

MARITIME DYNAMICS OF COASTAL STATES IN INDIA: TRENDS IN MAJOR AND NON-MAJOR PORTS FROM 2016-17 TO 2021-22

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Abstract

This research paper investigates the maritime activities of coastal states in India, focusing on major and non-major ports, cargo traffic, and the dynamics of non-major ports. The study employs a comprehensive research design, utilizing official reports, government publications, and maritime industry databases for data collection. The geographical scope includes Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, Odisha, and West Bengal.

Quantitative analysis and comparative studies are employed to scrutinize trends in major and non-major ports, cargo traffic, and the share of non-major ports. Case studies of select non-major ports in Gujarat provide insights into their individual dynamics, and commodity-wise analysis identifies patterns over the study period. Temporal trends and a comparative state analysis reveal the evolution of cargo traffic and port activities.

Findings indicate varying degrees of maritime activity among coastal states, with Gujarat, Maharashtra, and Tamil Nadu playing pivotal roles. India's maritime infrastructure consistently grew from 2016-17 to 2021-22, reflecting a commitment to enhancing capabilities and meeting industry demands. State-wise variations in cargo traffic highlight the diverse economic activities, with Gujarat leading in total cargo traffic.

Analysis of non-major port traffic reveals overall growth, with fluctuations influenced by state-specific factors. Gujarat maintains a significant share, and commodity-wise traffic at Gujarat's non-major ports reflects the diverse nature of handled commodities.

Keywords: Maritime sector, Major Ports, Non-Major Ports, Cargo

INTRODUCTION

International seaborne trade is the backbone of the world economy. When we examine the data on cargo handled, we can clearly see that seaborne trade has been continuously increasing. In the year 2000, worldwide seaborne trade was approximately 5,984 million tonnes, and in the year 2021, seaborne trade reached 10,985 million tonnes, with cargo handled at various ports around the world. Apart from this, we observe that yearly seaborne trade is increasing in absolute numbers, but in the years 2009 and 2020, there was a decrease in cargo handling compared to the previous year. This decline can be attributed to the impact of the Great Recession of 2008-09 and the COVID-19 pandemic on seaborne trade.

Seaports are the backbone of the world economy, offering the cheapest and most reliable transportation. Additionally, ports demonstrate efficiency when their facilities are reliable and connected to various modes of transportation such as railways, roads, and inland waterways. In India, ports can be classified in two ways based on jurisdiction: major ports and non-major ports. The 12 major ports fall under the jurisdiction of the Ministry of Ports, Shipping, and Waterways, while more than 200 non-major ports are managed by different State Maritime Boards.

According to the report on basic port statistics of India for the year 2021-22, there were 12 major ports in 2016 that collectively handled 648.47 million tonnes of cargo. The number of major ports remained the same in 2021-22 (12 ports), but there was a significant increase in cargo handling capacity, reaching 720.05 million tonnes. Additionally, when we consider non-major ports, there have been changes in both the number of ports and their cargo handling facilities

India has more than 200 non-major ports, which are controlled by various state maritime boards. We particularly emphasize the Gujarat region, which falls under the jurisdiction of the Gujarat Maritime Board. Each state has its own policies to enhance the port sector. In Gujarat, there are 48 non-major ports, and these ports have performed well compared to those in other states. However, in recent times, Gujarat has been facing an issue with the highest number of non-active ports. Despite this challenge, Gujarat leads in cargo handling among non-major ports.

RESEARCH METHODOLOGY

In this study, a comprehensive research design is employed to analyse the maritime activities of coastal states in India from the fiscal years 2016-17 to 2021-22. The objective is to understand the trends in major and non-major ports, cargo traffic, and the dynamics of non-major ports in select states, with a specific focus on Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, Odisha, and West Bengal.

Data collection is primarily based on official reports, government publications, and maritime industry databases, ensuring the reliability and accuracy of the information. Key variables include the number of ports, total cargo traffic, commodity-wise traffic, and the status of non-active ports. The geographical scope is concentrated on coastal states, emphasizing the significance of major and non-major ports in shaping India's maritime landscape. Quantitative analysis, including statistical tools, is employed to scrutinize trends in major and non-major ports, cargo traffic, and the share of non-major ports in total traffic. Comparative analysis is conducted to highlight variations in the performance of different states over the specified period.

The methodology incorporates case studies of select non-major ports in Gujarat, such as Sikka, Magdalla, and GAPL, to gain insights into their individual dynamics. Additionally, a commodity-wise analysis of traffic at non-major ports in Gujarat is conducted to identify patterns and shifts over the study period.

Temporal trends are explored to understand the evolution of cargo traffic and port activities. A comparative state analysis is undertaken to discern the growth trajectories of Gujarat, Maharashtra, and Tamil Nadu in terms of cargo handling and port infrastructure.

An inventory of non-active ports across states is compiled, and their percentage distribution is analysed to assess their impact on the overall maritime dynamics of each state.

The study concludes with the interpretation of findings, discussion of implications for policymakers and stakeholders, and recommendations for future policies, investments, and strategic planning. Limitations, such as data availability, are acknowledged, and suggestions for future research, such as exploring socio-economic impacts or conducting a more detailed analysis of specific ports, are provided.

LITERATURE REVIEW

Makarand Maheta, in his 2012 book "Gujarat ane Dariyo" published by 'Darshak Itihas Nidhi,' organizes the content into nine chapters, focusing on Gujarat's maritime aspects and sea transportation. The book covers Gujarat's maritime history from the Harappan civilization to the British colonial era. Maheta emphasizes that while Gujarat has a rich maritime history, it doesn't mean other regions lack such richness.

The book gives a historical overview of Gujarat's connection with sea transportation, explaining how technology evolved. Maheta discusses the impact of trade policies, incorporating references to literature for context. The narrative explores historical details of trade custom houses, the ancient shipping industry, growth of port cities, and highlights notable Gujarati traders. In essence, the book not only provides a historical account but also examines the changing dynamics of technology and trade influenced by various factors, as presented by Makarand Maheta.

Sudhir Prabhasker Tiwari completed his Ph.D. thesis in 2011, titled "Development of Ports in Saurashtra Region and Kutch Region: An Economic Analysis." The research focused on the Saurashtra and Kutch regions, with the following research objectives:

- 1.To examine the income and expenditure statements of Kandla Port.
- 2.To analysed how port facilities impact foreign trade volume.
- 3.To investigate the cargo traffic of major ports.
- 4.To study port infrastructural development.
- 5.To identify the income and expenditure patterns of Kandla Port.
- 6.To highlight the benefits and challenges associated with ports.
- 7.To explore future prospects and Special Economic Zone (SEZ) development for ports.
- 8.To provide suggestions for the enhancement of ports.

The key findings of the research indicate that the success of ports can be attributed to various factors, including strategic location, larger size, multiple productivity, provision of infrastructure facilities, liberal economic policies, proper planning and management, export performance, and overall facilities.

In his 2020 work titled "Port Development: Relationships between port traffic of Gujarat and its hinterland," Dr. K.M. Chudasama defines the hinterland as encompassing eight states in India, namely Gujarat, Madhya Pradesh, Rajasthan, Haryana, Delhi, Punjab, Himachal Pradesh, and Jammu Kashmir. The objective of the research is to explore the correlation between the cargo traffic value at Gujarat ports and the Gross State Domestic Product (GSDP) of these eight hinterland states.

Chudasama utilizes a Bivariate Log-Log Regression model to analysed the relationship between the variables. The independent variable is the hinterland GSDP, while the dependent variable is the volume of traffic at Gujarat ports. The study covers data from the period 2011-2019.

The findings reveal that a one percent increase in the GSDP of the hinterland states corresponds to an average increase of 0.39 to 0.55 percent in the volume of cargo traffic at Gujarat ports. In conclusion, the research highlights that the cargo traffic at Gujarat ports is significantly influenced not only by the economic output within Gujarat but also by the economic activities in its hinterland states.

DISCUSSION AND RESULT

Firstly, we explored the potential of India's coastal states, examining their richness in coastline and the number of ports. Next, we delved into the cargo handled by major and non-major ports in India. Following that, we examined the cargo handled by various states in India. We then proceeded to analysed the traffic handled by non-major ports, categorizing it by maritime state. Additionally, we observed the trends in each state. Moving on, we investigated the share of cargo handling contributed by non-major ports in each state. Based on the state with the highest share, we conducted further analysis on commodity-wise cargo handling. Finally, we explored port-based cargo handling in those states.

States	Coastal length	Major Ports	Non-Major Ports	Total Number of ports
Gujarat	1600	1	48	49
Maharashtra	720	2	48	50
Goa	131	1	5	6
Karnataka	300	1	12	13
Tamil Nandu	590	3	15	18
Kerala	1076	1	17	18
Andhra Pradesh	972	1	13	14
Odisha	485	1	14	15
West Bengal	158	1	1	2

Source: Basic Port Statistics of India Report 2021-22

The coastal states in India exhibit varying degrees of maritime activity, each contributing to the nation's extensive port infrastructure. Gujarat boasts the longest coastline among the states listed, spanning 1600 kilometres, and is home to 49 ports, including one major port and 48 non-major ports. Maharashtra follows with a coastal length of 720 kilometres and a total of 50 ports, comprising two major ports and 48 non-major ports. Goa, Karnataka, Tamil Nadu, Kerala, Andhra Pradesh, Odisha, and West Bengal also contribute significantly to maritime trade, with varying coastal lengths and port distributions. Tamil Nadu stands out with the highest number of ports at 18, including three major and 15 non-major ports. These coastal states play a crucial role in India's trade and commerce, facilitating the movement of goods through their extensive port networks

YEAR	MAJOR PORTS		NON-MAJOR PORTS		TOTAL NO OF PORTS	TOTAL CARGO HANDLED
	NO OF PORTS	CARGO HANDLED (MILLIONS TTONNES)	NON-MAJOR PORTS	CARGO HANDLED (MILLION TONNES)		
2016-17	12	648.47	205	485.22	217	1133.69
2017-18	12	679.47	205	529.09	217	1208.56
2018-19	12	699.17	212	582.61	224	1281.78
2019-20	12	704.93	212	615.05	224	1319.98
2020-21	12	672.68	212	577.3	224	1249.98
2021-22	12	720.05	217	603.75	229	1323.8

Source: Basic Port Statistics of India Report 2021-22

Over the span of the years 2016-17 to 2021-22, India's maritime infrastructure has consistently grown in terms of both major and non-major ports, reflecting a robust trend in cargo handling. In the fiscal year 2016-17, there were 12 major ports and 205 non-major ports, handling a total cargo of 1133.69 million tonnes. Subsequently, each year witnessed an increase in cargo handling capacity. By 2021-22, the major ports remained constant at

12, while non-major ports increased to 217. The total cargo handled across all ports surged to 1323.8 million tonnes, marking a notable growth from the initial figure. This upward trajectory signifies the nation's commitment to enhancing its maritime capabilities, fostering increased trade, and meeting the rising demands of the shipping industry.

Name of the State	Major ports	Non-Major Ports	Total
Gujarat	127.1	405.39	532.49
Maharashtra	135.89	52.47	188.36
Goa	18.46	0.03	18.49
Karnataka	39.3	0.79	40.09
Kerala	34.55	0.14	34.69
Tamil Nadu	121.43	7.84	129.27
Andhra Pradesh	69.03	87.98	157.01
Orissa	116.13	41.54	157.67
West Bengal	58.18	0	58.18
others (a)	0	7.37	7.37
	720.07	603.55	1323.62

Source: Basic Port Statistics of India Report 2021-22

During the fiscal year 2021-22, the cargo traffic at Indian ports exhibited significant variations across states, reflecting the diverse economic activities and trade dynamics. Gujarat emerged as a key player with a total cargo traffic of 532.49 million tonnes, comprising 127.1 million tonnes at major ports and 405.39 million tonnes at non-major ports. Maharashtra followed closely with a total cargo of 188.36 million tonnes, including 135.89 million tonnes at major ports and 52.47 million tonnes at non-major ports. Tamil Nadu demonstrated substantial maritime activity, contributing 129.27 million tonnes in total, distributed between 121.43 million tonnes at major ports and 7.84 million tonnes at non-major ports. Other notable contributors included Andhra Pradesh, Odisha, and West Bengal, each showcasing significant cargo traffic. The comprehensive picture of state-wise cargo traffic underscores the critical role of different regions in facilitating trade and commerce through their maritime infrastructure.

Year	Gujarat	Maharashtra	Andhra Pradesh	Tamil Nadu	Karnataka	Odisha	Other	Total
20016-17	345.47	34.89	69.6	1.15	0.71	22.47	10.65	484.94
% Growth	-	-	-	-	-	-	-	-
2017-18	370.77	37.91	86.29	1.1	0.68	22.6	9.74	529.09
% Growth	7.32	8.66	23.98	-4.35	-4.23	0.58	-8.54	9.10
2018-19	399.2	45.79	103.33	0.96	1.04	22.19	10.11	582.62
% Growth	7.67	20.79	19.75	-12.73	52.94	-1.81	3.80	10.12
2019-20	411.79	43.66	99.91	11.37	0.94	35.27	12.12	615.06
% Growth	3.15	-4.65	-3.31	1084.38	-9.62	58.95	19.88	5.57
2020-21	387.57	39.84	89.64	7.41	0.79	43.03	9.03	577.31
% Growth	-5.88	-8.75	-10.28	-34.83	-15.96	22.00	-25.50	6.14
2021-22	405.39	52.47	87.98	7.84	0.79	41.54	7.73	603.74
% Growth	4.60	31.70	-1.85	5.80	0.00	-3.46	-14.40	4.58

Source: Basic Port Statistics of India Report 2021-22

The table provides insights into the traffic handled by non-major ports in various Indian states, measured in million tonnes, with additional information that "Others" includes Kerala, Andaman & Nicobar Islands, Puducherry, and Goa. In the fiscal year 2016-17, Gujarat led with 345.47 million tonnes, followed by Maharashtra at 34.89 million tonnes. The cumulative traffic, including contributions from Andhra Pradesh, Tamil Nadu, Karnataka, Odisha, and the aforementioned regions, amounted to 484.94 million tonnes. Over subsequent years, there was a positive overall growth trend, with the total traffic reaching 582.62 million tonnes in 2018-19, showcasing notable increases in Maharashtra (20.79%) and Karnataka (52.94%).

The fiscal year 2019-20 demonstrated a 5.57% overall growth, driven by substantial spikes in Tamil Nadu (1084.38%) and Odisha (58.95%). Despite an overall positive trajectory, the year 2020-21 witnessed a slight downturn, with the total traffic decreasing to 577.31 million tonnes. Negative growth in Andhra Pradesh (-34.83%) and Karnataka (-15.96%) contributed to this decline. The latest data for 2021-22 indicates a recovery with an overall growth of 4.58%, led by Maharashtra (31.70%) and Gujarat (4.60%). However, some states, like Odisha (-3.46%) and Tamil Nadu (-1.85%), experienced negative growth. It is important to note that the category "Others" encompasses Kerala, Andaman & Nicobar Islands, Puducherry, and Goa, contributing to the overall dynamics of non-major port traffic.

Year	Gujarat	Maharashtra	Andhra Pradesh	Tamil Nadu	Karnataka	Odisha	Others	Total
20016-17	71.24	7.19	14.35	0.24	0.15	4.63	2.20	100.00
2017-18	70.08	7.17	16.31	0.21	0.13	4.27	1.84	100.00
2018-19	68.52	7.86	17.74	0.16	0.18	3.81	1.74	100.00
2019-20	66.95	7.10	16.24	1.85	0.15	5.73	1.97	100.00
2020-21	67.13	6.90	15.53	1.28	0.14	7.45	1.56	100.00
2021-22	67.15	8.69	14.57	1.30	0.13	6.88	1.28	100.00

Source: Basic Port Statistics of India Report 2021-22

The table depicts the distribution of the share of traffic handled by non-major ports as a percentage of the total traffic at non-major ports in different maritime states. In the fiscal year 2016-17, Gujarat led with a 71.24% share, followed by Maharashtra at 7.19%. Over subsequent years, there were minor fluctuations, with Gujarat consistently maintaining a significant share, such as 70.08% in 2017-18 and 68.52% in 2018-19. The year 2019-20 saw Gujarat with a 66.95% share, and notable increases in shares for Tamil Nadu (1.85%) and Odisha (5.73%). In 2020-21, Gujarat retained a substantial share at 67.13%, while Odisha had a notable share of 7.45%. The latest data for 2021-22 shows Gujarat continuing to dominate with a 67.15% share, followed by Maharashtra at 8.69%, and varying shares in other states, resulting in a total of 100.00%.

year	POL & Products	Coal	Building Material	Fertilizer &FRM	Iron Ore	Others	Total
2016-17	180.32	62.42	9.73	8.7	9.38	75.19	345.74
2017-18	188.47	65.96	10.51	5.48	11.58	88.77	370.77
2018-19	186.73	76.77	10.54	7.19	14.02	103.94	399.19
2019-20	190.7	77.97	10.21	8.15	15	109.76	411.79
2020-21	151.5	65.42	10.67	9.71	12.43	137.85	387.58
2021-22	160.37	52.72	8.21	7.89	15.85	160.34	405.38

Source: Basic Port Statistics of India Report 2021-22

The table details commodity-wise traffic handled at Gujarat's non-major ports in million tonnes for the years 2016-17 to 2021-22. In 2016-17, the highest traffic came from POL & Products at 180.32 million tonnes, followed by coal at 62.42 million tonnes. Building material, fertilizer &FRM, and iron ore contributed significantly as well, resulting in a total traffic of 345.74 million tonnes. Over the subsequent years, there were fluctuations in commodity-wise traffic. In 2021-22, the trend continued with the highest traffic coming from POL & Products at 160.37 million tonnes, followed by coal at 52.72 million tonnes. The "Others" category, with a notable increase

to 160.34 million tonnes, played a substantial role in the total traffic, which reached 405.38 million tonnes. This data reflects the diverse nature of commodities handled at Gujarat's non-major ports over the specified period.

Port \ year	20016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Sikka	126.59	129.45	128.09	134.14	121.42	127.98
Magdalla	25.79	29.81	33.06	34.46	28.7	32.47
Jafarabad	4.68	5.58	6	5.97	5.5	2.65
Bedi	6.28	5.25	1.84	2.24	3.43	2.68
MulDwarka	3.19	3.47	3.53	3.86	2.93	3.57
GAPL	104.55	115.76	130.13	132.32	137.65	144.21
Dahej	26.57	31.18	34.06	32.5	29.52	31.68
Pipavav (Inc.GPPL)	8.44	8.74	10.39	10.63	10.28	10.33
Others	39.65	41.53	52.11	55.67	48.63	49.84
Total	345.74	370.77	399.21	411.79	388.06	405.41

Source: Basic Port Statistics of India Report 2021-22

The table 7 presents the traffic achieved at select non-major ports in Gujarat in million tonnes for the years 2016-17 to 2021-22. Sikka consistently held the highest traffic, reaching 127.98 million tonnes in 2021-22. Magdalla, Jafarabad, and Bedi showed varying trends, with Magdalla experiencing an increase to 32.47 million tonnes in 2021-22. Jafarabad had a decline to 2.65 million tonnes, while Bedi witnessed a decrease to 2.68 million tonnes. MulDwarka and GAPL displayed fluctuations, with GAPL showing a steady increase to 144.21 million tonnes in 2021-22. Dahej and Pipavav maintained relatively stable traffic, with Dahej at 31.68 million tonnes and Pipavav at 10.33 million tonnes in 2021-22. The "Others" category contributed consistently, reaching 49.84 million tonnes in 2021-22. The total traffic at these selects non-major ports in Gujarat reached 405.41 million tonnes in 2021-22, showcasing the diverse and dynamic nature of cargo handling across these ports.

States	Non active port	% non-active
Gujarat	28	35
Maharashtra	0	0
Goa	4	5
Karnataka	3	3.75
Tamil Nandu	12	15
Kerala	8	10
Andhra Pradesh	11	13.75
Odisha	12	15
West Bengal	2	2.5
Total	80	100

Source: Indian Express 30 December 2021

The table 8 provides a snapshot of non-active ports in various Indian states and the percentage of non-active ports in each state. Gujarat has the highest number of non-active ports, standing at 28, constituting 35% of the total non-active ports in the presented states. Maharashtra reports no non-active ports, contributing to 0% in the overall distribution. Goa has 4 non-active ports, accounting for 5%, while Karnataka and West Bengal each have 3 and 2 non-active ports, representing 3.75% and 2.5%, respectively. Tamil Nadu and Odisha each have 12 non-active ports, making up 15% of the total non-active ports in the given states. Kerala and Andhra Pradesh contribute 8 and 11 non-active ports, representing 10% and 13.75%, respectively. In summary, the compilation of non-active ports across these states amounts to a total of 80, distributed to reflect the varying proportions in each state.

CONCLUSION

In the exploration of India's coastal states and their maritime contributions, our findings collectively unveil a dynamic tapestry of growth and diversity. Over the years 2016-17 to 2021-22, the nation has demonstrated a steadfast commitment to bolstering its maritime infrastructure, evident in the consistent expansion of both major and non-major ports. Gujarat, with its expansive coastline, emerges as a linchpin in this maritime ecosystem, leading in both the number of ports and cargo traffic. Maharashtra and Tamil Nadu also play pivotal roles, reflecting the economic vibrancy and diverse trade activities of these regions.

This upward trajectory in maritime capabilities is mirrored not only at the national level but also in the nuanced state-wise variations in cargo traffic. Gujarat's dominance in cargo handling is notable, closely followed by

Maharashtra and Tamil Nadu. The fluctuations in non-major port traffic, commodity-wise distribution, and the ebb and flow of select non-major ports in Gujarat reveal a multifaceted maritime landscape. As states like Andhra Pradesh, Odisha, and West Bengal contribute substantially to this intricate web, the overall picture emphasizes the interconnectedness of regional maritime activities. Moreover, the presence of non-active ports, particularly Gujarat's prominence in this category, adds another layer to the narrative, underlining the importance of both operational and non-operational port facilities in shaping the maritime dynamics of the nation. In essence, this research encapsulates the interplay of growth, diversity, and strategic importance in India's coastal states, reinforcing the imperative of sustained investment and strategic planning to navigate the evolving currents of global trade.

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