



IDENTIFICATION OF DEVELOPMENT POTENTIAL FOR URBAN PROJECTS: A CASE OF SAGARMALA PROGRAM INDIA

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Abstract: Ports play an important role in the economic development of the country and its interior and are an important infrastructure resource for the countries' trade. Thus, the development of these ports is an important factor as a large urban project. This document is the review of the development of the main ports that includes the evolution in the development of the ports after independence. The ports were developed after independence to reduce traffic and pressure on the port of Mumbai. But it still lags behind the need due to some limitations. These problems were identified and resolved after much research. In 2012, the 'Land Ports Authority of India (LPAD)' was created to provide state-of-the-art infrastructure facilities to the port. In 2015, the Indian government approved the Sagarmala project for port development.

Keywords: Urban projects, Port infrastructure, Sagarmala, Port modernization.

1. Introduction

The Sagarmala Program was originally proposed by the National Democratic Alliance Government (India) under Atal Bihari Vajpayee in 2003. On March 25, 2015, the Cabinet approved the Sagarmala Program.

The shipping industry has been transformed by the expansion of trade, the integration of different modes of transportation, and technological advancement. The production of components and goods throughout the world, especially in the developing economy, led to the establishment of global supply chains. Transportation in a global supply chain puts shipping at the forefront of the global economic system. Acting as a bridge between different geographic and economic regions, the maritime sector became the driver of economic growth and change. (Mallick, 2017)

Subsequently, the transport revolution changed the functions of seaports (hereinafter referred to as ports) from an interface between sea and land to an integrated element of the global supply chain as a consequence of inter-modalism and logistics integration. The evolution of containers brought about not only sea-based changes such as ship design, liner routes along with economic changes, but also significantly affected port infrastructure and operational practices. This phase of transformation of the maritime sector witnessed a significant increase in research work, particularly in operation, planning, governance and, more recently, sustainability in the maritime and port sector. (Mallick, 2017)

India is strategically located on the most important and famous East-West trade route in the world. During the ancient and medieval period, the ports and harbours of India played an important role in the expansion of trade, commerce and culture. From the earliest times to the end of the Mughal period, goods and other luxuries of life travelled from the ports of India to the cities of West Asia and Europe. (Weekly and Weekly, 2017)

India has an extensive coastline of 7,517 km, stretching along plateaus to the west and east of the mainland, as well as along islands. Its coastline stretches across nine states and four union territories. India's nine coastal states had a total of 13 major ports, 200 minor and intermediate ports (commonly known as small ports), and an exclusive economic zone (EEZ). The states are Gujarat, Maharashtra, Goa, Karnataka, Kerala (west coast) and Tamil Nadu, Andhra Pradesh, Orissa, West Bengal (east coast).

2. Port development post-independence

After independence, Mumbai was the only one to have a port where business would be conducted to reduce traffic and ease volume. A step was taken to create another port that would help a lot. Therefore, the port of Kandla was developed to alleviate the

volume of trade in the port of Mumbai due to the loss of the port of Karachi due to partition. But it still lags behind the progress in development and EXIM. No attention was paid to road and land port transportation.

2.1 Development limitations:

Before the adoption of the New Economic Policy in the early 1990s, India followed an introspective development strategy of import substitution and self-sufficiency, in which trade and exports received very little attention. Imports were mainly restricted to essential oils, fertilizers, and food products, which were imported during the crisis years, while equipment and machinery, as well as other intermediate goods, required import permits.(Ray, 2005)

Inadequate capacity: The main ports handled a traffic of about 179.02 million tons in 1993-94 against an estimated capacity of 173.04 million tons, which means a capacity overuse of almost 3.5%. This number peaked at 21.5% between 1995 and 1996 before beginning to decline. In addition to these quantitative capacity limitations, the main ports also have quality deficiencies. Outdated quay designs, outdated cargo handling equipment, inadequate maintenance and inefficient dredgers have made India's ports unsuitable for modern cargo handling. Specialized cargo handling fixtures as well as the number of technicians trained to handle modern equipment were in short supply. In addition, in the logistics chain, land transport capacity is not enough. The railways lacked the equipment and structures to ensure a steady flow of container traffic, and instead focused primarily on the transportation of bulk goods. The poor road connection to the port has also hampered the flow of goods.

Underutilization of existing facilities: In addition to the serious obstacles posed by incomplete capacity, India's major ports have also been characterized by non-existent problems with existing facilities. Some significant terminals for traditional goods have diminished over time, they have not yet been used. The excessive use of port capacities is also due to the control of many procedures and the inadequate communication between port employees, customs, gastronomic companies, transport agencies.

Outcomes: The inefficiencies of Indian ports have resulted in increased direct and ocean freight costs, making goods shipped from Indian ports unprofitable and uncompetitive in the international market. Furthermore, long waiting times have deterred large and profitable ocean liners from calling at Indian ports. As a result, Indian containerized goods must be transhipped in Colombo, Dubai or Singapore, which incurs additional costs and transit times.

Operation delays: Transaction delays also lead to corrupt practices such as paying "fast money" directly to individuals to expedite transactions, as well as high customs brokerage fees. These figures are estimated to represent 10%, 20%, and 20%, 40% of total container costs, respectively.⁹ Ultimately, overcapacity in the workforce led to further escalation of costs, making Indian ports uncompetitive.(Ray, 2005)

Inefficient financial performance: The aggregate financial performance of the major ports shows an operating surplus almost quadrupling from Rs 323.4 in 1989-90 to Rs. Recovery from 2001-02. It should be noted here, however, that this operating surplus does not necessarily reflect the actual profit of the port, since a large part of this surplus is expressed in circulation fees and foreign exchange for leasing another port due to the inherent inefficiency of the port area.

Insufficient land routes: Land routes and ports were not given due to attention after Independence, despite having served in ancient times as a means of commercial domain for India and a bridge for foreign travellers who come to India to spread its influence worldwide.

3. Port development in recent times

According to the union Home Minister on the 10th day of the founding of 'India Land Ports Authority' in 2022, India should have focused on improving road transport and land port after Independence, but he was given due priority in the last 10 years after which unprecedented positive changes have been seen. The LPAI filled the gap of the last 75 years and demonstrated its usefulness and relevance.

According to the Ministry of Shipping, about 95 percent of international trade is carried out by sea transport. The export from India is increasing very rapidly due to shipping. There are 9 coastal states namely Maharashtra, Gujarat, Karnataka, Goa, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, West Bengal and two union territories Daman and Diu and Puducherry in India. It has 13 major seaports and 200 notified minor and intermediate ports that handle a large volume of traffic. All of these are administered by the states and the central government.

To promote India's port and shipping industry, the government has also introduced various tax and non-tax incentives for companies that develop, maintain and operate ports, inland waterways and shipbuilding in India.(AECOM, 2016)

The Government launched the ambitious Sagarmala Program in March 2017, with a vision of port-led development and the growth of logistics-intensive industries. Under the Sagarmala Program, \$123 billion would be invested in 415 projects in the following identified components:

- Components of sagarmala project
- Port Modernization and New Port Development
 - Port connectivity enhancement
 - Port linked industrialisation
 - Coastal community development

The projects identified under the Sagarmala Program are expected to have the following impact:

- Mobilization of over \$58 bn of infrastructure investment
- Double the share of inland and coastal waterways in the modal mix from 6%
- Reduce time for export by 5 days
- Boost merchandise exports by \$110 bn
- Create 4 Mn new direct jobs and 6 Mn indirect jobs(AECOM, 2016)

Table-1 shows the list of ports and its corresponding states

Table 1. List of ports under Sagarmala project

Sr. no	Major Ports	State
1	Chennai	Tamil Nadu
2	Cochin	Kerala
3	KPL	Tamil Nadu
4	JNPT	Maharashtra
5	Deendayal	Gujarat
6	Syama Prasad Mookerjee	West Bengal
7	Haldia	
8	Mormugao	Goa
9	Mumbai	Maharashtra
10	NMPT	Karnataka
11	Paradip	Odisha
12	V. O. Chidambaranar	Tamil Nadu
13	Visakhapatnam Port Trust	Andhra Pradesh

(Source: sagarmala.gov.in)

4. Summary

The image 2. Show summary of all 13-major ports developed under Sagarmala program.

Ports	Kandla	Mumbai	JNPT	Marmugao	NMPT	Cochin	Tuticorin	Chennai	Ennore	Vizag	Paradip	Haldia	Kolkata
Owned by	Government of India	Government of India	Government of India	Government of India	Ministry of Ports, Shipping and Waterways, Govt of India	Ministry of Ports, Shipping and Waterways, Govt of India	V. O. Chidambaranar Port Trust, Ministry of Ports, Shipping and Waterways, Government of India	Chennai Port Trust, Ministry of Ports, Shipping and Waterways, Government of India	Kamarajar Port Limited	Ministry of Ports, Shipping and Waterways, Government of India	Government of India	Ministry of Shipping (India)	Syama Prasad Mukherjee Port Trust, Ministry of Ports, Shipping and Waterways, Government of India
Operated by	Deendayal port trust	Mumbai port trust	Jawaharlal Nehru port trust	Mormugao Port Trust	New Mangalore Port Trust	Cochin Port Trust and Dubai Ports World	V. O. Chidambaranar Port Trust	Chennai Port Trust	Kamarajar Port Limited	Visakhapatnam Port Trust	Paradip Port Trust	Kolkata Port Trust	Syama Prasad Mookerjee Port Trust
Annual revenue (in cr.)	780.41	1710	1988	382.68	600.5	632.12	387.8	890.4	166.65	0	346.8	0	2622
Operating income	885.11	1331.99	1475.85	286.75	380.23	385.83	466.84	698.75	563.64	792.62	920.94		1773.6
Features	Known as Tidal Port Acknowledged as Trade Free Zone Largest port by volume of cargo handled.	Largest Natural Port and harbour in India The busiest port in India	Largest Artificial Port, It is the Largest Container Port in India.	Situated on the estuary of the river Zuari, iron ore exports Earliest modern port	Deals with the iron ore exports	Sited in the Vembanad lake, Exports of spices and salts	A major port in south India deals with the fertilizers and petrochemical products, Marine trade and pearl fishery	Artificial Port, Second busiest port, automobile, fertilizer and petroleum products	India's First corporatized port	Deepest port of India deals with the export of iron ore to Japan. Amenities for building and fixing of ships are available, have largest rail network	Natural Harbor, deals with the export of iron and aluminium	Base of Indian coast guard, imports chemical, petrochemicals and oil	India's only major Riverine port Situated on Hugli river Known as Diamond Harbour
Major cargo handled	POL, Crude, Edible oil-64%	POL, Crude	Liquid Cargo	Coking Coal-37.5%	Cruid, Dry bulk	Oil	Coal	POL, Crude oil	Coal		Thermal coal		Coal
Connectivity													
Road	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Air	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rail	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Future Scope for													
Road	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Rail	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Future scope for development	Develop port as chemical Hub, Container terminal, Internal and external rail connectivity	Highway widening, SEZ, Multi modal logistic park, new terminals, Parking plaza	Four lane road, railway network augmentation, Berths redevelopment, Fishing jetty	Satellite port, Mechanization of berths, Additional storage area, deepening of port	Warehousing, cruise terminals, capacity enhancement, international ship repair facility, identifying land for sand mining, Tea park	Berth development, Road and rail connectivity, parking yard, Outer harbour Development, upgradation of inner harbor	Development of Navy Berth, Common Rail Yard, Parking Area, Internal road connectivity,	Multi cargo terminal, LNG terminal, RO-RO jerry, Internal Rail Road Network, External connectivity, Infrastructure projects, Expansion Plan of the Existing Harbour, Land Use Plan	Berth upgradation, Outer harbour development, Concept of Satellite Port, Mechanization of existing berth, Fly over bridge, Railway line electrification, road network etc	Development of berth and their mechanization, Area for smart city, outer harbour development	Capacity expansion projects, road and rail connectivity, Berth development		Berth capacity improvement,
Port Modernization	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Port led industrialization													No
Community development	No	Yes		No									No
Vulnerability	3	1	1	1	1	1	3	3	3	3	3	3	3
Tourism	No	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No
Fishing activities	No	Yes	No	No	No	Yes	No	Yes	No	Yes	Yes	No	Yes
Contributiob in GDP	23240	56027	65622	16664	18993	11731	16832	56153	10246	43630	43830		75762
Commercial operation	Port is major commercial port			Proposed	Proposed in 2019	Develop as commercial hub in terms of fisheries development 2019	Proposed 2015		2 Berths for commercial operations				Yes

Vulnerability 1,2,3 Moderate, High, Very high

Figure 1. Development of ports

5. Outcome

The Table 2. below shows the development potential of different ports. The yellow colour indicates the maximum potential of development, blue indicates the moderate potential and no colour means less potential.

Table 2. Development potential of ports

Details	Kandla	Mumbai	JNPT	Marmugao	NMPT	Cochin	Tuticorin	Chennai	Ennore	Vizag	Paradip	Haldia	Kolkata
Annual revenue (in cr.)	780.41	1710	1988	382.68	600.5	632.12	387.8	890.4	166.65	0	346.8	0	2622
Operating income (in cr.)	885.11	1331.99	1475.85	286.75	380.23	385.83	466.84	698.75	563.64	792.62	920.94		1773.6
Tourism	No	Yes	No	No	No	No	No	No	No	No	No		No
Vulnerability	3	1	1	1	1	1	3	3	3	3	3	3	3
Fishing activities	No	Yes	No	No can be developed	No	Yes	No	Yes	No	Yes	Yes	No	Yes
Contribution to GDP	23240	56027	65622	16664	18993	11731	16832	56153	10246	43630	43830		75762
Need for development of Commercial centres	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No				No
Smart port city/ smart city initiative by government	Yes	Yes	No	No	No	No	No	No	No	No	Yes	No	No
Projects under port led industrialization	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Vulnerability 1- Moderate 2- High 3- Very high

6. Conclusion

In ancient times there were many natural seaports that were used for the transportation of goods across the world in India. These ports were well used and developed after independence. The first port to be developed after independence was the port of Kandla in Kutch. After that, many ports were developed in different coastal states like Maharashtra, Gujarat, Goa, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, West Bengal.

In 2015, the Indian government launched Sagarmala, a huge infrastructure project involving investments of INR 8 crore. Sagarmala aims to: Reduce the time and cost of transporting goods using maritime and rail transport, and keep road transport to a minimum, allowing manufacturers and exporters to locate their industrial facilities at the point of shipment (ports), Building rail lines connecting ports to the nearest rail junction that can transport cargo to destination cities, building pipelines that will transport chemicals to the nearest destination (rather than trucking them), and creating a road network that will connect ports with the industrial corridor, without the vehicles having to go through the cities.

When completed, Sagarmala will generate an investment of Rs 4-8 crore, 40 billion jobs, save up to Rs 40 000 crore per year in logistics costs and increase exports by \$110 000 million by trying to achieve all this development by 2025 at the latest.

According to the port development study in Sagarmala, the development potential of the project was identified based on understanding, showing that Kandla and Marmugao have the maximum development potential for development. To conclude, port development in India is driving the progress of the logistics sector and will create employment for millions of people in all sectors. Therefore, it will help in the economic development of the country.

7. References

7.1 Journal Article

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