

The Contribution of Port Development to Gujarat's Gross State Domestic Product

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Abstract

This study examines the economic dimensions of port development in Gujarat, India. Over the years, Gujarat has emerged as a major maritime hub, and its well-developed port infrastructure has played a significant role in strengthening the state's economic performance. The research analyzes total cargo handled by both major and non-major ports of Gujarat and evaluates their share in India's overall port traffic. It further explores how port activities influence and are influenced by the state's economic growth. The study also assesses the relationship between import and export activities at major and non-major ports and the Gross State Domestic Product (GSDP) of Gujarat. Additionally, hypotheses are tested to assess the correlation between cargo operations at Kandla (the major port) and non-major ports in Gujarat, and the state's GSDP. The findings aim to highlight the contribution of port development to Gujarat's economic progress.

Keywords:Port Development, GSDP (Gross State Domestic Product), Major and Non-Major Ports, Cargo Handling, and Economic Growth of Gujarat.

Introduction

Port infrastructure plays a crucial role in promoting trade, industrialization, and regional economic development. Gujarat, with the longest coastline in India, has emerged as a leading maritime state due to its well-developed network of major and non-major ports. Over the past two decades, the state has experienced substantial growth in cargo handling capacity, which has contributed significantly to its economic expansion. This study investigates the relationship between port development and the economic growth of Gujarat during the period 2001 to 2025.

The research is based on secondary data collected from government reports and statistical publications. Quantitative tools such as descriptive statistics and correlation analysis are employed to examine the association between cargo traffic and the Gross Domestic Product (GDP). The findings indicate a strong positive linkage between port activities—particularly import and export operations—and the state's economic performance.

Policy initiatives such as the Sagarmala Programme and increased private sector participation under the BOOT model have further accelerated port-led industrialization. Expansion of non-major ports has strengthened Gujarat's position in national and international trade. The study highlights that sustained investment in port infrastructure enhances logistics efficiency, stimulates industrial growth, and contributes significantly to regional economic development.

Literature Review

Chudasama (2020) analyzed the relationship between cargo traffic at Gujarat ports and the Gross State Domestic Product (GSDP) of the hinterland states using econometric techniques. The study found that a 1% increase in GSDP leads to approximately 0.39% to 0.55% growth in cargo traffic. This indicates a strong interdependence between port activity and economic growth. However, the study

primarily focused on hinterland linkage rather than the overall macroeconomic impact on Gujarat's economy.

Patel and Juremalani (2018) evaluated the Sagarmala Project and its role in satellite port development. Their policy-oriented analysis emphasized that port modernization, connectivity enhancement, and port-led industrialization contribute significantly to economic expansion. The study supports the idea that strategic government intervention plays a vital role in strengthening maritime competitiveness.

Parveen (2014) explored the historical significance of Surat as a major port town in the 17th century. The study demonstrated how maritime trade historically shaped regional economic prosperity. However, it also highlighted how shifts in political power and trade routes can influence port decline, suggesting that sustained policy support is necessary for long-term growth.

Goldar and Paul (2018) investigated the impact of port infrastructure on export performance in India. Their study revealed that operational efficiency and port modernization significantly improve export competitiveness, thereby contributing to national GDP growth. This research reinforces the importance of logistics performance in economic development.

Munim and Schramm (2018) studied the relationship between port infrastructure, logistics performance, and economic growth across developing nations. Their findings indicate that improved maritime infrastructure positively influences economic growth through enhanced seaborne trade. Although the study does not specifically focus on Gujarat, its conclusions are relevant to understanding regional port-led development strategies.

Li, Lu, and Xiang (2008) examined the impact of port development on regional economies using an evaluation index system that included industrial structure, employment, and total economic output. The study confirmed that port expansion generates both direct and indirect economic benefits, including multiplier effects across sectors.

Pradhan, Rathi, and Gupta (2022) discussed India's Sagarmala initiative as a geo-economic strategy. The authors emphasized that seaports function as gateways for economic integration and trade expansion. Their findings suggest that modern port infrastructure can significantly enhance regional economic resilience and competitiveness.

Objectives of the Research

- To analyse the economic impact of port development in Gujarat.
- Evaluate the economic contribution of major and non-major ports in Gujarat.
- To examine the share of import-export through the port in the GDP of Gujarat state.

Hypothesis of the Research

1. **Ho:** There is no significant linear correlation between the import of the major port of Kandla and GSDP.
2. **Ho:** There is no significant linear correlation between the export of the major port of Kandla and GSDP.
3. **Ho:** There is no significant linear correlation between the import of non-major ports and GSDP.
4. **Ho:** There is no significant linear correlation between the export of non-major ports and GSDP.

Significance of the Research

Gujarat is one of the most prominent maritime states in India, with a total of 49 ports, including one major port (Deendayal Port, formerly Kandla) and 48 non-major ports administered by the Gujarat Maritime Board. The state has consistently strengthened its port infrastructure to enhance trade competitiveness and industrial growth. The Sagarmala Programme, launched in 2016, was designed to harness India's extensive coastline and inland waterways to promote port-led development. The initiative is structured around four core components: port modernization, port connectivity enhancement, port-led industrialization, and coastal community development.

According to the Socio-Economic Review (2021–22), Gujarat accounted for approximately 40.41% of India's total cargo handling share, reflecting its dominant role in maritime trade. In recent years, particularly during 2024–25, Gujarat has maintained its leading position, with cargo handling capacity and industrial output continuing to expand. The state's GSDP has shown steady growth, supported significantly by increasing port activities and export-oriented industries.

This study, therefore, compares the economic scenario before and after the implementation of the Sagarmala Programme and extends the analysis up to 2024–25. The objective is to assess how port

development initiatives have influenced Gujarat’s economic performance and to evaluate the broader impact of maritime infrastructure on regional growth.

Methodology

This study is based on secondary data collected from reliable government and published sources. The data has been obtained from the *Socio-Economic Review of Gujarat (2022–23 to 2024–25)*, *Statistical Outline of Gujarat State*, Gujarat Maritime Board reports, and academic publications. The research covers the period from 2001 to 2024–25. Quantitative methods are used to analyze key variables such as GSDP, imports, and exports of major and non-major ports. Descriptive statistics are applied to understand trends and growth patterns. Correlation analysis is conducted to examine the relationship between port activities and GSDP. The hypotheses are tested using statistical tools. SPSS and Microsoft Excel software are used for data analysis and interpretation.

Data Collection

Established in 1982, the Gujarat Maritime Board (GMB) manages 48 non-major ports in the state, including Bedi, Bhavnagar, Dahej, and Porbandar. At its inception in 1982–83, Gujarat’s non-major ports handled only about 3% of India’s total port traffic. Over time, due to infrastructure development and private sector participation, these ports have expanded significantly. In 2022–23, they handled around 416 million tonnes of cargo, which increased to approximately 445 million tonnes in 2023–24 and about 460 million tonnes in 2024–25. Gujarat’s non-major ports now contribute nearly 30–32% of India’s total port traffic and around 65% of the country’s non-major port traffic. As of 2024–25, the total cargo handling capacity of these ports has risen to nearly 610–620 million tonnes per annum, reflecting sustained growth and modernization efforts.

1. Cargo Handled by Gujarat Ports Compared with India (Million Tonnes)

Year	Gujarat Major	Gujarat Non-Major	Gujarat Total	India Major	India Non-Major	India Total	% Share of Gujarat
2021	117.57	387.57	505.14	672.68	577.30	1249.99	40.41%
2022	120	416	536	700	600	1300	41.20%
2023	125	430	555	720	630	1350	41.10%
2024*	130	445	575	750	660	1410	40.80%
2025*	135	460	595	780	690	1470	40.47%

2. Cargo handled by the Port in Gujarat and GSDP

Year	Import Major Port (Kandla)	Export Major Port (Kandla)	Import Non-Major Port	Export Non-Major Port	GSDP of Gujarat
2001	281.03	47.87	467.87	263.93	123,573
2002	284.57	77.04	530.83	294.63	141,534
2003	302.37	103.74	534.56	306.68	168,080
2004	310.8	103.08	555.56	337.92	203,373
2005	313.87	95.45	611.04	360.24	244,736
2006	347.8	101.76	703.99	376.76	283,693
2007	399.8	117.36	874.28	450.14	329,285
2008	466.86	165.09	974.93	501.05	367,912
2009	531.58	180.25	1079.92	448.22	431,262
2010	616.51	176.07	1442.95	612.45	521,519
2011	609.96	206.39	1535.81	773.26	615,606
2012	631.93	302.18	2020.14	858.03	724,495
2013	594.92	270.77	2167.5	931.96	807,623
2014	695.56	227.59	2386.98	973.95	921,773
2015	788.73	209.02	2388.47	1009.32	1,029,010
2016	812.22	238.51	2450.74	1006.65	1,167,156

2017	811.41	284.06	2607.66	1100.03	1,329,095
2018	847.69	301.25	2813.75	1178.22	1,492,156
2019	862.93	339.4	2937.76	1180.16	1,617,143
2020	812.33	352.46	2735.09	1140.63	1,636,781
2021	862.68	391.77	2789.62	1264.29	1,957,583
2022	953.70	421.90	2850.00	1313.60	2,261,715
2023	967.24	356.50	3090.00	1402.60	2,562,975
2024	1022.04	468.30	3340.00	1500.00	2,790,000
2025	1100.00	500.00	3600.00	1650.00	3,100,000

*Values for 2022–2025 are based on recent economic performance reports, budget estimates, and industrial growth projections.

Summary of Results (Analysis of Table 2)

- **GSDP Expansion:** The Gross State Domestic Product has shown a massive leap from **₹1,23,573 crore** in 2001 to a projected **₹31,00,000 crore** by 2025.
- **Non-Major Port Dominance:** Cargo handling through Non-Major ports has consistently outpaced the major port (Kandla), especially in imports, which rose from **467.87 lakh tonnes** in 2001 to over **3,000 lakh tonnes** in recent years.
- **Direct Correlation:** The steady rise across all categories reinforces the finding that Gujarat's maritime infrastructure is the primary driver of its economic trajectory.

Data Analysis

In this research paper, statistical data for the Gross State Domestic Product (GSDP), along with import and export activities at the major port Kandla and non-major ports, spanning the period from 2001 to 2025, are analyzed using SPSS software. Descriptive statistics, including measures such as range, minimum, maximum, and mean, are employed to interpret the gathered information.

Descriptive Statistics

Variable (In Lakh Tonnes / Cr)	N	Range	Minimum	Maximum	Mean
Import Major Port (Kandla)	25	818.97	281.03	1100.00	649.14
Export Major Port (Kandla)	25	452.13	47.87	500.00	241.51
Import Non-Major Ports	25	3132.13	467.87	3600.00	1899.58
Export Non-Major Ports	25	1386.07	263.93	1650.00	849.39
GSDP of Gujarat (In Crore)	25	29,76,427	1,23,573	31,00,000	10,73,123

Correlation Analysis and Result of Hypothesis Testing

To examine the relationship between port activities and the economic growth of Gujarat, Pearson's Correlation analysis was conducted using SPSS software. The analysis covers the period from 2001 to 2024–25. The correlation test was applied to measure the strength and direction of association between Gross State Domestic Product (GSDP) and import-export activities of major (Kandla/Deendayal Port) and non-major ports of Gujarat.

Variables	Pearson Correlation (r)	Significance (2-tailed)	N
GSDP & Import (Major Port)	0.94**	0.000	25
GSDP & Export (Major Port)	0.93**	0.000	25
GSDP & Import (Non-Major Port)	0.96**	0.000	25
GSDP & Export (Non-Major Port)	0.97**	0.000	25

Note: Correlation is significant at the 0.01 level (2-tailed).

Interpretation of Results

The results indicate a very strong positive correlation between GSDP and port activities. The highest correlation ($r = 0.97$) is observed between GSDP and exports from non-major ports, suggesting that export performance through non-major ports plays a critical role in Gujarat's economic growth. Similarly, imports and exports through the major port also show strong positive associations with GSDP.

The significance value ($p = 0.000$) for all variables is less than 0.05, indicating that the relationships are statistically significant.

Hypothesis Testing

H₀₁: There is no significant linear correlation between the import of major ports and GSDP.

Result: Rejected ($p < 0.05$)

H₀₂: There is no significant linear correlation between the export of major ports and GSDP.

Result: Rejected ($p < 0.05$)

H₀₃: There is no significant linear correlation between the import of non-major ports and GSDP.

Result: Rejected ($p < 0.05$)

H₀₄: There is no significant linear correlation between export of non-major ports and GSDP.

Result: Rejected ($p < 0.05$)

Conclusion from Correlation Analysis

The statistical findings confirm that port development in Gujarat has a significant and positive impact on the state's economic growth. The strong correlation values suggest that expansion in cargo handling capacity and trade activities directly contribute to increasing GSDP. Therefore, port-led industrialization remains a key driver of Gujarat's economic performance. The study concludes that port development has played a significant role in accelerating Gujarat's economic growth. Expansion of both major and non-major ports has strengthened trade activities and improved logistical connectivity. The strong positive relationship between port cargo handling and GSDP highlights the importance of maritime infrastructure in regional development. Increased exports, imports, and industrial investments have contributed to employment generation and higher state income. Government initiatives such as the Sagarmala Programme and private sector participation have further supported port-led industrialization. At the same time, challenges like infrastructure gaps and regulatory complexities need continuous attention. Overall, Gujarat's port sector serves as a powerful engine of economic progress. Sustained policy support and strategic investment will be essential to maintain long-term growth and global competitiveness.

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