-regulated private port, is the largest port in the country.

Exhibit 7. **India's significant ports**



Source: Ministry of Ports, Shipping and Waterways, Update on the Indian Ports Sector (31 March 2025); Adani Ports and SEZ for Mundra. Map boundary: Survey of India outline. Locations are indicative.

Gujarat stands apart. Its ports, central and state together, handled 637.88 million tonnes in FY25, or 39.8 per cent of the national total. Each significant port has a distinct role.

Exhibit 8. **Significant Indian ports and their role**

Port	State	Main cargo	Why it matters
Mundra (private)	Gujarat	Containers, coal, petroleum	India's largest port: 200.7 MT in FY25, the first to cross 200 MT in a year
Paradip	Odisha	Coal, petroleum, iron ore	Largest major port in FY25 (150.41 MT); gateway for the eastern mineral belt
Deendayal (Kandla)	Gujarat	Petroleum, dry bulk	Largest major port in FY26 (160.11 MT); serves north-western India
Jawaharlal Nehru	Maharashtra	Containers	India's main container gateway: 54% of major-port container traffic in FY25
Visakhapatnam	Andhra Pradesh	Petroleum, iron ore, coal	Main bulk port on the central east coast

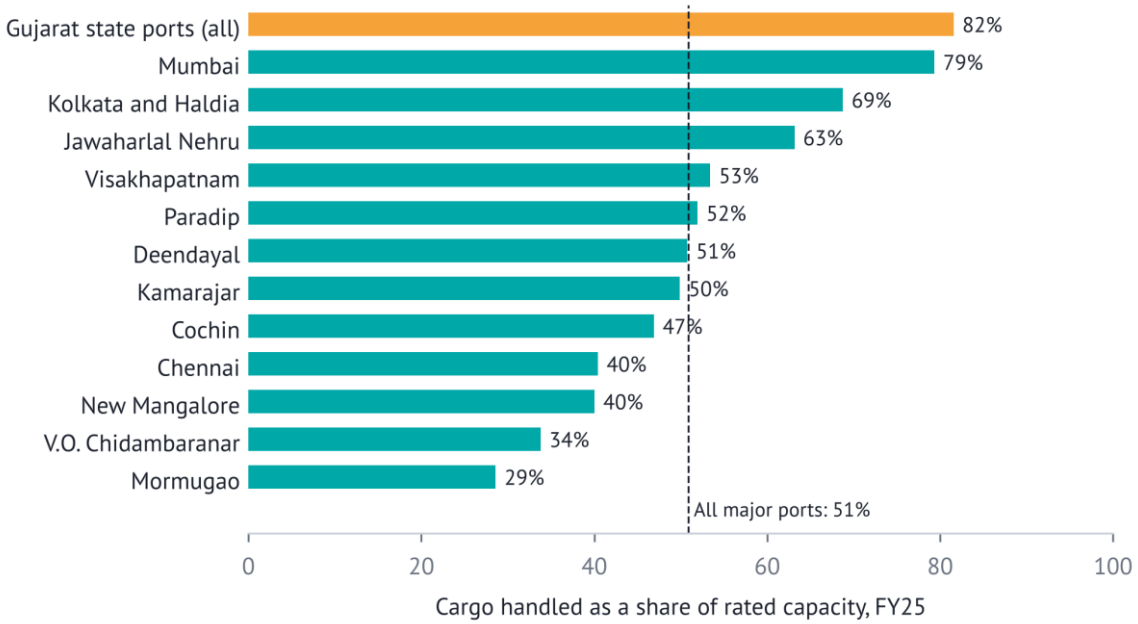
Port	State	Main cargo	Why it matters
Mumbai	Maharashtra	Petroleum, general cargo	Old city port; highest capacity use among major ports (79%)
Kolkata and Haldia	West Bengal	Containers, bulk, liquids	India's main river port system; river depth limits ship size
Chennai and Kamarajar	Tamil Nadu	Containers, coal, petroleum	Main gateways for the south; Kamarajar is the only major port run as a company
Cochin	Kerala	Petroleum, containers	Hosts the Vallarpadam transshipment terminal and an LNG terminal
Vizhinjam (private)	Kerala	Container transshipment	India's first deep-water transshipment port; 1.30 million TEU in FY26
Vadhavan (under construction)	Maharashtra	Containers, multi-cargo	Planned at 298 MTPA, including 23.2 million TEU

Source: Ministry of Ports, Shipping and Waterways, Update on the Indian Ports Sector (31 March 2025) and monthly reports for March 2026; Adani Ports and SEZ; Union Cabinet.

2.4 Capacity in place, capacity in use

India had about 2,770 million tonnes a year of rated port capacity at the end of FY25 and handled cargo equal to about 58 per cent of it. Major-port capacity has grown almost tenfold since FY94, from 172.59 to 1,680.74 million tonnes a year, much of it through private terminals. Use varies widely between ports.

Exhibit 9. Capacity utilisation at major ports, FY25



Source: Derived from Ministry of Ports, Shipping and Waterways, Update on the Indian Ports Sector (31 March 2025), port-wise capacity utilisation and traffic tables.

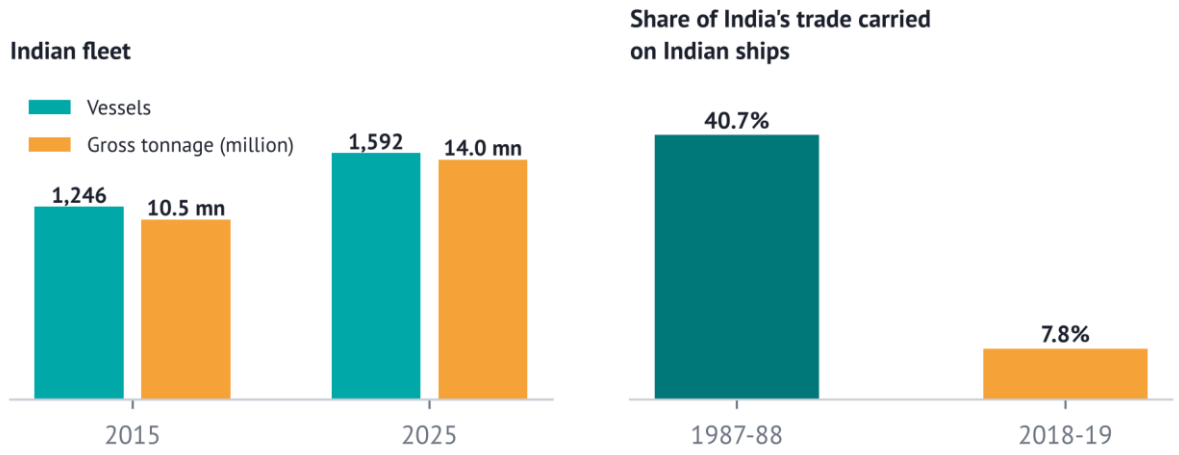
Gujarat's state ports ran at about 82 per cent, while among major ports use ranged from 79 per cent at Mumbai to 29 per cent at Mormugao. Spare capacity at one port does not stop cargo going to another that is deeper or better connected, a point Chapter 7 returns to. The gateways, in short, are large and growing. The same cannot be said of the ships that serve them.

3. Ships and the people who sail them

3.1 A fleet too small for the trade

India's fleet has grown, but slowly. At the end of 2025 it comprised 1,592 vessels with a combined gross tonnage of 14.02 million, against 1,246 vessels and 10.51 million GT in 2015. Of these, 503 vessels with 12.32 million GT were deployed in overseas trade. The fleet is also old: nearly half of all registered vessels, and 41 per cent of those in overseas trade, are more than 20 years old.

Exhibit 10. India's fleet has grown slowly, and carries a shrinking share of the country's trade



Source: Ministry of Ports, Shipping and Waterways, Indian Shipping Statistics 2025; Union Cabinet, scheme for promotion of flagging of merchant ships, 2021.

The more telling number is how little of India's own trade the fleet carries. Indian ships carried 40.7 per cent of the country's export and import cargo in 1987-88, but only about 7.8 per cent by 2018-19, when India paid about US$53 billion in freight to foreign shipping companies. In October 2025 the Petroleum Minister stated that only about 20 per cent of energy cargo, the largest commodity group at Indian ports, moved on Indian-flagged or Indian-owned vessels. Senior officials of the Ministry have described India's share of global ship ownership as less than 1 per cent.

3.2 Why it matters

A small fleet has three consequences. The first is cost: freight paid to foreign lines is money that leaves the country. The second is control: the owners of ships decide which ports their ships call at, especially in container trade, so a port's location and depth make it eligible but foreign lines decide whether it is used. The third is security: in a crisis, ships owned elsewhere go where their owners send them. The 2026 disruption in the Gulf, which led Indian oil companies to plan for owning more of their own tankers, made this risk concrete.

The Merchant Shipping Act, 2025 liberalised the rules for registering ships in India, and the pace of change has picked up: 94 ships joined the Indian flag in FY26 against 45 the year before.

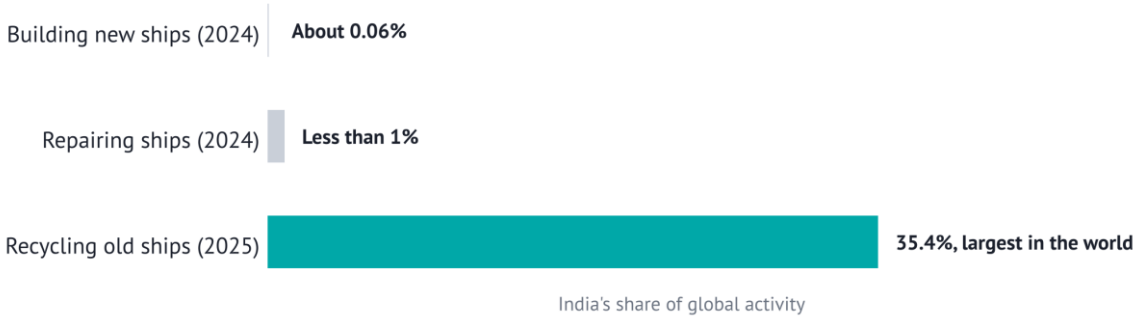
3.3 The people: India's real maritime strength

If India's fleet is small, its maritime workforce is not. The number of Indian seafarers rose from about 1.2 lakh in 2014 to 3,23,429 in 2025, and India is now the second-largest supplier of seafarers in the world, with about 12 per cent of the global workforce. The government's stated aim, under Mission 20%, is to raise that share to one in five. Around 90 per cent of Indian seafarers work on foreign ships, which means India supplies the skills that run the world's fleet while owning little of it. The ships themselves come from yards, and that is where the gap is widest.

4. Yards: building, repairing and recycling ships

Every ship has a life cycle: it is built, repaired many times over 25 years or more, and finally recycled for its steel. India's position at the three stages could hardly be more different.

Exhibit 11. India's place in the life of a ship



Source: Ministry of Ports, Shipping and Waterways, Annual Report 2024-25; Press Information Bureau, ship recycling backgrounder (2026).

4.1 Building ships

India builds very few commercial ships. In 2024 Indian yards produced about 40,000 GT, about 0.06 per cent of global output, ranking 16th. The country has public shipyards such as Cochin Shipyard and Hindustan Shipyard and private yards on both coasts, but most are small and many focus on defence work. Indian ship owners have mostly bought ships from abroad, where yards build faster and cheaper with long order books and cheap finance.

Shipbuilding is the part of the system the government is now working hardest to change. In September 2025 the Union Cabinet approved a Rs 69,725 crore package with four parts: an extended Shipbuilding Financial Assistance Scheme with a corpus of Rs 24,736 crore running to March 2036; a Maritime Development Fund of Rs 25,000 crore for long-term finance; a Shipbuilding Development Scheme of Rs 19,989 crore to build capacity and shipbuilding clusters; and legal and policy reforms. The stated aim is to raise domestic shipbuilding capacity to 4.5 million GT a year.

4.2 Repairing ships

Ships need regular dry-docking, maintenance and repair. India's share of the global ship-repair market is less than 1 per cent, and many Indian-flagged ships go to Singapore, Dubai or Colombo for repair. This is a missed opportunity for a country whose coast lies close to some of the world's busiest shipping lanes.

4.3 Recycling ships

At the end of a ship's life, India leads the world. In 2025 India recycled 2.99 million GT of ships, up nearly 60 per cent from 1.86 million GT in 2024, and its share of global ship recycling rose from 30.1 per cent to 35.4 per cent. Most of this work happens at Alang-Sosiya in Gujarat. The Recycling of Ships Act, 2019 aligned Indian yards with the Hong Kong International Convention, the global standard for safe and environmentally sound recycling, which came into force in June 2025; 115 Indian facilities have achieved compliance.

The new shipbuilding package links the two ends of the life cycle. A ship-breaking credit note, worth 40 per cent of the scrap value of a ship recycled in India, can be used towards the cost of a new ship built in an Indian yard.

The pattern across Chapters 3 and 4 is clear. India supplies the crews and breaks up the ships but builds, repairs and owns few of them. The next chapter turns from the vessels to the routes they sail.

5. Routes beyond the port

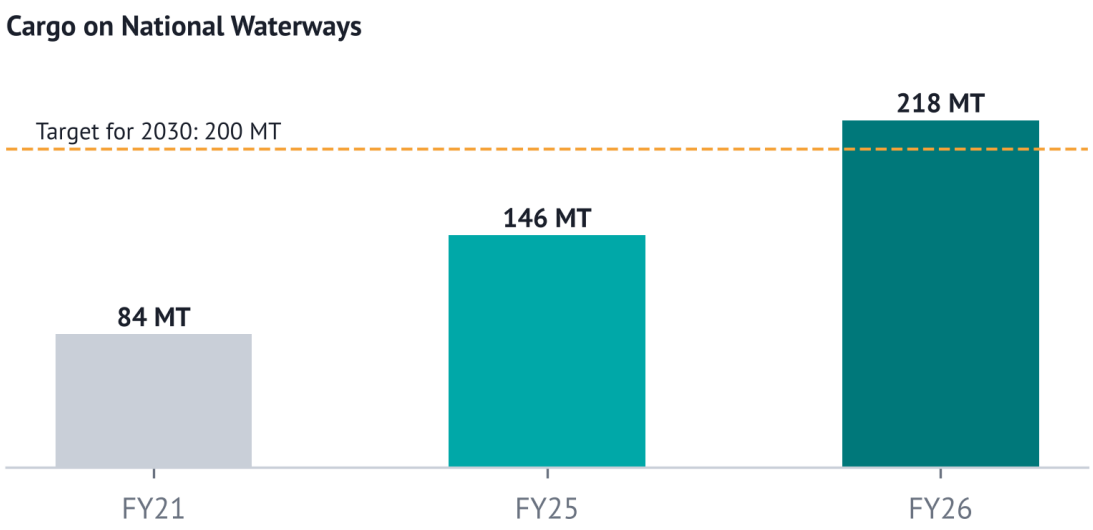
5.1 Coastal shipping

Coastal shipping moves cargo by sea between Indian ports. In FY25 it accounted for about 339 million tonnes, or 21 per cent of all port cargo. It is often the cheapest way to move bulk cargo such as coal and petroleum along the coast, and every tonne that moves by sea instead of road eases highway congestion. The Coastal Shipping Act, 2025, in force from March 2026, set out a new regime for this trade.

5.2 Inland waterways

India's rivers form a second network. The National Waterways Act, 2016 declared 111 National Waterways stretching 20,187 kilometres across 23 states and four Union Territories, of which 32 are operational. The Inland Waterways Authority of India develops and maintains them, building channels, terminals and navigation aids.

Exhibit 12. **Cargo on National Waterways is growing fast**



Source: Ministry of Ports, Shipping and Waterways; Press Information Bureau.

Cargo on National Waterways rose from 83.61 million tonnes in FY21 to 145.84 million tonnes in FY25 and 218 million tonnes in FY26, passing the target of 200 million tonnes set for 2030. Even so, inland water transport carries only about 2 per cent of India's freight, and the long-term aim is 5 per cent. Water transport is cheap per tonne, but it depends on year-round depth, terminals at both ends and reliable connections to road and rail.

5.3 Transshipment: the route India has not kept

Container ships on the main east-west route between Asia and Europe pass close to India's southern tip, but for decades India had no port deep enough and close enough to that route to act as a transshipment hub. Most Indian containers that needed transshipment were therefore moved between ships at foreign hubs. At the dedication of Vizhinjam in May 2025, the Prime Minister stated that 75 per cent of India's transshipment had been taking place at foreign ports.

Vizhinjam, built for its natural deep water close to that route, is the first serious attempt to change this. It handled 1.30 million TEU in FY26, its first full year, against an initial expectation of about 3 lakh TEU, and an expansion is targeted for completion by 2028. Part of its early volume came from another Indian terminal, as transshipment at Cochin's Vallarpadam terminal roughly halved in the same year, so the net gain for the country will take time to measure.

With the physical system laid out, the paper turns to how it is run.

6. Who runs it and who sets the rules

6.1 The institutions

Responsibility for the maritime system is spread across several bodies, at the Centre and in the states.

Exhibit 13. Who does what in India's maritime system

Institution	Role
Ministry of Ports, Shipping and Waterways	Sets national policy for ports, shipping and waterways; runs Sagarmala and the shipbuilding schemes
Major port authorities (12)	Own and run the major ports under the Major Port Authorities Act, 2021; set their own tariffs
State maritime boards and port departments	Regulate non-major ports and grant concessions to private port developers
Directorate General of Maritime Administration	Regulates ships, ship registration, safety and seafarers (formerly the Directorate General of Shipping)
Inland Waterways Authority of India	Develops and maintains the National Waterways and their terminals
Adjudicatory Board for Major Ports	Hears disputes between major ports, private operators and users (constituted August 2025)

Source: Ministry of Ports, Shipping and Waterways; Gazette of India.

6.2 Four ways of running a port

Indian ports are run under four broad models, which often sit side by side in the same port.

Exhibit 14. Four operating models in Indian ports



Source: Planet Ganges Research, based on Ministry of Ports, Shipping and Waterways publications.

The landlord model is the most important. The port authority owns the land, dredges the channel and builds breakwaters and common roads, then leases berths to private operators who invest in equipment and run the terminals. The operator earns from handling cargo and pays the authority a royalty or a share of revenue. Most of the growth in major-port capacity since the 1990s came this

way, which means that the public sector owns the waterfront while private companies run much of the handling.

6.3 Who sets prices

For decades, charges at major ports were fixed centrally by the Tariff Authority for Major Ports. The Major Port Authorities Act, 2021 withdrew that role and gave each port's board the power to set its own scale of rates. Tariffs at private terminals inside major ports follow the terms of their concessions, and an Adjudicatory Board for Major Ports, constituted in August 2025, hears disputes between ports, operators and users. State ports set charges under their own state frameworks.

6.4 A new legal foundation

In 2025 Parliament replaced much of the maritime law inherited from colonial times. The Indian Ports Act, 2025 replaced the 1908 Act and allows the Centre to notify ports of national importance as mega ports. The Merchant Shipping Act, 2025 modernised ship registration and seafarer rules; the Coastal Shipping Act, 2025 set a new regime for coastal trade; and the Carriage of Goods by Sea Act and the Bills of Lading Act updated the law on cargo contracts. Rules under the new Indian Ports Act are still being framed. Rules and institutions set the frame, but the daily choices that decide which ports and routes prosper are made by others.

7. How cargo and ships choose

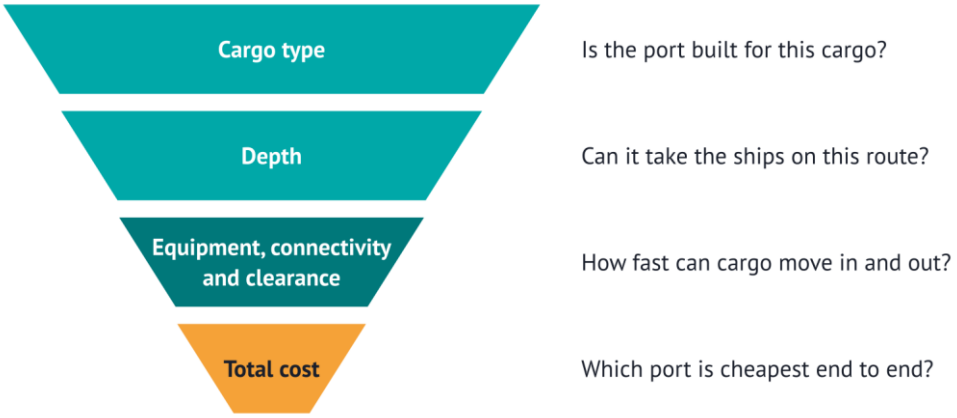
7.1 Who decides

Ports do not choose their cargo. For bulk cargo such as crude oil, coal and ore, the buyer decides: the refiner, the power company or the steel maker, which often builds its own jetty to stay in control. For containers, shipping lines decide which ports their ships call at, and exporters and freight forwarders follow. A line that stops calling at a port can take most of its container business with it.

7.2 The chain of choice

Every choice of port passes through the same chain of filters.

Exhibit 15. How a port gets chosen



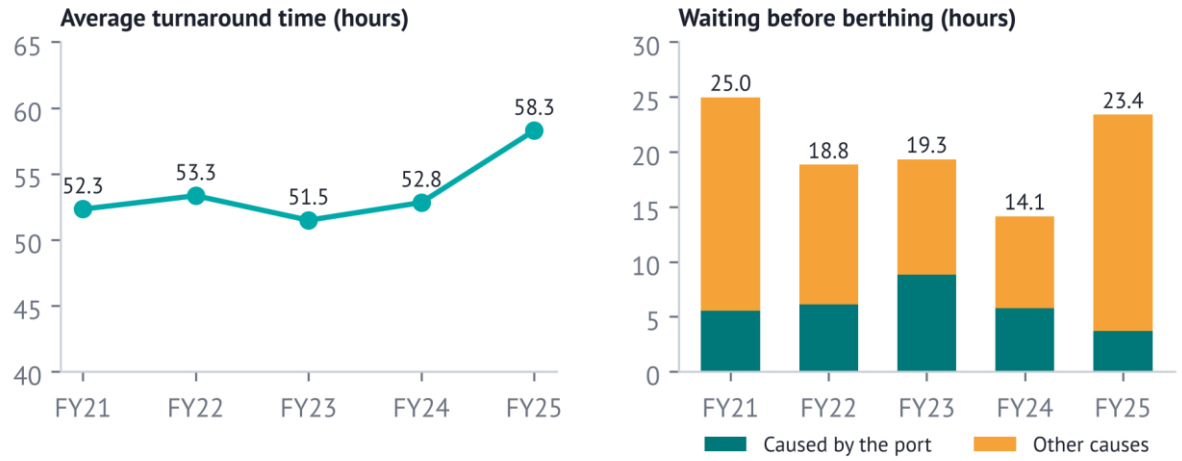
Source: Planet Ganges Research.

Cargo type comes first: is the port built for this cargo at all? Depth comes next: can it take the size of ship on this route? Then speed and connectivity: how fast can the ship be worked and the cargo moved inland? Finally total cost from origin to destination. A port that fails at any stage can sit half empty even while the country's trade grows. Connectivity is where the map is changing fastest. The Western Dedicated Freight Corridor, a freight-only rail line linking northern India to Jawaharlal Nehru Port, became fully operational in March 2026, and under the Comprehensive Port Connectivity Plan 84 of 294 identified road and rail projects had been completed by July 2026.

7.3 Where time is lost

Speed is measured in two ways. Turnaround time is the total time a ship spends in port, from the pilot boarding to the pilot leaving. Pre-berthing detention is the part of that time spent waiting at anchor for a berth.

Exhibit 16. Turnaround and waiting time at major ports, FY21 to FY25



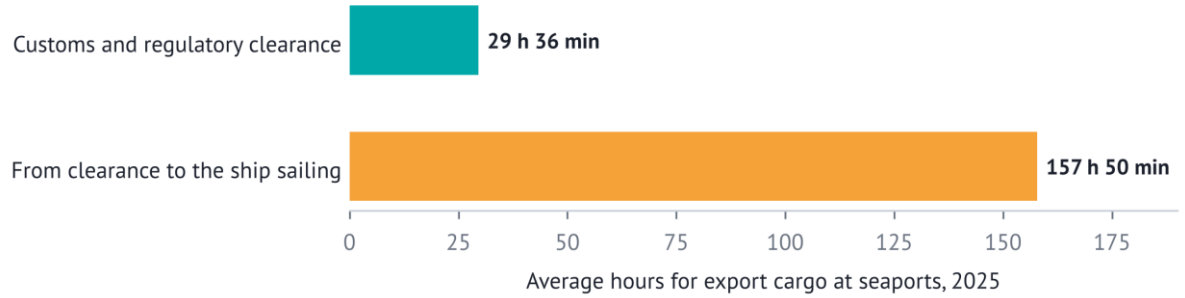
Source: Ministry of Ports, Shipping and Waterways, Update on the Indian Ports Sector (31 March 2025). FY25 provisional.

Productivity has improved a great deal over the long run: cargo handled per ship-berth day at major ports rose from 3,372 tonnes in 1990-91 to 22,320 tonnes in FY25. Most of the remaining waiting is

caused by something other than the port. Of the 23.38 hours a ship waited on average in FY25, the ports recorded only 3.67 hours as their own doing; the rest came from causes such as cargo not being ready, the shipper's arrangements, weather or tides. The split is recorded by the ports themselves, so it is best read as an indication.

The same pattern appears for cargo. The Central Board of Indirect Taxes and Customs measured export cargo at seaports in 2025.

Exhibit 17. Export cargo waits far longer after customs clearance than for it



Source: Central Board of Indirect Taxes and Customs, National Time Release Study 2025.

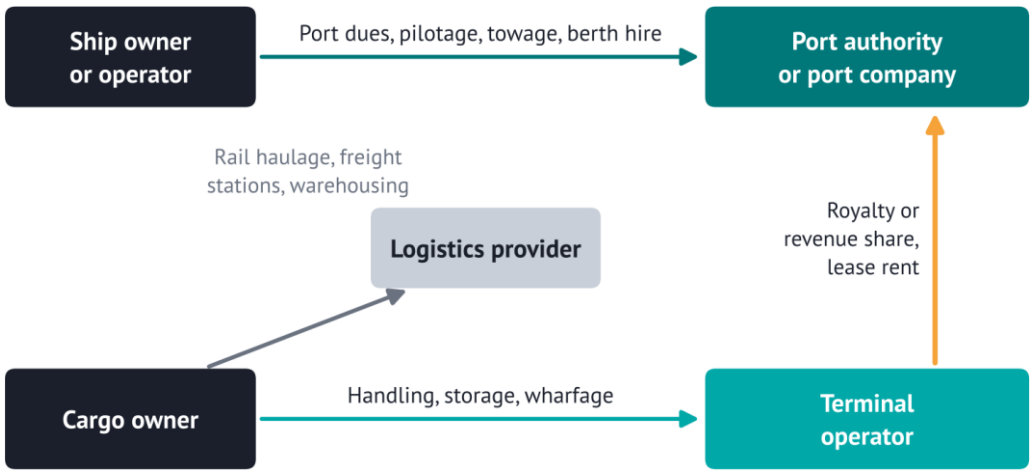
Customs and regulatory clearance took about 30 hours on average, but the cargo then waited about 158 hours before the ship sailed. Part of that is scheduled waiting for a sailing, but the gap shows that the next gains lie in yards, transport links and coordination more than in paperwork. Choices about where cargo goes, and how fast it moves, decide in turn how the system earns its money.

8. How it pays for itself

8.1 How ports earn

Money flows through a port in two broad streams. The ship owner pays for the waterside and berths; the cargo owner pays for handling and storage. Around these sit lease and concession payments between private operators and port authorities.

Exhibit 18. The main money flows in a port



Source: Planet Ganges Research.

Port economics are front-loaded. Almost all the cost is spent before the first ship arrives, on breakwaters, dredging, berths and cranes, while revenue arrives over 30 years or more. Once the infrastructure exists, handling one more ship costs little, so a busy terminal can earn very high margins and a half-empty one may never recover its capital. In FY26 Adani Ports and SEZ, the largest listed port group, reported an operating (EBITDA) margin of about 59 per cent, and JSW Infrastructure about 49 per cent. EBITDA is measured before the cost of the capital tied up in these assets, so the return on that capital is lower than the margin suggests. Use, not size, decides returns, which is why the 58 per cent national utilisation figure in Chapter 2 matters.

8.2 Why ships and yards need support

Ships and yards face harder economics. Ship owning is a global, cyclical business in which Indian owners compete with foreign lines that have larger fleets, cheaper finance and, in many cases, state backing. Shipbuilding needs long order books, cheap working capital and supply chains for steel and equipment, all of which large foreign yards enjoy and Indian yards largely lack. The result is the pattern in Chapters 3 and 4: freight earnings that flow abroad, and ships ordered from foreign yards.

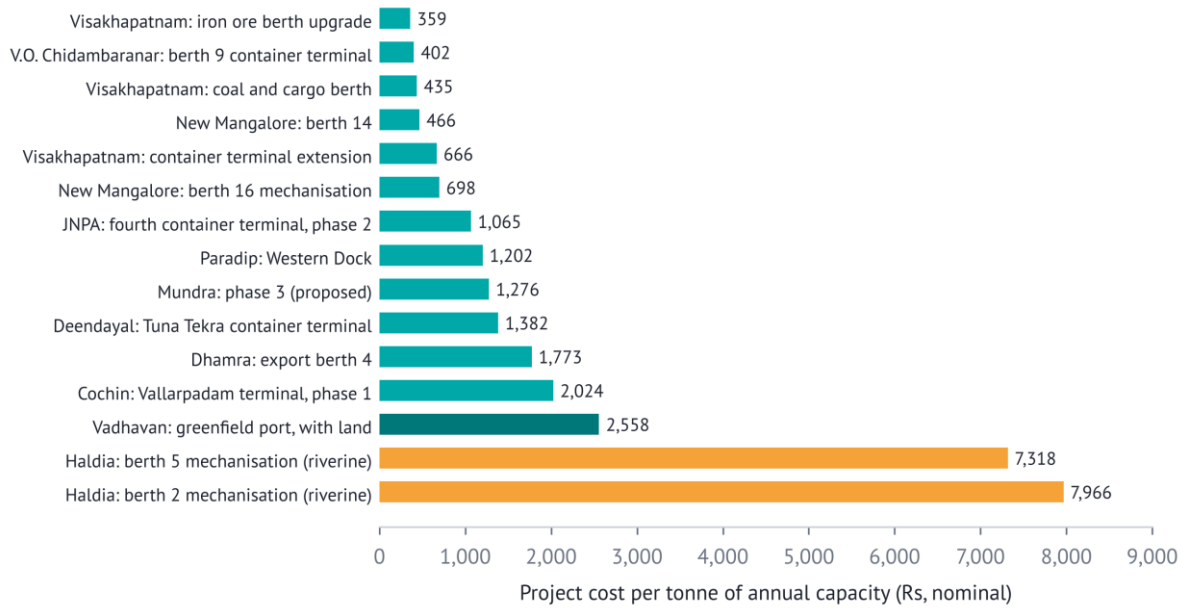
This is why the government's approach to ships and yards differs from its approach to ports. Ports attracted private capital once the landlord model and concessions made returns predictable. For ships and yards, the state is using direct financial support: assistance paid to shipyards on delivery of each vessel, a dedicated fund for long-term maritime finance, cheaper debt and the ship-breaking credit note. Whether that support creates yards that can compete on their own is the main open question for the sector.

9. Building the next generation

9.1 What new port capacity costs

Creating a tonne of annual port capacity can cost a few hundred rupees or several thousand, depending on whether the project upgrades an existing berth or builds a new port, how much dredging and land it needs and what cargo it handles.

Exhibit 19. Capital cost per tonne of port capacity varies more than twentyfold



Source: Derived from Ministry of Ports, Shipping and Waterways, Update on the Indian Ports Sector (31 March 2025), project appendices; Union Cabinet approval of Vadhavan, June 2024. Project cost divided by annual capacity, in nominal rupees; scopes and years differ.

Mechanising an existing berth at a deep coastal port is the cheapest way to add capacity. Greenfield ports cost far more, because breakwaters, dredging, land and reclamation come before the first berth. The most expensive capacity in the sample is at Haldia, a river port. Because the figures span different years and scopes, the ranking is more reliable than any single number.

9.2 How long it takes, and what can go wrong

Vadhavan in Maharashtra shows the timescale. It was notified as a major port in February 2020, approved by the Union Cabinet in June 2024 at Rs 76,220 crore including land, and its first phase is due by 2030, with the second between 2035 and 2039. From notification to full build-out the project spans close to two decades. It is being developed by a company set up by Jawaharlal Nehru Port Authority and the Maharashtra Maritime Board, with Rs 37,244 crore expected from private terminal operators. Like most coastal projects, it also faced strong objections from local fishing communities before receiving its clearances.

Not every project succeeds, and the Ministry's own records show where things have gone wrong.

Exhibit 20. Port projects that stalled, were terminated or drew no bids

Project	Port	What happened
Container terminal on a build, operate and transfer basis	Mumbai	Stalled and declared a non-performing asset (a loan that has stopped being serviced) since 2013; claims of Rs 2,967 crore by the operator and a counter-claim of Rs 2,406 crore by the port
East Quay-10 berth	Visakhapatnam	Concession terminated on 18 January 2025; tender reissued for a five-year operation contract
Redevelopment of berth 9 and barge berths	Mormugao	Pre-qualified bidders did not bid in 2023; a revised dry dock proposal received no bids in 2024
Greenfield captive port at Pavinkurve	Karnataka (state port)	Requests for proposals invited three times, with no bidders by February 2025
Lease of two crude and product berths to a refiner	Chennai	Dropped after the berths, built in 1972 and 1987, were found to need rehabilitation and no other bidder showed interest

Source: Ministry of Ports, Shipping and Waterways, Update on the Indian Ports Sector (31 March 2025), project appendices.

Projects fail when traffic forecasts prove optimistic, when financing cannot be closed, when the risk split in the concession does not work for the operator, or when the location cannot attract cargo.

9.3 What is being built now

Exhibit 21. Projects and programmes in motion

Project or programme	Type	Scale	Status
Vadhavan, Maharashtra	Greenfield major port	298 MTPA incl. 23.2 million TEU; Rs 76,220 crore	Approved June 2024; first phase due by 2030
Vizhinjam expansion, Kerala	Transshipment port	Several times its first-phase capacity of about 1 million TEU	Targeted for 2028
Galathea Bay, Andaman and Nicobar Islands	Greenfield transshipment port	Proposed	Notified September 2024
Mundra phase 3, Gujarat	Private port expansion	196 MTPA; Rs 25,000 crore	Project report under scrutiny
Shipbuilding and maritime package	Government programme	Rs 69,725 crore; target of 4.5 million GT of shipbuilding capacity a year	Approved September 2025
National Waterways	Inland water transport	20 new waterways to be made operational	Announced in Union Budget 2026-27
Indian Ports Act, 2025	Law	Replaces the 1908 Act	Rules being framed

Source: Union Cabinet; Ministry of Ports, Shipping and Waterways; Press Information Bureau; company disclosures. Plans and targets are not commitments.

Two features of this pipeline deserve attention. Public and private capacity are being planned for some of the same cargo: Vadhavan's planned capacity and the proposed third phase at Mundra are of similar size and both aim at the cargo of western and northern India, so not all of it will fill at once. And for the first time the push extends beyond ports to the ships and yards themselves.

9.4 The energy transition and exposure to shocks

Petroleum and coal make up about half of India's port cargo, so the energy transition will reshape what the system carries. The Ministry's Harit Sagar Green Port Guidelines of May 2023 ask major ports to cut emissions, raise their use of renewable power and prepare to handle cleaner fuels such as green hydrogen, ammonia and methanol. Deendayal, Paradip and V.O. Chidambaranar have been designated green hydrogen hubs. Coal berths may grow more slowly over their working lives, while demand rises for liquid and gas handling.

The system is also exposed to shocks far from India's coast. In 2026 conflict in the Gulf disrupted shipping through the Strait of Hormuz, and container congestion built up at west coast ports within weeks. Cyclones, siltation and rising sea levels are permanent exposures for assets that sit on the coastline by definition. Resilience, meaning alternative routes, spare storage and Indian-controlled ships, has a value that capacity figures do not show.

10. What leaders must weigh

This paper set out to explain what it takes to build, run and pay for the maritime infrastructure through which India trades, and where it still falls short. The answer is a system with strong gateways and weak ownership. India has built large, growing and increasingly private ports, and it supplies the crews for the world's fleet. It still depends on foreign ships, foreign yards and, until recently, foreign transshipment hubs. Public authorities own the waterfront, cargo owners and shipping lines decide how it is used, and returns depend on use rather than size.

For leaders whose businesses depend on the sea, whether as manufacturers, exporters, energy and commodity companies, logistics providers, investors or public officials, this turns into a set of practical considerations.

Exhibit 22. What leaders must weigh, and the question to ask

Consideration	What the evidence shows	The question to ask
Maritime decisions outlast strategies	Vadhavan spans close to two decades from notification to build-out; concessions run 30 years	Will this decision still make sense when today's strategy has changed?
Capacity on paper is not capacity in use	About 58% of port capacity was used in FY25; major ports ranged from 29% to 79%	What can this port actually handle for my cargo, at my volumes, today?
Depth and connectivity decide relevance	Larger ships need deeper water; new rail corridors and waterways redraw hinterlands	Can this port or route take the ships my trade is moving to, and move cargo inland quickly?
Dependence on foreign ships and hubs is a risk	Indian ships carry a small share of India's trade; about 75% of transshipment was handled abroad; the 2026 Gulf disruption delayed cargo within weeks	What is my fallback if a route, port or foreign carrier fails?
The real delay is often outside the port	Export cargo waited about 158 hours after customs clearance, against about 30 hours for clearance	Where in my chain is the time actually lost?
The energy transition will shift cargo	Petroleum and coal are about half of port cargo; ports are preparing for green fuels	How exposed are my port and route choices to a decline in fossil cargo?

Source: Planet Ganges Research, drawing on the evidence in this paper.

Three of these carry the most weight. The first is time: maritime infrastructure is planned in years, built over a decade and used for generations, so any decision tied to it is a long-term commitment. The second is relevance: a port or route is valuable only if it can take the ships a trade is moving to and move cargo quickly inland. The third is resilience: a disruption thousands of kilometres away can back up cargo at Indian ports within weeks, and a strategy that depends on a single gateway, route or foreign carrier carries risks that stay hidden until something goes wrong.

India is now building the next generation of its maritime system, from deep-water ports to shipyards and waterways. The organisations that understand how this system is made, run, paid for and renewed will be better placed to decide where to locate, whom to depend on and when to invest.

Method note

This paper is a secondary study. It brings together and analyses published evidence; no primary data was collected. Figures are drawn first from Indian government sources: the Ministry of Ports, Shipping and Waterways, the Press Information Bureau, the Gazette of India, Union Cabinet decisions, the Directorate General of Maritime Administration, the Inland Waterways Authority of India and the Central Board of Indirect Taxes and Customs. Company figures come from the companies' own results. News reports are used only where no primary source was available.

Port cargo, capacity and efficiency figures for FY21 to FY25 come from the Ministry's Update on the Indian Ports Sector (31 March 2025), in which FY25 figures are provisional; FY26 cargo comes from the Ministry's monthly reports for March 2026. All-port commodity shares for FY25 add the Ministry's separate tables for major and non-major ports, which define some groups differently, so the shares are close approximations. In the Ministry's FY25 capacity utilisation table the traffic figures for Chennai and Kamarajar appear to be transposed; this paper uses the port-wise traffic figures from the same publication. Two official series exist for turnaround time at major ports; the chart uses the series in the Update on the Indian Ports Sector.

Fleet figures come from the Ministry's Indian Shipping Statistics 2025. The share of trade carried on Indian ships is the latest figure published by the Union Cabinet, for 2018-19. Shipbuilding and ship-repair shares come from the Ministry's Annual Report 2024-25, ship recycling figures from the Ministry's 2026 release, and seafarer numbers from the Directorate General of Maritime Administration. Inland waterway cargo figures come from the Ministry's releases of 2025 and 2026.

Derived figures, including shares, margins and cost per tonne of capacity, are simple arithmetic on the sources named under each exhibit. Company plans and government targets are reported as targets, not outcomes.

References

Government statistics and releases

Central Board of Indirect Taxes and Customs (2025). National Time Release Study 2025. New Delhi: Ministry of Finance.

Directorate General of Maritime Administration (2026). Circular 06 of 2026 on Indian seafarer numbers. Mumbai.

Ministry of Ports, Shipping and Waterways (2021). Maritime India Vision 2030. New Delhi.

Ministry of Ports, Shipping and Waterways (2023). Harit Sagar Green Port Guidelines. New Delhi.

Ministry of Ports, Shipping and Waterways (2023). Maritime Amrit Kaal Vision 2047. New Delhi.

Ministry of Ports, Shipping and Waterways (2025). Annual Report 2024-25. New Delhi.

Ministry of Ports, Shipping and Waterways (2025). Constitution of the Adjudicatory Board for Major Ports. New Delhi.

Ministry of Ports, Shipping and Waterways (2025). Update on the Indian Ports Sector (31 March 2025). New Delhi: Transport Research Wing.

Ministry of Ports, Shipping and Waterways (2026). Cargo handled at major ports and monthly cargo report for non-major ports, March 2026. New Delhi.

Ministry of Ports, Shipping and Waterways (2026). Indian Shipping Statistics 2025. New Delhi.

Ministry of Ports, Shipping and Waterways (2026). Cargo movement on inland waterways, 2025-26. New Delhi.

Prime Minister's Office (2025). PM dedicates Vizhinjam International Deepwater Multipurpose Seaport to the nation, 2 May 2025. New Delhi.

Prime Minister's Office (2025). Cabinet approves Rs 69,725 crore package to revitalise India's shipbuilding and maritime sector, 24 September 2025. New Delhi.

Press Information Bureau (2025). Maritime India: From Vision 2030 to Amrit Kaal 2047, 26 October 2025. New Delhi.

Press Information Bureau (2026). A Ride through the Inland Waterways of India, 27 April 2026. New Delhi.

Press Information Bureau (2026). India's leadership in ship recycling, August 2026. New Delhi.

Union Cabinet (2021). Scheme for promotion of flagging of merchant ships in India. New Delhi.

Union Cabinet (2024). Development of an all-weather greenfield deep-draught major port at Vadhavan, 19 June 2024. New Delhi.

Government of Gujarat (1995). Port Policy, December 1995. Gandhinagar.

Laws

The Indian Ports Act, 1908.

The Major Port Trusts Act, 1963.

The National Waterways Act, 2016.

The Recycling of Ships Act, 2019.

The Major Port Authorities Act, 2021.

The Indian Ports Act, 2025; the Merchant Shipping Act, 2025; the Coastal Shipping Act, 2025; the Carriage of Goods by Sea Act, 2025; and the Bills of Lading Act, 2025. Gazette of India.

Company disclosures

Adani Ports and Special Economic Zone (2025). FY25 cargo volumes and Mundra port performance.

Adani Ports and Special Economic Zone (2026). FY26 results; Vizhinjam International Seaport, FY26 operations.

JSW Infrastructure (2026). Q4 and FY26 results.

Reports and news sources

Business Standard (2026). West coast ports face container congestion, March 2026.

The Loadstar (2026). Vallarpadam transshipment volumes, FY 2025-26.

The Tribune (2025). Petroleum Minister on India's tanker fleet, October 2025.

The Tribune (2026). Port capacity, connectivity and the Western Dedicated Freight Corridor, November 2026.

The Week (2026). Ministry of Ports, Shipping and Waterways special secretary on India's maritime position, March 2026.