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NITI Aayog

IMPACT OF NON-MAJOR PORTS ON SHIPPING

Potential and Way Forward

Acknowledgement
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Table of Contents

Abbreviations

BRICS	Brazil-Russia-India-China & South Africa
CAGR	Compound Annual Growth Rate
CEZ	Coastal Economic Zone
CFS	Container Freight Station
CHA	Custom House Agent
DFC	Dedicated Freight Corridor
EXIM	Export Import
FDI	Foreign Direct Investment
GAPL	Gujarat Adani Port Limited
GDP	Gross Domestic Product
GSU	Grab Ship Unloader
JNPA	Jawaharlal Nehru Port Authority
LEADS	Logistics Ease Across Different States
LNG	Liquified Natural Gas
MMT	Million Metric Ton
MOPSW	Ministry of Ports, Shipping and Waterways
MPPL	Mundra Panipat Port Pipeline
NLP Marine	National Logistics Portal Marine
PCS	Port Community System
SEZ	Special Economic Zone

List of Figures and Tables

Terms of Reference

Within the aforementioned background, the proposed study is aimed at facilitating trade through non-major ports, improving their contribution to the national trade flow thereby strengthening the economy of the country. The proposed project intends to identify, understand, pursue, promote and advocate regulatory, infrastructural and procedural reforms at non-major ports thereby enhancing their role in the Export Import (EXIM) ecosystem of the country. In order to come out with an exhaustive roadmap for non-major ports to achieve the aforementioned objectives, the study will delve into the following areas:

Mapping

The study will lay out the geographic spread of non-major ports across the 7,500 km coastline. The study will identify the location of the port (how far or near is the port from a major or another non-major port), neighboring ports, distribution network (CFS/ICD/train terminals) proximity to production and consumption centers and proximity to logistics hubs/nodes. This will be important to understand the competitive landscape.

Baselining

In order to suggest any reforms for the optimisation of processes and trade flows, it is important to assess the prevailing situation at the ports. This would be done through:

- **Infrastructural Appraisal:** Existing infrastructure (handling, movement, security & digitisation) installed capacity and capacity utilisation.
- **Regulatory Ecosystem:** Evaluation of the current policies and regulations in place and identifying gaps.
- **Trade Flows:** Capturing data on the volume of cargo handled (trends and projections), type of cargo handled – EXIM, domestic, coastal.
- **Cargo movement procedure mapping:** identifying processes, stakeholders, linkages with Partner Government Agencies (PGA), timelines and cost involved in the movement of cargo through non-major ports.
- **Market Access:** Identifying the major clusters within the hinterland that are either the sources or destination of cargo from non-major ports.
- **Connectivity:** Distance from the major hinterland clusters, access to railway lines and condition of the connectivity infrastructure

Benchmarking

The performance appraisal for the non-major ports would be carried out by benchmarking them against select major ports like JNPT, Mundra or Chennai ports. The benchmarking would be carried out against various parameters. This would be critical in identifying any gaps in the operations, infrastructure or regulatory ecosystem in which the non-major ports are operating. This would also be important to understand how can non-major ports better compliment major ports through capacity enhancements or cargo redistribution. This process will also highlight the difference in the performance of non-major ports. Since we know that not ·all non-major ports are performing the same, this exercise can bring out lessons for non-performing ports to try.

Business Process Analysis: The study will also delve into the business optimization of the non-major ports by understanding the existing process. The analysis would involve identifying the existing business collaborations, market access, port utilization and competitive landscaping. The study shall come out with plans for non-major ports to improve on their existing business portfolios by identifying opportunities for growth and potential trade flows that can be directed or re-directed to non-major ports.

By focusing on the aforementioned areas, the study will come out with recommendations for non-major ports on how they can improve their operations within the sector and complement the major ports of the country and enhance the productivity of the overall port ecosystem.

Executive Summary

INTRODUCTION

The report ‘Impact of Non-Major Ports on Shipping: Potential and Way Forward’ is the first of its kind report that focuses on the non-major ports in the country and aims at improving their contribution to the national trade flow.

The non-major ports, which are spread across 10 states/UTs, contributes around 45% of total cargo handled during 2022-23. India has 217 non-major ports, out of which cargo is handled on 66 non-major ports. Notably, the cargo handled by these ports witnessed a significant increase of 7.8%, rising from 603.56 million tonnes in 2021-22 to 650.96 million tonnes in 2022-23.

However, in terms of cargo handled, the performance of all non-major ports varies significantly. Ports from Gujarat, Andhra Pradesh and Maharashtra contribute around 90% of cargo handled by non-major ports. Non-major ports often face challenges related to proximity to maritime routes, hinterland connectivity, market access, proximity to manufacturing or consumption hubs, infrastructure, digitisation, draft, inter port connectivity, etc.

Government has launched several programmes and initiatives to capitalise on trade opportunities and promote growth of Indian maritime sector. However, a nuanced and holistic approach is necessary to delineate and address the needs of non-major ports in the country.

In this context, this report identifies, understand, pursue, promote and advocate regulatory, infrastructural and procedural reforms at non-major ports thereby enhancing their role in the trade ecosystem and maritime landscape of the country. Further, it comes out with a exhaustive roadmap for non-major ports to achieve the aforementioned objective.

DELIBERATIONS

From the above approach, it was realised that terminology used to categorise ports should evolve to better reflect their roles and potential contributions. Instead of using terms like 'minor port' or 'non-major port', a more nuanced approach can be adopted. Currently, non-major ports can be categorised into three distinct groups: dormant ports, active ports, and scalable ports.

Certain key factorswere identified that are leading to port's success. These include availability for suitable infrastructure to handle specific cargo, deep drafts, integrated ecosystems, technology-driven operations, connected ports, and seamless end-to-end trips. However, various issues such as siloed approach to port development, inadequate infrastructure, port congestion, indistinct price structure, and lack of digital ecosystem were observed

that impede the competitiveness of the non-major ports. Addressing these challenges is imperative to unlock the full potential of non-major ports and enhance their contribution to India's maritime trade.

The report presents strategic recommendations aimed at leveraging enablers to enhance the efficiency, competitiveness, and sustainability of India's port infrastructure and operations. This includes creation of master plan for ports with long- and short-term objectives that can strategise on development of infrastructure, facilitate cargo movement between major and non-major ports, and initiatives to raise awareness and promote non-major ports. Further, these plans should enable development of port ecosystem that can evolve port's role from mere transit points to dynamic hubs of economic activity.

Non-major ports can be established as cargo consolidation centres or feeder ports based on the type of activity delineated in the master plan. In line with government effort, they can also serve as pivotal nodes for coastal shipping, heralding a paradigm shift in freight transportation dynamics.

Regulatory interventions are required to streamline bureaucratic processes and paperwork for creating a business-friendly environment that attracts investments. Interventions such as simplifying procedural aspects, standardising port processes, transparency in charges levied are vital or fostering trust among stakeholders, and facilitating informed decision-making within the maritime industry. Further establishment of regulatory bodies such as trade facilitation committees and ports ombudsmen is imperative to ensure fairness, objectivity, and transparency in port operations.

There is a need of "digital nudge" to drive non-major ports towards digitisation and its associated benefits. It would facilitate creation of digital repository that would play a pivotal role in recording port performance metrics and enable informed data-backed decision making.

Finally, this report presents operational strategies and future perspective of non-major ports in India.

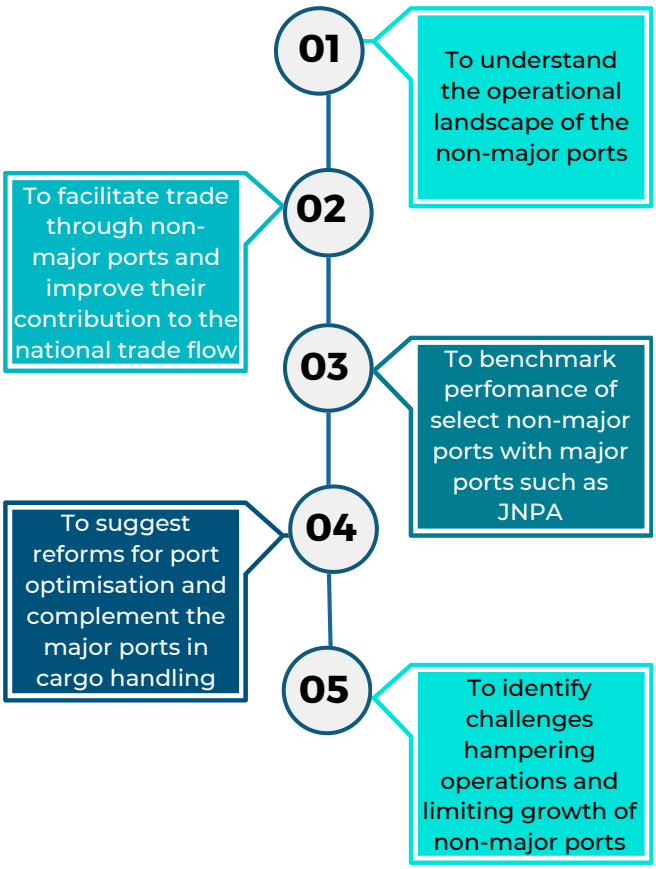
From a study perspective, this report is first of its kind analysis on non-major ports and is useful as it brings the issues and suggested plans of action directly from the stakeholders.

SCOPE & OBJECTIVES

OBJECTIVES OF THE STUDY

The primary objective of this study is to enhance trade facilitation via non-major ports, thereby augmenting their role in the national trade network and bolstering the country's economy. Specifically, the study aims to achieve the objectives mentioned in Figure 1.

Figure 1: Objectives of the study



SCOPE

In order to achieve the aforementioned objectives, the study delves into the following areas:

- **Mapping:** The study lays out the geographic spread of non-major ports across the 7,500 km coastline. It presents the location of the port (how far or near is the port from a major or another non-major port), neighboring ports, distribution network (CFS/ICD/train terminals) proximity to production and consumption centers and proximity to logistics hubs/nodes. This is important to understand the competitive landscape of these ports.

- **Baselining:** In order to suggest reforms for the optimisation of processes and trade flows, it is important to assess the prevailing situation at the ports.

Hence, baselining has been conducted through analysis of following metrics:

  - **Infrastructural Appraisal:** Existing infrastructure (handling, movement, security & digitisation) installed capacity and capacity utilisation
  - **Regulatory Ecosystem:** Evaluation of the current policies and regulations in place and identifying gaps
  - **Trade Flows:** Capturing data on the volume of cargo handled (trends and projections), type of cargo handled – EXIM, domestic, coastal.
  - **Cargo Movement Procedure Mapping:** Identifying processes, stakeholders, linkages with Partner Government Agencies (PGA), timelines and cost involved in the movement of cargo through non-major ports
  - **Market Access:** Identifying the major clusters within the hinterland that are either the sources or destination of cargo from non-major ports.
  - **Connectivity:** Distance from the major hinterland clusters, access to railway lines and condition of the connectivity infrastructure.

- **Benchmarking & Global Best Practices:** The performance appraisal for the non-major ports was carried out by benchmarking them against select major ports like JNPA, Mundra or Chennai ports for various parameters. This is critical for identifying any gaps in the operations, infrastructure or regulatory ecosystem in which the non-major ports are operating. It further

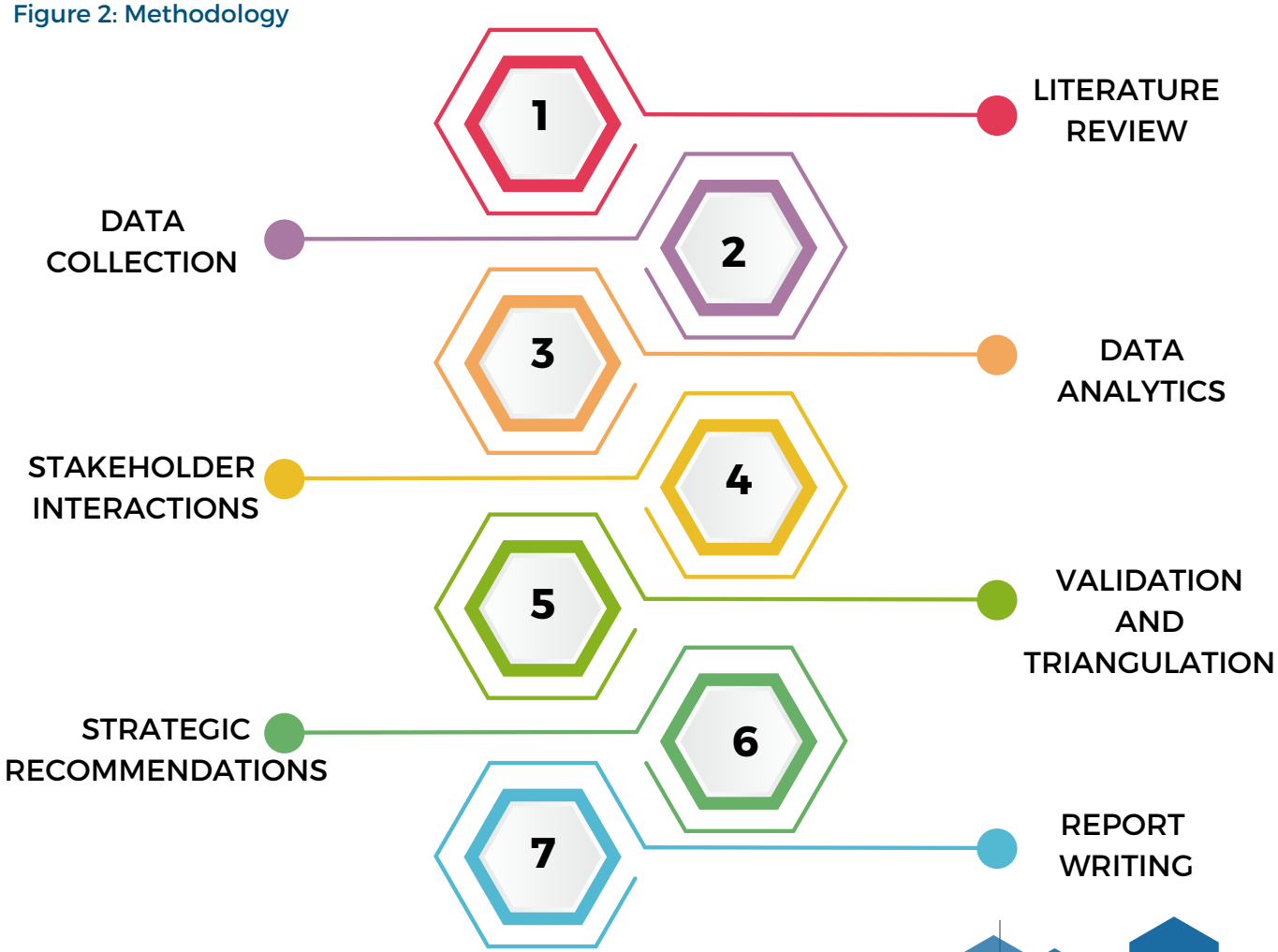
presents the opportunities for non-major ports to better compliment major ports through capacity enhancements or cargo redistribution. This process also highlighted the difference in the performance of non-major ports.

- **Business Process Analysis:** The study also delved into the business optimisation of the non-major ports by understanding the existing process. The analysis involves identifying the existing business collaborations, market access, port utilisation and competitive landscaping. The study comes out with plans for non-major ports to improve on their existing business portfolios by identifying opportunities for growth and potential trade flows that can be directed or re-directed to non-major ports. By focusing on the aforementioned areas, the study presents recommendations for non-major ports on how they can improve their operations within sector and complement the major ports of the country and enhance productivity of the overall port ecosystem.

METHODOLOGY

The research methodology employed for the study is a combination of primary and secondary research (Figure 2). Secondary research included desk review of relevant information and data available in the open sources such as policy documents, sectoral reports, academic papers, news articles, etc. In addition, government websites including that of state maritime boards, Ministry of Ports, Shipping and Waterways, Ministry of Commerce and Industry, Ministry of Finance, and websites of other agencies including logistics players were reviewed for gathering precise data and information on connectivity and operational/procedural details.

Figure 2: Methodology



The overall research methodology employed followed a process involving following steps:

- Literature Review

The existing literature on the non-major ports, especially that of top 10 performing non-major ports, were reviewed extensively to gain understanding of the prevailing situation, cargo movement, connectivity, modes of cargo movement, modalities, opportunities, bottlenecks, limitations existing at these ports. The literature reviewed included policy documents like the National Logistics Policy, State maritime policies or strategy documents, Maritime India Vision 2030, Maritime Amrit Kaal vision 2047, regulatory guidelines on port operations, academic papers, media articles, industry reports, etc.

- Data/Information Collection

Information regarding the Indian maritime industry and the port performance of major and non-major ports were sourced from secondary sources including publication from Ministry of Ports, Shipping and Waterways, State Maritime Board, port specific websites, industry magazines, academic journals/papers, and newspaper articles.

- Data Analysis

The data sourced from secondary sources was collated and then analysed to identify the locations of cargo handling non-major ports and its proximity to economic hubs, Further, the data was also used to identify cargo trends, cargo mix and top hinterland connections. The analysis is presented in the report through different infographics such as maps, charts, tables and graphs etc.

- Stakeholder Interaction

Sourcing information from primary sources is always an advantage for any research endeavour. Interaction with relevant stakeholders from the non-major ports in the east and west coast were a critical aspect of this study especially in the identification of challenges faced and getting insights into prevailing situation. Separate stakeholder consultations for the east and west coast ports were conducted as part of the study. In addition, research team interacted with few industry experts/traders through virtual mode to get specific insights. The stakeholder consultation saw participation from terminal operators, port authorities, Container Freight Station (CFS) operators, Custom House Agents (CHAs), private players, shipping vessel owners, freight forwarders, transporters, logistics players, trade agents amongst many others. Study has gained immensely from the inputs provided by the stakeholders and some of the strategic recommendations mentioned have come directly from the industry.

- Validation and Triangulation

Critical information, pre-dominantly qualitative information sourced from secondary sources was validated post stakeholder consultations, and developed basis for developing strategic recommendations. Further, data from secondary and primary research was triangulated using our internal models to come up with strategic recommendations and way forward.

- Strategic Recommendations

In order to recommend reforms and develop a roadmap for non-major ports, the existing policy structure, prevailing operational procedures, and stakeholder inputs were taken into consideration. We have also included lessons learnt from global cases to bolster the potential way forward.

- Report Writing

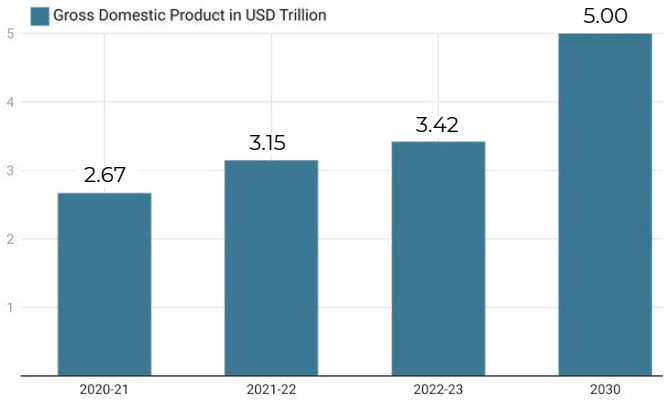
All the above steps culminated into preparation of a report that has been presented here.

CHAPTER-1
INTRODUCTION

1.1. INDIAN ECONOMY AND MERCHANDISE TRADE

The maritime sector in India serves as a fundamental pillar in the country's economic progress, showcasing its historical maritime legacy and strategic geographic placement. Spanning an extensive coastline of over 7,500 kilometers across nine states and four union territories, bordered by the Arabian Sea in the west, the Indian Ocean in the south, and the Bay of Bengal in the east, India possesses a rich maritime heritage intricately woven into its present day economic ambitions.

Figure 3: Gross Domestic Product: India



Source: GDP (Current US$) India, World Bank, BRIEF Insights

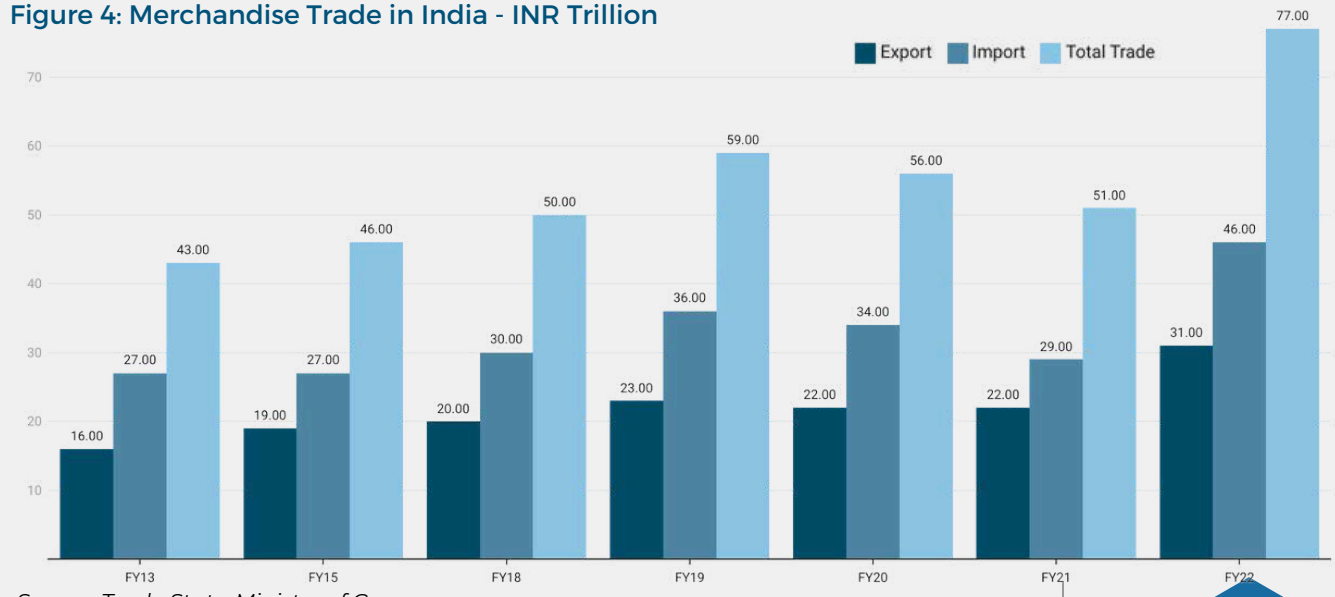
India stands on the threshold of becoming a 21st-century global economic powerhouse and has set a target of becoming a USD 5 trillion economy by 2025. Despite the markdown in near-term growth, India is positioned to be one of the fastest-growing major economies in terms of GDP between Fiscal 2024 and 2026.

To achieve the same, the country is aiming at USD 25 billion from the maritime zone in accordance with the global standard of about 5 %. Looking ahead to the target of achieving a USD 5 trillion economy by 2025, and making India an export hub, the maritime sector is poised to play a substantial role in this economic trajectory.

On the merchandise trade front, the growth has been significant (refer to Figure 4). Between FY13 and FY22, exports have grown with a CAGR of 7.6 % and imports with a CAGR of 6.2 % in value terms[1] . In FY22 the total export was INR 31.5 trillion whereas the total import was INR 45.7 trillion.

The overall share of goods export in GDP has increased from 10.9 % in 2020-21 to 13.3% in 2021-22[2]. Several reforms have been introduced which are key to boosting the export potential of the Indian economy, including the introduction of the Production Linked Incentive (PLI) scheme, lower corporate tax rates, simplification labor legislation and a greater focus on human capital. With the burgeoning merchandise trade in the country the ports are expected to handle increasing volumes of cargo in coming years.

Figure 4: Merchandise Trade in India - INR Trillion



Source: Trade Stats, Ministry of Commerce

[1] Ministry of Commerce & Industry and BRIEF
[2] Ministry of Commerce & Industry, Press Information Bureau

1.2. INDIAN PORT AND LOGISTICS SECTOR

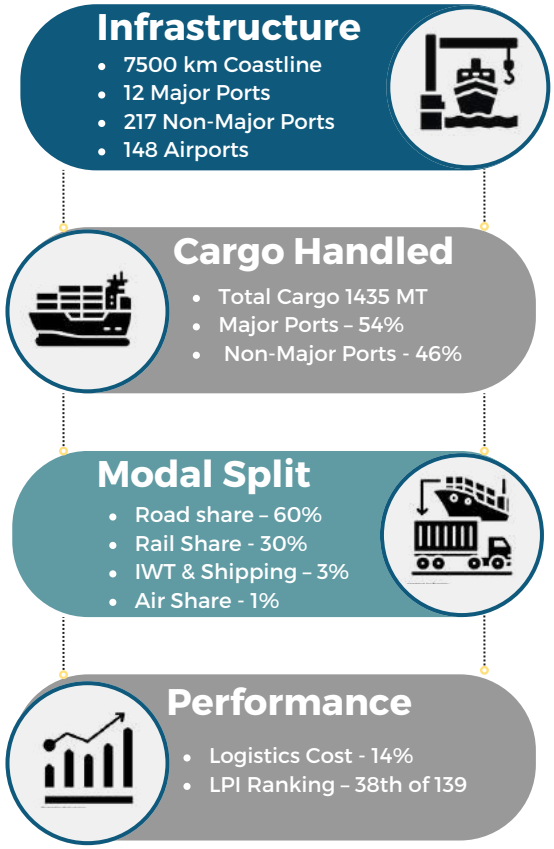
India's logistics cost as a percentage of GDP stands at around 14% which is on a higher side compared to 10-11% for Brazil-Russia-India-China and South Asia (BRICS) countries and 8-9% for developed countries. The Government of India focused on bringing down the overall logistics costs in the country. With this objective, the government through various relevant ministries and departments has been implementing various measures and reforms across the trade ecosystem in the country.

These reforms are driven by initiatives such as implementation of the Goods and Services Tax, investments towards road infrastructure, development of Inland waterways and Coastal shipping, thrust towards Dedicated Freight Corridors among others. The government is also providing key support in the development of the port industry. It has opened up the automated route to 100% Foreign Direct Investment for port and harbour building and maintenance projects. It has also made it easier for businesses that create, maintain, and operate ports, inland waterways, and inland ports to take advantage of a 10-year tax break.

Further, the Government has announced and implemented several initiatives such as **GatiShakti Scheme, National Logistics Policy** and **Bharatmala Pariyojana** to improve the transportation infrastructure in the country. As a result of the concerted efforts by the government through the aforementioned initiatives India has made a significant stride in the world Bank's Logistics Performance Index ranking.

India has moved to 38th position in 2023, which is six places ahead of its 44th place in 2018 and 16 places ahead of its 54th position in 2014. The ranking system evaluated 139 economies across the globe.

Figure 5: Snapshot of Logistics and Port Sector



A significant amount of attention and effort in the last 5-6 years has been directed towards the sea ports in the country which act as critical nodes of the overall trade ecosystem in the country.

India has a total of 239 ports dotting its extensive 7500 km coastline. The country's maritime sector plays a vital role in its trade and economic growth, as 95% of the country's trade by volume and 65% of the trade by value is undertaken through maritime transport[3]. According to the latest update on the Indian Port Sector, during the year 2022-23, ports in India handled a record volume of cargo 1435.23 million tonnes, reflecting an 8.4% point increase compared to the 1323.62 million tonnes of the previous year. As cargo has steadily grown, so has the port capacity. The cargo handling capacity at ports has more than doubled in the last decade.

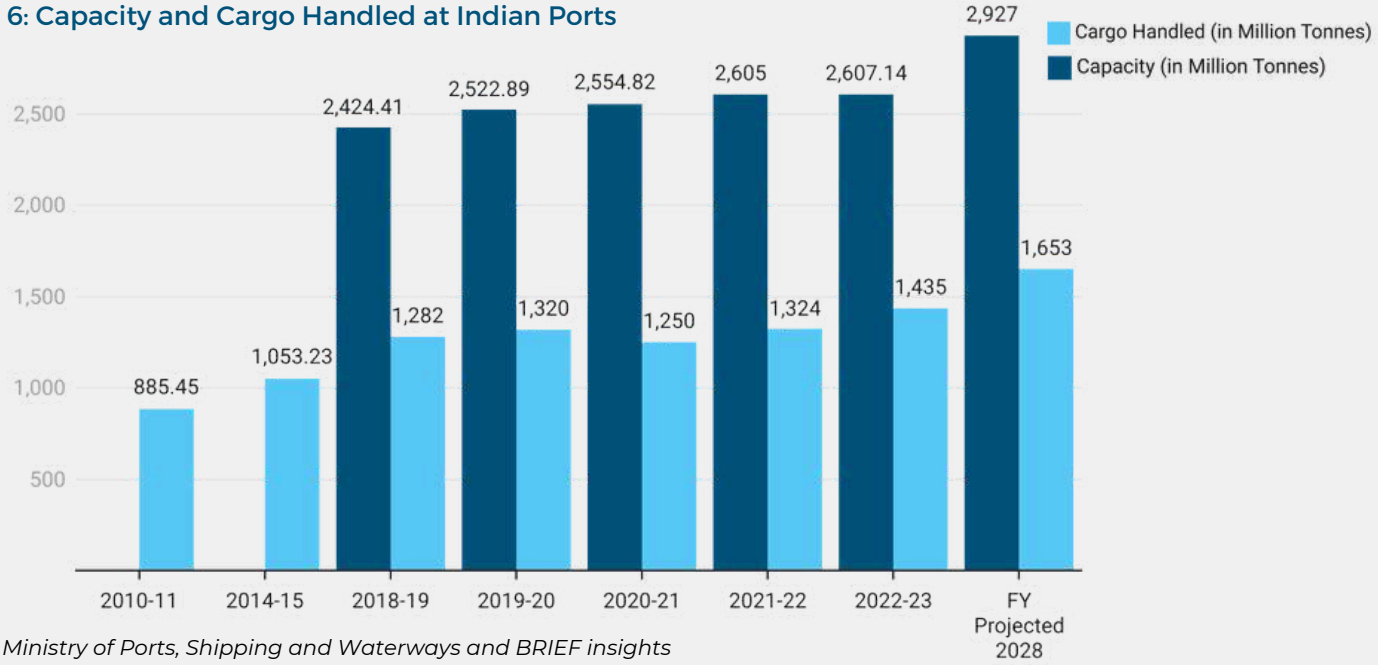
[3] President of India Speech, Press Information Bureau | October 27, 2023

Indian ports had a cargo handling capacity of 1598 million tonne as of year 2020-21 which is 163% more than 608 million tonne capacity in the year 2010-11 (Figure 6). The government further plans to upgrade the capacity by around 300% by 2047.

Maritime ports in India can be categorised into two main segments – Major ports and non-major ports. As of 2024, there are 12 major ports and 217 non-major Ports in the country. Major ports are administered directly by central government, whereas non-major ports are administration of State Government / State Maritime Board. The Major Port Authorities Act, 2021 governs the regulation, operation, and planning of major ports in India.

The Act revises the provisions of earlier act and vests the administration, control and management of such ports to the boards of major port authorities. On the other hand, non-major ports are all ports that are not classified as major ports under the Indian Ports Act, 1908. Non-major ports include both minor and intermediate ports. These ports come under the purview of the respective state governments and regulated by state departments, or the state maritime boards. Given the century old nature of the Indian Ports Act, it is imperative that the Act shall reflect the present scenario encompassing India's international obligation, address emerging environmental concerns and aid the consultative development of ports sector.

Figure 6: Capacity and Cargo Handled at Indian Ports



Source: Ministry of Ports, Shipping and Waterways and BRIEF insights

Given the century old nature of the Indian Ports Act, it is imperative that the Act shall reflect the present scenario encompassing India's international obligation, address emerging environmental concerns and aid the consultative development of ports sector. Accordingly, the draft Indian Ports Bill, 2022 ("IP Bill 2022") had been prepared and was put up for stakeholder consultation in August 2022. Both segments of the ports contribute almost equally towards cargo movement in the country. Major ports handled a majority share of 54%, whereas the remaining 46% was handled by non-major ports. The ports handle both overseas and coastal cargo with major commodities including petrol, oil and lubricants, iron ore, building material, coal, fertilisers & fertiliser raw material, and others. A detailed comparison of the two sets of ports and performance of non-major ports has been presented in the later sections of this report.

CHAPTER-2

NON-MAJOR PORTS IN INDIA

KEY HIGHLIGHTS

217
total non-major ports in India

650.96
million tonnes cargo handled by non-major ports in 2022-23

1009.55
million tonnes capacity of non-major ports in 2022-23

45.4%
share in the total cargo handled by Indian ports

64%
of all cargo processed by Gujarat non-major ports In 2022-23

76%
of the total cargo handled by ports on the west coast

>50%
of the capacity of non-major ports is installed in Gujarat In 2022-23

64.5%
capacity utilisation at non-major port

>40%
of all cargo processed by non-major ports is handled by the top 2 non-major ports.

2. NON-MAJOR PORTS IN INDIA

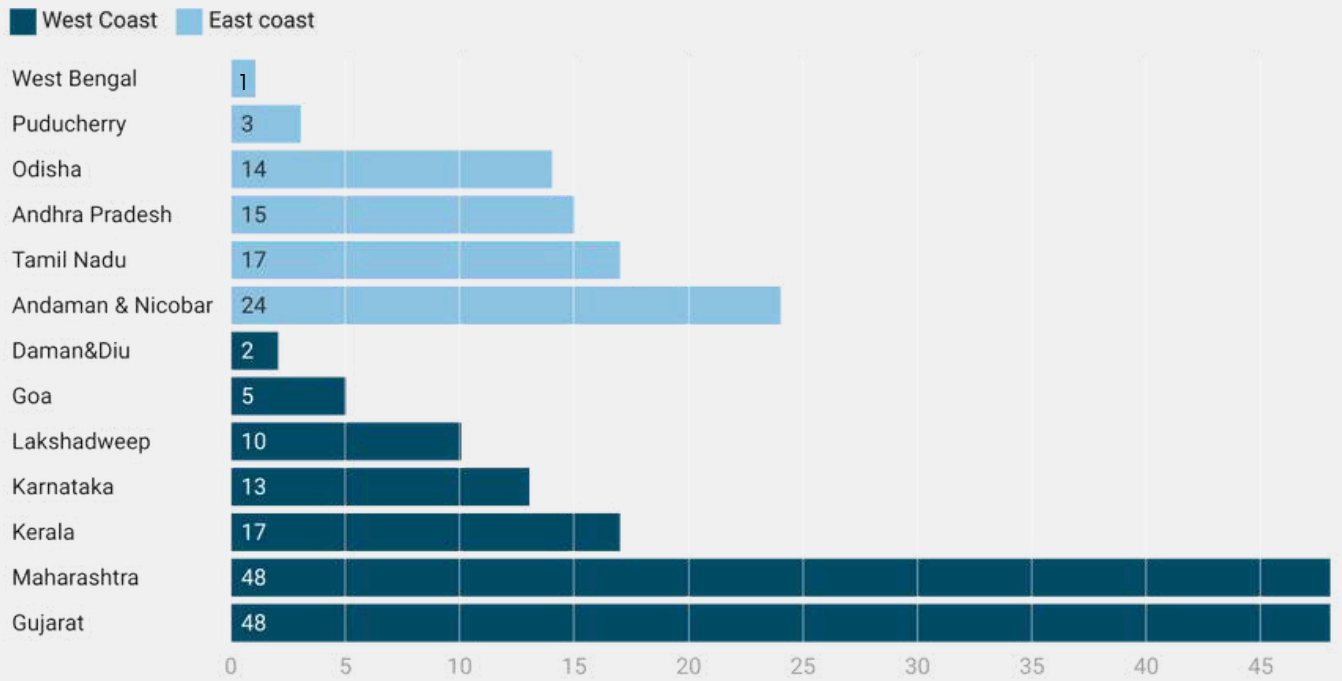
The importance of non-major ports in the Indian maritime landscape cannot be overstated. Not only do they account for 45.4% of total Indian maritime trade, but they also play a crucial role in facilitating passenger movement. These ports are indispensable for the regional development of coastal areas, promoting economic activities, trade, and employment opportunities in the respective regions. Non-major ports offer a unique opportunity to establish diverse and specialised port infrastructure that caters to local needs, contributing to a more sustainable and balanced regional development. Beyond facilitating trade and commerce, these ports also contribute to the growth of tourism and recreation activities in the surrounding regions. While, non-major ports fall within the Concurrent List of the Constitution. The administrative control of non-major ports lies with the State Maritime Boards or the State Government. These ports play a crucial role in regional trade, connectivity, and the efficient handling of cargo, thereby contributing significantly to economic activities within the state. This section is aimed at baselining the performance and operation of non-major of the country across various parameters.

2.1. MAPPING

There are 217 non-major ports in the country, with majority – 143 ports in the west coast. Within the West Coast, the states of Maharashtra and Gujarat collectively have 96 ports. The maritime State/UT-wise mapping of 217 non-major ports in the country can be observed in Figure 7 and Figure 8. The state profile are attached as Annexure I.

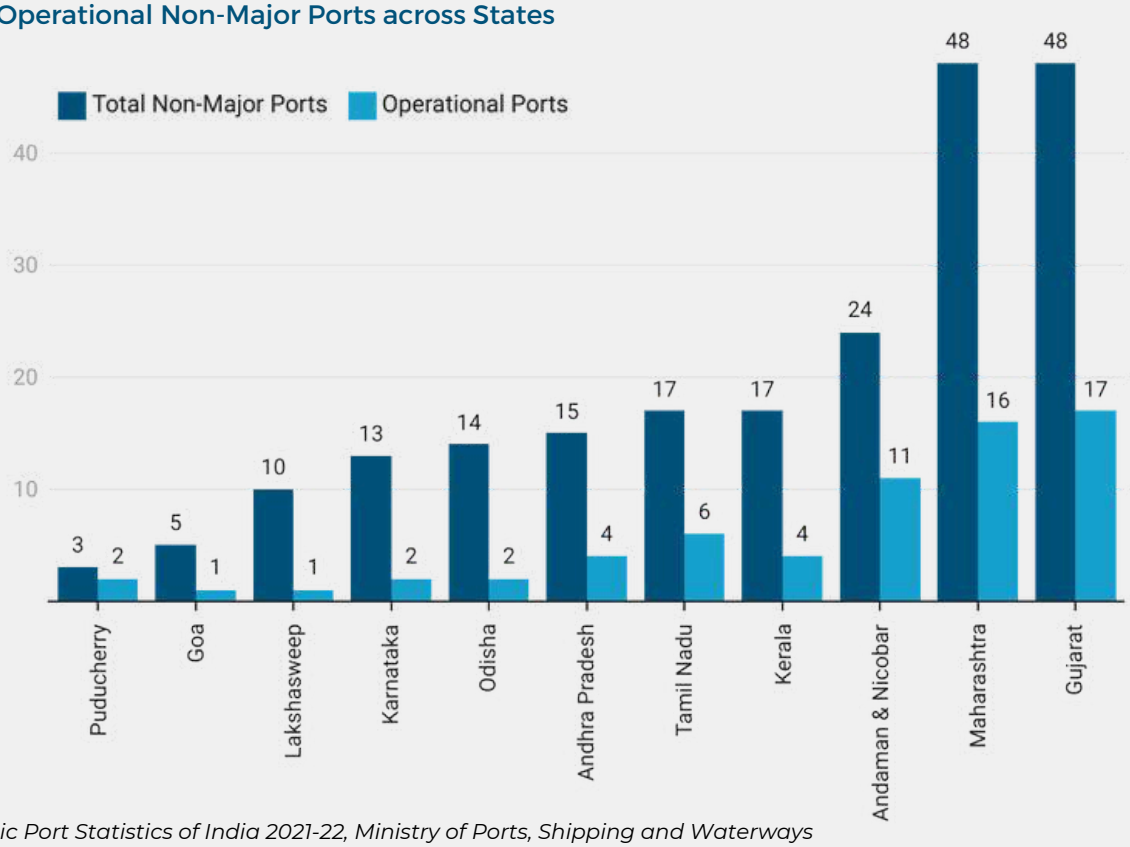
These non-major ports are broadly categorised into two sections: port limits and cargo handling ports. Port limits refer to those ports where no cargo is handled; instead, they are used by fishing vessels and small ferries to carry passengers across creeks, etc.

Figure 7: Geographic Spread of Non-Major Ports



Source: Basic Port Statistics of India 2021-22, Ministry of Ports, Shipping and Waterways

Figure 8: Operational Non-Major Ports across States



Source: Basic Port Statistics of India 2021-22, Ministry of Ports, Shipping and Waterways

Out of 217 non-major ports in the country, only 66 ports handle cargo. Figure 8 shows the list of cargo handling ports divided by States. Non-major ports have witnessed growth in traffic handled in the last few years. This growth can be attributed to factors such as the presence of captive cargo streams, higher operating efficiency, modern infrastructure, and a more diversified cargo basket. The below map shows the top 20 non-major ports based on cargo handled.

2.2 OPERATIONS

CARGO HANDLED

The port sector in India is poised for significant expansion, with projections indicating CAGR of 2.4% to reach an impressive throughput of 2500-3500 million tonnes by the year 2028[4]. Achieving this ambitious growth target necessitates a multifaceted approach, combining business optimisation strategies with capacity enhancement initiatives. By prioritising operational efficiency and investing in infrastructure upgrades, the sector aims to realise the objectives outlined in the Maritime Vision 2030, which envisions a modernised and globally competitive maritime industry. Central to this vision is the recognition of the pivotal role that non-major ports will play in accommodating the projected surge in maritime trade activities. With forecasts indicating a steady increase in capacity utilisation, reaching up to 67%, these ports are poised to emerge as key drivers of growth within the sector.

Traffic handled at non-major ports increased at a CAGR of 2.77% from 2018-19 to 2022-23. During 2022-23, non-major ports accounted for 45% of the overall traffic handled at Indian ports due to a significant shift of traffic from major to non-major ports.

[4] Study on Ports Sector in India, JSW Infrastructure Ltd (August 2023)

Map 1: Top 20 Non Major ports (by Cargo Handled)

Source: BRIEF Insights

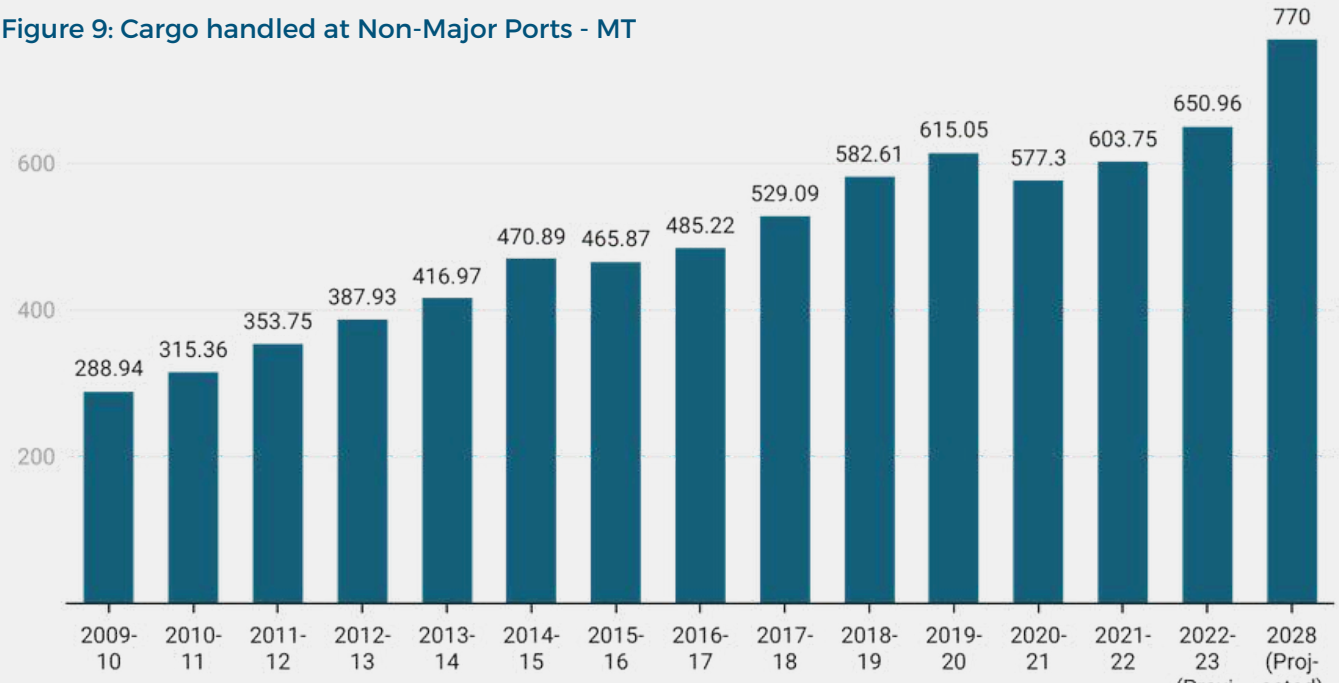
The historical cargo handled by non major ports is depicted in Figureure 09. Moreover, the cargo handled at non-major ports has also increased significantly, rising from 288.94 million tonnes in 2009-10 to 650.96 million tonnes (provisional) in 2022-23. Non-major ports are projected to handle 770 million tonnes of cargo by FY 28 registering a CAGR of 3-6%.

This staggering increase in cargo handled is mainly attributed to the rapid growth of private terminal port operators, empowered through Ease of Doing Business initiatives by both the Central and State governments. Initiatives, including the allowance of 100% FDI in the port sector, and fast-tracking clearances amongst others have played a pivotal role in fostering growth. The expansion of cargo not only signifies the robust performance of non-major ports but also strengthens their position in the future of India's maritime sector and propels India to the forefront of the global maritime sector.It is important to note that the top 10 non-major ports handle more than 80% of the cargo managed by non-major ports. These ports are primarily situated in Gujarat, Andhra Pradesh, Maharashtra and Odisha. On the other hand, approximately 56 cargo handling ports handle less than 20% of the total cargo managed by non-major ports.

- *Over 55 non-major ports handling less than 20 % of the total cargo handled by the non-major ports.*
- *Sikka Port and Gujarat Adani Port Limited in Gujarat handles over 45% of the total cargo handled by non-major ports in 2021-22.*

This metric underscores a critical gap in cargo handling capacity and port operations among non-major ports. It also paints a biased picture of non-major ports in the country, given the diverse levels of operationalisation and cargo handling capacities. However, these leading ports serve as guiding lights for other non-major ports.

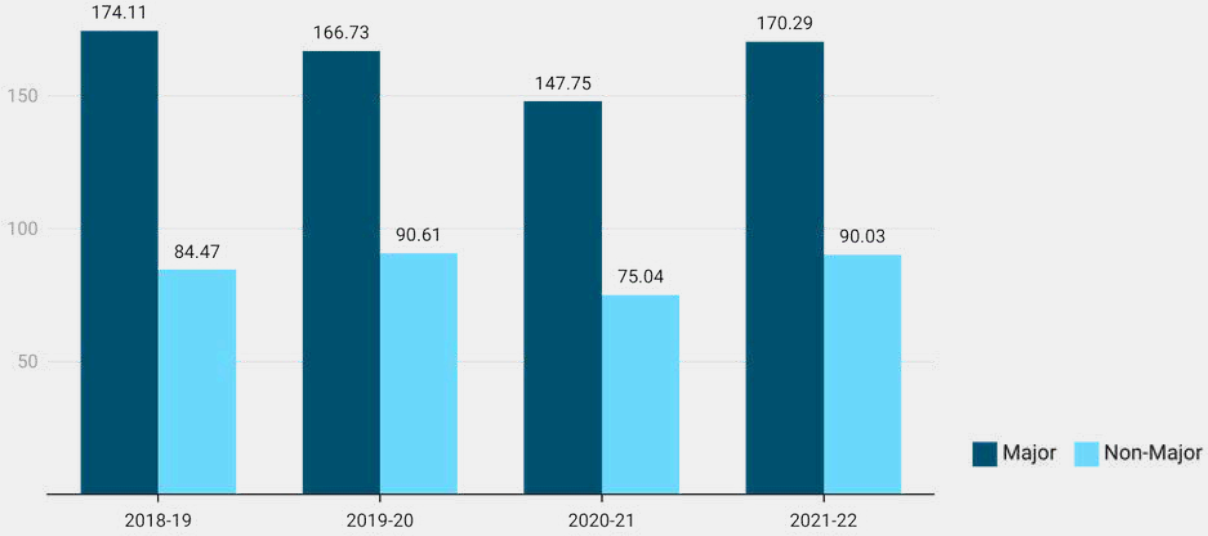
Figure 9: Cargo handled at Non-Major Ports - MT



Source: Basic Port Statistics 2021-22, MoPSW, Study on Port Sector in India, JSW Infrastructure Limited

In the year 2018-19, out of the total cargo handled by non-major ports, approximately 84% was overseas cargo, which has further increased to 86% in 2020-21. It is interesting to note that the volume of overseas cargo handle by the non-major ports is approximately equal to overseas cargo handled by the major port (Figure 10). However, non-major ports handle a low volume of coastal cargo as compared to major ports (Figure 11). The commodities handled at the non-major ports is primarily divided into six categories namely, petrol, oil and lubricants, iron ore, building material, coal, fertilisers & fertiliser raw material, and others. The commodity-wise split of the non-major ports is shown in Figure 12. It can be observed that

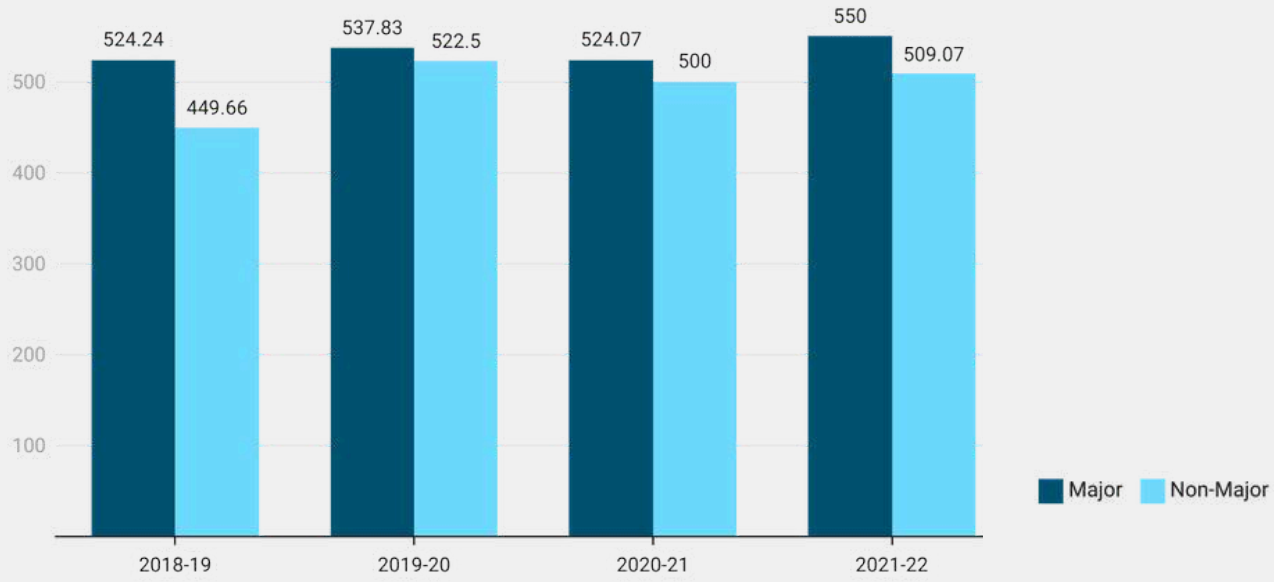
Figure 10: Comparison of Coastal Cargo Handled at Major & Non major ports- MT



Source: Sagar Unnati Dashboard, Ministry of Ports, Shipping and Waterways

over the last five to six years, the cargo at the non-major ports have diversified. This is reflected through the rise in the share of Other commodities from 24% in 2017-18 to 31% in 2022-23 (provisional).

Figure 11: Comparison of Overseas Cargo Handled at Major & Non Major Ports- MT



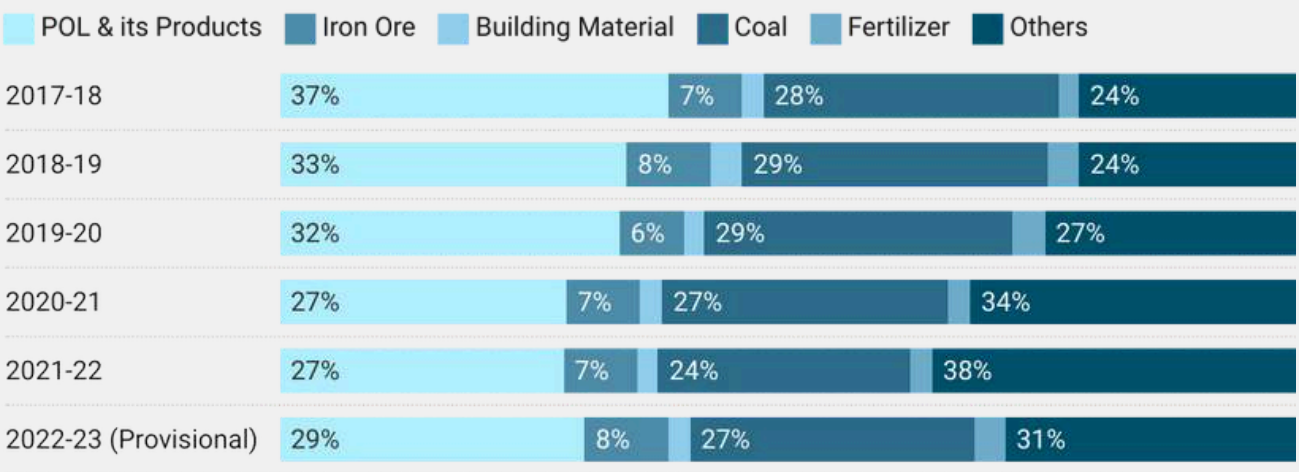
Source: Sagar Unnati Dashboard, Ministry of Ports, Shipping and Waterways

It is to be noted that the domination of traditional products such as Petroleum, Oil & Lubricants have decreased from 37% to 29%. Share of other categories such as Iron Orea, Building Materials, Coal, and Fertiliser & Fertiliser Raw material have remained approximately the same.

CARGO PROCESS

Through an exhaustive stakeholder consultation process, the report has mapped an indicative process of cargo imports and exports. It was observed that non-major ports largely follow a process similar to that of major ports in the country. However, stakeholders raised concerns regarding lack of standardized processes.

Figure 12: Commodity-wise Cargo Handled at Non-Major Ports



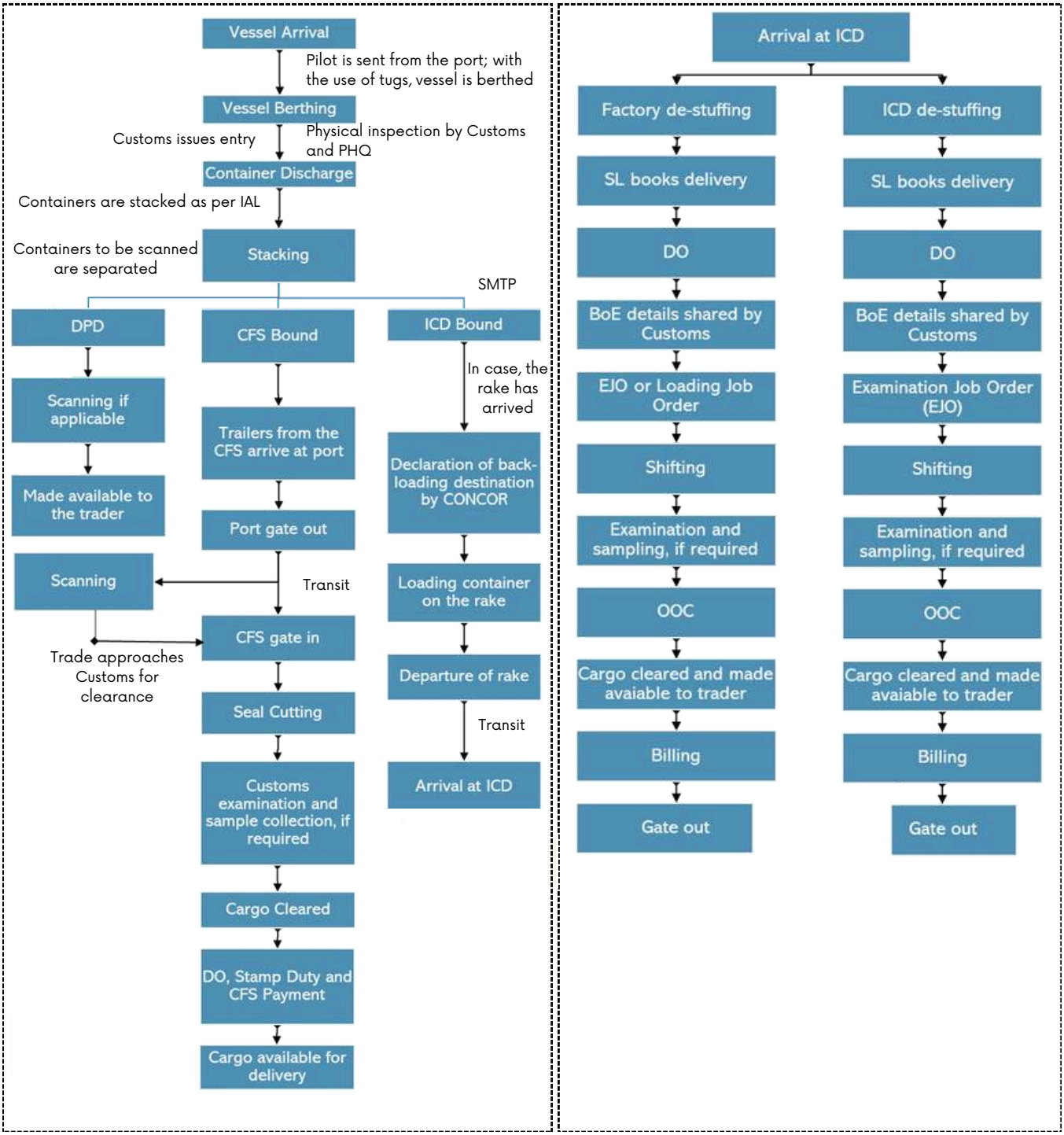
Source: Sagar Unnati Dashboard, Ministry of Ports, Shipping and Waterways

This lack of chronological standardisation can be observed across various ports. Furthermore, differences in the level of automation & mechanisation at port terminals contribute to variations in port processes. Use of digital mechanised processes also impacts cargo release times at ports & ultimately logistics costs.

1. Imports

Figure 13 visualise various steps involved in the arrival, handling, and clearance of imported goods and map the process of imports at a port. Beginning with the arrival of the vessel at the port, the process map delineates each stage, including berthing, unloading, customs clearance, inspection, documentation & delivery to the consignees.

Figure 13: Import Process Mapping at Port, ICD and CFS



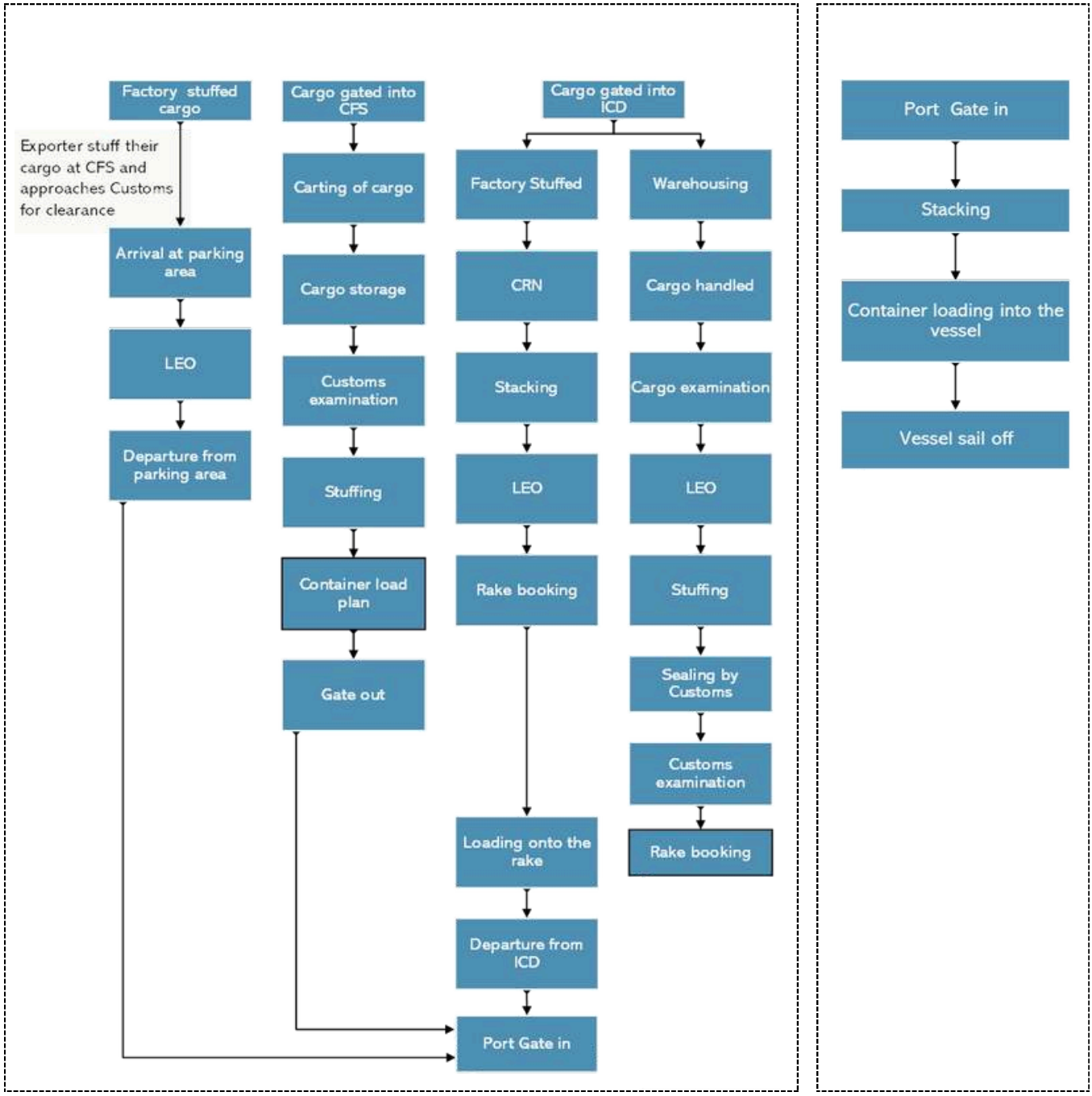
ICD – Inland Container Depot; **S.L** – Shipping Lines; **VOA** – Vessel operating agent; **IGM** – Import General Manifest; **IAL** – Import Advance List; **SMPT** – Sub Manifest Transhipment Permit; **DO** – Delivery order; **OOC** – Out of Charge; **DPD**: Direct Port Delivery; **CFS** – Container Freight Station; **BoE** – Bill of Entry; **LEO** – Let Export Order

Source: BRIEF Insights

2. Exports

Cargo process mapping of exports at a port entails a systematic examination and visualisation of the procedures involved in exporting goods from the port to their destination. The Figure 14 encompasses export stages such as cargo acceptance, documentation, customs clearance, loading onto vessels, and departure.

Figure 14: Export Process Mapping at the Port, ICD and CFS



Source: BRIEF Insights

2.3. INFRASTRUCTURE

The overall capacity of non-major ports have increased the capacity of the non-major ports have increased by around 28 % underscoring the increasing role and significance of non-major ports in facilitating trade and commerce across various industries.

According to the Ministry of Ports, Shipping and Waterway, the overall capacity of the non-major was 1007.41 Million Metric Ton (MMT) for the year FY 2021-22, with a projected increment of 2.14% to reach 1009.55 MMT in FY 2022-23. The capacity of the non-major ports in India is attached at Annexure II.

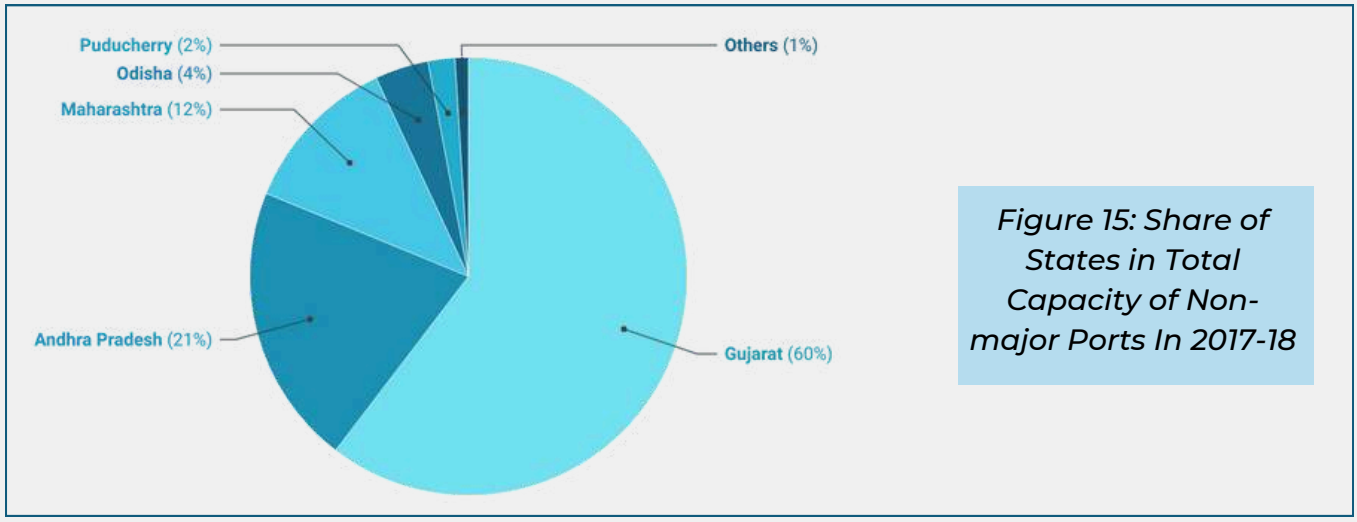


Figure 15: Share of States in Total Capacity of Non-major Ports In 2017-18

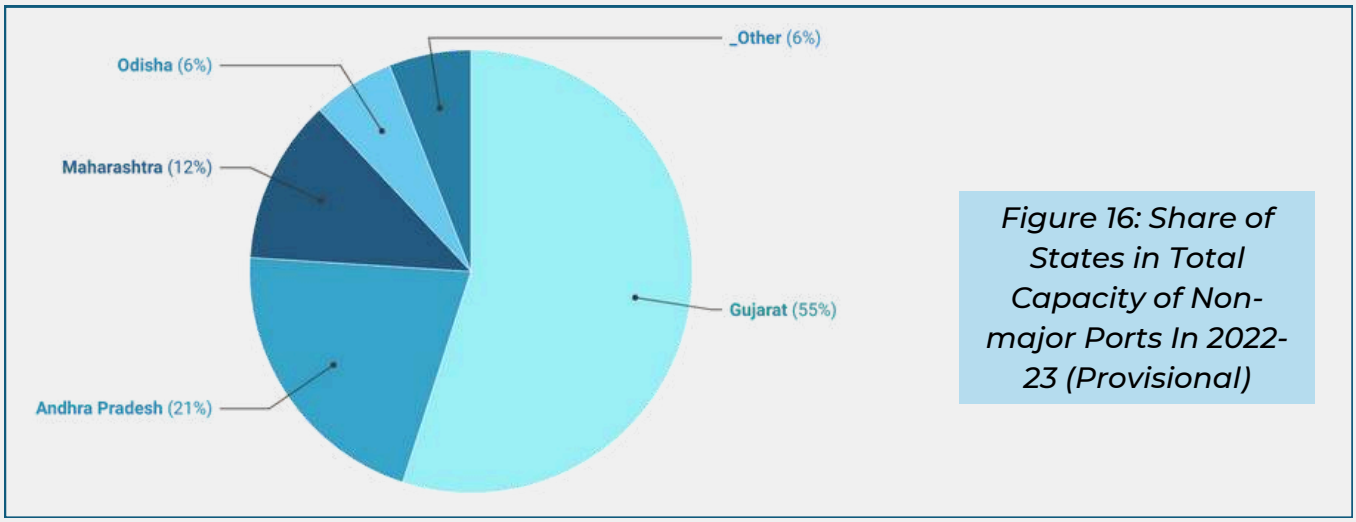


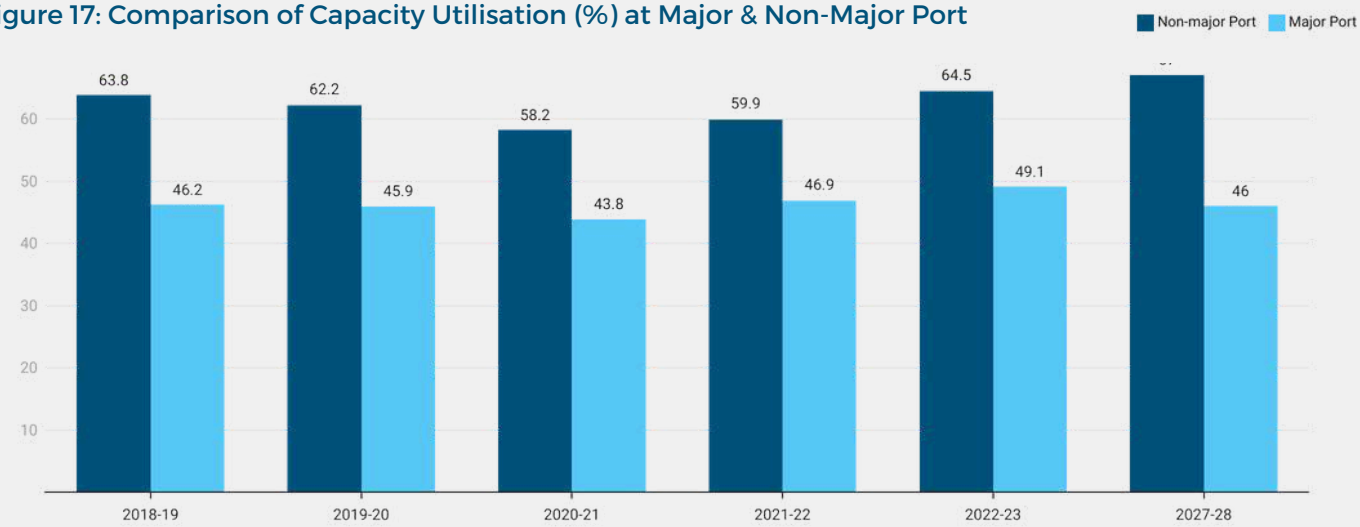
Figure 16: Share of States in Total Capacity of Non-major Ports In 2022-23 (Provisional)

Source: Update of Port Sector [31.03.2023], Ministry of Ports, Shipping and Waterways

This anticipated rise signifies a continued trajectory of growth in the non-major port sector within the nation. Over the last five years, the changes in capacity of (non-major ports) maritime boards/states have been depicted in the Figure 15 and Figure 16.

Notably, the lion's share of this capacity, totaling over 93%, is contributed by four key maritime states: Gujarat, Andhra Pradesh, Maharashtra, and Odisha, in descending order. This concentration highlights pivotal role these states play in the non-major port sector, serving as vital hubs for maritime activities and trade operations. The capacity utilisation at non-major ports surpasses that of major ports, indicating more streamlined and efficient business operations at these facilities. Industry experts suggest that maintaining optimisation levels around 70% is advantageous, as it indicates a balance between capacity utilisation and avoiding overcrowding.

Figure 17: Comparison of Capacity Utilisation (%) at Major & Non-Major Port



Source: Update of Port Sector [31.03.2023], Ministry of Ports, Shipping and Waterways and BRIEF insights

This optimal utilisation ensures that the port operates efficiently while leaving room for potential growth and flexibility to handle fluctuations in demand without encountering operational constraints. The trends in the capacity utilisation at non-major ports compared against major ports is showcased in Figure 17. Notably, the capacity utilisation of non-major ports stood at 59.9% in the fiscal year 2021-22, demonstrating a subsequent increase of 4.6% to reach 64.5% in 2022-23.

The correlation between capacity building and cargo movement in non-major ports is significant and serves as a driving force for infrastructure development within these ports. There is lack of standardisation in port infrastructure. For instance, ports like Mundra and Pipavav boast state-of-the-art infrastructure, rivaling major ports in India, while others States/UTs, lack adequate facilities. Consequently, infrastructure development closely aligns with the volume of cargo handled by ports, with a few well-equipped ports managing the majority of cargo, as previously highlighted.

Understandably, not all non-major ports can have identical infrastructure. Therefore, it's crucial to explore alternative uses for ports unable to accommodate EXIM cargo movement, such as repurposing them as consolidation centers or feeder ports.

To address this disparity, the study has identified the basic infrastructure available at the top ten non-major ports in India. These findings serve as reference points and benchmarks for other non-major ports across the country.

Apart from the physical infrastructure developed at the non-major ports in India, digitisation of port process is a crucial part for improving Ease of Doing Business. The central government has undertaken to enable the major ports as Smart Ports. This includes digitisation of process through Port Community System (PCS), promoting of Direct Port Delivery and Direct Port Entry services, tariff transparency, and establishing PGAs in port premises. Further, the government is implementing Enterprise Business System to simplify and digitise processes (from 1800+ to ~200 processes) across major ports. However, these initiatives are only implemented at major ports.

Consequently, non-major ports still rely on manual processes, significantly affecting their cargo handling prospects by impacting cargo release times and overall

Table 1: Basic Infrastructure at top 10 Non-Major Ports

NAME OF PORT	CAPACITY (MMT)	DRAFT (METRE)	INFRASTRUCTURE
MANDVI MUNDRA PORT AND SEZ	264 MMT	18m	• State-of-the-art rail mounted quay cranes, high capacity Grab Ship Unloaders (GSUs), fully-integrated high-speed conveyor system. • Twenty-seven berths and two single-point moorings
BEDI SIKKA	14.6 lakh tonnes of coal and 12.20 lakh tonnes of various other products.	10 m	• Single Point Mooring Equipment (SPMs), Jetty Berths for liquid product evacuation, Crude and Petroleum Product storage tanks and related undersea and on-shore pipelines for connecting the SPMs and Jetty with Marine Tank Farm ("MTF"),RO-RO Jetty and other facilities for handling various cargos
KRISHNAPATNAM PORT LIMITED	64 MMT	18.5 m	• Total wharf length of 3250 meters capable of berthing up to 14 vessels • 13 berths • Dedicated CFS having easy access to rail and port complex for smooth movement of containers. • Single Window Clearance:
DHAMRA	45 MMT	17.5 m	• For Import: GSU , Mobile Harbour Cranes, Truck Loading Hoppers and Stacker Reclaimer • For Export: Ship Loader, Stacker Reclaimer, Reclaimer, Wagon Tippler, Track Hopper • Four berths • Potential to handle more than 100 MMTPA of dry bulk, liquid bulk, break bulk, containerised and general cargo in the near future.
MAGDALLA	5 MMT	3.1m – 3.8 m	• Floating Units, Crawler crane, Computerised weighbridge, Vessel Traffic and Port Management System, Radar System, A.I.S, Weather Station, V.H.F., H.F. Sets., Telephone/Fax, Computers and Electronic Charts.
DAHEJ	14 MMT	DHIL : 13m	• Conveyor System: 9.8 Km (6.04 Km + 3.74 Km) long and capacity of 4200/5600TPH
		APDPPL – NORTH: 14m	• Mobile Harbour Cranes: 4 Nos. MHC (2 Liebherr; 2Gottwald)
		APDPPL - SOUTH: 14m	• 3 Nos. Stacker cum Re-claimer with stacking capacity of 4200 TPH and reclaiming capacity of 2500 TPH • 2 Nos. Rapid Wagon Loading SILO for rakeloading • India's first high-speed elevated triangular gallery overload conveying system for coal transportation that also eliminates dust pollution. • Mechanised cargo handling systems and wagon loading system • Two dry and break bulk berth,
GANGAVARAM PORT LIMITED	60 MMT	Depth in harbour: 20.2 m	• Maximum vessel size: 200,000 DWT • Vast storage area with Coal stackyard capacity of more than 5 MMT cargo • Fully mechanised coal terminal with two berths for handling two Capesize Coal Vessels simultaneously • Rake loading capacity of upto 25 rakes per day • State-of-art mechanised handling systems, facilitating fast and efficient operations with minimum cargo loss. • Berthing facilities: 9 berths with upto 19.5m water depth
MAGDALLA ADANI HARIZA PORT	30 MMT	Maximum permissible draft at MP 01, 02 & 03 and CB 01 & 02 is 14.0m, MP 04 is 13.0m.	• Liebherr Cranes, Grabs, MP-2: Mechanised Conveyor System, Hoppers (Rail Mounted) , Hoppers (Rubber Tyre), Quay Cranes, E Rubber Tyre Gantries
		Water Depth in approach channel: 15.5m	• Potential to handle 75 MMTPA of cargo in the coming years.

NAME OF PORT	CAPACITY (MMT)	DRAFT (METRE)	INFRASTRUCTURE
KAKINADA SEAPORT LIMITED	20 MMT	12 m	• Quay length: 2,500 Mtrs. • 11 berths with 2400m length • Mobile Cranes: 4 x 125 ts • Potential: 10 MMPTA terminals for import of Liquified Natural Gas (LNG) using FSRUs
JAFRABAD GUJARAT PIPAVAV PORT	• 1.35 million TEUs of containers; • 4 - 5 MMT of dry bulk cargo • 2 MMYT of liquid cargo and about 250,000 cars per year.	14.5m at chart datum	• Quay length: 735m (350m, 385m) • Operational Capacity - Gottwald Cranes –2 nos • Covered Warehouse • There are three fully functional Container Freight Stations (CFS) located between 2 and 8 • Kilometres from the container berths at the port - Logix Park, Contrans Logistics and CWC.

Source: BRIEF insights

logistics costs. While some top non-major ports have developed their own digital systems to streamline operations and drive growth, this isn't the case for all ports. Furthermore, the level of digitisation varies widely among top ports. Therefore, there's an urgent need for increased focus and attention on developing and improving both soft and hard infrastructure at non-major ports.

KRISHNAPATNAM

The Single Window Clearance has enabled the stakeholder to complete various cargo distribution operation faster. It further provide end-to-end services from stevedoring to customs documentation and enables smooth operation and distribution.

KAKINADA PORT

It enables speedy clearance of goods.

MAGDALLA PORT

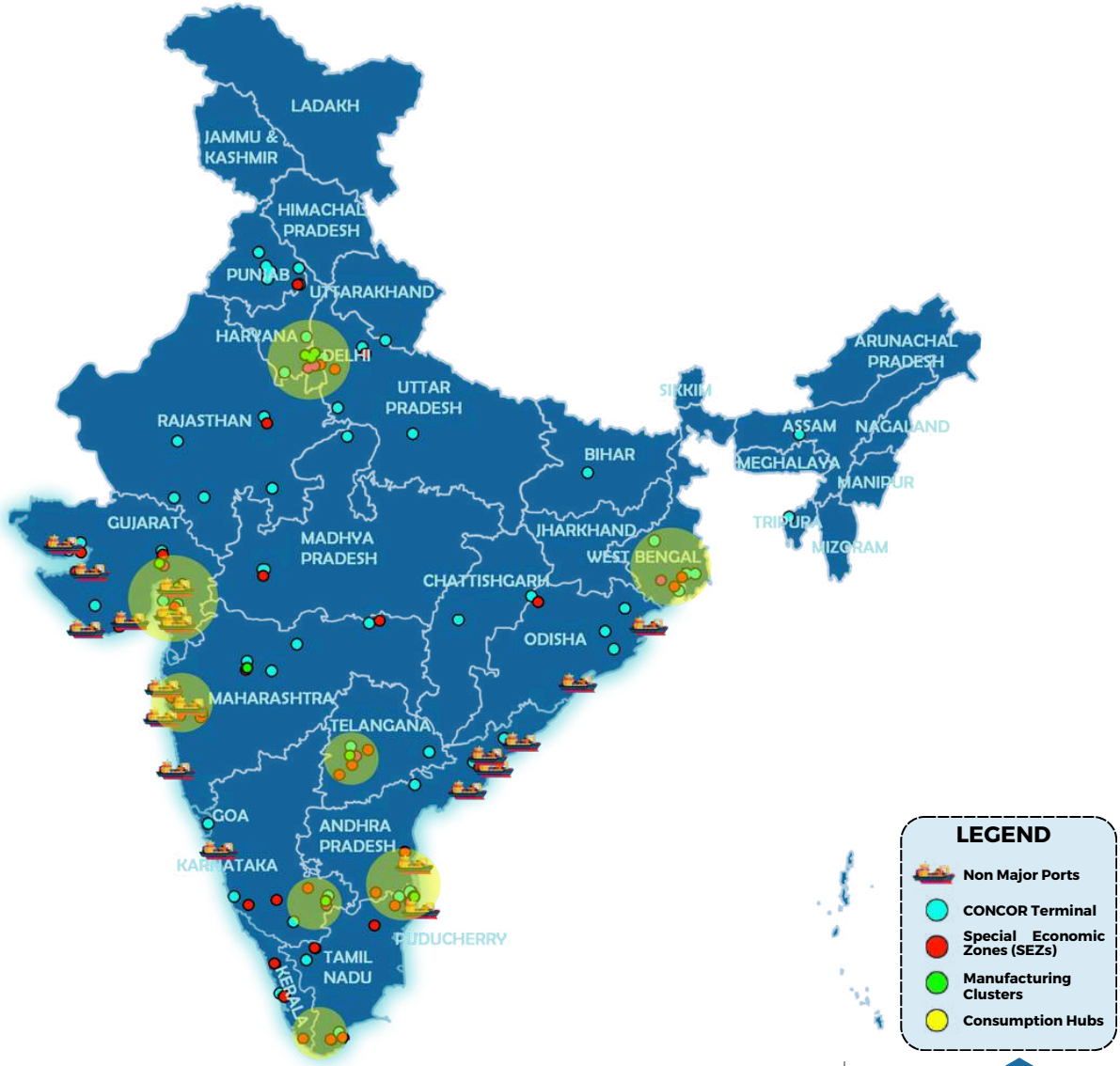
VTMS ensures safer navigation, more efficient traffic flow, and protection of the environment. Traffic flow in busy approach routes, access channels, and harbours are being coordinated safely, in the best interest of port and its users.

2.4. CONNECTIVITY

Ports serve as vital nodes in the global trade network, facilitating the movement of goods and fostering economic growth on both regional and international scales. The significance of market access for ports cannot be overstated, as it directly influences their efficiency, competitiveness, and overall contribution to economic development. Market access stands as a cornerstone of economic prosperity, particularly in the context of port operations. Market access for the top non-major port is attached as Annexure- III.

Probable market access after development of Coastal Economic Zones (CEZ) proposed under Sagarmala Programme. These CEZ envisions ports to actively participate and contribute to economic development of India similar to other large global ports are Probable market access after development of CEZ proposed under Sagarmala Programme. These CEZ envisions ports to actively participate and contribute to economic development of India similar to other large global ports are doing for their respective nations. Fourteen coastal economic zones have been identified along the coastline of the country, with each coastal state having one or more CEZ. These list of 14 CEZ is apprehended in Annexure IV.

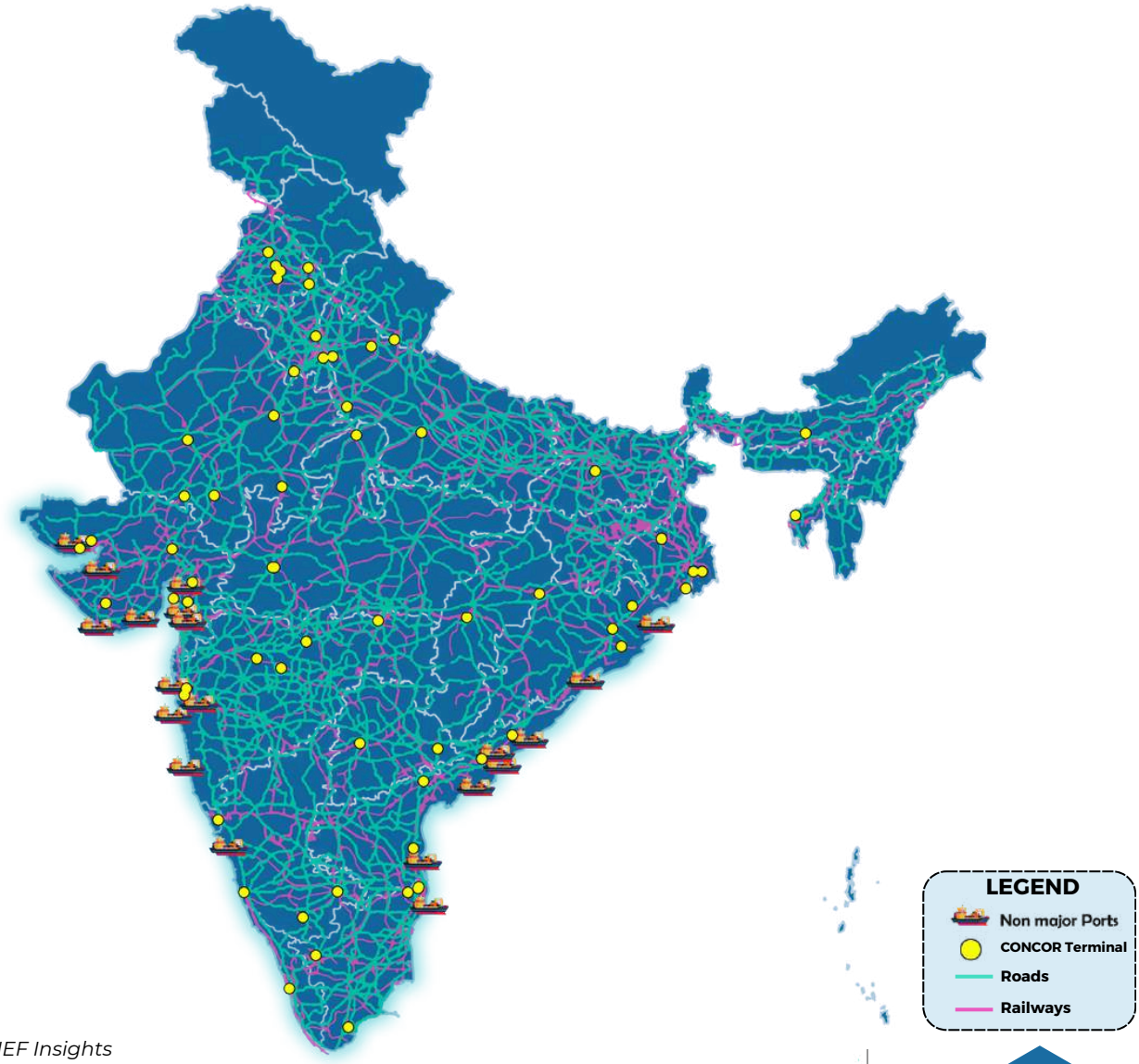
Map 2: Non-Major Ports and Clusters



Source: BRIEF Insights

Access to economic zones and clusters is vital for non-major ports as it provides strategic advantages, including proximity to industrial hubs and streamlined trade policies. This access not only facilitates trade flows but also attracts investment and stimulates infrastructure development, thereby enhancing the port's role in global supply chains and contributing to economic growth. Leveraging their proximity to clusters, non-major ports can identify their base cargo and prioritise infrastructure development accordingly, allowing them to specialise and optimise their operations. Further, ensuring robust connectivity to link various stakeholders, including shippers, carriers, manufacturers, and consumers is critical. Effective connectivity encompasses multiple dimensions, including physical infrastructure, digital systems, and logistical networks, all of which must work in harmony to facilitate the smooth movement of goods. From the above, it's evident that leading non-major ports serve as vital nodes for last-mile connectivity, leveraging road, rail, & coastal shipping infrastructure. List detailing the available connectivity at top non-major ports is provided in Annexure V. Nevertheless, there is considerable scope for improvement among other non-major ports to augment their connectivity & operational efficiency. Therefore, there is a pressing need for focused research on route planning for these ports.

Map 3: Non-Major Ports and Connectivity to Road and Rail



Source: BRIEF Insights

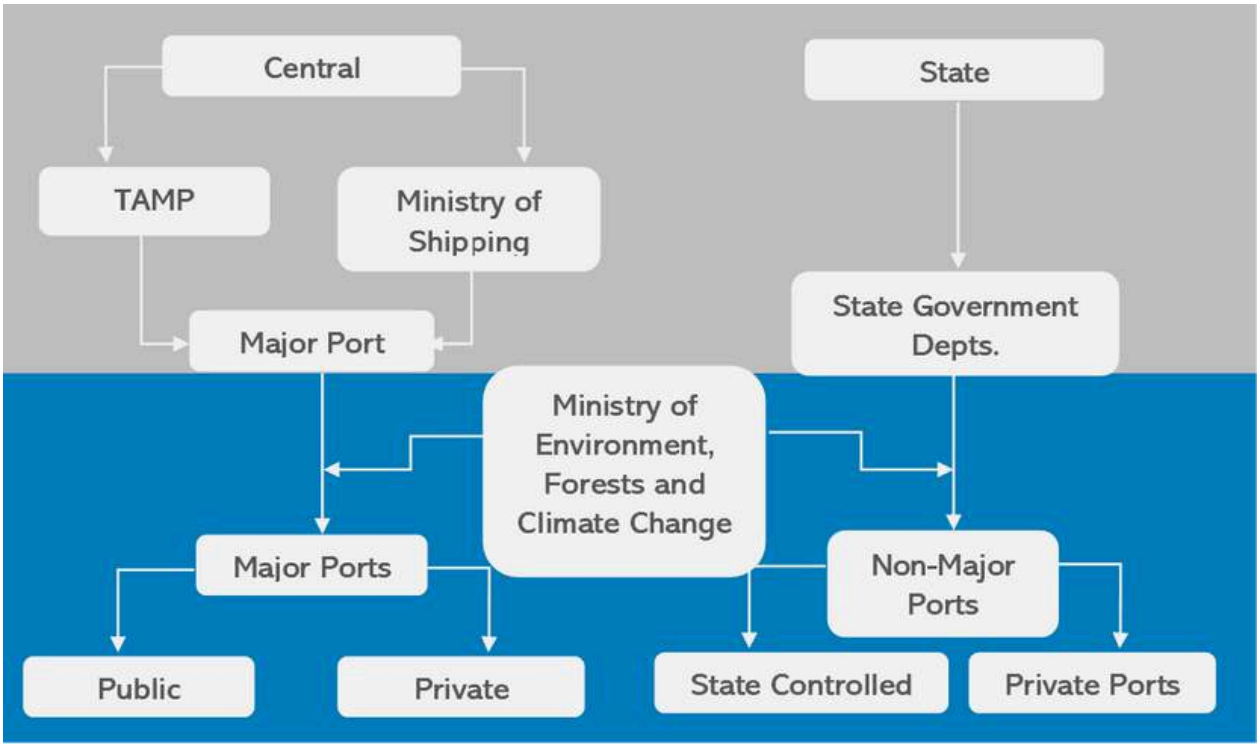
2.5. REGULATORY ECOSYSTEM

India's maritime infrastructure, encompassing major and non-major ports, operates within a robust legal framework. Governed by the Indian Ports Act of 1908, this legislation delineates the jurisdiction of the Central and State Governments over these vital facilities. It establishes rules for shipping safety, port amenity conservation, and administrative matters like port dues.

Major ports fall under the purview of Boards of Major Port Authorities, as mandated by the Major Ports Authorities Act of 2021. These boards, comprising 11-14 members, oversee the administration, control, and management of major ports.

Conversely, non-major port development within maritime states falls under State Governments' jurisdiction, without requiring Central Government permission. State Maritime Boards are responsible for formulating waterfront development policies, regulating minor ports, attracting private investment, and enforcing environmental standards. While port policies are available for five states and draft policies exist for two others, non-major ports typically operate through concession agreements with private sector participation, employing models like Build-Own-Operate or Build-Own-Operate-Share-Transfer.

Figure 18: Regulatory Framework of Indian Ports

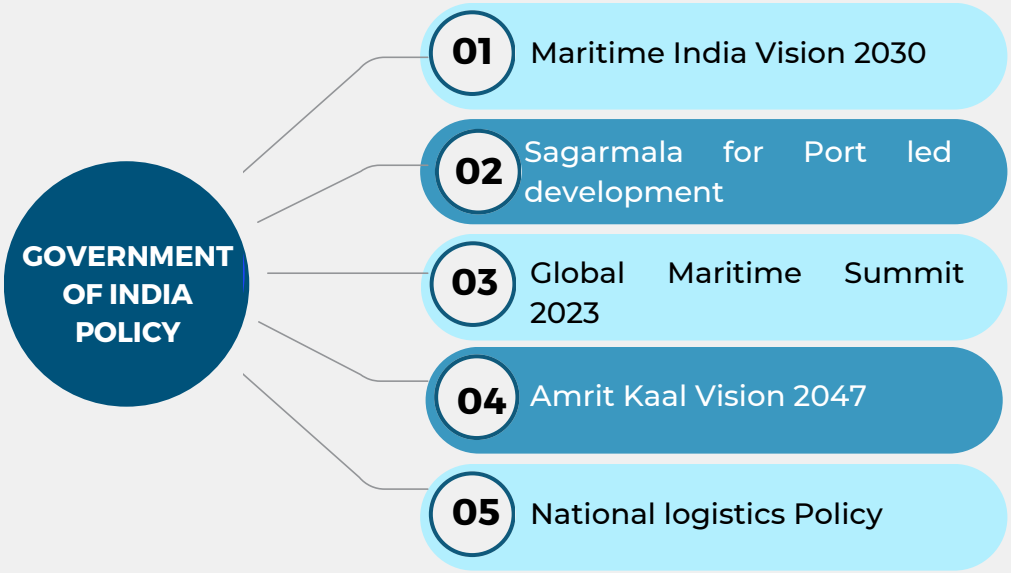


Traffic management at non-major ports lacks regulatory oversight and is driven by market dynamics, influencing fee structures, with limited public access to this information. Conversely, infrastructure investment and tariffs at major ports are controlled by port boards and accessible on respective port websites. Non-major port policies predominantly emphasise leveraging coastal advantages to bloster national and international trade, port-led industrialisation, establishing industrial clusters, infrastructure development to attract private investment, and enhancing the business environment. While sustainability aspects are acknowledged, detailed actionable plans are lacking in the public domain.

Further, there are several initiatives undertaken by the Government that encompasses both major and non-major ports in India.

Over the last decade, several iniatives such as Sagarmala programmer, Maritime India Vision 2030, Maritime Amrit Kaal Vision 2047 and other have been launched to develop the maritime industry in India.

Figure 19: Policy Framework for Port sector



1

Maritime India Vision 2030

Aimed at enhancing the performance and productivity of the maritime sector, it identifies over 150 initiatives across various sub-sectors such as ports, shipping, and waterways. These initiatives focus on improving operational efficiency, fostering port-driven industrialisation, and creating safe and sustainable ports to meet growing trade volume needs while reducing logistics costs.

Sagarmala for Port led development

2

Approved by the Union Cabinet in March 2015, Sagarmala aims to develop India's coastline and maritime sector through the National Perspective Plan (NPP). The vision is to reduce logistics costs for both EXIM and domestic trade by optimising modal mix, locating future industrial capacities near the coast, developing port-proximate manufacturing clusters, and streamlining EXIM container movement.

3

Global Maritime Summit 2023

This summit, spanning three days, addresses key issues in the maritime sector, including future port development, decarbonisation, coastal shipping, shipbuilding, finance, innovation, safety, security, and tourism. It serves as a platform to attract investment into India's maritime sector.

Amrit Kaal Vision 2047 : Blueprint for the Indian maritime blue economy

4

This blueprint outlines strategic initiatives for enhancing port facilities, promoting sustainability, and fostering international collaboration to support India's maritime blue economy.

5

Proposal for Maritime Development Fund

A proposal aimed at establishing a Maritime Development Fund to provide competitive long-term financial assistance to the shipping sector.

Moving forward, there is a need for greater transparency and standardisation in port governance and policies across states, with a focus on sustainable development and fostering private sector investment. Actionable plans for sustainability, alongside efforts to streamline regulatory processes and enhance transparency, will be essential for optimising the contributions of both major and non-major ports to national and international trade and commerce.

POLICY LEVEL CONVERGENCE AT NON-MAJOR PORTS

While not all State or State maritime boards have notified their port policies governing non-major ports, several common denominators emerge in the policies that have been implemented. These policies reflect a growing recognition of the importance of standardised guidelines in fostering efficiency and competitiveness within the maritime sector.

Firstly, these policies focus on enhancing port governance by establishing frameworks for effective management, streamlined operations, and transparent decision-making processes. Thus, creating a conducive environment for maritime activities. Secondly, they also emphasise capacity utilisation strategies to accommodate increasing trade volumes efficiently. This proactive approach enables non-major ports to efficiently accommodate growing trade volumes, thereby significantly contributing to the nation's economic activities.

Moreover, these policies promote port efficiency through the adoption of sustainable practices, including eco-friendly technologies, waste reduction initiatives, and energy-efficient measures. Furthermore, they integrate port activities with regional and community development efforts, fostering economic growth and local prosperity. Overall, state port policies serve as strategic frameworks that strengthen the nation's port infrastructure and drive economic development.

2.6. BENCHMARKING

In this section, two prominent non-major ports in the East and West Coast (Dhamra and Mundra respectively) are benchmarked against a major port JNPA and the top international port in the world (Shanghai Port). This exercise is done on the five parameters, namely, infrastructure (including digital), cargo handled in FY 2022-23, capacity utilization, sustainability measures undertaken, capacity building initiatives, and economical/trade impact of the port.

Table 2: Benchmarking of Non-Major Port

PARAMETERS	MAJOR PORT- JNPA	NON-MAJOR PORT MUNDRA	NON-MAJOR PORT DHAMRA	INTERNATIONAL PORT SHANGHAI
INFRASTRUCTURE	JNPA houses 5 Container Terminals, one Liquid Bulk terminal and one Shallow Water Berth for general cargo. These terminals are well supported with excellent backup infrastructure like good rail/road connectivity, 34 nearby CFSs, rail connectivity with 50 ICDs, dedicated Custom House, Tank Farm, Airport, Hotels, proximity to Mumbai, Pune, Nasik city and its industrial belt etc.	The deep draft, all-weather port is the largest commercial port in India with state-of-the-art infrastructure, Largest Coal Import Terminal which gives faster cargo evacuation and minimal turnaround time.	With deep draft berths and multipurpose terminals, the port efficiently handles the largest bulk carriers in the world. The port has covered and open storage areas with enormous capacity.	The port of Shanghai has a total of 43 container terminals, 191 berths, and 156 container cranes. It can accommodate the largest container ships in the world, such as the Maersk Triple E class, which can carry up to 18,000 TEUs. The port also handles various types of cargo, such as bulk, liquid, break-bulk, and ro-ro (roll-on/roll-off).
	Navigational channels have a draft of 15 mts thus can berth larger vessels up to 12500 TEUs	With deep draft berths and multipurpose terminals, the port efficiently handles the largest bulk carriers in the world. Total covered storage area for 7 LMT of cargoes inside Port & 3 LMT at Agri park	Fully mechanised import & fully mechanised export berths for faster turnaround of vessels.	
	Multiple CFS with rail connectivity to port	5 container terminal and approx. 8 million TEU container terminal capacity	Specialised facilities for ensuring clean and contamination free handling of cargo.	
	Coastal movement handled separately through shallow water berth			
DIGITAL	RFID Based Terminal Gate transaction	Enabled Integrated Transport Utility Platform (ITUP) system		World's largest automated container terminal
	Container tracking	Implemented Data Lake to help the organisation identify and act upon the opportunities for faster business growth. This has optimised resource utilisation and empowered decision making		Blockchain Application in the port clearance system
	JNPA Call Centre and Mobile App	Enforced Gate Automation to reduce turnaround time and manual intervention to become future ready		A comprehensive service information platform of the Yangtze River transportation network was developed. This helps in establishing an information exchange mechanism and unifying data exchange standards for various container terminals along the Yangtze River basin.
	E Delivery Orders	Developed mobile application SafetyApp to enhance safety preparation and develop a quick response mechanism. This was started at Mundra and shall be rolled out to other APSEZ sites		Smart command and control center project: This is the first project in the world to apply optical networking technology for centralized remote control in ports
	Up-gradation of PCS System			
	Up-gradation of Navis System with Navis N4 Terminal Operating System			
	Online Port Driving Permit			

PARAMETERS	MAJOR PORT- JNPA	NON-MAJOR PORT MUNDRA	NON-MAJOR PORT DHAMRA	INTERNATIONAL PORT SHANGHAI
CARGO HANDLED (2022-23)	83.86 MMT (2022-23)	6.6 million TEUs (2022-23) 155 MMT (2022-23)	31.28 MMT (2022-23)	47.3 million TEU (2022) 698.27 MMT (2021)
CAPACITY UTILISATION	53.76%	58%	69.50%	
LAST-MILE CONNECTIVITY	Connected through • Road Network • Railway Network	Connected through • Road Network • Rail Network • Cross-country pipelines	Connected through • Road Network • Rail Network	Connected through • Road Network • Rail Network • Canal Network
SUSTAINABILITY	As per the direction of Ministry of Shipping GoI on Green Port Initiative, JN Port has prepared an action plan covering all activities of the Port including cargo handling, storing, evacuation and many other activities related to environmental protection.	Mundra Port invested in renewable energy (solar and wind)	Development of site-specific Biodiversity Management Plan	Shanghai as global first berths "Astrid Mærsk" (large methanol-enabled vessel) at Yangshan port. It is the first green methanol bunkering with simultaneous cargo and bunkering operations in China.
	Some of the Green Port Initiatives include operationalisation of new Sewage Treatment Plant, Monitoring of Environmental Management Plan, Development of Eco Park, Green Skill Training, projects related to using of renewable energy, Energy saving /conservation projects, facility to respond to an oil spill of Tier I magnitude, marine conservancy, comprehensive plantation, Prohibition of disposal of all kind of garbage in the sea, MARPOL provisions and sustainable development and operation.	The port implemented efficient water consumption, waste management and environmental conservation Mangroove afforestation Green zone development Biogas plants in Mundra and Kattupalli serve as a foundation of circular economy commitment, focusing on nutrient recycling and reducing greenhouse gas emissions.	Zero waste to landfill	The water-to-water transhipment ratio of containers has reached more than 50%, the ship-to-ship synchronous LNG bunkering service has achieved normal operation, and about 97.95% of the operating ships have been renovated with shore power receiving facilities. The Ports of Shanghai and LA creates the world's first Green Shipping Corridor. The primary aim of the partnership is to lower the emission of greenhouse gases for moving cargoes between the largest ports in the U.S. and China.

PARAMETERS	MAJOR PORT - JNPA	NON-MAJOR PORT MUNDRA	NON-MAJOR PORT DHAMRA	INTERNATIONAL PORT SHANGHAI
ECONOMICAL IMPACT	JNPA developed a multi-product SEZ in its owned freehold land of 277.38 hectares at Navi Mumbai. The multi-product port-based JNPA SEZ aims to boost exports by enabling port-led automation under the Sagarmala initiative of the Ministry of Ports, Shipping and Waterways	Mundra port established Automobile Roll On – Roll Off (RO RO) Terminal in the year 2009 and since then has been serving as a gateway port for Automobile companies situated in Delhi NCR, Rajasthan and Gujarat region. World's largest private single location thermal power plant is an integral part of Mundra SEZ.	Industrial Zones (IZ) across various Ports of APSEZ are being planned to increase Industry led Port Growth, including at Dhamra Port, a Capesize Port with LNG terminal having potential for attracting various Industries	Development of new industries, including bonded maintenance services, inbound and outbound distribution and key industry remanufacturing Shanghai Customs has been actively promoting bonded maintenance services for strategic goods – such as aircraft and automobiles – within the China (Shanghai) Pilot Free Trade Zone, creating a raft of trade opportunities at the port. Shanghai has also taken the lead in key industry remanufacturing, with Shanghai Zhenhua Heavy Industries Co Ltd getting the green light to repair and refurbish old port machinery for re-export.
CAPACITY BUILDING	Green Skill Training	Development OHS (Occupational, Health, Safety) Excellence Center		Shanghai Port Education and Training Center was established, where an annual employee education and training plan has been developed. It contains training courses related to the port's digital development, mainly related to technology and management.
	JNPA Antwerp Port Training and Consultancy Foundation	Local managers at all locations till top level undergo training programs focused on how to undertake stakeholder engagement.		Shanghai Port has developed a virtual reality tire crane simulation operating system, officially installed in the education and training center.
	JNPA-CIDCO Multi-Skill Development Centre	Training as part of ESG program 12090 trainings conducted on behavioral training & E-learning		

From the above benchmarking, it may be observed that both top major and non-major ports are equipped with similar physical and digital infrastructure, reflecting the need to develop world-class infrastructure at the ports. It also highlights the importance of identifying the primary cargo of each port. For example, Dhamra primarily handles coal, and accordingly, it has invested in developing bulk cargo handling capacities. Similarly, JNPA and Mundra have focused on enhancing their container handling capacities to align with their operational needs. On the digital front, while major and non-major ports have integrated digital initiatives into their operations, it is evident that the top international port is significantly ahead in this aspect. The integration of blockchain technology into the port ecosystem and the standardisation of data exchange between multiple ports are crucial for the future operations of ports.

Regarding capacity handled and utilisation, Mundra has surpassed major ports in India. As discussed earlier, the capacity utilisation at non-major ports slightly exceeds that of major ports. It's worth noting that all the top ports in India and the Shanghai port are well connected to multimodal transportation networks, which are essential for the smooth evacuation of cargo from the ports.

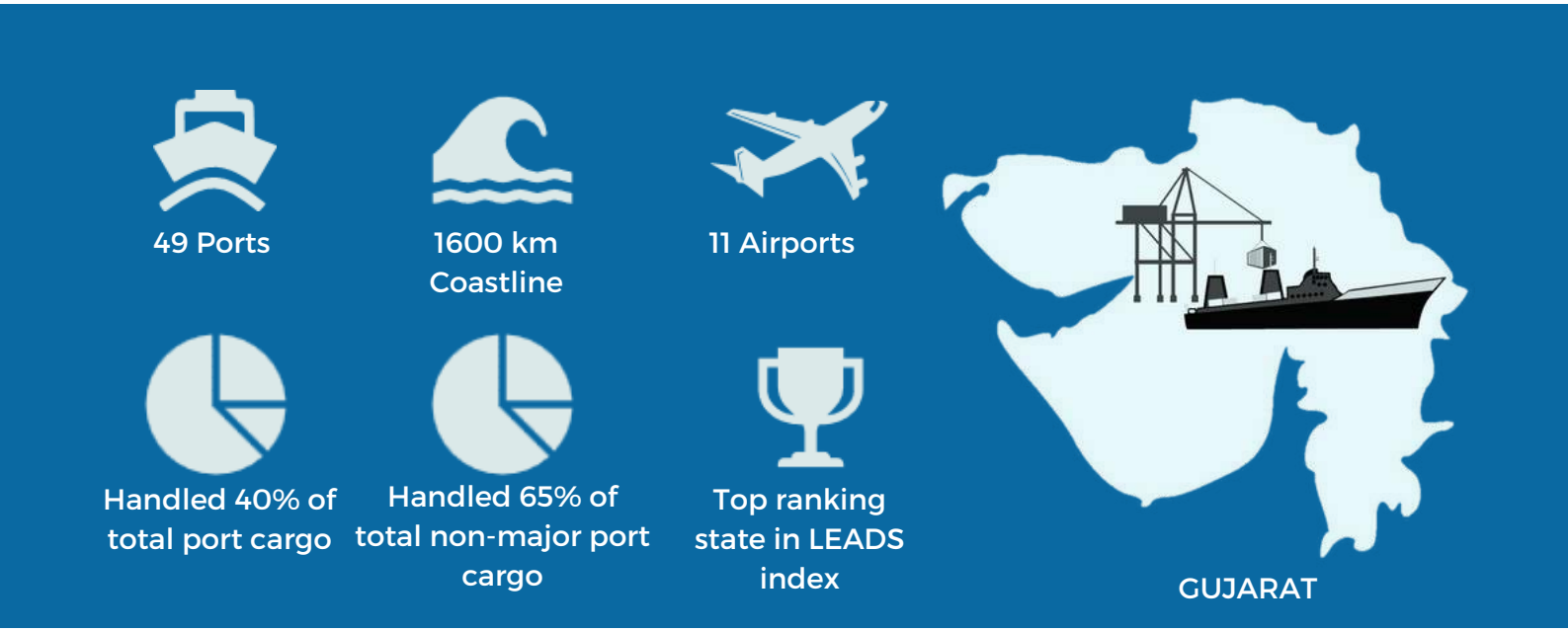
Efforts are underway both nationally and internationally to decarbonise the maritime industry, with a focus on sustainability in operations. Major ports are concentrating their efforts under the Green Ports and Harit Sagar initiatives of the Government of India, while private ports are aligning with the nation's commitment at the global level through their corporate social responsibility initiatives. International ports are exploring various innovations and new practices in port operations to promote sustainable and environmentally responsible port activities.

Efficient ports are central pillars of the trade ecosystem in the country. In recent decades, ports have prioritised improving the ease of doing business and have invested in creating industrial clusters and zones in the vicinity of ports. From the data presented, it's evident that establishing industrial clusters brings multiple advantages to ports. These clusters ensure a steady supply of cargo to the port and facilitate the port's development as a hub for specific industries. For instance, Mundra has become a gateway port for automobile exports for Northern India through the establishment of an Automobile Roll-on and Roll-off facility. Major ports like JNPA and non-major ports like Dhamra are also following suit by initiating the establishment of SEZ in the port's vicinity. Additionally, the port of Shanghai has pioneered new trade opportunities, such as re-manufacturing and re-exporting old port machinery.

Finally, all ports have developed modules, training programs, and exercises for their port operations and personnel. These capacity-building initiatives are critical to ensuring optimal port operations and to upskilling employees for new opportunities in the industry. Overall, while major and non-major ports may operate on different scales, Indian ports are aligning themselves with developments at the top international ports and focusing on similar parameters to guide their operations.

CASE STUDY

GUJARAT: A MARITIME SUCCESS STORY



CASE STUDY - GUJARAT: A MARITIME SUCCESS STORY

Gujarat, situated on the western coast of India, stands as a pivotal maritime state endowed with strategically advantageous port locations. Its approximately 1600 kilometers long coastline, constituting one-third of India's coastline, positions it as a key maritime outlet to regions such as the Middle East, Africa, and Europe.

The state's proactive approach is evident in its formulation of the 'Gujarat Integrated Logistics and Logistics Park Policy 2021' and its consistent top ranking in Logistics Ease Across Different States (LEADS) for three consecutive years up to 2021. Moreover, Gujarat's recognition of the logistics sector's industry status, along with special incentives and provisions, underscores its commitment to fostering a conducive environment for logistics stakeholders.

Over the years, Gujarat has significantly bolstered India's export sector, with its contribution soaring from 20.25% in 2019-20 to 30.05% in 2021-22[5]. The primary export commodity is petroleum, followed by gems, stones and precious metal.

The State has 49 ports, including one major port (Kandla) and 48 non-major ports. Out of 48 non-major ports, traffic is handled at 17 ports. The remaining 31 ports are used for fishing activities and have negligible traffic.

Impressively, from April to February 2024, Gujarat Maritime Board handled 62.08% of the total cargo handled by non-major ports nationwide, followed by Andhra Pradesh (16.40%), and Maharashtra (10.47%). Overseas traffic was 363.81 million tonnes with the remaining 43.31 million tonnes being coastal traffic. As of 2022-23, the capacity utilisation in Gujarat's non-major ports reached 75.42%, handling 416.36 MMT against a capacity of 552.00 MMT[6]. Which a big boast from capacity utilization at all non-major ports and major ports at 64.5% and 49.1% respectively.

On the back of these impressive numbers, Gujarat has clearly emerged as a flagbearer of the Indian maritime success story. It is critical to delve into and understand the backdrop and reasons for the success of non-major ports in Gujarat, especially from

[5] Export Preparedness Index 2022, NITI Aayog | July 2023
[6] Updates on Indian Port Sector 31.03.2023, Ministry of Ports, Shipping and Waterways | September 2023

the perspective of gaining insights and lessons for other states that are operating non-major ports in the country.

- **Strategic Location**

One of the major factors enabling the ports in Gujarat is its proximity to a vast hinterland consisting of fast-developing northern and central Indian States (such as Rajasthan, Madhya Pradesh, western Uttar Pradesh, Delhi, Haryana, Punjab, Himachal Pradesh, and Jammu & Kashmir), which constitute 35% of the country's total exports [7]. Any economic development, taking place in these hinterland states have a direct bearing on Gujarat ports. For example, the distance between Delhi NCR and Mundra port is almost 1200 km compared to JNPA Delhi NCR distance of approximately 1500 km. This difference of 300 km translates into significant cost and time efficiency for traders in northern part of the country which has resulted in cargo diverting to ports in Gujarat from other ports in Maharashtra.

- **State's Economic Growth**

Gujarat with a gross state domestic product of USD 216.74 billion in 2020-21 in nominal terms constituted 8.36 % of India's GDP in 2020-21[8]. Manufacturing contributed more than 35 % of Gujarat's GSVA in 2021-22 which is among the highest in India. With a strong industry base, the state consumes and produces large volume of cargo that feeds into the state's major and non-major ports.

- **Multimodal Infrastructure**

Gujarat has one of the country's most extensive and traffic-intensive highway networks. As of 2020-21, it had a combined total road length of 17,000 km of State highway and 6000 km of national highway. Gujarat's national highway network has benefited from the Golden Quadrilateral and the National Highway Development Program.

The state's share in Golden Quadrilateral stands at 18% of the length of the highways. 30% of the length of the new Mumbai-Delhi expressway passes through Dahod – Godhra – Vadodara – Surat. Further, a total rail network of 5300 km and its track km per capita is 4.3 which is relatively higher than Rajasthan and Maharashtra at 3.5 and 2.5 respectively. Gujarat's freight carrying capacity is supplemented with a Dedicated Freight Corridor (DFC) with 6 key industry nodes connected to the DFC. Gujarat has 11 operational airports with 2 international and 9 regional airports. Ahmedabad and Surat are the key airports operating as air freight terminals, while other airports have limited air freight movement.

- **Regulatory Support**

A supportive and enabling regulatory ecosystem has enabled non-major ports in Gujarat to flourish. Gujarat was the first Indian state to have a dedicated maritime authority in 1981 and a port policy formulated in 1995. More than the maritime authority, it was the port policy that opened the doors for a port-led development in Gujarat.

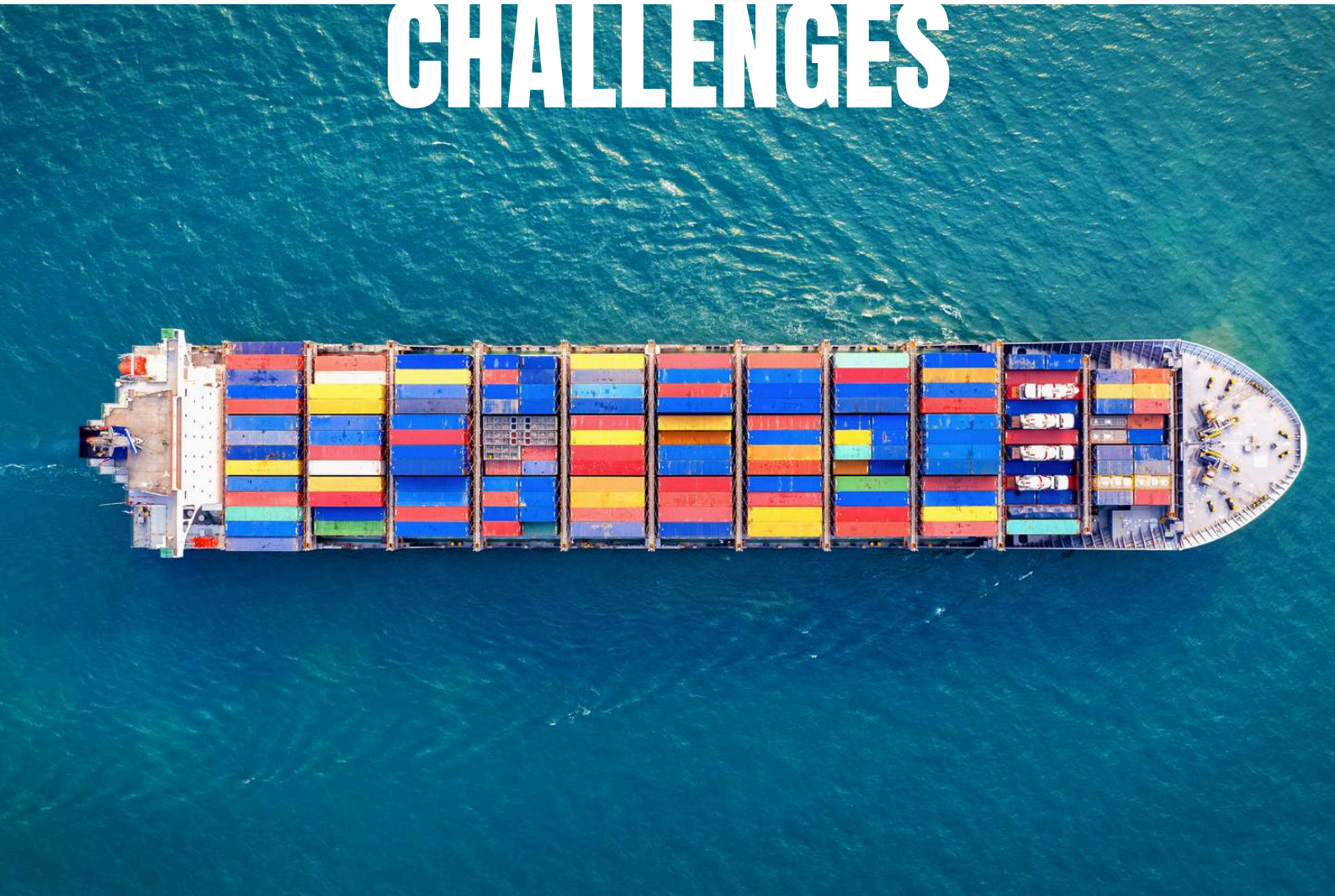
The port policy allowed private partnership and tariff freedom that led to port-led development in the state. Tariff freedom has attracted large private investors to Gujarat's ports. Investors did not view the tariff mechanism of major ports in India as conducive. As per them the partnership model was not giving any incentive to the private port operator. On the other hand, Gujarat's public-private partnership model with tariff freedom seemed more attractive to investors. Further, the state government took significant strides in the development of SEZ, attracting manufacturing hubs and amplifying industry base in the state which further amplified port operations.

[7] Port Policy, Gujarat Infrastructure Development Board
[8] Strategy for Government of Gujarat to enable India to become a USD 5 trillion economy, Task Force Committee, Finance Department, Government of Gujarat | May 2022

These enablers have provided the non-major ports with much needed support ecosystem to operate efficiently. Among Gujarat's non-major ports, Mundra port emerges as a standout performer, contributing 35.6% of the cargo handled across the state. It serves as a compelling example of increased privatisation and port-led industrialisation within the Indian maritime sector. Positioned at the northern side of the Gulf of Kutch, Mundra port has witnessed an exemplary rise over the past decade, making it one of the top 10 busiest ports in the country.

Apart from the multimodal facilities provided by the state, Mundra has its own airport planned as an international air cargo hub. Presently the air runway strip is 900 meters which is to be expanded to 4500 meters. Further, Mundra Panipat Pipeline (MPPL) consists of a 74 km long pipeline from Mundra to Churwa, which connects to the existing system of the Kandla-Panipat section of the erstwhile Kandla-Bhatinda pipeline near Gandhidham. Further, the Mundra-Anjar pipeline enables the transfer of natural gas from the Mundra LNG terminal to the existing Gujarat State Petronet, a high pressure gas grid. Adequate expansion of maritime capabilities has made Gujarat one of the most developed maritime states in India. With the state being India’s gateway in the commercial sector with 1600 km of coastline, Gujarat today has a chemical port, a container port, and a recycling port, along with the first compressed natural gas port also envisioned to be built in the near future. Gujarat is well-connected with all major port-based trade routes and has road, rail and air connectivity to major trade centres across the globe, thus offering vast international trade opportunities, making it one of the preferred maritime destinations of the world.

CHAPTER-3
CHALLENGES



The non-major ports, despite their contribution to maritime trade, face myriad of challenges that impede their efficiency and development. Due to the non-centralised operations of non-major ports, these challenges need concerted efforts from multiple stakeholders to facilitate trade and enhance port operations. Addressing these issues is vital for enhancing the contribution of non-major ports to India's maritime trade and overall economic growth.

The challenges can be broadly categorised into three sections -

- Infrastructural challenges
- Operational challenges
- Regulatory challenges

INFRASTRUCTURAL CHALLENGES

Siloed Approach to Port Development

Non-major ports often operate without sufficient support infrastructure and integration with ancillary government institutions for even basic access and efficient port operations. The support includes connectivity infrastructure like roads, railway lines, etc. Many non-major ports lack proper road and railway infrastructure for better hinterland connectivity.

For example, the Pipavav port in Gujarat, operationalised in 1998, recently got connected through the national highway network. Such a siloed approach has led to redundancy in port operations. The inaccessibility to ports can become a major deterrent to future port prospects by limiting the port users to utilise port capacity. Further, the lack of an integrated system on ports leads to manual interventions in the port process that increase both the time and cost of doing business.

Lack of proper planning

The absence of a master plan for the development of the port ecosystem like identification of base cargo, proximity to specific manufacturing and consumption hubs, and augmentation of port capacity has resulted in inefficient and unoptimised ports. This is reflected in the port performance of 60-62 operational non-major ports that are handling only 15-20% of the total cargo handled by the non-major ports.

Owing to such problems, these ports continue to lose cargo to the nearby competitors and once cargo volume starts dwindling the port operators start losing incentive on upgrades and augmentation which only aggravates the existing problems.

Inadequate port infrastructure

Major non-major ports suffer from insufficient cargo handling capacities such as berthing facilities, berth numbers, and sufficient length for proper berthing of the vessels. This lack of infrastructure and capacities comes from the non-identification of base cargo for the ports and port forecast. For example, the port of Rameshwaram (Tamil nadu) has the potential for handling dry-bulk cargo, however, it is currently not handling any such cargo due to a lack of suitable infrastructure. Additionally, infrastructure development in the country has primarily been focused on the movement of containerised cargo. This is not viable for non-major ports which often suffer from land and draft constraints. For a diverse country like India, focus on the development of infrastructure facilities for other types of cargo such as dry cargo, and break-bulk cargo is critical to cater to both domestic and international shipments.

Port congestion

The absence of a master plan for ports in India have traditionally been developed with an approach that can best be described as a 'Port before Road' approach, where the port is established before developing other transport infrastructure. In many cases, the modern ports have come up on the existing historical trading sites along the coastline. As the cargo kept increasing the port complimented the surge with capacity augmentations and infrastructure upgrades. The same development could not be seen outside the port in the form of ancillary infrastructural upgrades which created problems of congestion, delays in cargo evacuation, and poor hinterland connectivity. For example, legacy ports like Chennai port face accessibility issues due to the rapid development of the surrounding city, which has hampered connectivity to the port thereby limiting the volume and type of cargo that the port can handle.

Although the port can upgrade its capacity and infrastructure, however, the lack of connectivity outside the port does not allow it to do so. The EXIM cargo of the port has to pass through busy and congested city roads leading to delays which translates into high costs. The inaccessibility of ports by the hinterland industrial clusters also leads to operational and logistical inefficiencies as nearby clusters need to use far-away ports for services. This further leads to a rise in logistics costs and decreases the export competitiveness of products.

Coastal shipping opportunity lost

While there has been a concerted effort by the government to promote coastal shipping as a sustainable mode of transportation, non-major ports face significant challenges in adapting their infrastructure to accommodate coastal shipping operations. This is also reflected in the volume of coastal cargo handled by non-major ports in 2021-22 which is a mere 90 million tonnes as against 170 million tonnes handled by major ports in the same period [9].

Non-major ports have the advantage of strategic locations along the coastline of the country, where cargo could be transferred from a larger port like JNPT, or Mundra or Chennai to smaller non-major ports situated closer to the final destination of the cargo. However, non-major ports have not been able to translate the strategic location advantage into an opportunity owing to a lack of infrastructure.

This means that even if a major port or top-performing non-major port endeavors to establish itself as a primary hub for coastal cargo movement, the infrastructure and facilities necessary to support such operations are lacking at other nodes or non-major ports. Further, the high costs associated with upgrading port facilities for coastal shipping, coupled with additional expenses incurred during cargo handling and transportation, act as deterrents for businesses considering the shift to this environment friendly mode of transport.

[9] Basic Ports Statistics 2021-22, Ministry of Ports, Shipping and Waterways

Limited dedicated berths for coastal cargo

The coastal cargo movement as an alternative to road and rail-dependent cargo transportation has been one of the major initiatives aimed at improving logistics efficiency and bringing down the overall costs. However, the numbers suggest that the coastal shipping cargo volume in the country has been almost stagnant from 258 million tonnes in 2018-19 to 260 million tonnes in 2021-22. The situation on the ground is that the lack of dedicated berths for coastal cargo at ports further exacerbates the already existing pain points in the whole ecosystem. In the absence of dedicated berths, currently, the coastal vessels have to compete with vessels with overseas cargo for a berthing space at the port. Basis the volume of cargo and the economics associated with overseas cargo, most of the time the berths are allocated to vessels with overseas cargo.

Disparities in digitisation across ports

The absence of robust digitisation initiatives poses a significant hurdle for non-major ports. The limited adoption of digital technologies and processes inhibits operational efficiency, data transparency, and stakeholder collaboration. Moreover, outdated manual processes contribute to delays, errors, and inefficiencies across various port functions, including cargo handling, documentation, and regulatory compliance. Furthermore, the government of India through its logistic efficiency and Ease of Doing Business initiatives has focused on select major and non-major ports, resulting in a general lag in the adoption of digital technologies and optimisation reforms among non-major ports.

For example, the PCS is not used by every cargo-handling non-major port. Further, at a time when the country is focusing on paperless trade across ports, there are non-major ports where the entire documentation process is still paper-based. This selective attention has perpetuated disparities in digitisation efforts, leaving many non-major ports struggling to modernise their operations and keep pace with industry advancements.

OPERATIONAL CHALLENGES

Non-standardisation of port process

Non-major ports lack standardised port processes, resulting in a diverse range of operational procedures. Although lack of standardisation is a challenge faced by major and non-major ports equally, however, in the case of non-major ports the extent to which digital initiatives and other reforms have been implemented varies a lot leading to a larger variation of port process.

For example, many non-major ports are using digital platforms compared to others where paper mode is still operational, Further, there are ports that are still not using the PCS. When each port follows its own unique set of operational procedures, it creates confusion and inefficiencies for port users. Without standardised processes, businesses encounter difficulties in understanding and complying with port requirements, leading to delays, errors, and increased costs. Furthermore, the absence of standardisation makes it challenging to implement automated solutions and digital technologies across ports. This limits the

ability to streamline operations, optimise resource allocation, and improve overall port performance. Inconsistent processes also hinder interoperability between different ports and transportation modes, disrupting the flow of goods and increasing transit times.

Lack of transparency on tariffs

Port users have consistently raised concerns regarding the unavailability of tariffs within most of the non-major ports. Especially when compared to the transparency offered by major ports, where prices are readily accessible and posted on the port's website. This leads to ambiguity and unpredictability in the charges levied on port users. This opacity in pricing mechanisms not only complicates financial planning for businesses but also introduces an element of risk and uncertainty into their operations. Consequently, the inability to accurately forecast costs leads to higher expenses associated with trade activities, ultimately eroding the competitiveness of businesses operating through these ports.

Inadequate promotion for non-major port

Non-major ports have not received adequate promotion and marketing from the government compared to major ports. As a result, they often suffer from a negative image characterised by slow evacuation, issues with last-mile connectivity, and inadequate facilities. Ambiguity amongst the trade about the port capacity has led to increased insurance charges by global companies for calling at non-major ports. Increased insurance charges at the non-major ports increase the cost of trade for the port users and erode their trust in port efficiency. Port users hesitate to engage in trade activities or may seek alternative routes, ports, or suppliers, leading to lost business opportunities and reduced competitiveness. It further adds to the costs for the terminal operator and thereby, increases the overall logistics cost of the port operations.

REGULATORY CHALLENGES

Limited literature available on non-major ports

The limited literature on non-major ports presents a significant challenge in understanding their operations, challenges, and potential for growth. Without comprehensive research and analysis, there is a lack of insight into the unique dynamics of these ports, including their infrastructure, capacity, efficiency, and connectivity. This dearth of information hampers informed decision-making by policymakers, investors, and port authorities. Most of the studies conducted on the port sector in the country focus on major ports or some of the top-performing non-major ports leaving out a significant number of non-major ports.

Additionally, the absence of robust data on non-major ports restricts the ability to benchmark performance, identify best practices, and implement targeted interventions to enhance their competitiveness and contribution to the maritime sector. This study provides an excellent opportunity for establishing a comprehensive database for non-major ports, enabling stakeholders to benchmark performance metrics, discern best practices, and implement targeted interventions aimed at bolstering competitiveness within the maritime landscape.

Absence of centralised databank

The absence of a centralised databank for non-major ports has significantly impeded informed decision-making processes. Without a comprehensive repository of data, stakeholders often face challenges in assessing performance metrics, identifying trends, and implementing strategic initiatives. This lack of comprehensive data not only hampers the ability to gauge the efficiency and effectiveness of port operations but also complicates efforts to forecast future demands and adapt to evolving market dynamics. Consequently, the absence of a centralised databank exacerbates the complexity of decision-making processes, often resulting in suboptimal strategies due to the lack of a reliable information infrastructure.

Absence of an integrated maritime master plan

Without a clear roadmap delineating short-term and long-term objectives, the non-major ports struggle to prioritise investments, optimise infrastructure utilisation, and adapt to evolving market dynamics. The lack of a master plan by the respective state governments undermines strategic planning efforts, leading to fragmented development initiatives and suboptimal outcomes in terms of efficiency, competitiveness, and sustainability. By lacking clear long-term objectives, non-major ports risk missing out on opportunities to leverage their strategic location and maritime resources to stimulate economic activity and improve livelihoods in surrounding communities. It further poses a significant obstacle for non-major ports in their efforts to spearhead port-led industrialisation.

Missing trade facilitation committee and grievance redressal mechanism

Without a dedicated committee to streamline processes and resolve disputes, trade activities within the port are susceptible to bottlenecks and inefficiencies. Additionally, the lack of a standardised mechanism for addressing grievances can lead to conflicts, legal disputes, and reputational damage. These deficiencies undermine the port's operational efficiency, competitiveness, and attractiveness to investors and shipping companies.

Addressing these challenges is imperative to unlock the full potential of non-major ports, enhance their contribution to India's maritime trade, and catalyse overall economic growth. Through concerted efforts and proactive measures, the Indian government, industry stakeholders, and regulatory bodies can create an enabling environment that fosters the efficient and sustainable development of non-major ports, ultimately driving progress toward the nation's economic goals and aspirations.

CHAPTER-4

RECOMMENDATIONS

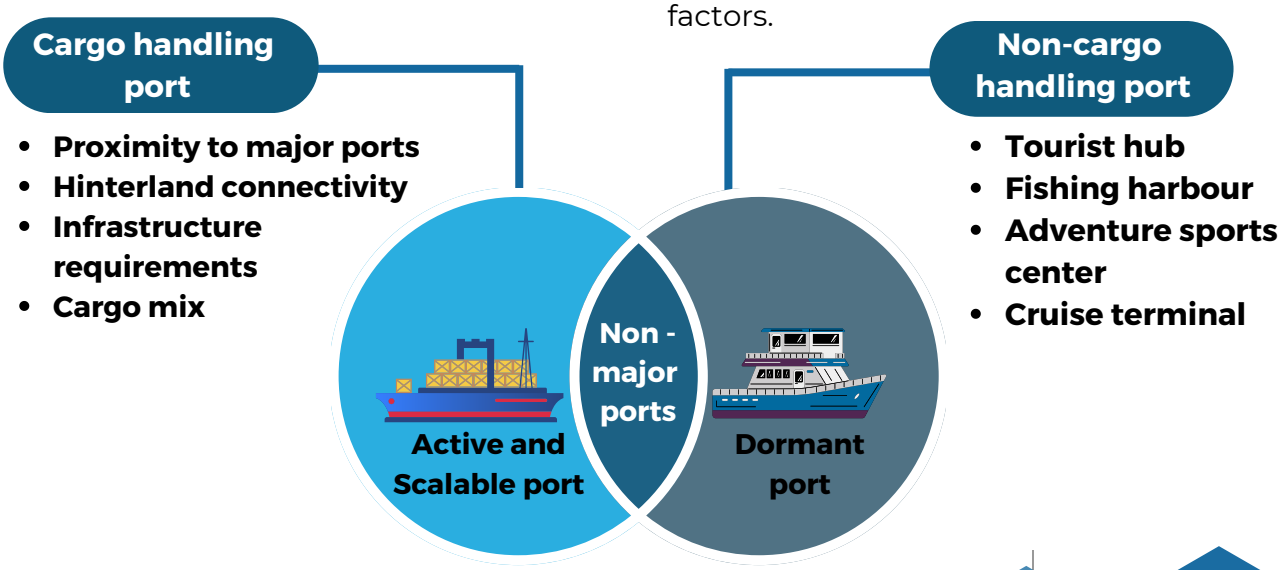
In envisioning the transformative potential of India's maritime sector, certain key factors emerge as crucial, including deep drafts, integrated ecosystems, technology-driven operations, connected ports and seamless end-to-end trips.

However, it is important to note that the terminology used to categorise ports should evolve to better reflect their roles and potential contributions. Instead of using broad categories like 'minor port', 'intermediate port' or 'non-major port', a more nuanced approach can be adopted to ensure effective policy support and well directed reform measures. Ports can be classified – based on their operations – into groupings such as cargo handling ports, bio-diversity ports, fishing harbours, etc. This study has tried to provide a broad overview on cargo handling non-major ports – with specific focus on their potential to aid distribution of cargo handling with a view to reduce the load on major ports – and has attempted to classify these ports into three distinct groups i.e. active ports, scalable ports and dormant ports.

- **Active Ports:** These ports are already actively handling majority of the cargo, and have the capability to further enhance their cargo handling facilities, infrastructure and overall operations to a greater extent. (Examples: Mundra port and Sikka port)
- **Scalable Ports**: These ports – which handle some cargo – possess the potential for further development to incorporate specific infrastructure (such as coastal berths) as well as latest advancements to meet evolving needs. They may also evolve as cargo consolidation centres, feeder ports, etc. (Examples: Tirupur port and Rameshwaram port)
- **Dormant Ports**: These ports – which are non-cargo handling ports – may primarily serve tourism, adventure and recreational activities (such as adventure sports), etc. Further, it can include the fishing ports as well. (Examples: Alappuzha port and Bitra port[10]

Each category represents a different level of activity, functionality and potential for growth within the maritime landscape. By moving away from traditional terminology and adopting this more refined categorisation, stakeholders can better understand the diverse roles and capabilities of these ports, thereby facilitating targeted strategies for their development and optimisation.

To classify, evaluate and rank non-major ports, and subsequently undertake concerted policy reforms aimed at facilitating support from non-major ports to major ports, it is essential to develop port-wise action plans based on several critical factors.



[10] Alappuzha port in Kerala was a very active EXIM port till 1989. Currently, the backwaters of Alappuzha are among the most popular tourist attractions in Kerala. Similarly, Bitra port in Lakshadweep can also be developed for tourism.

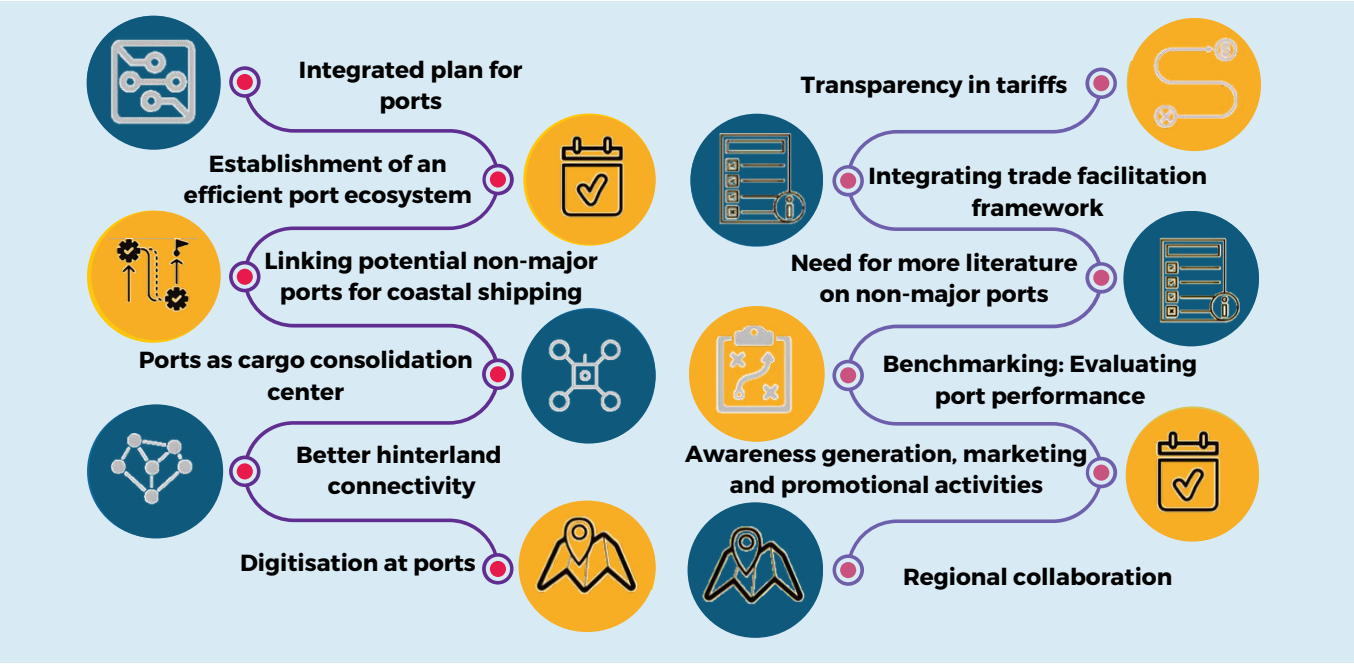
These factors include their proximity to major ports, hinterland connectivity, status of established infrastructure and cargo mix. The port-wise action plans will be crucial in defining roles as well as enhancing infrastructure and capacity utilisation at select non-major ports. The following factors may be kept in mind while creating port-specific action plans:

- **Port categorisation:** The action plans need to group ports as per classification outlined above. In the initial phase, 5 non-major ports from each category – active, scalable and dormant – may be evaluated to gather insights into as-is status of operations and reasons for the same. Furthermore, these plans should establish classifications for non-major ports based on proximity to major ports, hinterland connectivity and infrastructural deficits. Such classifications will be instrumental in recommending targeted, classification-based reforms –that address the unique needs and strengths of each port category – in consonance with the objective to undertake reforms that enable these ports to support major ports more effectively and to identify new base cargo for optimal operationalisation.

- **Geographical location and proximity assessment**: The ports under assessment may be evaluated based on their geographical location as well as proximity to other ports, ancillary infrastructure (SEZs, CONCOR terminals, roads, railways, etc.), consumption centres etc., which may facilitate well directed reform measures going forward. For instance, Krishnapatnam port is an isolated port geographically and therefore may warrant specific assessment based on this criterion. Further, certain non-major/major ports are in close proximity to other prominent ports. Ports such as Mundra and Kandla, Dhamra and Paradip, etc. are situated close to each other which may entail synergies as well as competition, which has to be evaluated, in addition to assessing the suitability of such port locations (the learnings would act as a guidance for deciding locations of upcoming ports).

- **Port operations:** The port-specific plans should contain specific operational plans based on port-level cargo-handling capacities, regulations, hinterland connectivity, market dynamics, synergies with facilities in close proximity, etc. among others. For instance, the Dhamara Fishing Harbour is located near the Dhamra Port; therefore, potential synergies between these establishments may be evaluated. Further, ports which are not currently handling any cargo need to be evaluated for their potential to support other emerging activities. These activities may include developing the ports into tourist hubs, fishing harbours, adventure sports centres, cruise terminals, etc. Such evaluations would involve assessing the geographic and environmental suitability of the ports for these emerging opportunities, as well as considering the economic and social benefits that could arise from these developments. This diversified use of port infrastructure can contribute to regional development, create new job opportunities and enhance the overall economic landscape.

Some strategic recommendations aimed at leveraging these enablers to enhance the efficiency, competitiveness and sustainability of India's port infrastructure and operations have been listed below for the perusal of the respective state governments.



Integrated plan for ports

The volume of cargo handled at Indian ports is expected to grow by 3-6% to reach 1653 million tonnes in the period from 2024 to 2028. At this rate, the volume handled by non-major ports will reach 770 million tonnes in FY28 from 603 million tonnes in FY22. The numbers suggest there is an opportunity for the active and scalable non-major ports to better their performance. State governments through their maritime boards need to come up with integrated plans for the non-major ports within their jurisdiction to drive sustainable growth and competitiveness in the maritime sector. These plans must strategically address various aspects to optimise port utilisation, facilitate trade, and promote equitable distribution of economic activities.

These plans should majorly strategise on the following aspects

- Identifying infrastructure requirements based on the type of available cargo for each port and aligning it with capacity augmentation efforts are crucial steps to ensure the efficient handling of current and future cargo volumes.
- Ports may specialise in handling containerised cargo, bulk cargo, or industry-specific cargo such as automobiles, petrochemicals, and agricultural products, depending on their strengths and the requirements of the hinterland they serve. To maximise their potential, private operators can be encouraged to collaborate with key industries in the port vicinity. By forging partnerships with relevant players, non-major ports can position themselves as essential gateways for specific cargo types and niche products in the realm of EXIM trade.
- Actionable plans should be formulated to facilitate cargo movement between major and non-major ports, promoting a balanced distribution of trade activities and alleviating congestion at major hubs. Integrating non-major ports into maritime corridors further enhances connectivity and accessibility, fostering economic development in underserved regions. For instance, commodities for two-way traffic between Nhava Sheva and Goa port can be identified.

Establishment of an efficient port ecosystem

Ports by their very nature, serve as vital nodes in global supply chains, facilitating the movement of goods and commodities. However, to truly thrive, they must transcend their role as mere transit points and evolve into dynamic hubs of economic activity. That is one lesson non-major ports can learn from Gujarat. One of the reasons why ports in Gujarat are performing better is because Gujarat has an extensive industry base which act as source and destination of cargo that is being handled by the ports. States with non-major ports need to integrate specific industries with ports so that both the entities can thrive on each other's growth.

By fostering an ecosystem of interconnected businesses and services, non-major ports can unlock their full potential and become catalysts for regional development. For instance, the utilisation of the 11,000-acre land at Krishnapatnam port presents a prime opportunity to foster an industrial ecosystem in close proximity to the port. This strategic approach allows for the development of manufacturing, logistics, warehousing, and distribution facilities, among other supportive industries, which can capitalise on the port's infrastructure and connectivity to global markets.

Moreover, by diversifying the economic base and attracting a range of industries, non-major ports can mitigate risks associated with fluctuations in specific sectors, ensuring resilience and sustainability in the long term. For example, ports in Karnataka, Goa and Odisha have lost a chunk of their cargo since the government has imposed a ban on export of iron ore. Thus, the establishment of a vibrant ecosystem of supportive industries around non-major ports is essential for their sustainable development and long-term success.

Linking potential non-major ports for coastal shipping

Non-major ports possess immense potential to serve as pivotal nodes for coastal shipping, heralding a paradigm shift in freight transportation dynamics in the country. By leveraging their strategic coastal locations, these ports offer a viable alternative for cargo transfer, thereby reducing the heavy reliance on conventional road and rail transport networks. There is a need to identify specific non-major ports that can act as nodes in the entire coastal shipping ecosystem.

These select ports would need infrastructure augmentation specific to coastal cargo. Simultaneously, at hub-ports like JNPA, Mundra, etc. dedicated berths for coastal cargo are needed which will surely amplify the cargo volume being moved via coastal shipping. Non-major ports, with their relatively smaller scale and adaptable infrastructure, are well-suited to accommodate a diverse range of vessels and cargo types. Further, coastal shipping can serve as a vital artery for facilitating movement between major and non-major ports, by utilising short sea routes, cargo can be transported swiftly and reliably between major ports and their non-major counterparts, bypassing congested road networks and reducing transit times.

Regional Collaboration

The scope for collaboration of non-major ports with relevant entities in the region – to ensure the delivery of integrated services – may be explored going forward. Specific non-major ports may explore the opportunities for collaboration with neighboring ports (major and non-major), industries, logistics players, etc. to create regional clusters and corridors offering integrated services and economies of scale.

Ports as cargo consolidation centers

Non-major ports that are located in a close proximity to a top-performing port can be leveraged as cargo consolidation centers and feeder ports thereby elevating efficiency in cargo handling and distribution networks. Select non-major ports need to be identified as central hubs for consolidating and redistributing cargo. As a first step, state maritime boards need to carry feasibility studies to identify such ports.

This mechanism would ensure multitude of benefits across the entire supply chain. For instance, empty container movements can be minimised to fosters a more sustainable and environmentally friendly approach to logistics. This will also address the congestion at the ports.

Establishing ports as cargo consolidation centers allows for the aggregation of smaller shipments into larger, more economically viable units. This consolidation process reduces fragmentation in cargo movements and optimises container loads, leading to cost savings for shippers and logistics providers. Moreover, it minimises the number of handling and transportation steps required, thereby reducing transit times and enhancing overall efficiency.

Designating ports as feeder ports facilitates the seamless transfer of cargo between larger hub ports and smaller regional ports. Feeder services play a crucial role in extending the reach of major ports and connecting them to remote or less accessible areas. By acting as distribution nodes, feeder ports enhance connectivity and accessibility, enabling smoother and more reliable supply chain operations.

Better hinterland connectivity

Prioritising infrastructure development, especially for non-major ports, stands as a critical imperative in bolstering regional connectivity and advancing economic growth. Emphasising the enhancement of transportation networks, particularly roads and connectivity links to ports, is paramount for ensuring seamless movement of goods and services and fostering accessibility to these vital trade gateways.

For instance, the development of Tirupur port in Tamil Nadu holds significant promise as a multimodal port hub with substantial cargo potential. However, despite its strategic location and potential, limited progress has been made in realising its envisioned role. By investing in road infrastructure and connectivity networks linking Tirupur port to key economic centers and hinterland regions, the port's accessibility and efficiency can be significantly enhanced.

Digitisation at ports

Government-led efforts to digitise port operations have been successful in select major ports, but non-major ports have been slower to adopt these initiatives. This discrepancy underscores the urgent need for a comprehensive "digital nudge" to drive non-major ports towards digitisation and its associated benefits. Embracing digitization initiatives across all port operations is crucial for enhancing transparency and efficiency in the maritime sector. For example, the implementation of PCS exemplifies selective adoption of digitization in Indian port operations. As all non-major ports are

not fully onboarded on this system. Similarly, non-major ports need to adopt paper-less operations. All the digital initiatives that the GoI has implemented at major ports need to be implemented at non-major ports for seamless trade processes.

Further, there is a scope for implementation of advanced technologies to achieve streamlined processes and reduced turnaround time for vessels at ports. Magdalla port, for example, has employed Vessel Traffic Management System that provide real-time information about vessels at the port. This system is further used by Hazira port to streamline their operations. The use of automation, Internet of Things (IoT) and data analytics for predictive maintenance, efficient resource allocation and procedural streamlining may considerably facilitate the optimum utilization of non-major ports.

Transparency in tariffs

Charges levied at non-major ports by various service providers must be reflected on the port or state maritime board's website. It is essential for promoting transparency, fostering trust among stakeholders, and facilitating informed decision-making within the maritime industry.

It will enable port users to evaluate the competitiveness of port charges relative to alternative transportation modes or competing ports, allowing them to make informed decisions about route selection, modal choice, and port utilisation. This promotes healthy competition among ports, incentivising them to offer competitive pricing and improve service quality to attract and retain customers.

Integrating trade facilitation framework

The establishment of regulatory frameworks and bodies, such as trade facilitation committees and ports ombudsmen, is imperative to ensure fairness, objectivity, and transparency in port operations. These regulatory mechanisms play a crucial role in addressing grievances and fostering a conducive environment for trade, thereby promoting economic growth and facilitating international commerce.

Trade facilitation committees serve as platforms for collaboration and coordination among stakeholders involved in port operations. By bringing together representatives from government agencies, port authorities, shipping companies, freight forwarders, trade fraternity and other relevant parties, these committees facilitate dialogue, streamline processes, and harmonise regulations. Through regular meetings and consultations, trade facilitation committees identify bottlenecks, resolve disputes, and implement measures to improve efficiency and effectiveness in port operations. The inputs from these committees may be shared with Maritime State Development Council for advocating policy reforms and regulatory measures that support the development of a conducive business environment for maritime activities.

Need for more literature on non-major ports

There is very scarce literature available on non-major ports which presents a significant challenge in understanding their operations, challenges, and potential for growth. There needs to be more focus on understanding the non-major ports and outlaying their growth potential.

State governments through their maritime boards need to conduct comprehensive studies on non-major ports. This will help identify challenges and also scope for improvement. Moreover, the creation of a digital data bank specifically tailored for non-major ports is imperative. Such a repository would play a pivotal role in recording port performance metrics. By systematically capturing and analysing metrics such as average turnaround time, cargo volume and cargo types handled, port authorities can gain valuable insights into operational efficiency and pinpoint areas for improvement. Additionally, the availability of such data enables informed decision-making by policymakers, investors, and port authorities. The data can also be utilised for establishment of a ranking system to incentivise non-major ports to embrace digitisation and improve their operational efficiency. Such a system fosters healthy competition among ports and encourages investments in digitisation initiatives.

Benchmarking: Evaluating port performance

In order to understand and evaluate the operational efficiency of non-major ports, a comprehensive port benchmarking with country's top ports and global leaders needs to be carried out.

This will be instrumental in the identification and adoption of best practices that enhance operational efficiency, productivity, and competitiveness. Ports that demonstrate efficiency, reliability, and adaptability are more likely to attract investment, stimulate trade growth, and contribute to the overall economic development of the nation. Therefore, aligning Indian port practices with international standards is crucial for ensuring sustained growth and relevance.

Awareness, marketing and promotional activities

Efforts to enhance the visibility and attractiveness of non-major ports necessitate robust awareness generation, marketing, and promotional activities. Such initiatives are vital to showcase the capabilities and advantages of these ports to potential stakeholders, including shipping companies, logistics providers, and industries. By highlighting their unique features, specialised services, and strategic location, non-major ports can attract increased traffic and investment.

Effective marketing campaigns, participation in trade exhibitions, and collaboration with industry associations play crucial roles in raising awareness and positioning non-major ports as viable alternatives in the maritime trade landscape. Ultimately, investing in awareness generation and promotional efforts is essential for non-major ports to capitalize on their potential and contribute meaningfully to regional development and global trade networks.

Focus on value-added services

The potential of non-major ports as entities providing end-to-end supply chain solutions may be explored. Non-major ports may offer value-added services such as warehousing, packaging, logistics, etc. to ensure streamlined movement of cargo and ease of doing business. Non-major ports providing integrated solutions can potentially add a lot of value – in terms of operational efficiency as well as cost optimisation – to businesses, thereby attracting domestic and international customers. Ports such as Mundra and Dhamra provide covered storage and warehouses spaces to its client which further make them attractive to trade.

PROPOSED ACTION PLAN

SHORT TERM

ACTION ITEM	RELEVANT STAKEHOLDER
Classification of non-major ports into more distinctive groups	Ministry of Ports, Shipping and Waterways
	Logistics Division, Ministry of Commerce & Industry
Identification of ports as cargo consolidation centers	Ministry of Ports, Shipping and Waterways
	State Maritime Boards
	Logistics Division, Ministry of Commerce & Industry
Identification of non-major feeder ports	Ministry of Ports, Shipping and Waterways
	State Maritime Boards
	Logistics Division, Ministry of Commerce & Industry
Transparency in tariff	State Maritime Boards
Digitisation at ports	Ministry of Ports, Shipping and Waterways
	State Maritime Boards
	Central Board of Indirect Taxes and Customs , Ministry of Finance
	Indian Ports Association

MEDIUM TERM

ACTION ITEM	RELEVANT STAKEHOLDER
Establishment of port ecosystem	Ministry of Ports, Shipping and Waterways
	State Maritime Boards
Infrastructure upgradation for coastal shipping	Inland Waterways Authority of India
	State Maritime Boards
Integrating trade facilitation committee	State Maritime Boards
Need for more literature on non-major ports	Ministry of Ports, Shipping, and Waterways
	State Maritime Boards

LONG TERM

ACTION ITEM	RELEVANT STAKEHOLDER
Better hinterland connectivity	Ministry of Ports, Shipping and Waterways
	State Maritime Boards
	Ministry of Road Transport and Highways
	Ministry of Railways
Benchmarking: Evaluating port performance	Ministry of Ports, Shipping and Waterways
	State Maritime Boards
Awareness, marketing and promotional activities	State Maritime Boards
Focus on value-added services	Ministry of Ports, Shipping and Waterways
	State Maritime Boards
Integrated plan for ports	Ministry of Ports, Shipping and Waterways
	State Maritime Boards

CHAPTER-5

WAY FORWARD

The surge of cargo handled at non-major ports to 45.4% of India's total maritime trade underscores their growing significance in the country's port ecosystem. However, this rise has not been without impact on major ports, necessitating a comprehensive approach to defining the future role of non-major ports in India. It is imperative for the government to delineate the role of non-major ports vis-à-vis major ports. Currently, non-major ports have emerged as competitors to major ports. This has presented an opportunity to enhance competitiveness, foster innovation, and leverage technology in the Indian maritime sector. Strategic planning and operational enhancements can be achieved by identifying base cargo and tailoring infrastructure development accordingly. This further necessitates the role played by the state maritime board.

For example, port authorities in Rotterdam, have started to move beyond the 'landlord' role and have become more active in bringing parties together and intermediating.

In addition to their role as competitors, non-major ports can play a vital complementary function to major ports, significantly bolstering overall port efficiency and effectiveness. By assuming the responsibility for managing storage and warehousing of cargo, non-major ports alleviate the burden on major ports, allowing them to concentrate on their core function of shipping goods. Moreover, non-major ports can strategically position themselves as consolidation centers for cargo destined for major ports.

By aggregating and consolidating shipments, they can streamline the movement of goods, reduce logistical complexities, and minimise transit times. Furthermore, non-major ports can function as feeder ports, serving as crucial nodes in the supply chain network within the country. For example, containers destined for Scandinavia are often first shipped to larger hub ports in Northern Europe and subsequently transported to Scandinavia by feeder. This centralised approach not only facilitates smoother operations and ensures timely delivery of goods to major ports for onward shipping but also enhances connectivity and accessibility, thereby improving the overall reliability and resilience of the maritime transport system.

Effective industrial cluster development is vital to underpin potential roles of non-major ports within the maritime landscape. Port-led industrialisation, comprising the establishment of industrial clusters and special economic zones in close proximity to ports, serves as a cornerstone for synchronised cargo evacuation and the seamless operation of ports.

For instance, Shenzhen, a small fishing village has turned into one of the world's largest metropolises and ports within a few decades due to export-driven growth triggered by a free trade zone and extensive port development. Further, In Finland, the national government has sought to provide a broad framework for maritime cluster development through its National Maritime Cluster Programme. The programme aims to provide support for all stages of cluster development. It seeks to provide the conditions for the emergence of new clusters through funding innovative initiatives, and helps the cluster identify and pursue new business opportunities.

These industrial clusters offer a conducive environment for businesses to thrive, facilitating synergistic relationships between port activities and industrial operations. By strategically locating industrial clusters near ports, companies can benefit from cost-effective transportation and logistical advantages that enhances the overall competitiveness of Indian products.

Sustainability stands as a pivotal aspect that demands meticulous attention in the development and operation of non-major ports. Embracing sustainable practices not only mitigates environmental impact but also ensures long-term viability and resilience of port operations. Coastal shipping and inland waterways present environmentally friendly alternatives for transporting goods, particularly for smaller vessels navigating shorter distances. By utilising these waterborne transportation routes, non-major ports can significantly reduce their carbon footprint and alleviate pressure on terrestrial infrastructure. For example, Containerized Coastal Shipping services are widely used in Africa. In West Africa, Coastal Shipping activity is dominated by trans-shipment and feeder cargo for global shipping lines instead of regional freight.

Lastly, it's imperative to prioritise the onboarding of non-major ports onto digital systems to enhance their efficiency, transparency, and competitiveness in the maritime industry. A key aspect of this digital journey is the establishment of a digital repository that will enable port authorities to monitor their progress, track key performance indicators, and make data-backed informed decisions to optimise operations and resource allocation. For instance, The Port of Valencia has established a PCS that not only provides services related to maritime transactions and shipping companies on the basis of the existing core port operations, but also incorporates inland and rail transport services.

However, the successful implementation of digital systems hinges on the capacity building of port personnel. Training programs, workshops, and skill development initiatives are essential to equip port staff with the necessary knowledge and expertise to effectively utilise digital tools and platforms. Japan, for example, has linked higher education system to the career development of students differently between technical and non-technical jobs. The maritime sector recruits' seafarers straight out of maritime academies (junior college) or maritime universities. They start their career as junior officers on board vessels and mostly keep themselves employed by the same firm until retirement.

GLOBAL BEST PRACTICES

Role of port authorities

Port Authorities in Rotterdam,have started to move beyond the 'landlord' role and have become more active in bringing interested businesses together and intermediating.

Complementary function to major ports

Containers destined for Scandinavia are often first shipped to larger hub ports in Northern Europe and subsequently transported to Scandinavia by feeder. This centralised approach not only facilitates smoother operations and ensures timely delivery of goods to major ports for onward shipping but also enhances connectivity and accessibility, thereby improving the overall reliability and resilience of the maritime transport system

Port-led industrialisation

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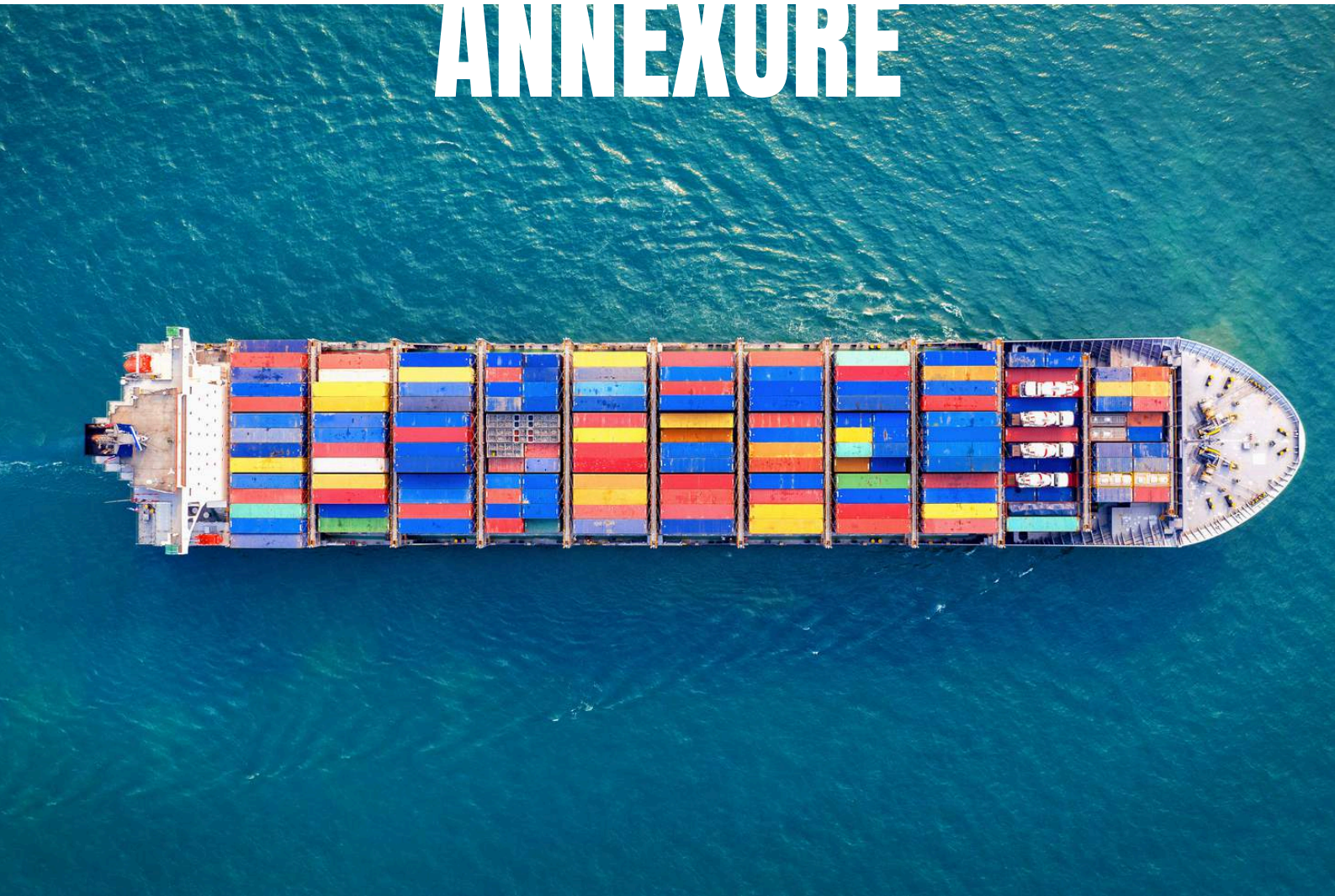
Port sustainability through coastal shipping

Containerized Coastal Shipping services are widely used in Africa. In West Africa, Coastal Shipping activity is dominated by trans-shipment and feeder cargo for global shipping lines instead of regional freight.

Onboarding of non-major ports onto digital systems

The Port of Valencia has established a PCS that not only provides services related to maritime transactions and shipping companies on the basis of the existing core port operations, but also incorporates inland and rail transport services.

ANNEXURE



ANNEXURE – I
STATE PROFILES

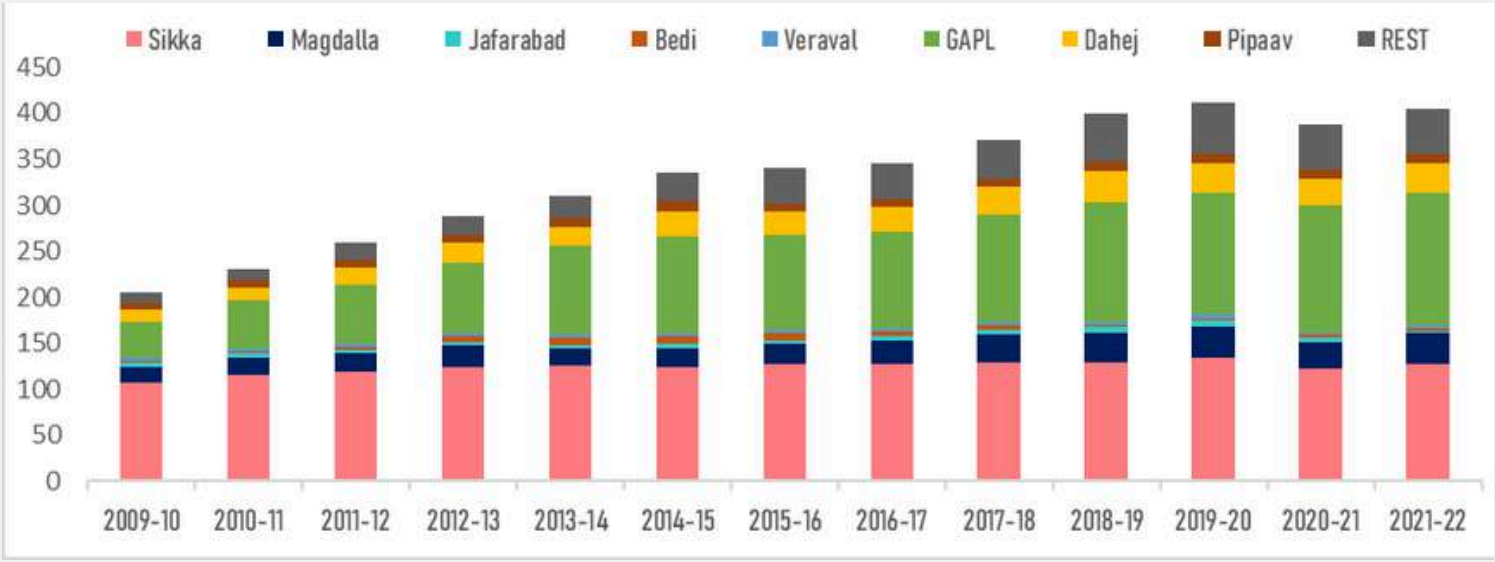
GUJARAT

Gujarat, a prominent maritime state, boasts a natural coastline extending 1215 kilometers, contributing to 16% of India's total coastal expanse. Administered by the Gujarat Maritime Board since April 1982, the state is home to 48 non-major ports. Of these, 17 actively manage maritime traffic, while the remaining 31 are predominantly utilised for fishing activities with minimal traffic.

The strategic geographic positioning of Gujarat, connecting to the Northern and Central Indian States, has led to a heightened demand for the services offered by its non-major ports. The active involvement of the private sector has been a catalyst for the robust development of these ports, enhancing the overall maritime infrastructure in the state.

Figure 20 shows the total traffic handled by non-major ports in the State. It can be observed that over the last decade, Gujarat Adani Port Limited Mundra (GAPL) emerges as a key player in the state's maritime landscape, handling an impressive cargo tonnage of 144.21 million tonnes during the 2021-22 fiscal year. This represents 35.6% of the total cargo managed by non-major ports in Gujarat.

Figure 20: Traffic handled by Non Major Ports in Gujarat-MT

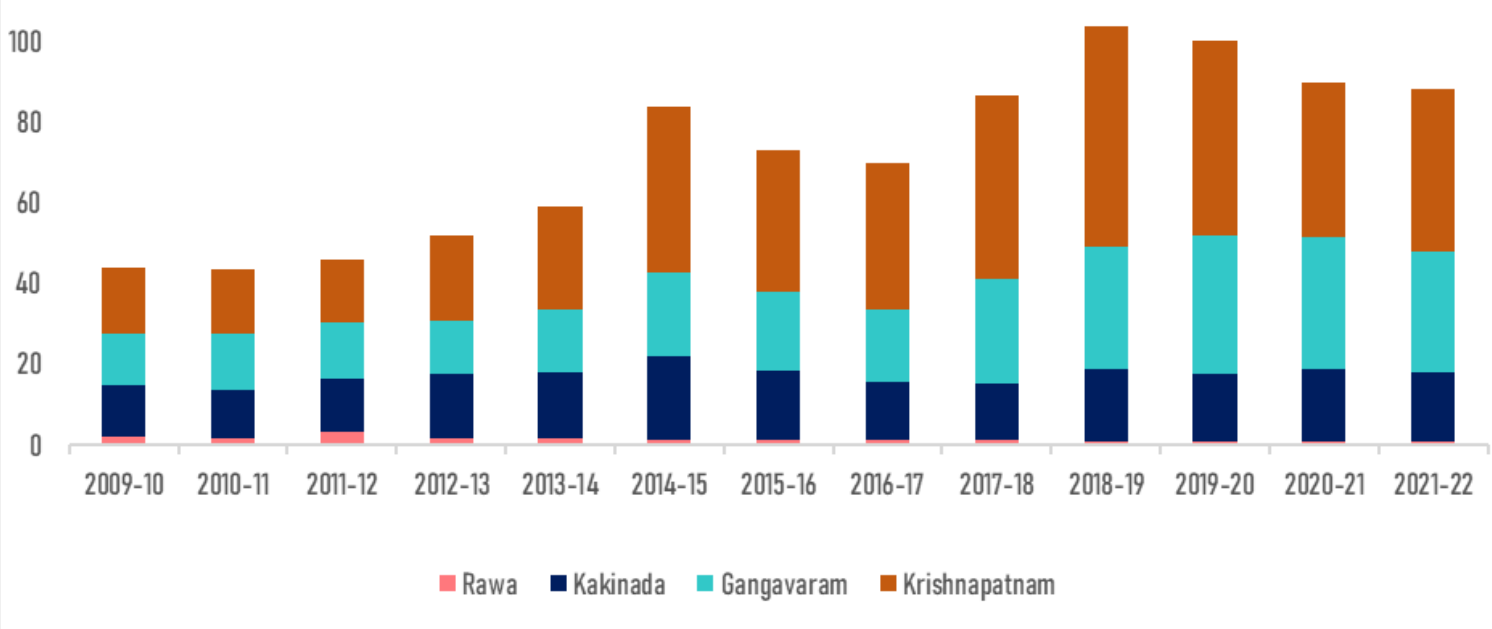


ANDHRA PRADESH

Andhra Pradesh holds significance in the maritime domain, featuring a coastline of approximately 975 kilometers. The state hosts a network of 15 non-major ports, with four of them—Rawa, Kakinada Anchorage/Kakinada Deep Water Port, Gangavaram, and Krishnapatnam—regularly involved in cargo activities.

In the fiscal year 2021-22, Andhra Pradesh played a modest yet notable role on the national maritime stage, contributing 14.6% to the total traffic managed by non-major ports across the country. The Figure 21 provides an overview of traffic handled by non-major ports in Andhra Pradesh's acknowledging the state's measured impact in the broader maritime sector.

Figure 21: Traffic handled by Non Major Ports in Andhra Pradesh - MT

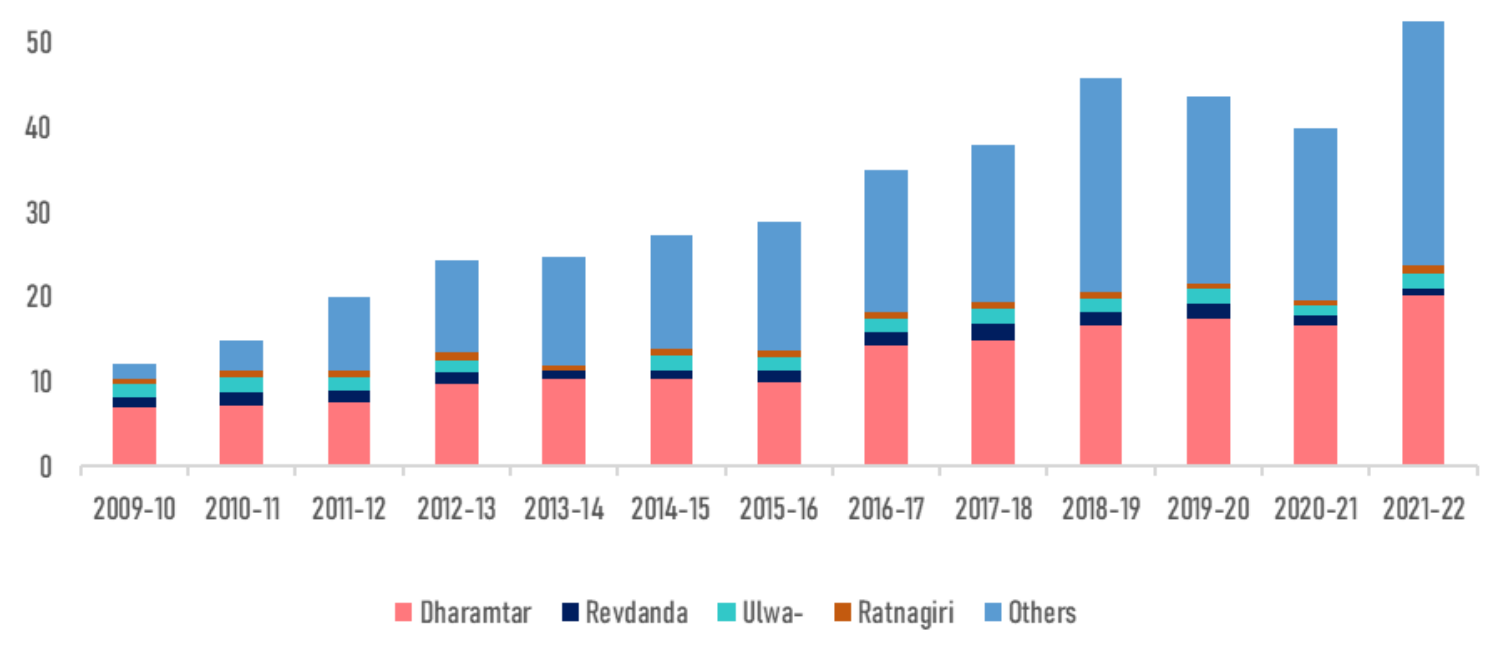


MAHARASHTRA

Maharashtra, endowed with a coastline spanning approximately 653 kilometers, accommodates a substantial network of 48 notified non-major ports. Among these, only 16 ports were actively engaged in cargo traffic operations during the fiscal year 2021-22.

Notably, the non-major ports in Maharashtra exhibited a significant uptrend in cargo handling, with the total cargo traffic reaching 52.47 million tonnes in 2021-22. This marks a significant increase of 31.7% compared to the previous fiscal year's Figure of 39.84 million tonnes in 2020-21. The surge in the total cargo handled during the last decade can be observed in Figure 22.

Figure 22: Traffic handled by Non Major Ports in Maharashtra - MT

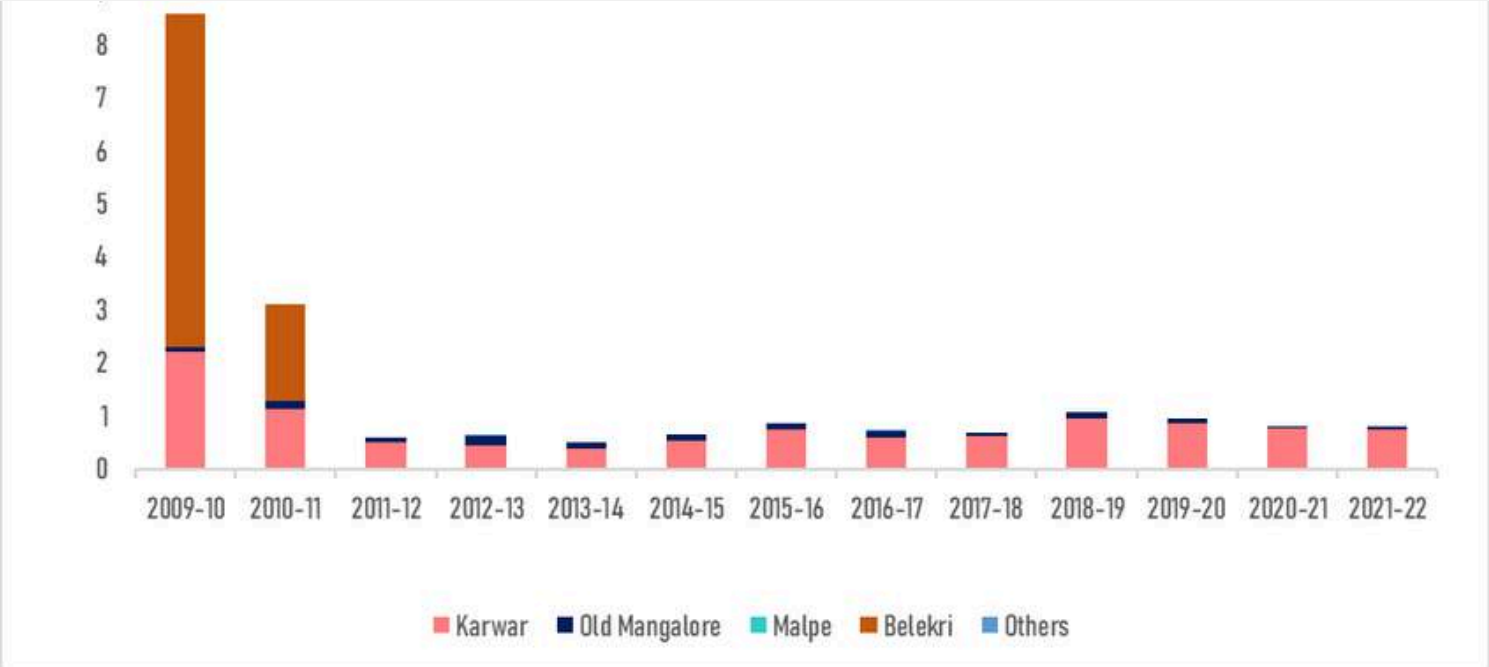


KARNATAKA

Karnataka, characterised by a coastline stretching approximately 280 kilometers, accommodates 13 non-major ports within its maritime infrastructure. However, it is noteworthy that only two of these ports were actively involved in cargo traffic operations during the fiscal year 2020-21.

In the subsequent fiscal year of 2021-22, the non-major ports in the state-maintained consistency in cargo handling, registering a total of 0.79 million tonnes—mirroring the cargo traffic volume recorded in the previous year (2020-21). Of particular significance is the contribution of the Karwar Port, which accounted for 0.73 million tonnes, constituting an impressive 92.9% of the total cargo handled by non-major ports in Karnataka during the 2021-22 period. Figure 23 showcase the consistent cargo volumes and the predominant role played by the Karwar Port in shaping the overall cargo scenario in the state.

Figure 23: Traffic handled by Non Major Ports in Karnataka - MT

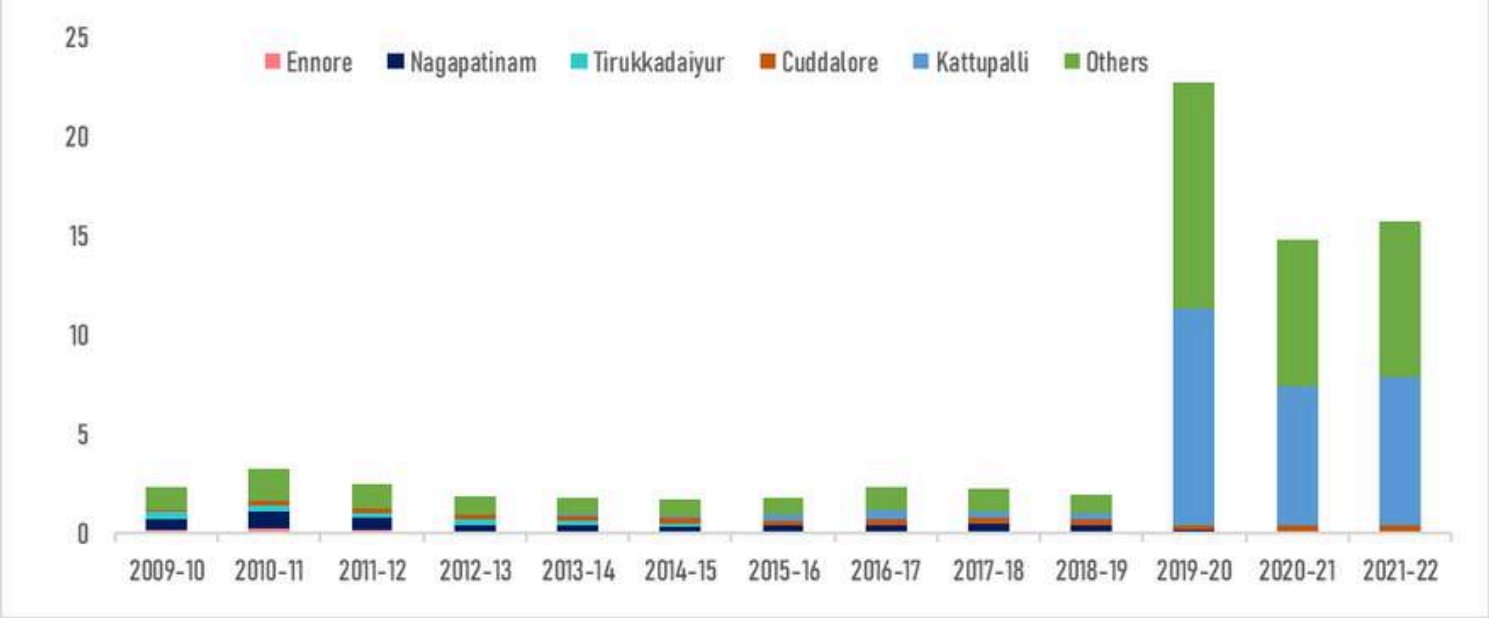


TAMIL NADU

Tamil Nadu boasts a coastline stretching approximately 906 kilometers, hosting a total of 17 non-major ports. However, cargo traffic was actively managed by only 6 of these ports during the fiscal year 2021-22. Over this period, the collective cargo traffic at Tamil Nadu's non-major ports reached 7.84 million tonnes, indicating a modest increase from the previous year's Figure of 7.41 million tonnes.

Kattupalli Port emerged as the key player, handling the highest traffic at 7.44 million tonnes, constituting an impressive 94.9% share. Cuddalore Port followed with 0.30 million tonnes, accounting for 3.9%, while Other Ports collectively contributed 0.9 million tonnes, making up 1.2% of the total cargo traffic handled by all non-major ports in the state. Figure 24 provides an overview of cargo activities in Tamil Nadu's non-major ports, highlighting the significant contributions of specific ports in shaping the overall maritime landscape.

Figure 24: Traffic handled by Non Major Ports in Tamil Nadu - MT

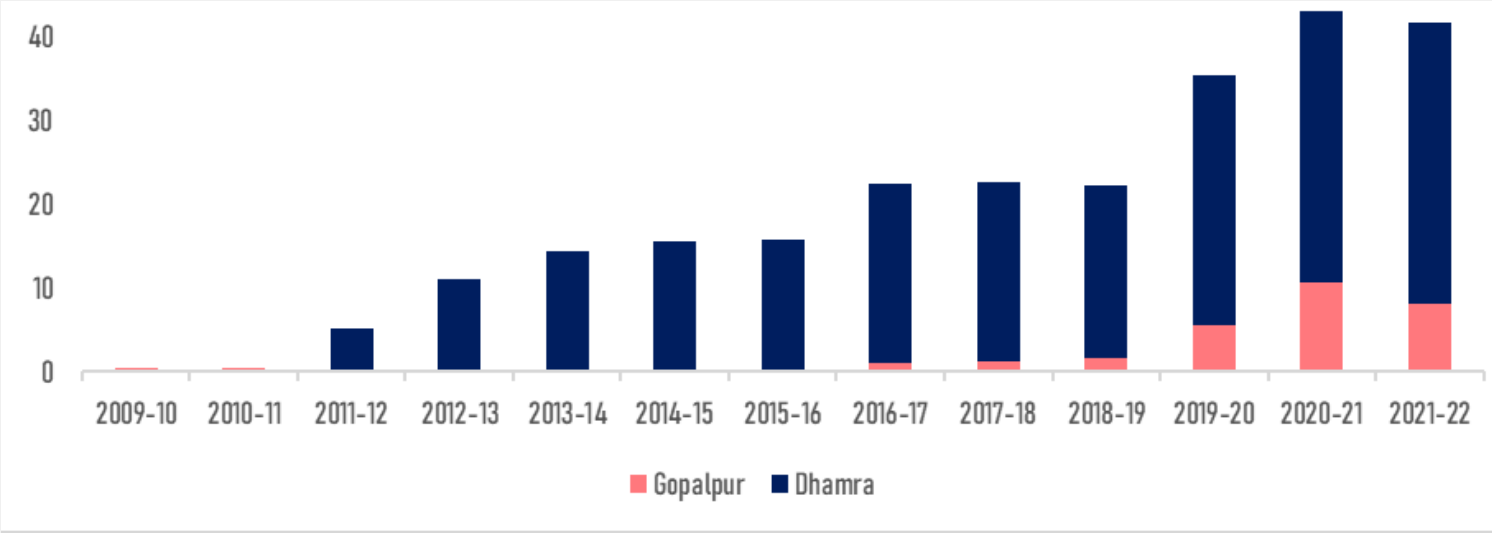


ODISHA

Odisha, with an extensive coastline spanning 480 km from the Ganjam District border with Andhra Pradesh to the Balasore District border with West Bengal, holds promising opportunities for maritime development. The state boasts naturally conducive and strategically located port sites, and recognising this potential, the Government of Odisha identified 14 locations for the development of Minor Ports. In 2004, the state government formulated the Port Policy to provide a framework for developers, fostering the establishment of these ports.

Presently, Odisha has 14 non-major ports, of which only two actively handled cargo traffic in the fiscal year 2021-22. Despite the strategic advantages, there was a 3.5% decrease in cargo traffic, with the ports collectively handling 41.54 million tonnes compared to 43.03 million tonnes in the previous year.

Figure 25: Traffic handled by Non Major Ports in Odisha - MT



ANNEXURE – II

CAPACITY OF (NON-MAJOR PORTS) MARITIME BOARDS/STATES AS ON 31ST MARCH 2023

(Million Tonnes)

S.No	States	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23 (P)
1	Gujarat	501.00	523.00	542.00	542.81	544.62	552.00	552.00
2	Maharashtra	85.80	100.90	102.40	125.00	125.00	125.00	117.55
3	Goa	0.12	0.07	0.02	9.00	9.00	9.00	9.00
4	Tamil Nadu	1.17	1.10	2.15	26.15	25.05	25.05	25.05
5	Kerala	0.01	0.01	0.55	0.55	1.07	1.07	1.07
6	Karnataka	0.71	0.68	17.80	5.00	5.00	5.00	5.00
7	Andhra Pradesh	154.40	178.00	178.00	193.40	193.40	193.40	207.00
8	Odisha	27.50	34.50	47.50	65.00	70.00	70.00	65.00
9	Puducherry	14.90	14.90	16.90	16.96	16.96	16.96	17.95
10	Andaman & Nicobar Islands	3.00	3.00	3.00	4.11	4.11	4.11	4.11
11	Lakshadweep	-	-	-	-	-	5.82	5.82
	Total	**788.61**	**856.16**	**910.32**	**987.98**	**994.21**	**1007.41**	**1009.55**

Source: Update on Indian Port Sector (31.03.2023)

ANNEXURE – III

MARKET ACEESS TO TOP NON-MAJOR PORTS

NAME OF PORT	MARKET ACCESS
MANDVI MUNDRA PORT AND SEZ	Natural gateway to the cargo hubs in northern and western hinterlands of India.
BEDI SIKKA	The port of Sikka, operated by M/S Reliance Ltd, was constructed to serve the oil refinery
KRISHNAPATNAM PORT LIMITED	The port caters to land locked hinterland of South India with multimodal connectivity
DHAMRA	Proximity to the mineral belts of Odisha, Jharkhand and West Bengal helps serve hinterlands with the greatest efficiency. Secondary hinterland consists of North and South Gujarat, Western Madhya Pradesh and North Maharashtra.
DAHEJ	Connected to contiguous industrial hubs of Gujarat, Maharashtra and eastern Madhya Pradesh.
GANGAVARAM PORT LIMITED	Gangavaram is the gateway port for a hinterland spread over 8 States across Eastern, Western, Southern and Central India. The port is located about 5 Km south of Visakhapatnam, the industrial nerve centre of Andhra Pradesh.
MAGDALLA ADANI HARIZA PORT	The port provides multimodal connectivity to the northern, northwestern, and central parts of India. It is a convenient international trade gateway to Europe, Africa, America and the Middle East.
KAKINADA SEAPORT LIMITED	The port is surrounded by the districts of East and West Godavari, Krishna, Guntur and the entire Telangana region. Primary cargoes of this region include agricultural products, minerals, coal and fertilisers.
JAFRABAD GUJARAT PIPAVAV PORT	Its primary hinterland includes southern Gujarat and northern India.

ANNEXURE – IV

LIST OF COASTAL ECONOMIC ZONES

S.NO	COASTAL ECONOMIC ZONE	PROBABLE DISTRICTS	PORT	POTENTIAL INDUSTRIES	OTHER SAMPLE PROJECTS
1	Kachchh – Gujarat	Kachchh	Kandla, Mundra	Petrochemicals, Cement, Furniture	LPG import terminals, container and bulk terminals at Kandla port
2	Saurashtra – Gujarat	Junagarh, Amreli, Bhavnagar, Ahmedabad	Pipavav, Sikka	Apparel, Automotive	Connection of Western DFC to Pipavav, Expressway from Sarkhej to Pipavav
3	Suryapur – Gujarat	Bharuch, Surat, Navsari, Valsad	Dahej, Hazira	Marine Clusters	Connection of Western DFC to Hazira, Ro-Paz Ferry services between Gogha and Dahej
4	North Konkan – Maharashtra	Nashik, Thane, Mumbai, Pune, Raigarh	JNPT, Mumbai	Power, Electronic, Apparel	Vadhvan port, Expressway from Ahmedabad and Dighi to JNPT, Terminals in Nhava Creek
5	South Konkan – Maharashtra	Ratnagiri, Sindhudurg, North Goa, South Goa	Dighi, Jaigarh, Mormugao	Refining, Steel, Food Processing	Upgradation of SH164 to connect to Jaigad port to NH 17, Connectivity of NH 17 to North and South of Dighi Ports
6	Dakshin Kanara – Karnataka	Udupi, Dakshin Kannada, Kodagu, Mysore	Mangalore	Petrochemicals	Railway line from Bellikeri port to Ankola, Food grain and fertiliser handling facility in NMPT
7	Malabar - Kerala	Ernakulam, Alappuzha Kollam, Thiruvanthanpuram	Kochi	Furniture	Food grain import terminal, fertiliser bagging facility

Source: Sagarmala Report, 2016

S.NO	COASTAL ECONOMIC ZONE	PROBABLE DISTRICTS	PORT	POTENTIAL NDUSTRIES	OTHER SAMPLE PROJECTS
8	**Mannar – Tamil Nadu**	Kanniyakumari, Tirunelveli, Thoothukudi	Tuticorin	Apparel Refining	Enayam port, Expressway to Enayam, Road to Hare Island, container berth at Tuticorin
9	**Poompuhar – Tamil Nadu**	Cuddalore, Perambalur, Ariyalur, Tiruchirappallu, Thanjavur, Thiruvarur, Nagapattinam	Cuddalore	Leather Processing, Power	Sirkazhi/ Cuddalore port, Road connectivity to Cuddalore port
10	**VCIC South – Tamil Nadu**	Thiruvallur, Chennai, Kancheepuram	Chennair, Ennore and Katupalli	Steel, Petrochemicals, Electronics, Ship building	LNG import terminal, Rail link to KPL, MLT-2 at Ennore
11	**VCIC Central – Andhra Pradesh**	Chittor, Nellore	Krishnapatnam	Electronics	Upgradation of road connecting Krishnapatnam port to Nellore, Road to Krishnapatnam port to Naidupeta
12	**VCIC North – Andhra Pradesh**	Guntur, Krishna, West Godavari, East Godavari, Visakhapatnam Srikakulam	Vizag, Kakinada	Food processing, Petrochemicals, Cement, Apparel	Machilipatnam/ Vodarevu port, Oil jetty at Vizag, road from Machilipatnam to NH-SH-46
13	**Kalinga – Odisha**	Puri, Jagatsinghapur, Cuttack, Kendrapara, Jajapur, Bhadrak	Paradip, Dhamra	Petrochemicals, Marine processing	Paradip outer harbour, IWT terminal, Heavy haul, LPG import terminal
14	**Guad – West Bengal**	Purba Medinipur, South twenty parganas	Kolkata, Haldia	Leather processing	Sagar port, ICD, LPG, import terminal, Expressway from Durgapur to Haldia

Source: Sagarmala Report, 2016

ANNEXURE – V

MULTIMODAL CONNECTIVITY AT TOP NON-MAJOR PORTS

NAME OF PORT	CONNECTIVITY
MANDVI MUNDRA PORT AND SEZ	• Road: The port is linked to the national highway network through State Highway 48 via Anjar and State Highway 6 via Gandhidham. It's also connected to National Highway 8A Extension, which facilitates seamless connectivity to the northern and western parts of India • Rail: A 210-km-long electrified rail line connects Mundra to Adipur near Gandhidham in Western Railways, facilitating efficient cargo transport. • Air: Mundra port has its own airport planned as an international air cargo hub. Presently the air runway strip is 900 meters which is to be expanded to 4500 meters. • Pipeline: The MPPL consists of a 74 km long pipeline from Mundra to Churwa, which connects to the existing system of the Kandla-Panipat section of the erstwhile Kandla-Bhatinda Pipeline near Gandhidham. Further, the Mundra-Anjar pipeline enables the transfer of natural gas from the Mundra LNG terminal to the existing Gujarat State Petronet high-pressure gas grid.
BEDI SIKKA	• Road: Connected with SH-6A and NH-8E • Rail: Broad gauge rail link is directly connected with the port
KRISHNAPATNAM PORT LIMITED	• Road: A four-lane road connects the port to NH5 (Chennai-Kolkata highway). Upgration of the 4 lane to 6 lane road is in progress with ROW of 60 m. Internal road network of 55 Kms; capacity - 5,000 Trucks/day. • Rail: The Krishnapatnam Rail Co Ltd facilitates rail connections, with 15 km double rail lines linking Venkatachalam Station to the port. Rail Connectivity: It facilitates rail connections, with 15 km double rail lines linking Venkatachalam Station to the port. Additionally, the new Kadapa-Bengaluru rail line reduces the distance between Bengaluru and the port by 60 km. Additionally, internal track length of 52 Km with capacity of 60 rakes per day • Air: The port enjoys easy access to major airports in Chennai (180 km) and Tirupati (120 km).

NAME OF PORT	CONNECTIVITY
DHAMRA	• Rail: 62 km rail connectivity from Dhamra to Bhadrak/Ranital Link Cabin, connecting the main Howrah-Chennai line.
MAGDALLA	• Road: State highway is 2 km away from the Magdalla Port. The NH 8 is 15 km away from the Magdalla Port. • Rail: The nearest Railway BG line is 15 km away from the Magdalla Port (Sachin Yard). The Surat railway station is 16 km away from Magdalla Port
DAHEJ	• Road: Well-connected to the National Highway 8, through a six-lane state highway - SH 6. • Rail: A special railway line, BDRCL, connects Dahej Port with the national rail network
GANGAVARAM PORT LIMITED	• Rail connectivity was established with the national network of the Chennai-Howrah rail corridor. • Road connectivity established by a 4-lane expressway connecting the port with NH-16 (Chennai to Kolkata).
MAGDALLA ADANI HARIZA PORT	• Rail: Located on the main broad gauge rail route between Delhi and Mumbai, which is double track, fully electrified and designed for fast trains, which brings a strategic location advantage
KAKINADA SEAPORT LIMITED	• Road: NH 216 Passing through Kakinada, NH 6(Old #5) Connected by 60KM ADB Road • Rail: Kakinada is connected by a 20 KM Railway line to Howrah – Chennai Trunk line • Air: Rajahmundry Airport – 1 Hour; Visakhapatnam Airport – 2 1/2 Hours, Vijayawada Airport – 3 Hour • Pipeline: Natural Gas Grid of Andhra Pradesh; East West Pipe Line of Reliance; Products Pipelines for Edible Oil, Petroleum Products, FRM, Liquid Ammonia
JAFRABAD GUJARAT PIPAVAV PORT	• APM Terminals Pipavav is located just 152 nautical miles (10 hours steaming time) from Nhava Sheva in Mumbai. It has access immediate access to key markets in northwest India and the largest sea food export belt in India via road and rail, including direct electrified access to the Western Dedicated Freight Corridor. • 269 Km PRCL connectivity from Port Pipavav to Surendranagar. Direct Connection with various ICD and CFS in North and North West India. • Road network connectivity with NH-8E

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