

**RESTRUCTURING OF MAJOR PORTS
OF INDIA IN THE POST REFORM ERA
(1991-2004)**

*Dissertation submitted to Jawaharlal Nehru University
in partial fulfillment of the requirements
for the award of the Degree of*

MASTER OF PHILOSOPHY

SADANAND GUPTA



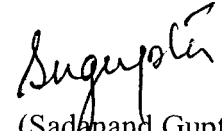
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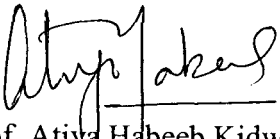
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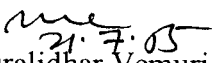
CERTIFICATE


I, **Sadanand Gupta**, certify that the dissertation entitled “**RESTRUCTURING OF MAJOR PORTS OF INDIA IN THE POST REFORM ERA (1991-2004)**” submitted for the degree of **Master of Philosophy** is my bonafide work and may be placed before the examiners for evaluation.


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To My

Grandparents...

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(SADAN AND GUPTA)

ABBREVIATIONS

BOOT	Build, Own, Operate and Transfer
BOT	Build, Operate and Transfer
CFS	Container Freight Station.
ChPT	Chennai Port Trust
CONCOR	Container Corporation of India
CoPT	Cochin Port Trust
DCI	Dredging Corporation of India
DLB	Dock Labour Board
DWT	Dead Weight Tonnage
FDI	Foreign Direct Investment
FIs	Financial Institutions
FRM	Fertiliser Raw Material
GAPL	Gujarat Adani Ports Ltd.
GOI	Government of India
GPPL	Gujarat Pipavav Port Ltd.
GRT	Gross Registered Tonnage
HDC	Haldia Dock Complex
ICD	Inland Container Depot
ICICI	Industrial Credit and Investment Corporation of India
IDBI	Industrial Development Bank of India
IDFC	Infrastructure Development Finance Company
IFCI	Industrial Finance Corporation of India Ltd.
IIPM	Indian Institute of Port Management
IPA	Indian Port Association
JNPT	JawaharLal Nehru Port Trust
KDS	Kolkata Dock System
KoPT	Kolkata Port Trust
KPT	Kandla Port Trust
MbPT	Mumbai Port Trust
MoPT	Mormugao Port Trust

MOST	Ministry of Surface and Transport.
MPTA	Major Port Trust Act
MT	Million Tonnes.
MTPA	Million Tonnes per Annum
NFTP	National Foreign Trade Policy.
NIPM	National Institute of Port Management
NMPT	New Mangalore Port Trust
NSICT	Nhava Sheva International Container Terminal
POL	Petroleum, Oil & Lubricant
PPT	Paradip Port Trust
R&D	Research and Development
SPV	Special Purpose Vehicles
TAMP	Tariff Authority of Major Ports
TEU	Twenty Feet Equivalent Unit
TPT	Tuticorin Port Trust
VPT	Visakhapatnam Port Trust

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CHAPTER I

INTRODUCTION

“A port is essentially an economic concept, an economic infrastructure that serves coastal and overseas traffic. Port is a sub-system of the total transport network and a meeting place of other modes of transport. A port is a gateway for the entrance from surface water to land and vice versa. Port is also constructed as the major crossroad of traffic in ideas, peoples and goods over the centuries”¹.

India is endowed with an extensive coastline of about 6,100 kms along nine coastal states, namely Gujarat, Maharashtra, Goa, Karnataka, Kerala (on the west coast) and Tamil Nadu, Andhra Pradesh, Orissa, West Bengal (on the east coast). India had only five major ports at Kolkata, Mumbai, Chennai, Cochin and Visakhapatnam when it became independent in 1947² (Table 1.1). Today, these nine states have in all 12 major and 185 minor ports. Among these 12 major ports, six are located on the west coast (Kandla, Mumbai, Jawaharlal Nehru Port, Mormugao, New Mangalore and Cochin) and six on the east coast (Tuticorin, Chennai, Ennore, Paradip, Visakhapatnam, and Kolkata). Four of the major ports viz, Kolkata, Mumbai, Chennai and Mormugao are more than 100 years old. Cochin and Visakhapatnam ports have recently celebrated their golden jubilee (Table 1.1). The ports of Kandla, Tuticorin, New Mangalore, Haldia and Paradip came into existence after independence. JNPT became operational after 1989. Ennore is the first major corporate port of India which started its operation in 2001. Out of total declared 185 minor ports only 40 are fully operational right now, 120 ports (67 percent) belong to west coast states and 24 ports to east coast states and the rest belong to the island union territories. Maharashtra has the highest number (53) of minor ports in India³. The state of Tamil Nadu is having maximum number (3) of major ports in India and 14 minor ports. West Bengal is the only maritime state, which, even with adequate

¹ Kindelberger, C. P. (1996), “*World Economic Primacy: 1500-1990*”, Oxford Unit Press (OUP), New York.

² Ray, Animesh “*Maritime India – Ports and Shipping*”, Pearl Publishers, Kolkata, 1993.

³ *Basic Port Statistics of India*, (2002-03), MOST, GOI, p. 26.

waterfront has no declared minor port. Most of the minor ports are nonfunctional⁴ (Appendix I).

It is worthwhile to mention here that nearly 180 years after Johann Von Thunen's Isolated State (1826), 76 years after Alfred Weber's theory of location of Industries (1929), 50 years after August Losch's "The Economics of Location" (1954) and Walter Isward's "Location and the Space Economy" (1956) were published but nowhere in the world do spatial factors like transportation and more specifically sea transportation in regional economic development got proper place in the textbooks⁵.

The major ports are under the purview of the Central Government, while other ports (minor and intermediate ports) come under the jurisdiction of the respective State Governments⁶. States with Maritime Boards are Gujarat, Maharashtra, and Tamil Nadu while States without Maritime Boards are Kerala, Andhra Pradesh, Goa, Karnataka, Orissa, West Bengal and Union Territories⁷. Currently, the port sector is governed by a plethora of complex laws and regulations. These include The Indian Ports Act (1908), The Inland Vessels Act (1838), The Dock Workers (Regulation of Employment) Act (1948), The Merchant Shipping Act (1958), the Major Port Trusts Act (1963), and The Dock Workers (Safety, Health and Welfare) Act (1986)⁸. The port sector lacks an independent, full-fledged regulatory authority. At present the regulation is done through the TAMP, which was formed in March 1997. Ennore is an exception here because it does not come under its jurisdiction⁹. Its functions are threefold, namely, the regulation of tariffs levied by major port trusts and private terminals therein, fixing rates for services rendered as well as for the use of properties and setting the governing conditions that influence application of rates. Overall, TAMP aims to use tariffs to bring about operational efficiency, to rationalize tariffs and to systematise tariff-setting systems across all major ports. But the Financial

⁴ Ramakrishanan, R. "Scenario of Port Handling and Vision", *Indian Port*, Oct., 2003, pp.5-17.

⁵ Ghosh Buddhadeb and De Prabir, "Indian Ports and Globalisation Grounding Economics in Geography", *Economic and Political Weekly*, August 25, 2001, p.3271.

⁶ Ramakrishanan, R., Ibid.

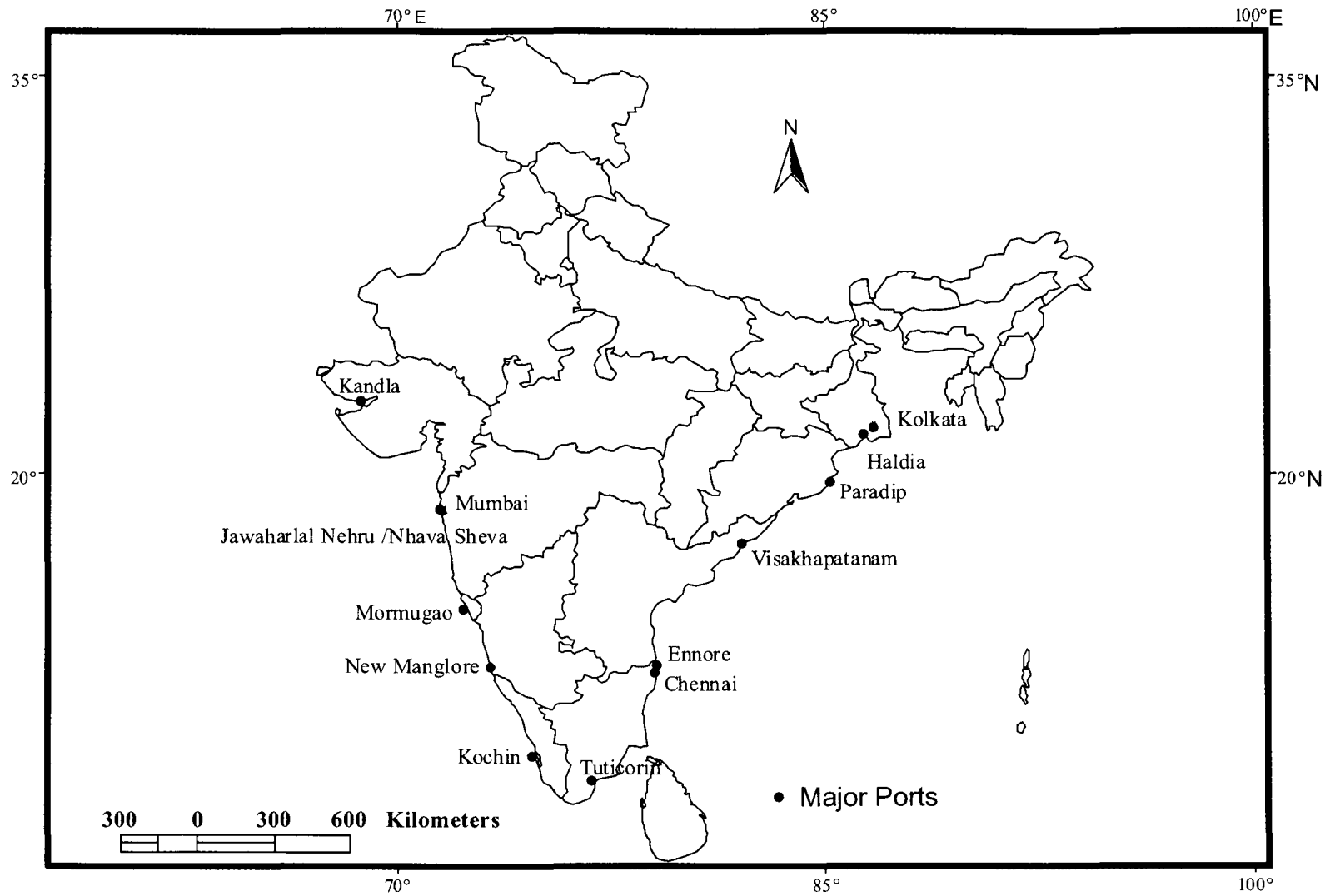
⁷ "Ports Of India", India Infrastructure Publishing Pvt. Ltd., Qutab Institutional Area, New Delhi, table of contents.

⁸ "Port Financing: Still a Trickle", *Indian Infrastructure*, July 2001, pp.28-29.

⁹ "Tariff Authority for Major Ports", *Indian Infrastructure*, June 2004, p. 32.

Map 1

INDIA LOCATION OF MAJOR PORTS



institutions want these things consolidated into a single law for better performance and efficiency¹⁰.

Table 1.1: Location, Year and Important Functions of Major Ports of India

Ports	Year of Est.	Location		Special Features
		Lat.	Long.	
Kolkata (West Bengal)	1870	22°33'N	33°19'E	A riverine port located on the bank of the Hoogly River. Handles diversified commodities, coming from S.E Asian countries, Australia and New Zealand.
Mumbai (Maharashtra)	1873	18° 54'N	72° 49'E	Natural Harbour with impounded Wet Docks, It is the leading general cargo port handling about 18% of the country's general cargo traffic, the leading container port accounting for about 30% of the country's trade in the containerized cargo and the leading POL ¹¹ .
Chennai (Tamil Nadu)	1881	13° 06'N	80° 18'E	Artificial Harbour with Wet Docks, it is the oldest artificial harbour on the east coast of India. Handles petroleum products, crude oil, fertilizers, iron ore and dry cargo.
Cochin (Kerala)	1930	9° 58'N	76° 16'E	Natural harbour (lagoon port), handles the export of tea, coffee and spices and imports of petroleum oil and fertilizers.
Visakhapatnam (Andhra Prad.)	1933	17° 41'N	83° 18'E	Natural Harbour, India's deepest landlocked port handling crude oil and petroleum products ¹² .
Kandla (Gujarat)	1955	23° 01'N	70° 13'E	Kandla port is situated in the Kandla Creek (Tidal Creek) and is 90 Kms. from the mouth of the Gulf Of Kachch. Handles crude oil, petroleum products, edible oil, food grains, salt, cotton, etc.
Mormugao (Goa)	1963	15° 25'N	73° 47'E	Open Protected Natural Harbour (at the mouth of river Zuari); It is the premier iron ore exporting port of India with an annual throughput of over 18 million tonnes of iron ore traffic. The Port accounts for about 50% of India's iron ore export and ranks within the first ten leading iron ore exporting ports of the world ¹³ .
Paradip (Orissa)	1965	20° 15'N	86° 40'E	Artificial Lagoon Port, handles iron ore and coal.

¹⁰ Ghosh, Buddhadeb and De, Prabir; op. cit., 2.

¹¹ Profile of Major Ports of India, May, 2005, IPA, New Delhi.

¹² Basic Port Statistics of India; op.cit, 1.

¹³ Profile of Major Ports of India; Ibid.

New Mangalore (Karnataka)	1975	12° 55'N	74° 48'E	Artificial Lagoon Port, handles the export of iron ore of Kundremukh and imports of petroleum products, fertilizers, edible oils, etc.
Haldia (West Bengal)	1977	22° 02'N	88° 06'E	A new port which has been developed on the River Hoogly to relieve Kolkata port. Also a site of refinery.
Tuticorin (Tamil Nadu)	1979	8° 45'N	78° 13'E	Artificial Harbour, handles mainly coal, salt, edible oil, dry cargo and petroleum products.
JNPT (Maharashtra)	1989	18°56.43' N	72° 56.24'E	All weather tidal port, Equipped with modern facilities having mechanized container over 60 percent of cargo handling.
Ennore (Tamil Nadu)	2001	13°15'43" N	80° 21'E	Artificial Harbour first corporatised port of India which started operation since 2001, Ennore Port as a multi-functional energy port of the New Millennium.

Source: Compiled from Basic Port Statistics of India, MOST, GOI, 2002-03 and various issues of Indian Ports and The Link Global Trade and Freight Review.

Ports handle 90 percent of India's foreign trade in terms of volume and 70 percent of it in value terms. The capacity of the Indian Ports increased from 20 million tonnes (MT) of cargo handling in 1951 to 390 MT as on 31 March 2004. At the beginning of the Tenth Plan, the capacity of major ports was about 344 MT¹⁴. It is proposed to be increased to 470 MT by the end of the Tenth Plan. Since 2000-2001, the aggregate capacity in the major ports is in excess of the traffic handled. Consequently, capacity is no longer a constraint in major ports. As a result, there has been a substantial improvement in their efficiency as borne out by the reduction in waiting time for the ships. The number of cargo vessels handled at major ports is about 16,000 per annum. The aggregate cargo handled at major ports during 2002-03 was approximately 345 MT. Important commodities, by quantity, handled through the major ports are crude oil and petroleum products, ore (primarily iron ore), coal, fertilizers and fertilizers raw materials, food grains and general cargo including containers. The traffic handled by major ports pertains to liquid cargo (39 percent) followed by dry cargo (40 percent) and the remaining to general cargo. Container traffic handled at ports is fast increasing and around 3.90 million TEUs were handled in 2003-04 at all major ports. About 70 percent of the cargo handled normally at these ports is for overseas trade, of which around 40 percent constitutes exports.

¹⁴ *India Year Book*, Publication Division, Ministry of Information and Broadcasting Government of India, 2005, p.688.

During the Tenth Five year plan (2002-07), it is proposed to enhance capacity and improve productivity of major ports with focus on measures aimed at modernization, rendering cost-effective services, enhancement of service quality, commercialization through corporatisation and increased private sector participation. The Tenth Plan outlay for the ports sector is Rs. 5,418 crore for scheme / projects to be implemented from public funds. In addition scheme / projects, at an estimated cost of Rs 17,257 crore are also expected to be taken up for execution through private sector investment¹⁵.

1.1. The Statement of the Problem

The purpose of this study is to highlight the role the port plays in India's regional economic development, and also to find the relationship between port performance, the demands of globalisation/liberalization and the impact of corporatisation and privatisation. The importance of such work has increased since the initiation of the globalisation programme in 1991. No such research work exists which fully incorporates the impact of recent changes after globalization in the port system in India and the importance of the project like Sagarmala.

1.2. Aims and Objectives of the Study

Following aims and objectives have been set for the present study:

1. To trace the long term trends of cargo traffic handled by the major ports, the qualitative and quantitative changes in the nature of cargo, changes in export and import structure and container traffic at the ports.
2. To trace the impact of private sector participation in port sector.
3. To analyse measures and indicators of port performance.
4. To assess the likely impact of Sagarmala project.

¹⁵ Ramakrishanan, R.; op. cit 2.

1.3. Data Sources

1. Basic Port Statistics of India (1991 to 2003), published by the Transport Research Division, Ministry of Surface Transport, Government of India, New Delhi.
2. The Data Bank of Indian Ports Association (IPA), New Delhi.
3. Economic Survey – various issues, Government of India, Ministry of Finance Economic Division.
4. Statistical Abstract – various issues, CSO, Ministry of Statistics and Programme Implementation, New Delhi.
5. India Year book (1995 to 2005), Publication Division Ministry of Information and Broadcasting Government of India.
6. Various issues of Indian Infrastructure and the Link Global Trade & Freight Review.

1.4. Methodology

The following methods have been used to analyse the structure, functions and performance of the major ports of India:

1. To estimate the long term trends of cargo traffic over time, the qualitative and quantitative changes in the nature of cargo, changes in the export and import structure, and container traffic of the ports growth rate have been computed for the period 1990-91 to 2003-04.
2. To test the performance of ports, Composite Index has been computed which is a function of the interplay of a number of variables for which, time series data (1990-91 to 2003-04) have been collected for the following indicators –
 - a. *Ship Turn – Round Time* (TRT): It is the total time spent by a ship since its entry to till its departure.
 - b. *Pre-Berthing Waiting Time* (PBWT) means the time for which a ship waits before getting entry into a berth.
 - c. *Non-Working Time at Berth* (NWTB): Non-Working time of a ship is without loading or unloading of cargo at berth.

- d. *Output per Ship Berth Day (OSBD)* means total tonnage handled or distributed over the total number of ship berth days.
- e. *Cargo Handled* in a year by individual port.
- f. *Number of Vessels* in a year by individual port.

The basic limitation of this method of construction of port performance index (PPI) is that while combining the performance indicators they give subjective adhoc weights to different indicators. To overcome such problem I have made all the indicator scale free by subtracting mean value from the real value of each indicator and after dividing them by their respective standard deviation. All the values are added to find out the composite index.

1.5. Literature Review

Ports play an important economic role in maritime nations by facilitating foreign trade. They are thus catalysts for social and economic development in any maritime nation. Maritime transportation has been the life-blood of world trade since time immemorial. Thus their study becomes very important to understand the subject matter carefully.

The available literature on the ports and their functioning and performance is vast, hence for convenience it has been grouped under the following themes.

1. Conceptual, historical, and contemporary studies.
2. Globalisation and port privatisation.
3. Studies to assess performance efficiency and productivity of ports.
4. Studies analyzing the process of modernization and development of ports.

1.5.1. Conceptual, Historical, and Contemporary Studies

Kidwai, (1992)¹⁶ in her work “*Conceptual and Methodological Issues: Port Cities and Port-Hinterlands*” deals the basic concepts in port geography like ports, harbours, entrepots, site and situation of ports, stages in the evolution of sea ports, port enclaves, outposts, port-hinterlands, forelands, port complexes, port

¹⁶ Kidwai, A.K. (1992), “Conceptual and Methodological Issues: Port Cities and Port-Hinterlands”, in Indu Banga (ed.), “*Ports and Their Hinterlands in India 1700-1950*”, Manohar Publications, pp.7-43.

concentration, port diffusion and port cities etc. According to her, a port is essentially an economic concept; a harbour, a physical one. A *port* is the place of contact where goods and people as well as cultures are transferred between land and maritime space. It is a knot where ocean and inland transport lines meet and intervene. A harbour is the sheltered area of deep water. An *entrepot* is essentially a trans-shipment point where transfer of goods and passengers takes place from ship to ship. According to Kidwai the origin, evolution and growth of a port depend on many physical and cultural factors. Among the physical factors site is the most important. The *site* is the area of land and the associated waters on which the port and the port town are actually developed. *Situation* is a more complicated concept and has both physical and cultural implications. According to her the most acceptable model for the evolution of ports, is the one by Rimmer where he has delineated five stages of port-development. She further states that the concept of port-hinterland has become more complex with the passage of time and it is explained as a hierarchy of areas with overlapping layers.

Ray (1993)¹⁷ in his book “*Maritime India: Ports and Shipping*” has given more weightage to historical and locational aspects for port development and has studied Calcutta as a leading port because of its historical significance.

Fujita and Mori (1995)¹⁸ in their study “*Structural Stability and Evolution of Urban System*” have explained the evolutionary model of spatial economic development in which agglomeration economies and the hub-effect of transport nodes interplay in the making of major cities. Their model explains the irreversibility of spatial economic development such as the continuing prosperity of port cities even after initial advantage of water-access has become irrelevant. It has also been shown that in order to decentralize industries from the core region to a periphery, a temporary protection of industries in the periphery by worsening the transport connection with the core for a short period of time may be desirable. But their finding may not be true in case of an economy where port does not play a decisive role in the growth of the economy.

¹⁷ Ray, A. (1993); op. cit., 1.

¹⁸ Fujita, M and Mori (1995), “Structural Stability and Evolution of Urban System”, *Regional Science and Urban Economics*, Vol. 34(8), pp. 41-59.

Beatty and Fothergill (2004)¹⁹ in “*Economic Change and the Labour Market in Britain’s Seaside Towns*” have done comprehensive study to find out reasons for emergence of seaside town and potentiality over time in Britain. According to them the first and most obvious is that joblessness in seaside towns is the result of the decline of the traditional tourist base. The second potential explanation for the apparent difficulties is the weakness in the rest of the local economy. A third possibility is that imbalances in the seaside economy reflect in-migration outstripping jobs. The fourth possibility is a variation on the immigration theme.

1.5.2. Globalisation and Port Privatisation

Port Policy Report (2001)²⁰ “*Opening up the Sector in Phases*” emphasized that the government has taken several policy initiatives to allow joint ventures and foreign collaborations for port development. It has also allowed 100 percent FDI in the sector and taken up port corporatisation.

Port sector Report (2001)²¹ “*Coping with Growth*” reveals that Indian ports have long been plagued by problem of inefficiency, over manning and poor management. However, all of these have begun to change with the government encouraging private participation in developing port facilities. The minor ports have succeeded in attracting private interest, but the major ports still have a long way to go.

The report on “*Private Participation in Ports: Picking up at Last*” (2001)²² reveals the response to government initiatives to attract private sector participation in the major ports which has been quite slow. Private participation has been mostly restricted to licensing of operations of existing container berths or granting BOOT concessions for increasing terminal capacity. On the other hand, quite a few states have succeeded in involving the private sector in port activities.

The report on “*Port Financing: Still a Trickle*” (2001)²³ indicates that despite liberalized rules for private participation and several fiscal incentives, uncertainties

¹⁹ Beatty, Christina and Fothergill, Stephen (2004), “Economic Change and the Labour Market in Britain’s Seaside Towns”, *Regional Studies*, July, Vol. 38(5), p.461-480.

²⁰ “Port Policy: Opening Up the Sector in Phases”, *Indian Infrastructure*, July 2001, p.23.

²¹ “Port sector: Coping With Growth”, *Indian Infrastructure*, July 2001, p.22.

²² “Private Participation in Ports: Picking Up at Last”, *Indian Infrastructure*, July 2001, p.24.

²³ “Port Financing: Still a Trickle”, op. cit., 2.

cloud such crucial issues as the rate of return and the level of comfort available to banks and Financial Institutions (FIs). In India the leading domestic FIs in the area of port financing are ICICI, IDBI, IFCI and IDFC. The World Bank's private arm, the International Finance Corporation (IFC), has been an active participant in providing both debt and equity. The Asian Development Bank (ADB) is also a significant player.

Kotak, (2001)²⁴ in his paper, "*Privatisation of Ports*", has analysed the opportunities and challenges in privatisation of ports and terminals.

Baird, A. J. (2001)²⁵ in his paper, "*Trends in Port Privatisation*", seeks to tackle the questions such as, what is the extent of private sector intervention in seaports, which specific seaports activities do the public and private sector perform, what methods of privatisation are used, and what changes does this imply for the role of both the public and private sector and what are perceived to be the main advantages of these changing institutional arrangements.

The report on "*Port Policy and Privatisation (2002)*²⁶", *Indian Infrastructure*, deals with the situation in the port sector that has been clouded in ambiguity for many years. On the one hand, the major ports trust act was passed in 1963 to permit private participation in the development of port facilities but on the other hand environment provided by the successive governments was never really conducive to any sorts of activity. In fact, it was as late as October 1996 that the Ministry of Surface Transport finally issued the first comprehensive guidelines on the issues.

The report on "*Major Ports-Performance Round-up (2002)*²⁷", in the article *Indian Infrastructure*, reveals that India has 12 major ports, out of these Vishakhapatnam leads in terms of cargo traffic. The JNPT is the most advanced in terms of containerisation followed by Chennai. On the privatisation front, the Visakhapatnam and Chennai ports have been in the forefront. Ennore is the first major corporate port of India. In the last few years, In terms of profitable

²⁴ Kotak, Krishna (2001), "Privatisation of Ports", *Times Shipping Journal*, Vol. 1(8), pp.36.

²⁵ Baird, Alfred J. (2001)²⁵, "Trends in Port Privatisation", *Ports and Harbour*, Jan-Feb, pp.16-21.

²⁶ "Port Policy and privatisation", *Indian Infrastructure*, June, 2002, Vol. 4(4), pp.24-25.

²⁷ "Major Ports-Performance Round-up", *Indian Infrastructure*, June, 2002, pp. 28-30.

commodities, petroleum-oil-lubricants have overtaken coal as the commodity that earns the maximum revenue for the ports.

Mukherjee (2003)²⁸ in “*A Time to Change*” posits that port sector in general and major ports in particular, now, stand at the crossroads. The winds of change are blowing away monolithic monopolies. The evolving environment is one of competitive commercialization, and corporatisation, B.O.T berths and facilities are already in existence. Foreign ports like the port of Singapore authority are now part of the scenario. Private ports are sprouting in the back yards of major ports and existing minor ports are being privatized. The Major Port Trust Act is being amended. Joint ventures between major ports and other business partners are now trying to come up. The ports, therefore find themselves in a rapidly shifting environment. Liberalization, privatization and globalization are heralding in an era of unprecedented growth in the port sector.

Raman (2004)²⁹ in “*Corporatisation of Ports: Is it the way forward*” has addressed the limited issue of the format or structure in moving forward in a dynamic, competitive and complex segment of the infrastructure sector. He attempts an objective analysis of the corporate format of management for development of the port sector. The Government of India has taken a policy decision to corporatise the major ports in the country. Corporatisation of other ports is on the anvil. A bill in this regard has been introduced in the parliament. Presently, it is before the standing committee of the Parliament.

1.5.3. Studies to Assess Performance, Efficiency and Productivity of Ports

In 1976, United Nations Conference on Trade and Development³⁰ (UNCTAD) presented a report on “*Port Performance Indicators*” and advised port authorities on the collection and the use of a set of performance indicators concerning both operational and financial aspects of port operation. The benefits associated with each indicator were discussed to aid in the selection of indicators for implementation. They

²⁸ Mukherjee, S. (2001), “A Time to Change”, *Indian ports*, Vol. 32(3), Jan., pp.17-21

²⁹ Raman, R. (2004) “Corporatisation of Ports: Is it the way forward”, *Indian Ports*, Jan., Vol 35(3), p.23.

³⁰ UNCTAD Report (1976), “*Port Performance Indicators*”, United Nations Conference on Trade and Development at Geneva, United Nations, New York.

had selected all indicators with a view to provide assistance to port management in medium term planning and control. Then onwards the port authorities all over the world seriously thought of the necessity of analyzing the importance of operational and financial indicators.

Maffait, (1979)³¹ in “*Port Performance Indicators*” described the need of measures of port performance and inter-port comparison and norms. A number of primary indicators such as berth throughput, ship turn-around time, berth occupancy, productivity and labour costs have been described. In his study, a number of secondary indicators such as tonnage handled per meter of quay and over-quay throughputs per meter also have been brought out. A model to study the elements of turn around of ships has also been developed.

De (1999)³² in “*Performance of Indian Ports*” has defined three types of performance indicators such as operational performance indicators, asset performance indicators and financial performance indicators. In his study, the port performance index (PPI) of all major ports has been calculated and ranking was done based on this index. In his analysis, he concluded that two of the operational performance indicators: pre-berthing waiting time (PBWT) and ship turnaround time (TRT) and one asset performance indicators—berth occupancy rate (BOR) became the first three most influential variables in determining performance of an individual port. Moreover, financial performance indicators like operating surplus ton of cargo handled (PTOS) and rate of return of turnover (RRT) have emerged as factors of low importance in determining performance of an individual port.

Chakraborty (2000)³³ in “*Analysis of Performance of Major Ports during the First Quarter of 1999-2000*” studied performance of major ports during the first quarter of 1999-2000. In this study, the ranking of ports was done separately in terms of traffic, absolute growth of traffic, variety of commodity handled, ship traffic, average pre-berthing detention (PBD), average output per ship day and average

³¹ Maffait, G., “*Port Performance Indicators*”, Proceedings of the UNCTAD/ECA seminar on Port Operation, Odessa, USSR, 7-8 August 1978, United Nations, Nov.1979, pp.173-182.

³² De, Prabir (1999), Performance of Indian Ports, *Journal of Indian Ports*, Oct., Vol.31 (2), pp. 5-10.

³³ Chakraborty, S. N. (2000), “Analysis of Performance of Major Ports during the First Quarter of 1999-2000”, *EXIM Shipping Times*, New Year Special Supplement, pp. 23-34.

turnaround time. This study has not considered the ranking of port based on all parameters together.

Ghosh and De (2001)³⁴ in “*Indian Ports and Globalisation Grounding Economics in Geography*” were concerned with the economics of Indian ports as one of the important phenomenon in Indian economic geography, and its relationship with regional development under the free market economy. A port performance index derived with the help of principal component analysis of eight individual port performance indicators shows that overseas traffic intensity is the most significant determinant of performance. With increasing openness of the economy and absence of an integrated policy towards export transport network, there is a decline in export intensity and rising domestic coastal traffic in Indian ports.

Bose (2001)³⁵, in “*Cargo Handling of Major Ports in India: A Case study*” attempted to analyse the performance of major ports in India taking into account the absolute cargo handled by them during 1951-52 to 1992-93. The particular focus of the study is the Kolkata – Haldia port for the same period, with a view to determine the reasons for its deteriorating performance.

Chakrabarty and Das (2002)³⁶ in “*Comparison of Performance of Major Ports of India during April to September 2000 through a single Measure of Efficiency: Few Approaches*” emphasized that performance of a port is usually reflected by a set of physical/financial indicators viz. cargo throughput, average turn round time (TRT), average output per ship day, average pre-berthing detention (PBD), cost per tonne etc. In his paper, he has calculated efficiency by arithmetic mean of ratios of indicators, Calculation of weights for Different Indicators and Ports, Efficiency: Weights Proportional to share of Ports, Efficiency: Uniform Weights to all Ports, Efficiency by geometric mean of ratios of indicators, efficiency by volume of parallelepiped, efficiency by inner product approach etc.

³⁴ Ghosh, Buddhadeb and De, Prabir; op. cit., 2.

³⁵ Bose, Santu Kumar (2001), “Cargo Handling of Major Ports in India: A Case study” *Economic and Political Weekly*, August 25, pp.3284 – 3288.

³⁶ Chakrabarty, S.N and Das, Rebecca (2002), “Comparison of Performance of Major Ports of India during April to September 2000 through a single Measure of Efficiency: Few Approaches”, *Indian Ports*, Sept., pp.15-30.

Sarkar (2002)³⁷ in “*Principle of Traffic forecasting*” emphasized that there are several micro and macro economic variables that determine the actual traffic movement through particular ports. While the Management of a particular port can effectively manage land influence and the micro economic variables. It has limited ability to influence macro economic factors which depend on the policies of the government, politics and activities of the Maritime trade bodies.

Ramakrishnan (2002)³⁸ in his study “*Indian Ports Performance*” reveals the performance of 2000-01, during which Major Ports handled 281 MT of cargo, while in 1950, five ports had handled 20 MT. The main drawback with Indian ports is that ships have to wait to berth and while at berth the handling is largely labour-oriented, resulting in reduced productivity and inefficiency, Indian ports lacks the zeal and competitive spirit required to attain speed in productivity.

Kumar and Bhasi (2004)³⁹ in “*A Comparative Study of Performance of India Major Sea Ports*” have compared the performance of eleven major ports in India. Ranking of ports is done on the basis of four important performance indicators: 1) Operation Performance, 2) Financial Performance, 3) Facilities Available and 4) Man power and its utilization. A weighted score model is developed by them to rank the ports based on the four performance indicators. According to them the weights have been chosen on the basis of opinion of experts in the field.

1.5.4. Studies analyzing the process of Modernization and Development of ports

The report on “*Port services: A Fragmented Industry Dominated by a Handful of Operators*” (2001)⁴⁰ is concerned with the lack of port modernization and the increased costs of operations. These have emerged as the most serious threats to the domestic litherage and barging industry. Different regulations framed a long time ago, like the Coastal Vessels Act, 1917 pertaining to Goa and Gujarat, fail to cater to the current requirement of the industry. Moreover, lack of coordination and cooperation

³⁷ Sarkar, J. (2002), “Principle of Traffic forecasting”, *Indian Ports*, July, pp.9-12.

³⁸ Ramakrishnan, R (2002), “Indian Ports Performance”, *The Link*, Feb., pp. 26-29.

³⁹ Kumar, R. Sasi and Bhasi, M (2004), “A Comparative Study of Performance of India Major Sea Ports” *Indian Ports*, Vol. 36 (2), Oct., pp. 9-18.

⁴⁰ “Port services: A Fragmented industry Dominated by a Handful of Operators” *Indian Infrastructure*, July 2001.

amongst the main players and the unorganized nature of the industry have added to the difficulties in the battle for survival.

De and Palit (2001)⁴¹ in “*Impact of Performance on Traffic: Evidence from Major Ports of India*” attempt to analyse a new emerging approach to the funding, management, and operation of port infrastructure. Governments around the world are improving the operational efficiency of national ports through institutional reform, changing the role of port authorities and increasing the use of private sector. Billions of private capital has been pledged for capacity expansion and service modernization in the world port system during 1991-98. Although, India has opened the sector for private investments for modernization and capacity addition, but her performance of port system is still hovering around sub-optimal level. In the paper, they have also emphasized that significant port performance can lead to significant increase in port throughput, which may then increase the demand for port services. Moreover, in explaining this they have found increasing economies of scale. If ports perform better primarily by improving their operational and asset performance then their traffic will go up.

Ramakrishanan (2003)⁴² in “*Scenario of Port Handling and Vision*” firmly believes that a port is as an infrastructure which affords the transit facilities of import/export of trade/cargo and is an important infrastructure for socio-economic development. High volume / low value and more than 90% of import/export trade passes through the ports. Port handling growth of port traffic, composition of port traffic, predicting the traffic for future and development of the ports, economic development, technological and sociological changes, Government politics on Import / export, Industrial Development, Drought or good rains, lacking of infrastructure facilities such as road/rail. Port Privatisation – Port Development, Increased productivity, Better Management, Flexibility in Operation and Use of Latest equipments.

⁴¹ De, Prabir and Palit, T. K. (2001), “Impact of Performance on Traffic: Evidence from Major Ports of India”, *Indian Ports*, Dec., pp.27-35.

⁴² Ramakrishanan, R., op. cit., 2.

Ranade⁴³ in “*Impact of Infrastructure Development on the Ports of India’s Western Coast*” attempts to analyse infrastructure development around the ports of western coast of India. He finds that infrastructure development on the western coast has positive impact on the traffic handled by these ports. After the commissioning of Konkan railway, the connectivity of these ports with other parts of the country has increased. With the improvement in infrastructure facilities for handling the traffic of specialized items like LPG, edible oil, POL product, other liquids, cement, etc., the trade at these ports has become more diversified. The composition of trade is also responsible for variations in the growth of traffic at ports. JNPT with more diversified composition of cargo recorded higher growth compared to other ports. Analysis also reveals that the improved connectivity of western coastal ports after the construction of Konkan railway has helped to relieve the congestion at the Mumbai ports. The impact of infrastructure development and upgradation of infrastructure facilities is visible in the increase in volume of traffic handled by these ports.

1.6. Chapterisation

The present study has been divided into six chapters:

In *Chapter 1*, a general introduction about the topic of the study has been given under which, the objectives of the study, data base for the present study and methodology for the study have been formulated to find out the objectives and review of literature are included.

Chapter 2 deals with the analysis of major structural parameters, like cargo traffic and trend, commodity-wise breakup, state wise analysis, containerisation etc.

Chapter 3 deals with the impact of corporatisation and private sector participation in ports.

Chapter 4 deals with the measures and indicators of port performance in a comprehensive manner.

In *Chapter 5*, the likely impact of Sagarmala project has been assessed.

In *Chapter 6*, the summary of conclusions of the study has been presented.

⁴³ Ranade, Prabha shastri, “Impact of Infrastructure Development on the Ports of India’s Western Coast”, *Foreign Trade Review*, pp.69-84.

CHAPTER II

AN ANALYSIS OF STRUCTURAL PARAMETRES OF MAJOR PORTS

2.1. Introduction

Ports provide an interface between the ocean transport and land-based transport. In India the traffic has traditionally been handled mostly at major ports. However, over the years, non-major ports have also witnessed growth in traffic. The growth in the cargo handled at Indian ports has increased from a level of 19.38 million tonnes (major ports) in 1950-51 to around 457.96 million tonnes (major and non-major ports) by 2003-04. The share of traffic at major and non-major ports stood around 345 and 113 million tonnes respectively. About 90 percent by volume and 70 percent by value of the country's trade is carried on through the maritime transport; the strengthening of maritime infrastructure would have favorable impact on the country's trade front and economic growth¹. It is inevitable that Indian ports have many advantages like they have an excellent location close to the international shipping route on the east-west shipping corridor. It requires minimal maintenance of dredging. It also has a natural water depth of more than 20 metres within a nautical mile off the coast.

2.2. An Overview of Major Ports (2004-05)

Considering the current level of India's share in global merchandise trade at around 0.67 percentages, the strengthening of the maritime infrastructure would have a favorable impact on the country's trade front and also on economic growth.

The year 2004-05 has been another good year for growth of traffic volumes at major ports. Traffic handled by major ports increased by 11.3 percent to 383.77 million tonnes during this year. Notably, this has been the highest growth in traffic during the last

¹ Ramakrishna, R., "Scenario of Port Handling and Vision" Indian port Oct 2003, pp.5-17.

decade. The Visakhapatnam port was the only to cross the 50-MT mark in 2004-2005, though with a low growth of 5.05 percent. The port's share in the total traffic handled increased to 13.07 percent during the year from 13.84 percent in 2003-04. In fact, it was declining over the past few years, from 15.42 percent in 2001-02 and 14.67 percent in 2002-03.

Table 2.1 shows that four major ports Visakhapatnam, Kolkata, Chennai and Kandla which cross their traffic share (2004-05), in two digits combinedly contribute to 47.33 percent of total. While other ports contribute less than 10 percent, the least share of traffic is handled by port of Ennore followed by Cochin and Tuticorin.

Only two ports that raised their shares steadily in the past few years were Kolkata (which also includes Haldia) from 10.5 percent in 2001-02 to 11.42 percent in 2002-03, 11.97 percent in 2003-04 and 12.03 percent in 2004-05 and New Mangalore from 6.09 percent in 2001-02 to 6.84 percent in 2002-03, 7.74 percent in 2003-04 and 8.83 percent in 2004-05. Chennai improved its share from 10.65 percent in 2003-04 to 11.41 percent in 2004-05 but between 2001-02 and 2002-03, it dropped from 12.56 percent to 10.74 percent.

Mumbai's share in 2004-05 was higher at 9.15 percent than 8.7 percent in 2003-04 and 8.55 percent in 2002-03 but lower than 9.19 percent in 2001-02.

The New Mangalore port posted the highest growth in traffic (27.06 %) among all major ports in 2004-05 (Table 2.1). In the process, the port achieved a 22.04 percent increase over the target fixed by the Shipping Ministry². At a throughput level of 33.89 MT the port posted more than 27 percent growth, followed by Chennai 19.33 percent growth at 43.80 MT (Table 2.2). Paradip witnessed growth of 18.94 percent at 30.10 MT, Mumbai 17.10 percent at 35.12 MT, Tuticorin 15.59 percent at 15.81 MT and Kolkata 11.87 percent at 46.15 MT.

All other ports registered single-digit growth and the lowest growth was observed in Kandla 0.04 percent, at 41.54 MT. Ennore posted 2.19 percent growth at 9.48 MT,

² The Link Global Trade and Freight Review Vol. 10 (4), April 2005, pp.6-10.

Table 2.1: Traffic Handled at Major Ports (2004-05)

(% share commodity-wise)

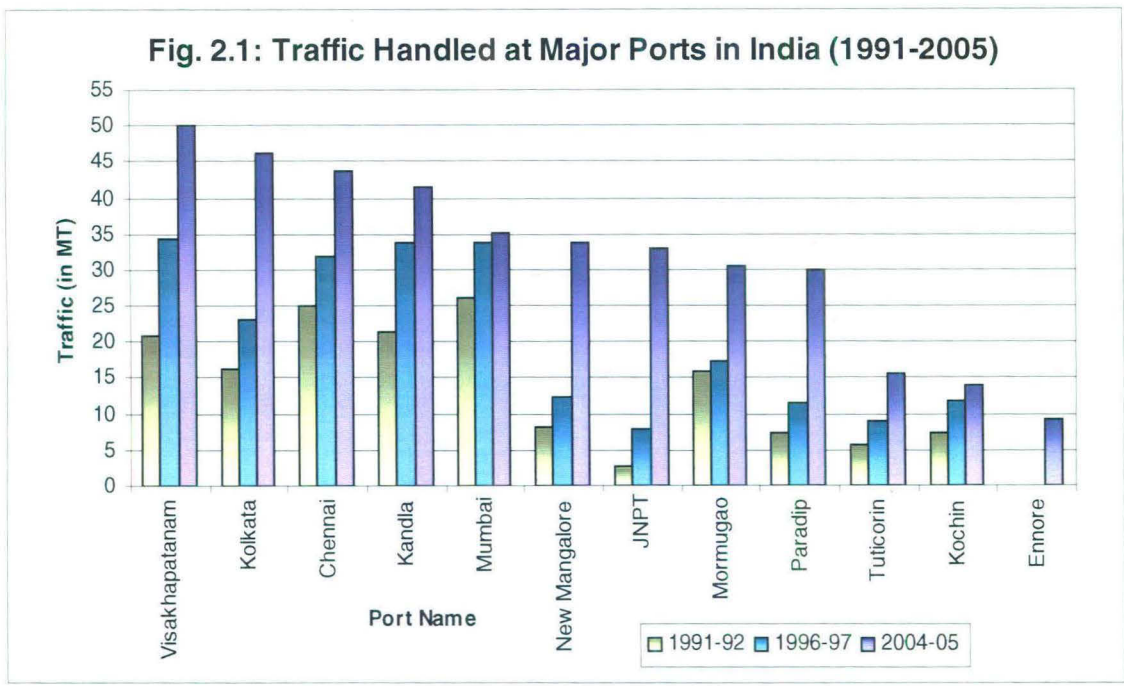
Port Name	POL %	Iron Ore %	Fertiliser %	Coal %	Container Tonnes %	Container TEUs %	% of Total	% variation 2003-04
Kolkata	17.34	7.10	5.39	14.33	7.96	6.80	12.03	11.87
Paradip	0.66	11.89	27.04	24.65	0.06	0.05	7.84	18.94
Visakhapatnam	11.55	21.70	21.47	16.76	1.16	1.09	13.07	5.05
Ennore	0.08	0.68	0.00	15.38	0.00	0.00	2.47	2.19
Chennai	9.24	12.61	9.02	13.03	17.98	14.59	11.41	19.33
Tuticorin	0.59	0.06	9.97	9.32	5.84	7.25	4.12	15.59
Kochi	8.12	0.00	5.67	0.36	4.22	4.39	3.67	3.86
New Mangalore	16.93	13.50	3.72	0.55	0.25	0.21	8.83	27.06
Mormugao	0.80	32.47	1.79	5.23	0.21	0.26	7.99	9.99
Mumbai	15.27	0.00	5.96	0.00	4.69	5.17	9.15	17.10
JNPT	1.95	0.00	0.06	0.00	52.65	55.96	8.59	5.64
Kandla	17.47	0.00	9.92	0.40	5.00	4.25	10.82	0.04
All ports	100.00	100.00	100.00	100.00	100.00	100.00	100.00	11.30
% Share	32.99	19.84	2.51	15.02	14.30	1.10	15.34	100.00

Source: Compiled from Profile of Major Ports of India, 2003-2004, Indian Ports Association and Indian infrastructure in May 2005.

Cochin 3.86 percent at 14.09 MT, JNPT 5.64 percent at 32.94 MT and Mormugao 9.99 percent at 30.66 MT. In terms of volume handled, Kolkata occupied the second position in 2004-05 after Visakhapatnam while Chennai was ranked third and Kandla fourth. Kandla had occupied the second position for the three successive years from 2001-02 to 2003-04 but at last overtaken by Kolkata.

Chennai ranked third in 2001-02 and fourth in 2002-03. Kolkata occupied the third position for two successive years, 2002-03 and 2003-04. Visakhapatnam has remained premier port since the last five years (2000-01) consecutively.

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2.2.1. Port-Wise Analysis of Traffic Handled

Kandla port handled a record traffic of 41.54 MT during 2004-05, as against 41.52 MT handled during 2003-04, crossing the 40 MT mark for the third consecutive year. The growth in 2004-05 works out to be 0.04 percent. The port sustained its outstanding performance, especially in dry cargo handling, by handling 14.12 MT of dry cargo in 2004-05, compared to 13.54 MT in 2003-04, registering a growth of 4 percent.

Mumbai port reached its pinnacle of success with highest traffic of 35.12 MT, surpassing the previous high of 34.05 MT. Mumbai port registered an unparalleled growth of 17 percent over the traffic in the previous year (29.92 MT), as against an overall major ports growth of 11.30 percent. Growth was seen in all types of cargo, though break-bulk cargo registered the highest increase of 50 percent from 7.34 MT in 2003-04 to 11.82 MT.

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Table 2.2: Traffic Share at Major Ports (1991-2005)

Port Name	2004-05			2003-04			1996-97			1991-92		
	Traffic in MT	% of Total	Rank	Traffic in MT	% of Total	Rank	Traffic in MT	% of Total	Rank	Traffic in MT	% of Total	Rank
Visakhapatnam	50.15	13.07	1	47.74	13.85	1	34.5	15.18	1	21	10.02	4
Kolkata	46.16	12.03	2	41.05	11.9	3	23.12	10.17	4	16.1	16.14	5
Chennai	43.81	11.41	3	36.71	10.65	4	31.85	14.01	3	25.05	3.34	2
Kandla	41.54	10.82	4	41.52	12.04	2	33.73	14.84	2	21.52	12.78	3
Mumbai	35.13	9.15	5	29.92	8.68	6	33.73	14.84	2	26.26	5.28	1
New Mangalore	33.89	8.83	6	26.67	7.74	8	12.45	5.48	6	8.27	1.34	7
JNPT	32.95	8.59	7	31.27	9.07	5	8.07	3.55	10	2.79	4.79	11
Mormugao	30.66	7.99	8	27.87	8.08	7	17.31	7.62	5	16	19.02	6
Paradip	30.10	7.84	9	25.31	7.34	9	11.58	5.1	8	7.3	12.96	9
Tuticorin	15.81	4.12	10	13.68	3.96	10	9.18	4.04	9	5.87	4.53	10
Kochin	14.10	3.67	11	13.57	3.93	11	11.74	5.17	7	7.48	9.81	8
Ennore	9.48	2.47	12	9.28	2.69	12	-	-	-	-	-	-
All Ports	383.77	100.00		344.59	100		227.26	100		157.64	100	

Source: Compiled from Profile of Major Ports of India, 2003-2004, Indian Ports Association and Indian infrastructure in May 2005.

The total traffic handled by port of JNPT was 32.94 MT in 2004-05 all time highest, with the growth rate of 5.64 percent.

Mormugao port has handled a record traffic of 30.7 MT in 2004-05. 81 percent of the total traffic was attributed to iron ore exports (24.7 MT). The port has also increased its import traffic of coal from 2.4 MT to 3.7 MT.

Table 2.3: Comparative Position of Major Ports (1991-2004)
(Based on cargo handled)

Improved	Static	Decline
Visakhapatnam	Chennai	Kandla
Kolkata	New Mangalore	Mumbai
JNPT	Paradip	Mormugao
Ennore	Tuticorin	Cochin

Source: Prepared on the basis of Table 2.2.

New Mangalore Port has handled a record traffic of 33.89 MT during 2004-05 as against 26.67 MT during 2003-04, registering a growth of 27.06 percent.

The Cochin Port has handled a record throughput of 14.09 MT during 2004-05, as against the total of 13.57 MT in 2003-04.

Tuticorin Port handled an all time record traffic throughput of 15.811 MT during 2004-05 exceeding the previous year's throughput of 13.678 MT, thereby registering an increase of 15.59 percent. Of the total throughput of 15.811 MT, imports accounted for 12.06 MT and exports 3.751 MT, recording an increase of 1.876 MT in imports and 0.257 MT in exports, respectively.

Chennai Port set an all-time high record in cargo throughput by handling 43.80 MT during 2004-05. The achievement constituted 11.41 percent of the cargo handled by all major Ports and an increase of 19.33 percent over 2003-04. With this excellent performance, the Port has moved from its earlier fourth position to the third position among all major ports in terms of total tonnage of throughput. Of the total throughput of

43.80 MT, exports stood at 19.18 MT, as against 16.41 MT in 2003-04, an increase of 16.88 percent.

Visakhapatnam Port has retained its premier position among Major Ports for the fifth consecutive year by handling the highest-ever quantity of 50.15 MT of cargo in 2004-05. In the process, it achieved a growth rate of 5.05 percent over the 47.74 MT registered in 2003-04. VPT excelled in all efficiency parameters. The output per berth day of 12,241 tonnes was the highest in the history of the Port. Also, the Port's March 2005 throughput of 5.106 MT is another national record, being the highest-ever handled by any port in a month³.

Paradip port handled 30.10 MT of cargo in 2004-05, exceeding the fiscal target of 27.48 MT set by the Ministry of Shipping by 9.52 percent, registering a growth of 18.94 percent⁴.

Kolkata Port handled a record 46.16 MT of cargo during 2004-05, thus achieving the second position among all Major Ports in cargo handling. The Port expects to handle more than 50 MT of cargo during 2005-06⁵. The Port had handled 41.05 MT of cargo in 2003-04, 35.80 MT in 2002-03 and 30.40 MT in 2001-02. During 2004-05, Kolkata Port recorded 11.87 percent growth in cargo traffic, which is higher than the national average of 11.3 percent for all Major Ports.

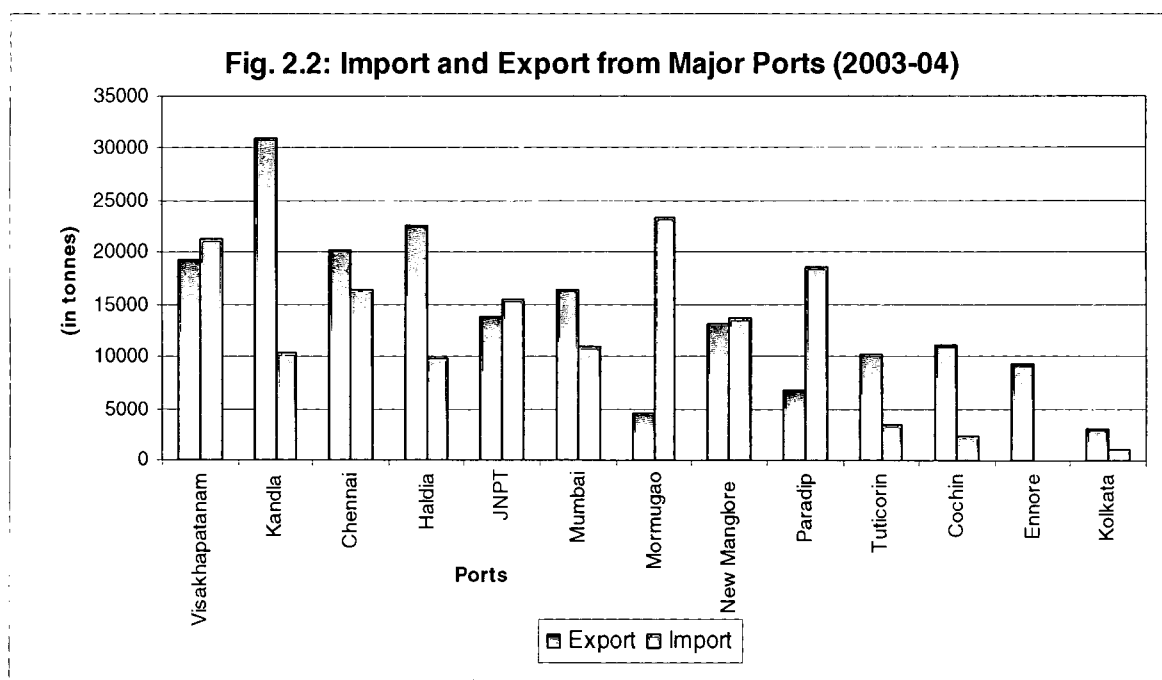
Ports are classified as export or import-based, depending on the net directional flow of trade which passes through them. At present, there are only seven export-based ports, i.e., Kandla, Chennai, Haldia, Mumbai, Tuticorin, Cochin, Ennore and Kolkata while Mormugao and Paradip are import-based. In the three exceptions, namely Visakhapatnam, JNPT and New Mangalore, of which import and export flows are almost, balance⁶. (Appendix IV).

³ Ibid, 19.

⁴ Ibid,.

⁵ Ibid,.

⁶ Basic Port Statistics of India (2002-03), MOST, GOI.



2.2.2. Capacity and Traffic at Major Ports

In 1950, traffic handled by Major Ports was 19.2 MT, which grew to 390 MT in 2004 an almost 20 times increase in the last 55 years. In percentage terms increase was maximum in initial years because of sharp increase in cargo traffic. Till 1999-2000, Major ports had a lower capacity of traffic but after 2000 there has been a sharp increase in capacity, more than the traffic handled by major ports. This clearly indicates the impact of port privatisation, corporatisation and much awaited response of globalization which started in early 1990's. Cargo traffic handling capacity of major ports has been increasing over the years. The capacity which was placed at 169 million tonnes at the end of 1991-92 has increased to a level of around 363 million tons at the end of 2002-03 and 390 million tonnes at the end of 2003-04.

Table 2.4: Growth of Traffic at Major Ports
(Traffic in MT)

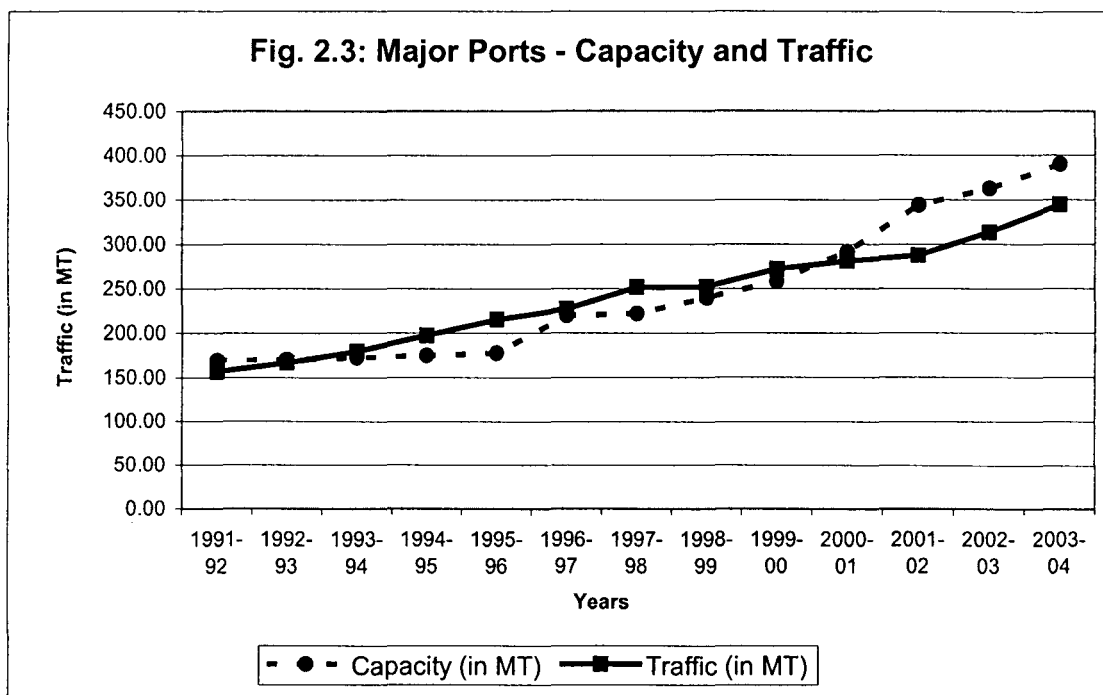
Year	No. of Major Ports	Capacity of Traffic (in MT)	Traffic (MT)	% Increase
1950-51	5	-	19.20	-
1960-61	6	-	39.90	107.81
1970-71	8	-	55.80	39.85
1980-81	10	-	81.30	45.70
1990-91	11	-	153.90	89.30
1991-92	11	169.23	156.65	1.79
1992-93	11	170.11	166.57	6.33
1993-94	11	172.44	179.26	7.62
1994-95	11	174.53	197.26	10.04
1995-96	11	177.21	215.21	9.10
1996-97	11	219.50	227.26	5.60
1997-98	11	222.01	251.66	10.74
1998-99	11	239.50	251.74	0.03
1999-00	11	258.05	271.92	8.02
2000-01	12	291.45	281.13	3.39
2001-02	12	344.00	287.58	2.29
2002-03	12	362.75	313.55	9.03
2003-04	12	390.00	344.77	9.96
2004-05	12	-	383.77	11.31

Source: Compiled from Basic Port Statistics of India (1990-2003), MOST, GOI, India Year Book 2005 Publication Division, Ministry of Information and Broadcasting, GOI, and Indian Infrastructure, May 2005.

The capacity addition and the productivity improvements achieved by the major ports coupled with the increasing role of non-major ports have changed the earlier scenario at major ports trying to cope with excessive traffic to a situation where ports, in general, wait for ships. The capacity utilization which was 92.6 percent in 1991-92 and 97.3 percent in 1992-93 was consistently above 100 until 1999-2000. The years 2000-01,

2001-02 and 2002-03 have witnessed a reversal of the trend with the capacity utilization coming down to 96.46 percent, 83.61 percent and 86.44 percent respectively for all the major ports⁷.

Port-wise capacity utilization during 2001-02 indicates that Mormugao (111.84%), Visakhapatnam (107.76%) experienced a capacity utilization of more than 100%, other parts which experienced capacity utilization higher than the all port average (83.61%) are Kandla(94.32%), Tuticorin(93.31%) and Chennai(93.20%).



After India's independence, decadal growth rate of traffic increased slowly but there was a sharp increase from 1980. This could be attributed to the gradual operating up of the Indian economy.

⁷ Basic Port Statistics of India (2002-03), MOST, GOI, p.9.

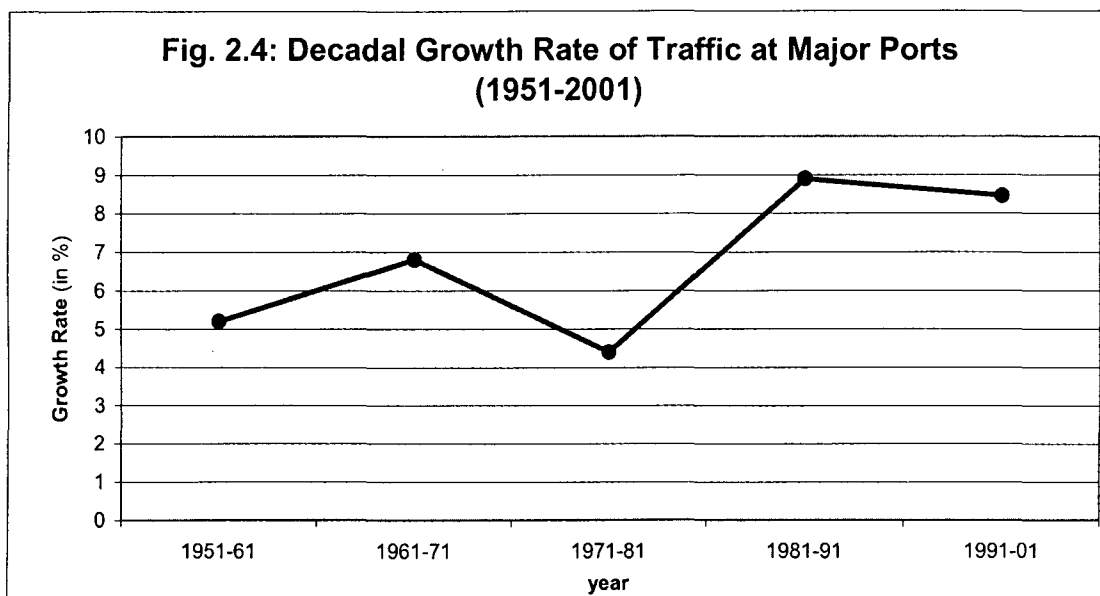


Table 2.5: Decadal Growth Rate of Traffic at Major Ports (1951-2001)

Decade	Growth Rate in %
1951-61	5.2
1961-71	6.8
1971-81	4.4
1981-91	8.9
1991-01	8.46

Source: Basic Post Statistics of India, MOST, GOI., 2002-03.

2.2.3. Commodity – Wise Cargo Handled By Major Ports

Commodity-wise, coking coal (imports) posted the highest growth of 57.6 percent on a total throughput of 24.38 MT in 2004-05, followed by finished fertilizers (imports) 33.56 percent at 3.82 MT, Iron ore (exports) 29.36 percent at 76.13 MT. In fact, the volume increase was maximum, 17.28 MT, in respect of iron ore exports.

Fertiliser raw materials imports at 5.81 MT posted 24.14 percent growth, containers (in terms of TEUs) 12.46 percent at 4.24 million TEUs, crude and petroleum

products 3.64 percent at 126.61 MT. The throughput of thermal coal (for coastal shipment) at 33.26 MT registered a marginal drop.

Interestingly, six ports accounted for the bulk of iron ore exports, four on the east coast – Haldia, Paradip, Visakhapatnam and Chennai and two on the west New Mangalore and Mormugao. While in terms of volume handled, Mormugao topped the list with a throughput of 24.72 MT with a low growth of 7.78 percent. At New Mangalore, Paradip and Haldia, substantial quantities of ore were transported to the ports by road, suggesting that a much costlier fuel was burnt to transport a much cheaper mineral.

The highest growth of 89 percent in iron ore throughput was achieved by New Mangalore at 10.27 MT followed by Paradip 54.23 percent at 9 MT, Haldia 43.21 percent at 5.4 MT, Visakhapatnam 33.4 percent at 16.52 MT and Chennai 14.28 percent at 9.6 MT.

In coking coal imports, the highest growth in throughput, more than 450 percent, was recorded by Chennai at 5.5 MT, followed by Mormugao 73 percent at 2.78, Paradip 50 percent at 3.3 MT, Visakhapatnam 18 percent at 7.2 MT, and Haldia 14 percent at 5.1 MT. It is only during the last two years or so that Mormugao started handling coking coal imports to meet the requirement of the steel plants that have come up in its hinterland.

The Visakhapatnam port accounted for the bulk of the finished fertilizer imports, of 1.37 MT, followed by Kandla 6.78 lakh tonnes, New Mangalore 3.54 lakh tonnes and Mormugao 1.72 lakh tonnes.

At two other ports, the volume of the traffic declined. In Haldia by 1.72 lakh tonnes and in Cochin by 71000 tonnes. JNPT did not handle finished fertilizers in 2004-05 though it had in the previous year.

**Fig. 2.5: Commodity-Wise Break-Up at Major Ports
(2004-05)**

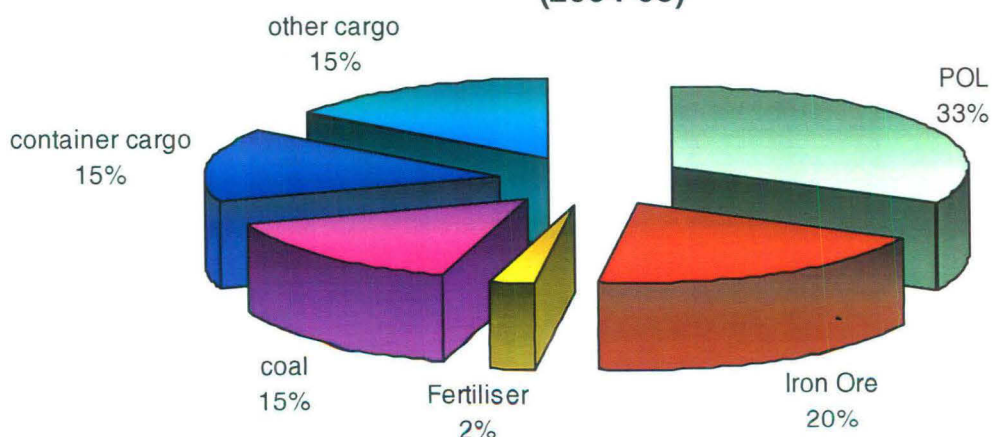


Table 2.6: Commodity -Wise Traffic Break-Up at Major Ports

Commodity	2004-05		2003-04		1996-97		% variation 2003-04 to 2004- 05
	Traffic in MT	% share of traffic	Traffic in MT	% share of traffic	Traffic in MT	% share of traffic	
POL	126.61	32.99	122.30	35.09	98.08	42.84	3.52
Iron ore	76.12	19.84	58.89	16.90	33.05	14.43	29.26
Fertilizer	9.63	2.51	7.51	2.16	7.18	3.14	28.23
Coal	57.65	15.02	48.98	14.06	34.86	15.22	17.70
Container Cargo	54.87	15.40	54.95	15.77	22.29	9.73	-0.15
Other cargo	63.11	15.34	55.85	16.03	33.50	14.63	13.00
All Ports	383.77	100.00	348.49	100.00	228.96	100.00	10.12

Source: Compiled from Profile of Major Ports of India, 2003-2004, Indian Ports Association and Indian infrastructure in May 2005 and Basic Port Statistics of India.

2.2.4. Ninth and Tenth Plan forecast and Handling of Cargo (2002): Commodity – Wise

With the background of economic revival deregulation, privatisation etc. Ninth plan projected that at the end of the plan, the port traffic from 227 MT in 1996-97 to increase 424 MT in 2002. The projections have not realized as could be seen from Table

2.6. It may touch about 300 MT only or about 70% of projection. The increase in ninth plan is

Table 2.7: Ninth and Tenth Plan forecast and Handling of Cargo (2002)
Commodity – wise (In MT)

Cargo	Ninth Plan Projection 2002-03	Actual Handling 2001-2002	Tenth Plan for 2006-07
POL	187	102	154
Iron Ore	34	47	53
Coal	94	47	71
Fertilizer	14	8	14
Container	39	38	61
Other Cargo	56	46	62
Total	424	288	415
Increase	87%	27%	44%

Source: 10th Five-Year plan document, planning commission, GOI.

around 32 percent as against projected 87 percent. The reasons are many folds including the recession of economy, worldwide. Such variations are not uncommon. The major variation had caused in POL and Coal. In respect of POL hardly there is any increase in traffic: private port in Jamnagar by reliance caused a part of shortfall. But the Private refinery created in Mangalore is in red is another sore aspect. In respect of coal, the handling is 50 percent of projections as the Kayangulam project in Kerala and that at Mangalore is yet to take shape. The iron ore has exceeded the target of 34 MT by 33 percent. The container handling has matched the projection, mainly due to remarkable handing in privatized terminal in JNPT⁸.

Tenth plan has projected traffic of 415 MT for major ports (Table 2.6) it could be seen expecting for container and iron ore, the tenth plan projection are less than the Ninth Plan for all the commodities. The overall increase over 2001 handling is only 44 percent.

⁸ Ramakrishna, R; op. cit., 18.

Whether even this will be achieved, time can only say, 150 MT is projected for minor ports. It appears that the projections for minor ports are far higher to achieve, unless all the maritime states put serious efforts.

Capacity utilization of traffic was maximum during second five year plan (105%) followed by seventh five year plan and third five year plan respectively. While the least utilization of capacity was in fifth five year plan the cause is obvious that country was passing through great turmoil. The port capacity augmentation in Tenth Plan project at 470.6 MT an addition of 126 MT.

2.2.5. Tenth Plan Proposal (2002-2007)

The capacity at major ports at the end of March 2002 stood at 343.95 million tonnes. A capacity addition of 126.65 million tonnes is proposed under the Tenth Plan. The overall capacity at the end of the Tenth Plan period should be around 470 million tonnes. Traffic meanwhile is projected to grow to 565 million tonnes by 2006-07 collectively at both major and minor ports. While major ports will receive around 415 million tonnes, the minor ports will receive around 150 million tonnes. In order to handle this growing volume, container terminals are being developed at a number of major ports including Kolkata, Kochi, JNPT, Mumbai, Kandla and New Mangalore.

There is no proposal in Tenth Plan to create any new major port. The effort is to improvise expand and consolidate, the existing major ports⁹

2.2.6. Share of Major and Minor Ports in Cargo Traffic

The major ports control three-fourth (75.20%) of cargo traffic. The minor ports currently control about 24 percent of traffic. The share of minor ports in cargo handling has grown briskly at over 30 percent CAGR in the past but there was some decline in minor traffic this year. It is clear from the Table 2.8 that the major ports have handled around 75 percent of the sea borne traffic of India in 2004. It is also noted that the share

⁹ Ramakrishna, R; op. cit., 18.

of major ports have constantly declined and of minor ports constantly increased. This is because of gradual increase in the number of minor ports.

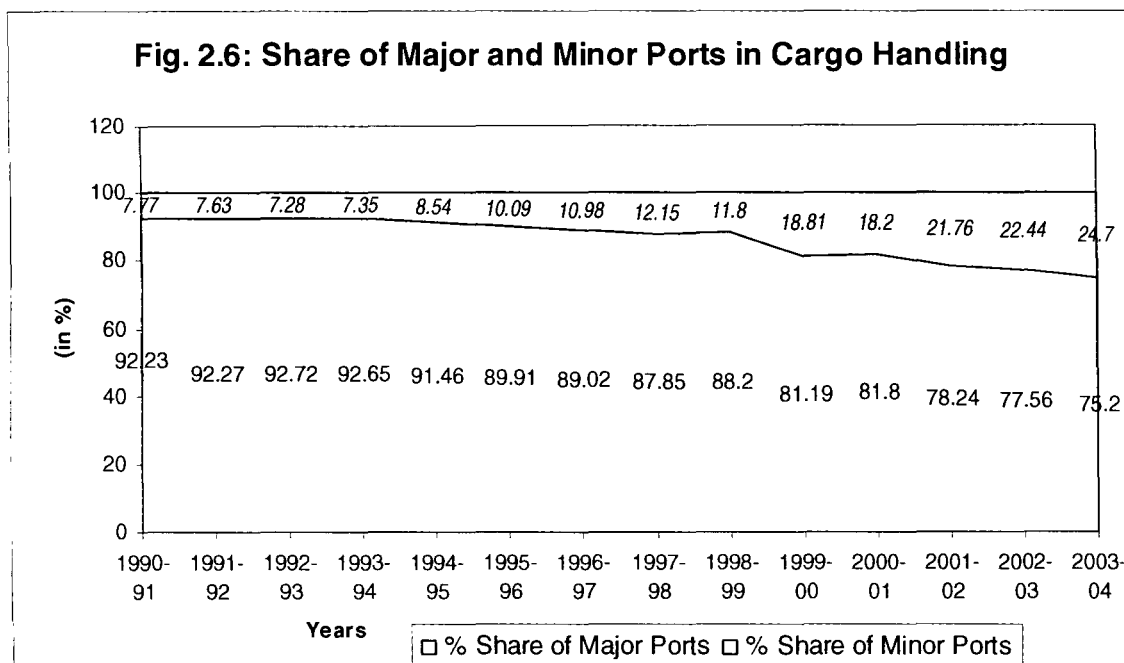


Table 2.8: Share of Major and Minor Ports in Cargo Traffic (1990-91 to 2003-2004)
(Traffic in MT)

Years	Major Ports	Minor Ports	Total	% Share of Major Ports	% Share of Minor Ports
1990-91	151.67	12.78	164.45	92.23	7.77
1991-92	156.64	13.26	169.90	92.27	7.63
1992-93	166.57	13.08	179.65	92.72	7.28
1993-94	179.26	14.23	193.49	92.65	7.35
1994-95	197.26	18.41	215.67	91.46	8.54
1995-96	215.34	24.16	239.50	89.91	10.09
1996-97	227.00	28.00	255.00	89.02	10.98
1997-98	251.49	34.78	286.27	87.85	12.15
1998-99	271.20	36.30	307.50	88.20	11.80
1999-00	272.00	63.00	335.00	81.19	18.81
2000-01	281.00	62.50	343.50	81.80	18.20
2001-02	287.70	80.00	367.70	78.24	21.76
2002-03	363.00	105.00	468.00	77.56	22.44
2003-04	390.00	128.62	518.62	75.20	24.70

Source: Compiled From Basic Port Statistics of India (1990 to 2003), MOST, GOI and Indian Infrastructure May 2005.

Major ports and non-major ports in India collectively handled 518.62 million tons of cargo traffic during the year 2003-04 as compared to 421.61 million tonnes in 2002-03 and 383.10 million tons in 2001-02. During 2003-04, the share of major ports in total traffic was 390 MT and that of non-major ports was 128.62 MT. (The corresponding levels of traffic for 2002-03 were 313.55 MT and 108.06 MT at major and non-major ports respectively). Major ports account for 75.20 percent share in 2003-04, which has come down since 1992-93 at the level of 92.72 percent.

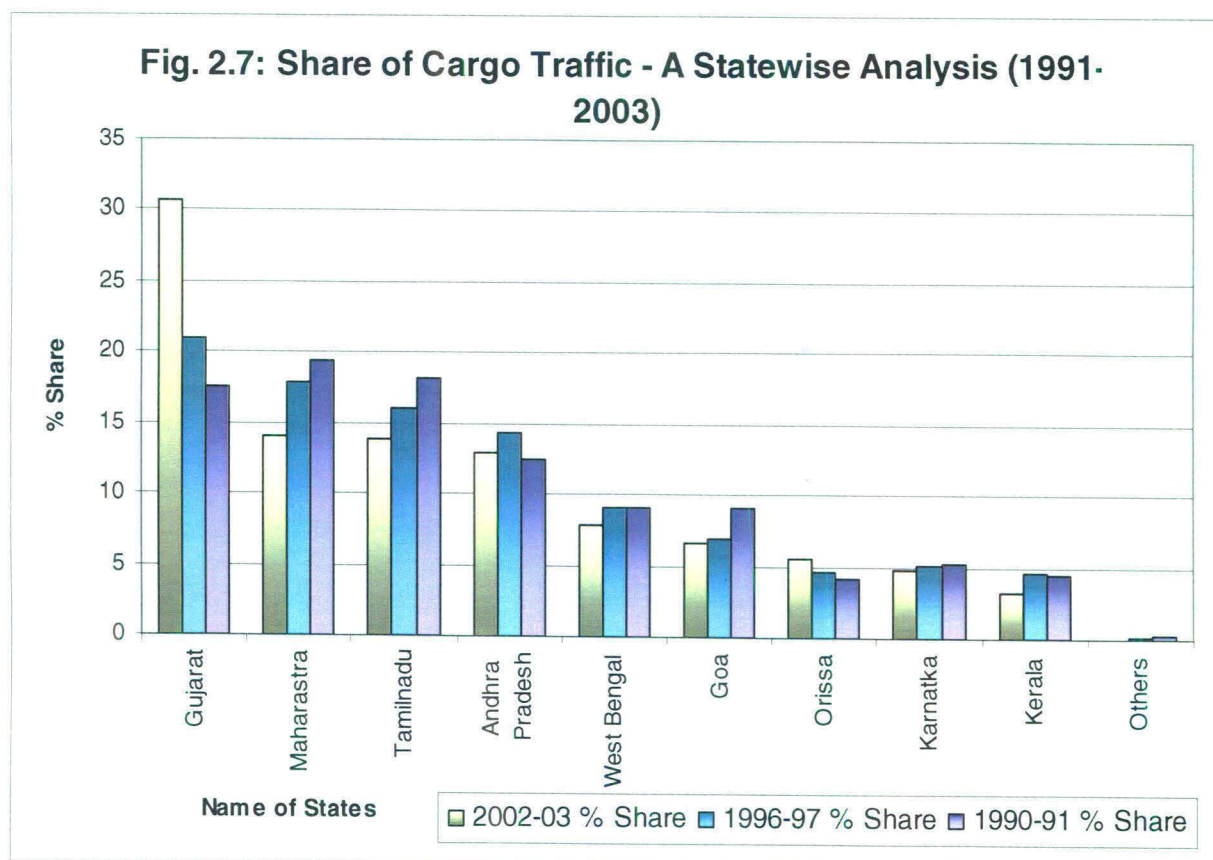
Non major ports unlike major ports have improved their share and have strengthened their position in India's maritime trade-In 1990-91 the share of minor ports was just 7.77 percent which gradually improved and reached up to 24.7 percent within the very short span of twelve years.

2.3. Statewise Analysis of Cargo Traffic

Gujarat is a principal maritime state endowed with a natural coastline of approximately 1600 Kms (about 29% of India's total Coastline). The state has 40 non major ports. These are under administrative control of the Gujarat Maritime Board (GMB) since April 1982. Gujarat has the advantage of a vast hinterland covering the northern and the central Indian states and as a result, there is high demand for the services offered by the non major ports in Gujarat. Further, through the port policy of 1995, the GMB has been securing the active participation of the private sector in the development of the non major ports in Gujarat; there has been steady increase in the infrastructure as well as growth in the volume of traffic handled during the medium term. This traffic is handled mainly through 14 non major ports. The remaining 26 are used for fishing activities and sailing vessels traffic of small volume. The share of Gujarat in the total cargo handled by all the non major ports in India has been increasing as a result of the successful development of the sector by the Gujarat Maritime Board.

The total throughput of Indian ports in 2002-03 was 419 million tonnes. As much as 126 million tonnes pass through the ports in Gujarat. At an average annual growth rate of 6 to 7 percent, it is expected that throughput for all Indian ports will be around 1.4

billion tonnes by 2020. Gujarat is projected to proceed around 500 million tonnes of this maritime trade.



It is observed that of the maritime states, Gujarat comes first with a share of 30.68 percent followed by Maharashtra (14.1 %), Tamil Nadu (13.8%), Andhra Pradesh (13 %), West Bengal (7.94%), Goa (6.74 %), Orissa (5.53 %), Karnataka (4.76 %) and Kerala (3.18 %). As against the all-India year-on year growth of 3.89 % in cargo traffic in 2002-03, Gujarat, Maharashtra, Goa and Orissa have recorded higher rates during 2002-03 and as a result increased their share as compared to the previous year. The shares of the other maritime States were lower than the all India year-on-year growth rate. As a result of recording decline or poor growth rates, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh and West Bengal have witnessed a reduction in their share during 2002-03 as compared to the previous year.

**Table 2.9: Share of Maritime States in the Total Cargo Handled
(Through all Ports)**

Name of the States	2002-03	1996-97	1990-91
	% Share	% Share	% Share
Gujarat	30.7	21.02	17.63
Maharashtra	14.1	17.95	19.37
Tamil Nadu	13.8	16.11	18.13
Andhra Pradesh	13	14.41	12.49
West Bengal	7.9	9.07	9.09
Goa	6.7	6.95	9.07
Orissa	5.5	4.60	4.22
Karnataka	4.8	5.09	5.25
Kerala	3.2	4.68	4.50
Others	0.03	0.13	0.24
Total	100	100.00	100.00

Source: Basic Port Statistics, MOST, GOI., 1991-2003.

Gujarat is the only state which has been witnessing increase in its share of sea-borne cargo over the years; its share has increased from 17.63 percent during 1990-91 to 30.68 percent in 2002-03 in the total traffic due to the development of non-major ports in the state with the active participation of sector. In Gujarat minor ports have been more successful in attracting private participation, three ports, namely Mundra, Pipavav and Dahej are being developed by the private operators. Pipavav, India's first fully privatized port was set up by Gujarat Pipavav Port Limited – a joint venture between seeking infrastructure and the Gujarat Maritime Board (GMB).

2.4. Containerisation of Ports

2.4.1. Containerisation in World and in India: An Overview

In comparison to world containerisation in India is still a considerable lag, Hong Kong as the premier port followed by Singapore and Shanghai respectively. Antwerp is the tenth largest port, in contrast, JNPT, India's largest container port, handled roughly 2 million TEUs in 2002-03 and 2.3 million TEUs in 2003-04, with this JNPT improved to 30th place from 40th¹⁰.

Table 2.10: World's Top Ten Container Ports in 2004

Port Name	TEUs (in million)
Hong Kong	20.50
Singapore	18.10
Shanghai	11.40
Shenzhen	10.70
Pusan	10.40
Kaoshing	8.80
Los Angles	7.10
Rotterdam	7.10
Hamburg	6.10
Antwerp	5.40

Source: Indian Express.

An interesting fact is that the top five global container terminals are located in Asia and account for 23 percent of global container traffic. Container traffic grown at over 10 percent per annum for the last three years. This reflects the global dominance of containerized traffic. But only 13 percent of India's port capacity is devoted to container traffic. About 70 percent of India's container traffic is transshipped through hubs like Colombo, Singapore and Dubai. There has been little action on the government's plan to set up hub ports to handle container traffic.

¹⁰ Economic Survey (2004-05), Ministry of Finance, Economic Division, GOI., p. 210.

2.4.2. Containerisation of Indian Ports:

In India, Containerisation started in 1973 in a limited way with the creation of interim container handling facilities at Mumbai and Cochin Ports. Since then, container traffic has steadily increased over the years more specifically after 1992-93¹¹. This traffic which was .68 million TEUs in 1991-92 has increased over the years to 3.9 million TEUs in 2003-04. Privatisation has resulted in higher supply-led growth. The container volumes of the eastern ports have stagnated; incremental markets are being captured by the western ports.

2.4.2.1. Container Traffic at Major Ports:

In containers, JNPT topped the list, though with a 10 percent growth on a throughput of 2.37 million TEUs.

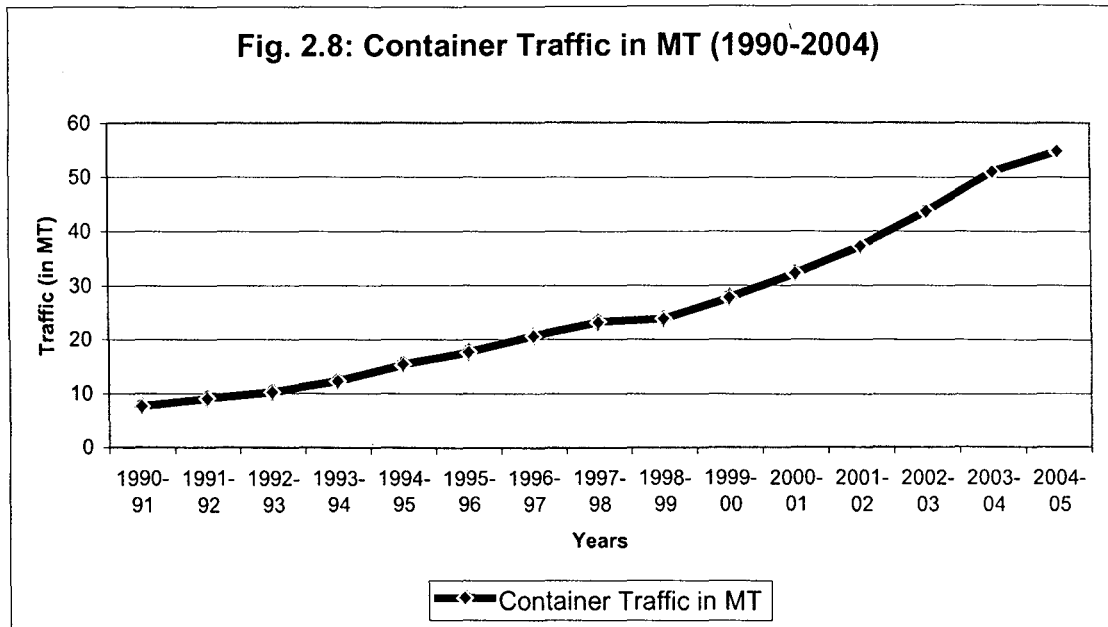
The highest growth of 20.86 percent was posted by Tuticorin at 3.07 lakh TEUs followed by Chennai 14.65 percent at 6.18 lakh TEUs, Kolkata 11.2 percent at 2.88 lakh TEUs, Mumbai 11.16 percent at 2.19 lakh TEUs, Cochin 9.4 percent at 1.86 lakh TEUs and Kandla 5.8 percent at 1.8 lakh TEUs.

Indian container traffic posted an impressive CAGR of 15.5 percent over the decade between 1991-92 and 2001-02¹². This was well above the growth rate of other cargo. Crude and POL recorded a CAGR of 4.07 percent while dry bulk clocked a CAGR of 5.08 during the same period. The CAGR for other cargo was 8.46 percent¹³. An analysis of trade figures in various ports between 1991-92 and 2001-02 reveals that other cargo and break bulk have seen a down-trend in volume while containerized cargo has seen growth. However, dry bulk volume has increased. This again reinforced our finding that more and more break bulk cargo is being containerized.

¹¹ Basic Port Statistics of India (2002-03), MOST, GOI, p.12.

¹² Basic Port Statistics of India (2002-03), MOST, GOI., p.31.

¹³ The Link Global Trade and Freight Review, Vol. IX No.11, Nov 2004, pp.16-55



Container growth has outstripped other cargo growth. It has grown at a five-year CAGR of 9.2 percent and a 10 year CAGR of 10.4 percent. Other cargoes such as oil, gases, chemicals, dry bulk and general cargoes such as oil, gases, chemicals, dry bulk and general cargo have grown at under 5 percent. This is driven by the change in the global trade basket. The share of ores, fuels and metals has declined while the share of office and telecom equipment has increased and that of textiles and other items has remained stagnant. In 2003-04, containerised cargo grew to 51.05 million tonnes, up around 16.9 percent over 2002-03. The JNPT handled the lion's share of container traffic, while Chennai port was a distant second.

The container traffic at Kandla Port maintained its upward trend, with the port handling a total of 1,80,463 TEUs, over the previous fiscal, thus registering a growth of 6 percent, while containerised cargo traffic recorded an increase of 14 percent.

Container traffic at the port of Mumbai, for the first time since 1997-98, registered an increase of 11.22 percent from 1,96,000 TEUs in 2003-04 to 2,19,000 TEUs in 2004-05, while POL and other liquid bulk traffic increased by a small 5 percent to 20.10 MT.

Table 2.11 Growth of Aggregate Container Traffic (1991-2004)

Year	Container Traffic in MT	% Growth	In lakh TEUs	% Growth
1990-91	7.63		6.80	
1991-92	9.01	18.09	6.77	
1992-93	10.2	13.21	7.99	
1993-94	12.25	20.09	10.52	
1994-95	15.36	25.38	12.57	19.49
1995-96	17.62	14.72	14.49	15.27
1996-97	20.59	16.87	16.98	17.18
1997-98	23.12	12.29	18.92	11.43
1998-99	23.78	2.86	19.32	2.11
1999-00	27.69	16.43	21.85	13.10
2000-01	32.22	16.37	24.70	13.04
2001-02	37.23	15.54	28.84	16.76
2002-03	43.67	17.31	33.66	16.71
2003-04	51.00	16.78	39.00	15.86
2004-05	54.87	7.59		

Source: Compiled from Basic Port Statistics of India & Indian infrastructure May 2005.

**Table 2.12 Containerisation in Indian Ports
(% share of MT)**

Ports	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
Kolkata	11.42	11.47	10.3	9.48	9.18	8.29	7.65	6.24	3.79	3.43	3.42	4.3
Haldia	0.71	0.54	0.29	0.57	1.66	1.8	1.57	2.5	4.09	4.24	4.46	3.66
Paradip			0					0.02		0.08	0.12	0.06
Visakhapatnam	0.66	0.82	0.53	0.81	0.63	0.72	0.95	0.86	0.86	0.68	0.54	1.16
Chennai	13.11	13.15	13.1	0.81	12.98	12.37	14.36	17.9	15.73	16.53	16.92	17.98
Tuticorin	3.31	4.25	4.3	0.81	0.5	5.1	5.9	4.87	5.91	5.27	5.27	5.84
Cochin	3.48	4.56	4.52	0.81	3.79	4.11	4.5	5.56	5.1	4.74	4.17	4.22
New Mangalore	0.12	0.05		0.81				0.06	0.1	0.19	0.19	0.25
Mormugao	0.08	0.08	0.11	0.81	0.13	0.16	0.18	0.14	0.16	0.21	0.2	0.21
Mumbai	44.19	40.81	38.3	0.81	35.02	29.85	22.24	13.54	9.9	7.2	5.52	4.69
JNPT	16.96	19.07	23.1	0.81	26.17	33.76	38.57	44.31	49.65	52.35	54.48	52.65
Kandla	5.96	5.2	5.45	0.81	5.62	3.85	4.1	3.99	4.71	5.09	4.71	5
Total	100	100	100	0.81	100	100	100	100	100	100	100	100

Source: Compiled from Basic Port Statistics of India & Indian infrastructure May 2005.

The JNPT, in year 2004-05, by handling 2,371,338 TEUs. The individual share of the Jawaharlal Nehru Port container Terminal (JNPCT) and the Nhava Sheva International Container Terminal (NSICT) in the combined figure were 1,138,868 TEUs and 1,232,470 TEUs, respectively. A substantial 4.51 percent more than the previous

fiscal's 2.269 million TEUs. The figure is also higher than the 2.35 million TEU target set for 2004-05.

The Cochin Port handled 1.85 lakh TEUs during 2004-05.

The container traffic in Chennai Port has been growing steadily at 17 percent in the last three years. In 2004-05, the Chennai container Terminal handled 6,16,530 TEUs (up by 14 percent), wherein the tonnage works out to 9.86 MT. The container terminal performed an average 16 moves per hour on quay areas.

The container terminal run by the Visakha Container Terminal Pvt. Ltd (VCTPL) at Visakhapatnam Port achieved a staggering 120 percent throughput growth in 2004-05, over 2003-04, by handling 45,517 TEUs (20,730 TEUs).

As for container traffic, Kolkata Port handled 2, 87,992 TEUs during the fiscal, as against 2, 59,076 in 2003-04. Of the 2, 87,992 TEUs, Kolkata Dock System (KDS) alone contributed 1, 59,242 TEUs and recorded an increase of 30.08 percent over the preceding year.

There are immense opportunities for port development in India; eighty percent of Indian containers are transshipped outside India. Sixty to seventy percent of the containers handled in Colombo are of Indian Origin or destination. This result in an estimated loss of around Rs 10 billion.

2.4.2.2. Containerisation under Tenth Plan

Container Traffic accounted for 14 percent of the total traffic in 2002-03, up from 10 percent in 2001-02. Currently, containerisable cargo accounts for less than a third of the total merchandise trade. In countries with similar economic characteristics, containers account for over 70 percent of traffic. The share of containerized cargo was 58 percent in 2002-03. Under the Tenth Plan, a goal has been set to achieve international standards of 70 percent containerization by the end of the plan period. Containerisation is accepted the world over and dedicated ports and terminals are constructed for containerization.

Containers offer the advantages of being cheap, fast, regular and reliable. Worldwide, the container fleet has increased at an extraordinary rate. The fully cellular container fleet has doubled TEU capacity during the past seven years.

2.4.2.3. Impact of Containerisation

With the advent of containerisation, several of the efficiency parameters of Indian ports have improved dramatically. The average turnaround time for ships have has reduced from over four days in the late 1990s to 3.4 days at present. Average berthing delays have also reduced to less than half the previous levels. Of the 12 major ports of India, the JNPT and Mumbai Port Trust have been the frontrunner in creating container capacity with a combined market share of more than 60 percent of the total container traffic. Other ports have lagged behind due to the lack of adequate infrastructure in the form of container handling equipment, container freight station networks and rail networks.

2.5. Conclusion

Ports provide an interface between the ocean transport and land-based transport. In the initial years, the traffic was being handled mostly at major ports. However, over the years, non-major ports have also witnessed growth in traffic. The growth in the cargo handled at Indian ports has increased from a level of 19.38 million tonnes (major ports) in 1950-51 to around 457.96 million tonnes (major and non-major ports) by 2003-04. The share of traffic at major and non-major ports stood around 345 and 113 million tonnes respectively.

The capacity utilization which was 92.6 percent in 1991-92 and 97.3 percent in 1992-93 was consistently above 100 until 1999-2000. The years 2000-01, 2001-02 and 2002-03 have witnessed a reversal of the trend with the capacity utilization coming down to 96.46 percent, 83.61 percent and 86.44 percent respectively for all the major ports. Port-wise capacity utilization during 2001-02 indicates that Mormugao (111.84%), Visakhapatnam (107.76%) experienced a capacity utilization of more than 100%, other

parts which experienced capacity utilization higher than the all port average (83.61%) are Kandla (94.32%), Tuticorin (93.31%) and Chennai (93.20%).

Under vision 2020 it is proposed that cargo handling will be about 1300 MT (both minor and major ports), while tenth plan projection is to achieve 450 MT. The maximum traffic handled is at port of Visakhapatnam about 50.147 MT, while in a foreign country a single port handled 100-300 MT, this indicates to develop some mega ports in our country. The required need and focus is to develop one port in the East and West coast to develop facilities and handle as Mega Port of about 100 million tonnes. But, there is no vision even today in the next 20 years to develop any existing or new port in that direction. Perhaps the situation in the next decade may change the scenario, which has to be seen.

The year 2004-05 has been another good year for growth of traffic volumes at major ports. Traffic handled by major ports increased by 11.3 percent to 383.77 million tonnes during this year. Notably, this has been the highest growth in traffic during the last decade. The Visakhapatnam port was the only to cross the 50-MT mark in 2004-2005, though with a low growth of 5.05 percent. The port's share in the total traffic handled increased to 13.07 percent during the year from 13.84 percent in 2003-04. In fact, it was declining over the past few years, from 15.42 percent in 2001-02 and 14.67 percent in 2002-03. Kolkata occupied the second position in 2004-05 after Visakhapatnam while Chennai was ranked third and Kandla fourth. Kandla had occupied the second position for the three successive years from 2001-02 to 2003-04 but was last overtaken by Kolkata.

Commodity-wise, coking coal (imports) posted the highest growth of 57.6 percent on a total throughput of 24.38 MT in 2004-05, followed by finished fertilizers (imports) 33.56 percent at 3.82 MT, Iron ore (exports) 29.36 percent at 76.13 MT. In fact, the volume increase was maximum, 17.28 MT, in respect of iron ore exports.

The New Mangalore port posted the highest growth in traffic (27.06 %) among all major ports in 2004-05. In the process, the port achieved a 22.04 percent increase over the target fixed by the Shipping Ministry. At a throughput level of 33.89 MT the port

posted more than 27 percent growth, followed by Chennai 19.33 percent growth at 43.80 MT. Paradip 18.94 percent at 30.10 MT, Mumbai 17.10 percent at 35.12 MT, Tuticorin 15.59 percent at 15.81 MT and Kolkata 11.87 percent at 46.15 MT.

Major ports and non-major ports in India collectively handled 518.62 million tons of cargo traffic during the year 2003-04 as compared to 421.61 million tonnes in 2002-03 and 383.10 million tons in 2001-02. During 2003-04, the share of major ports in total traffic was 390 MT and that of non-major ports was 128.62 MT (The corresponding levels of traffic for 2002-03 were 313.55 MT and 108.06 MT at major and non-major ports respectively). Major ports account for 75.20 percent share in 2003-04, which has come down since 1992-93 at the level of 92.72 percent.

It is observed that of the maritime states, Gujarat comes first with a share of 30.68 percent followed by Maharashtra (14.1 %), Tamil Nadu (13.8%), Andhra Pradesh (13 %), West Bengal (7.94%), Goa (6.74 %), Orissa (5.53 %), Karnataka (4.76 %) and Kerala (3.18 %). As against the all-India year-on year growth of 3.89 % in cargo traffic in 2002-03, Gujarat, Maharashtra, Goa and Orissa have recorded higher rates during 2002-03 and as a result increased their share as compared to the previous year. The shares of the other maritime States were lower than the all India year-on-year growth rate. As a result of recording decline or poor growth rates, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh and West Bengal have witnessed a reduction in their share during 2002-03 as compared to the previous year.

In India, Containerisation started in 1973 in a limited way with the creation of interim container handling facilities at Mumbai and Cochin Ports. Since then, container traffic has steadily increased over the years but real growth in containerisation has taken only after 1992-93. Container traffic which was 0.68 million TEUs in 1991-92 has increased over the years to 3.9 million TEUs in 2003-04. Privatisation has resulted in higher supply-led growth. The container volumes of the eastern ports have stagnated; incremental markets are being captured by the western ports. In containers, JNPT topped the list, though with a 10 percent growth on a throughput of 2.37 million TEUs.

The highest growth of container 20.86 percent was posted by Tuticorin at 3.07 lakh TEUs followed by Chennai 14.65 percent at 6.18 lakh TEUs, Kolkata 11.2 percent at 2.88 lakh TEUs , Mumbai 11.16 percent at 2.19 lakh TEUs, Cochin 9.4 percent at 1.86 lakh TEUs and Kandla 5.8 percent at 1.8 lakh TEUs.

The infrastructural drawbacks in major ports to handle large vessels, productivity, managements, all needs drastic improvement and ethos to think big and do the drastic high tech development and mind set to overcome. Corporatisation and private participation should be result in better vision and mission to achieve the goal in suitable manner. The achievement in privatising container terminal in JNPT is a pointer on this, a trend setter. Development of private ports in Gujarat such as Adani, Pipavav, Dahej, Jamnagar and Mundra, with pro active thinking, policy and co-ordination is a welcome step which other maritime state should pursue. Port development is costly proposition and hence proper co-ordination is essential such as the ports complement and supplement for traffic. Remarkable breakthrough in port handling and management can be accepted in next five ten years, in view of the management and will to act.

CHAPTER III

CORPORATISATION AND PRIVATISATION OF MAJOR PORTS

“Corporatisation only represents a change in the legal structure of the body. Corporatisation of ports by itself would not have much impact on this vital segment of national infrastructure. Since the ownership prior to and after the corporatisation remains with the Government which would only mean that corporatisation is only a mere change in the legal structure of the organisation and would not have much impact on its functioning”¹.

3.1. Introduction

Even under the Major Port Trust Act of 1963, the Boards of trustees constituted under the Act are “body corporate” having perpetual succession and the right to sue and be sued, in their own name². Thus except for the “share holding”, there are no major differences between these formats as far as managements of the organizations are concerned. Operational restrictions and administrative controls by Government, under the existing Port Trust Management format are stated to be limited factors in the unbridled growth of the ports and hence the need to look at alternate formats that would facilitates the unfettered development of the port sector. If these fetters are removed, the Board of Trustees should be free to perform and achieve on par with any corporate. The standing example is the Port of Singapore Authority, which had the reputation of managing the ports most efficiently, long before it was corporatised in 1997³.

Another factor in favour of corporatisation of the Ports is the fact that corporative ports which do not fall under the purview of Major Ports Trust Acts of 1963 are exempted from regulation by the authority for major ports and are free to fix their own tariff. Even as a corporate port, as long it remains a state owned enterprise,

¹ Raman, M. (2004), “Corporatisation of Ports: It is the Way Forward?” *Indian Ports*, Jan, Vol. 35(3), pp. 5-6.

² Ramakrishanan, R., (2003), “Scenario of Port Handling and Vision” *Indian Port*, Oct, pp.5-17.

³ Mukherjee, S., “A Time to Change”, *Indian Ports*, Oct. 2002, pp. 17-21.

subject to all the regulations and procedural restrictions on the management of public enterprises, the decision making authority of these entities are severely restricted particularly in matters of capital investments and borrowings which are crucial for exploitation of commercial opportunities⁴.

3.2. Need of Corporatisation and Privatisation of Ports

Actually, improvement in productivity and efficiency of port operations is one of the challenges facing major ports today. Major Ports in India are suffering from under capacity and low productivity, lack of adequate commercial orientation and less degree of autonomy to the port management. This requires reduction of costs as well as workforce rationalization. Both privatization and corporatisation are part of the attempt to increase efficiency. Corporatisation will provide easy access to private funds even equity market, which is not possible now.

Government is interested in corporatisation because it will complement the Government's policy of economic liberalization. It will also reduce Government's budgetary commitment to the Major Ports. Port Trust Management is interested in corporatisation because of a variety of reasons. But the most basic of them is the greater autonomy from Government control⁵.

3.2.1. Corporatisation of Ports

In next five years, Corporatisation of ports should be taken up in the following sequence⁶:

- ❖ Haldia
- ❖ Kandla, Tuticorin and New Mangalore
- ❖ Mumbai, Paradip, Visakhapatnam and Chennai.
- ❖ Mormugao and Cochin.
- ❖ Calcutta

⁴ Raman, M; op.cit, 46.

⁵ Sarkar, J. (2002), "Principle of Traffic forecasting", *Indian Ports*, July, pp.9-12.

⁶ "Perspective Plan for Indian Port Sector", Vision 2020, Volume II, Apr. 2001, Rites Ltd, New Delhi, pp. 39-42.

- ❖ Ennore has already been corporatised and JNPT is under corporatisation process. Any new port to be developed should be a corporate body from the beginning itself, decided by Government of India since 2001. Following resolution has been passed-
- Amend Major Port Trust (MPT) Act suitably, if it is finally held that denotification is not possible in the absence of enabling legislation.
- Although amendments to MPT Act may serve the purpose, however, for achieving the objective of corporatisation of major ports in stages, a special law is recommended which can be titled as “The Development of Ports Act”.
- Adopt share holding pattern out of 100 percent equity held by other major ports, State Government or financial institutions and 25 percent equity held by private partners⁷.
- Select the strategic partner through a process of pre-qualification in order to identify and short-list only suitable builders who could bring in necessary technological or financial inputs.
- The new port company, as it would be working mostly on the landlord concept of operation, should be compact, homogenous and its each department should assume multi-functional responsibilities.
- The port managers should be suitably trained in view of new management set-up.

3.2.2. Expectations from Corporate Ports

1. The new corporate entity should be able to meet the challenge of economic liberalization and the emerging domestic and international competition in all commercial activities.
2. The new corporate entity should be able to take faster decisions in the matter of capacity expansion and modernization.
3. It should be able to mobilize resources both internally and externally for its own growth.
4. It should have a commercial outlook.

⁷ . “Port Policy: Opening up the Sector in Phases”, *Indian Infrastructure*, July 2001, pp.23.

5. It should be efficient in providing services.
6. It should have relatively low operating expenditure.

3.3. Privatisation

“It is urgent necessity to attract private sector investment into the port sector. It is not just a question of adding capacity. Private investment would lead to the induction of modern technology, improved management; improve efficiency and productivity and quality of service as well as to bring in competitiveness in port services⁸”. It is expected that the end of the tenth plan period, the capacity of the major ports is projected to be 470 million tonnes per annum, adequate private support is crucial to meet this target. Private investment is fairly limited, though there has been some interest in the last three years⁹. PSA Corporation and Dubai Ports international and Maersk have a presence. Domestic players such as L&T, CONCOR and JM Baxi are also active in the sector. This is the result of major evolutionary changes in the policy. The sector was open up for private participation in the early 1990s but there was no activity. In October 1996, the Ministry of Surface and Transport issued a new guideline on port privatisation¹⁰.

3.3.1. Privatising Options

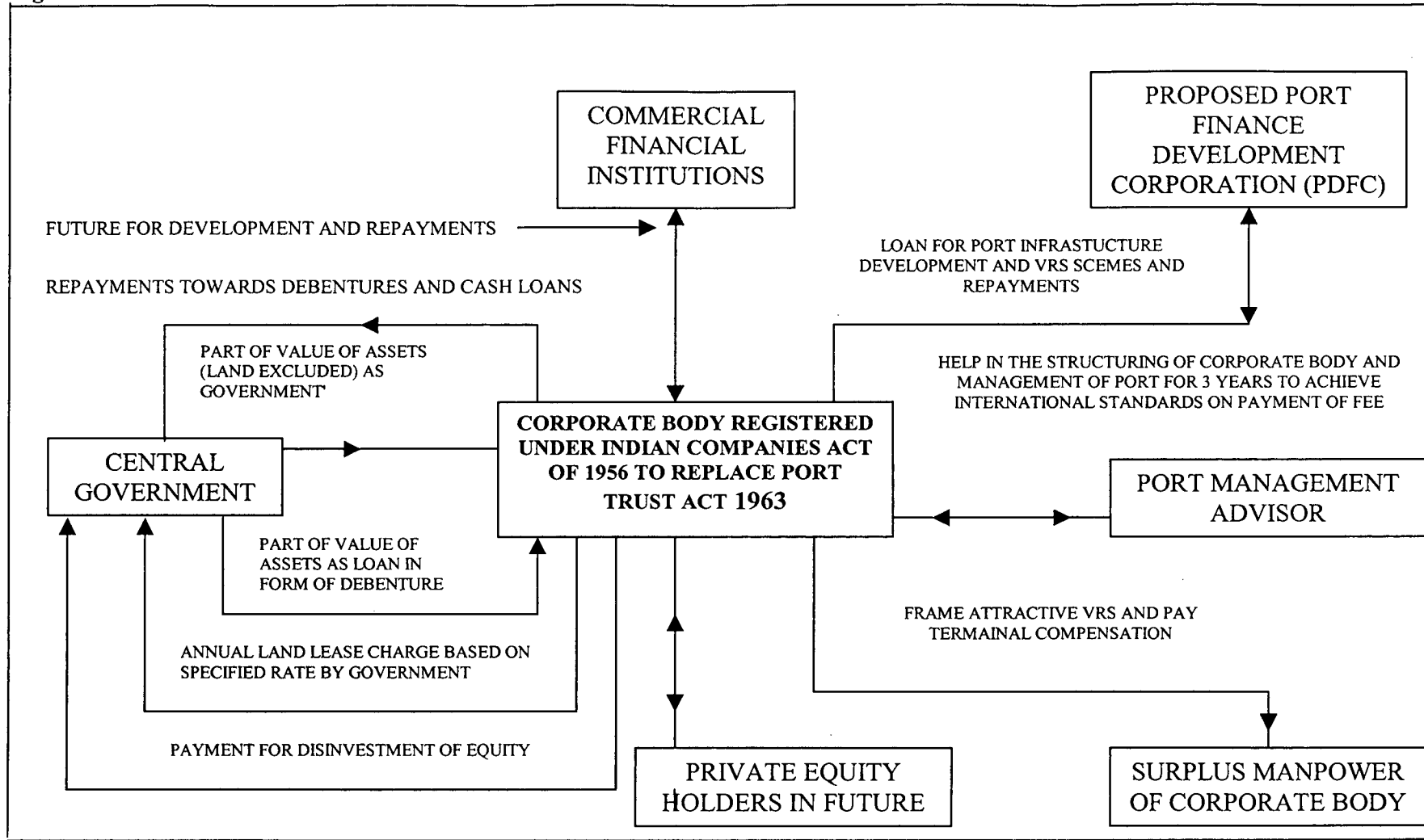
- The options for privatizing port services depend on the size of the port and the services involved. Models for privatizing include the following:
- Full privatizing: all assets and liabilities are transferred to the private sector.
- Built operate and own: parts of the port are sold to private operators to be developed.
- Built operate and transfer: private operators build or rehabilitate facilities, which are eventually transferred to public ownership also known as concessions.
- Joint ventures: operators create a new independent company. This type of agreement arises when two or more parties with common interests join forces.

⁸ “Privatisation Policy for Ports”, *Indian Infrastructure*, June 2004, p. 28.

⁹ “Port sector: Coping With Growth” *Indian Infrastructure*, July 2001, p.22.

¹⁰ Ghosh, Buddhadeb and De, Prabir, “Indian Ports and Globalisation Grounding Economics in Geography” *Economic and Political Weekly*, August 25, 2001, pp.3271-3283.

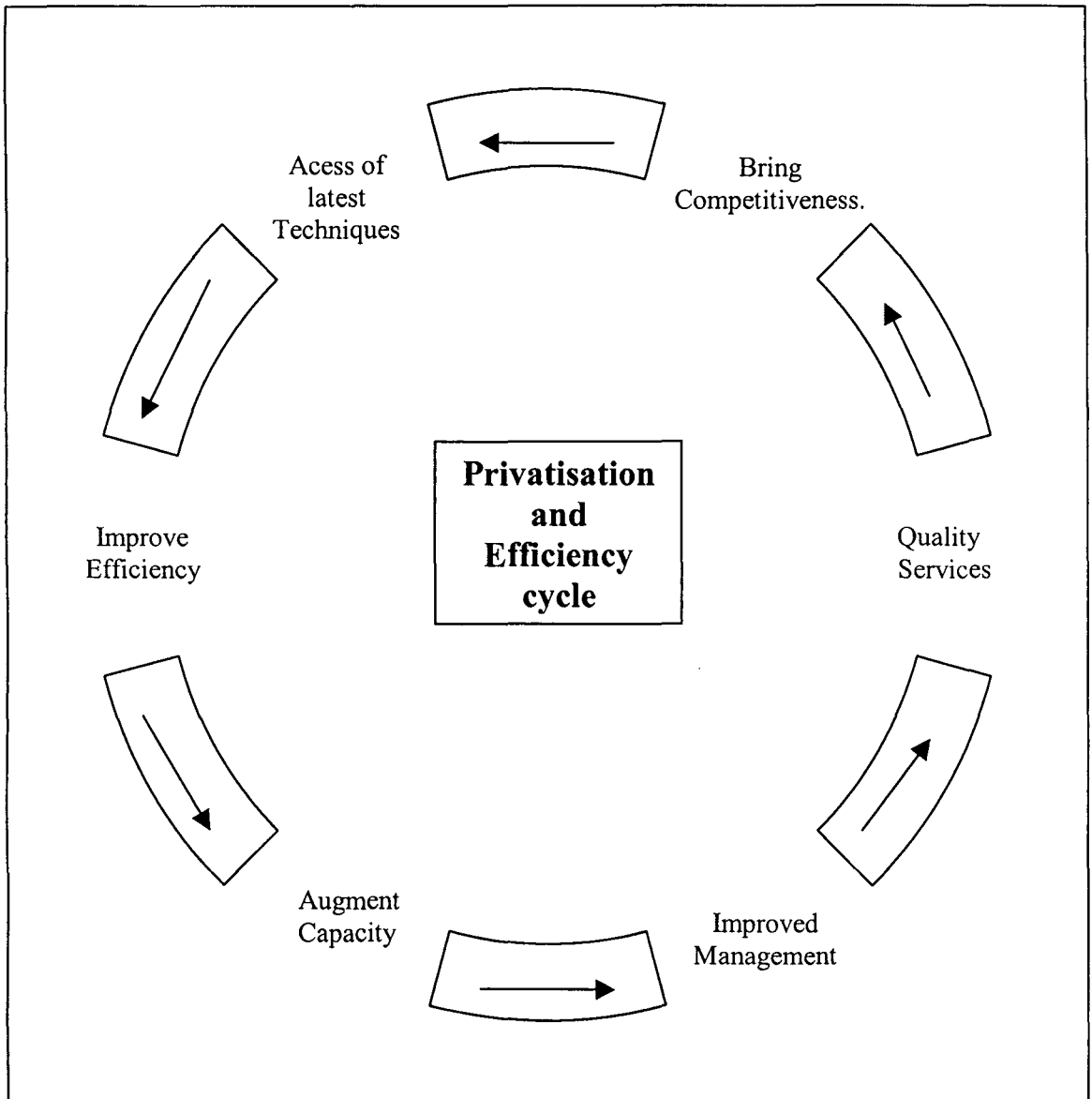
Fig.3.2: STRUCTURE OF PROPOSED MODEL FOR PRIVATISATION OF MAJOR PORTS THROUGH CORPORATISATION



Source: Prepared on the Basis of Perspective Plan for Indian Port Sector Vision 2020, Vol.II, Apr.2001, Rites Ltd.

- Leasing: the port authority leases port assets to private operators for a given period. In contrast with a concession, the private operators do not usually make investment, and therefore they only assume commercial risks.

Fig. 3.2



Source: Prepared on the basis of various literature.

- Licensing: Private operators provide services requiring basic equipment, which they own. The port authority owns the port infrastructure and super infrastructure and charges. The private operators for their use.
- Management contract: the port authority remains the owner of the port, but the port is run by a private firm, which can provide more efficient management of operations.

3.3.2. Guidelines on Privatisation

The guidelines clearly identified areas for private participation. These included leasing out existing assets, construction and operation of liquid bulk, break bulk, multipurpose and specialised cargo berths. Construction and operation of container terminals, construction and operation of ware houses, CFS, storage facilities, tank farms, captive power plants, captive facilities for port based industries and leasing of floating crafts. Open competitive bidding was introduced along with a two cover tender system, covering both a technical and a price bid. The main criteria for selecting bidders were highest returns and lowest cost to the port trust. There were not many takers. In particular foreign players were unhappy with the BOT framework. They found it difficult to raise finances in the absence of an ownership clause. The port trust gave no guarantee either of financial return or expected traffic. By the mid 1990s the only, major private player was the Australia based P&O, which expressed an interest in developing a BOT container terminal at JNPT¹¹. After long-drawn negotiations. P&O was handled the BOT project in January 1997.

In 1997, the Ports Laws Act modified both the Indian Port Act 1908 and The Major Port Trust Act 1963. This also paved the way for setting up an independent regulatory body for setting tariffs-The Tariffs authority for major ports, which was established in 1997. Further modifications were made in port policy on June 1998 to allow for the setting up of joint ventures and collaborations between a major port and company/consortium and between a major and minor port. It also allowed ports to enter into bi-lateral agreements with foreign Governments.

Initially 51 percent FDI was allowed in the sector. In 1999, the FDI limit was increased to 100 percent. Another significant move was the finalisation and issue of a model concession agreement in March 2000¹². In this, the Government's shares a number of risks with investors. Despite this, private participation remains quite selective; most of the private interest is concentrated on the development of containers. Container terminals are being given to private operators on a BOT basis for a period of thirty years. Very few seem interested in cargo terminals or

¹¹ Iyer, K.V.A. (2004), "Refining Seaport Privatisation – Indian Experience", *Indian Ports*, Jan., pp. 19-23.

¹² "Privatisation Policy for Ports", *Indian Infrastructure*, June 2004, p. 28.

infrastructural facilities. The cause is obvious that containerisation will provide quick return as compared to other infrastructures like cargo terminals which have long-gestation period. The Adani Group will be a pioneer when it submits the final bid to develop in iron ore terminal and in a coal terminal at Ennore Port in July. The Minor Ports have found it comparatively easier to attract private investment. The Adani Group is developing the Mundra Port, in which P&O is developing a container terminal. Similarly, Gujarat Pipavav Port Limited has invested in Pipavav Port along with a number of private investors, including Maersk. Reliance has set up The Jamnagar Port. Shell Hazira is developing an all weather port and in LNG regassification terminal at Hazira. ESSAR Group is developing its all weather ports at Vadinar, Gujarat. There are also some developments in Green Field Projects. The Mumbai Maritime Board has identified three minor ports. Rewas-Aware, Dighi and Jaigadh, for development on a BOT basis. TATA Steel and L&T have plans to develop Dhamra Port, Orissa via joint venture. Several ports in Kerala including Beypore, Azhikkal and Alaphuza ports are seeking private investment¹³.

3.3.3. Identification of Venue for Privatisation by the Central Government of India (1998)

- Major Port Trust (MPT) will identify the area in which privatisation is required.
- The foreign investors should have proven capability in the identified area.
- Financial participation revenue sharing and terms of participation will be negotiated.
- The foreign port may implement the scheme by promoting Indian company in the form of special purpose vehicle without equity contribution from major port trusts.
- Leasing of equipment for port handling and leasing of floating crafts from the private sector.
- Pilotage.
- Captive facilities for port based industries
- Leasing out existing assets of the port.

¹³ "Ports of Future", *Geography and You*, Vol.3 (9), Sep., 2003, pp. 31-32.

- Construction/creation of additional assets, such as:
 - i. Construction and operation of container terminals.
 - ii. Construction and operation of break bulk, multipurpose and specialized cargo berths.
 - iii. Warehousing, Container Freight Stations, storage facilities and tank farms.
 - iv. Cranage/handling equipment.
 - v. Setting up of captive power plants.
 - vi. Dry docking and ship repair facilities.

And also there is provision for each port that they may identify specific projects for implementation through private sector participation.

3.4. Financing Agencies

However, multilateral agencies which have a larger developmental role have been involved in port financing, especially in Greenfield projects. Amongst multilateral agencies, the World Bank is the biggest source of aid for the sector in India. It has provided four loans and credit amounting to \$420 million to date. The World Bank's private arm, the International Finance Corporation (IFC), has been an active participant in providing both debt and equity. The Asian Development Bank, ANZ, Standard Chartered and HSBC are the other prominent foreign banks involved in the sector. In India, the leading domestic FIs in area of port financing are ICICI, IDBI, IFCI and IDFC¹⁴. These have been more active in funding private port projects such as Dhamra (ICICI), Adani (IFCI) and Pipavav (IDBI). Domestic banks such as Canara Bank also provide loans to port projects, mostly in conjunction with domestic FIs. The promoters of the SPV companies are usually foreign and domestic ports, shipping agents, stevedoring companies, construction companies, O&M companies, shipping lines or other companies involved in the port sector. Foreign companies are allowed to hold 100 percent equity in the SPV Company. Some of the foreign companies operating in the port sector in India are P&O Ports (of Australia), PSA, Stevedoring Services of the US, Maersk Shipping and Precious Shipping of Thailand.

¹⁴ "Port Financing: Still a Trickle" *Indian Infrastructure*, July 2001, pp.28-29.

Several multilateral agencies have also contributed to the equity in SPVs. These are ADB (which is likely to pick up equity in Ennore) and CDC of the UK (in Pipavav).

Table. 3.1: Status of private sector projects:

Particulars	No. of Projects	Capacity(MT) to be created	Amount (Rs. Billion)
Already approved	17	60.05	45.27
Under bidding process	4	27.4	29
Bids yet to be invited	3	5	4.5
Total : Identified projects	24	92.45	78.77

Source: Indian Infrastructure, June 2003.

3.5. Private Sector Participation so far at Major Ports

- Berths leased out for 10 years to TISCO at Haldia - 1991 for impart of coking coal and export of iron & steel material.
- Berths leased out to "X-Press Container Line UK" and "Shreyas Shipping Ltd". for two years at Mumbai for handling containers.
- A consortium led by P&O Australia is setting up a \$200 million Container terminal on BOT basis at Jawaharlal Nehru Port Trial operation started in April 1999.
- Agreement signed for construction of a captive Coal Jetty at Mumbai by Tata Electrics.
- Agreement signed at Mormugao Port in April 1999 for re- construction of \$52 million two berths by M/s ABG on BOOT basis for handling Coal.
- One berth and waterfront leased out Western India Group for a floating Dry Dock and ship repairing complex in operation since 1997.
- Provision of equipment, operation and maintenance of container terminal at Tuticorin Port by Singapore Port Authority on BOT basis - 530 million. Operation to commence in 2000 AD.
- Construction and management of two coal berths at New Mangalore Port (BOT) - \$ 120 Million.
- Extension of container terminal at Cochin on BOT. Bids received from international companies under scrutiny.
- LNG Terminal - \$ 150 Million by UNOCOL, USA proposed.

- At Kandla, a captive jetty for fertilizer raw materials (\$55 million) commissioned. Two oil jetties (\$7 million) under construction by IOC & HP. Provision equipment, operation & maintenance of the container terminal (\$100 million) - operator selected. Construction of four multipurpose berths and a CFS - bids invited.
- Integrated 5 berth chemical terminal with annual throughput of 19 million tonnes at Jawaharlal Nehru Port (\$500 Million) - selection process on. POL Handling Facilities (\$50 Million) awaiting signing of agreement with IOC & BPCL.

Table. 3.2: Private Sector Projects Approved in Ports Till 2004

Sl. No.	Port	Project	Capacity (MT)	Project Cost (Rs Crores)	Name of Party
1.	JNPT	Container Terminal	6.00	800.00	P and O. The project is under completion
2.	JNPT	Liquid cargo Berth	4.50	200.00	BPCL and IOC. Agreement is under finalisation and to be executed soon.
3.	Kandla	5th Oil Jetty	2.00	221.00	IFFCO Completed
4.	Kandla	Oil Jetty at Vadinar	15.00	600.00	Essar Oil Ltd. Agreement finalised
5.	Kandla	Two Virtual Jetties	2.00	30.00	IOC and HPCL Completed
6.	Mormugao	Off Shore Stockyard and Berth	5.00	300.00	Mormugao Martina
7.	Tuticorin	Container Terminal	3.60	100.00	PSA Corporation Under Completion

Source: Tenth Five Year Plan 2002-07, Volume-II, Planning Commission.

- Captive facilities for handing coal, liquid bulk, etc. at Greenfield port of Ennore under construction near Chennai. Proposals for creation of LNG, POL product and chemical handling facilities by intentional oil giants under negotiation.
- Development of captive port facilities proposed for petroleum crude, LPG, LNG by Indian and foreign oil companies at Haldia, Paradip, Visakhapatnam, Mangalore, Tuticorin and Cochin.
- Two Multi-purpose berths each at Haldia and Visakhapatnam - NIT issued. One LPG terminal with underground storage at Vizag already commissioned.

3.6. Privatisation of Ports: A case study of Gujarat

Minor ports have been more successful in attracting private participation. In Gujarat, three ports, namely **Mundra, Pipavav and Dahej** are being developed by private operators¹⁵. **Pipavav, India's first fully privatized port** was set up by Gujarat Pipavav Port Limited- a Joint venture between Seaking Infrastructure and the Gujarat Maritime Board. The Port has a natural draft of 13 meters. Some of the major commodities handled are coal, cement and steel. Over the years several private parties such as Maersk Shipping, port of Singapore Authority, PSA Corporation, the IDBI and UTI acquired stake in GPPL. Today, Seaking Infrastructure has a 26 percent stake while Maersk has a 14 percent stake. Maersk has plans of increasing its stake. Maersk is developing a container terminal at the port with an annual capacity of 1.3 million TEUs. The development of the terminal is to be carried out in two phases. Phase one includes the deployment of three quay cranes, 394 meters of quay length, a draft of 13.5 meters and container yards in excess of 170,000 square metres. Phase two includes increasing the draft to 15.5 metres, development of a 350 metres container yard by another 100,000 square metres. Work on the first phase is likely to be completed by the end of 2005 and of the second phase by 2007. Another milestone for the port was the commissioning of the 269 Km Pipavav Broad Gauge Rail link Project in 2003, connecting Pipavav with Surendranagar. The cargo traffic handled by the port in 2003-04 was 1.89 million tonnes. GPPL's long-term plans include adding to direct berthing facilities, development of facilities for shipbuilding and high quality support services.

Mundra Port was developed by Gujarat Adani Port Limited a joint venture between the State Government and Adani group. The port started operations in January 2002, it is an all-weather port that can receive dry cargo, liquid cargo and container ships up to 150,000 dwt. Mundra port is well connected to the north-western hinterland through a national highway and a 57 Km broad gauge rail line was built at a cost of Rs 1.6 billion. This is the longest rail line in India that has been privately developed. Two multipurpose Jetties are currently in operation at the port, handling liquid and solid cargo. The jetties have four berths of 15 metres draught each. Major commodities handled by the port include coal, minerals bauxite, fertilizers steel plates

¹⁵ Ramakrishanan, R.; op.cit, 46.

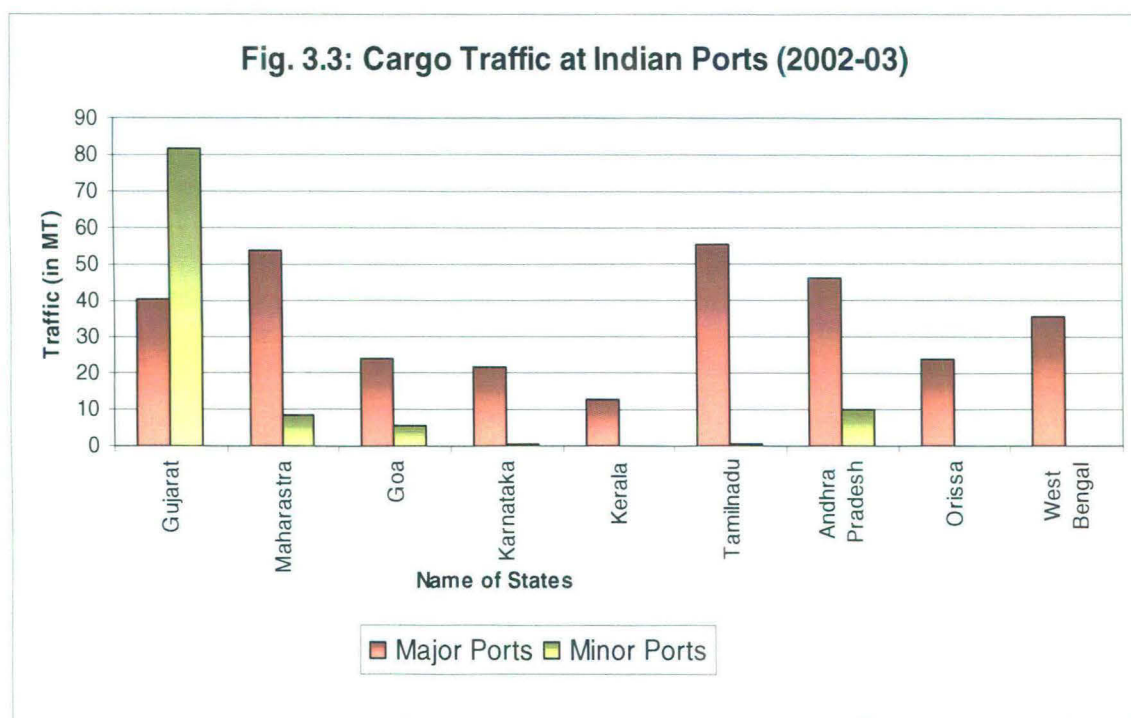
and crude palm oil. Port has also emerged a very strong player in the handling of agricultural exports, especially wheat and rice. An 1100 metres container terminal with a natural draft of 18.5 metres is being developed by global container terminal operator P&O Ports Private Limited. Phase one of the terminals, with a length of about 632 metres, has been completed. It is capable of handling 1.5 million TEUs. The port has earmarked a total investment of Rs 10 billion by 2010. The cargo traffic handled by the port in 2003-04 was 4.52 million tonnes.

The Port of Dahej was conceived of and built by Gujarat Chemical Port Terminal Company Limited- a joint venture company promoted by several public sector organizations including Indian Petrochemicals Corporation Limited, Gujarat Maritime Board and the Gujarat Industrial Development Corporation. The port became operational in January 2001. The facilities include a commercial port, a storage terminal. The storage terminal has a capacity of 300,000 cubic metres. Currently, the port has a single jetty handling 6000-60000 dwt. The 5 mmipa LNG terminals developed by Petronet LNG Limited is the first LNG terminal in India. Some of the major commodities handled by the port are fertilizers, coal, copper, fuel oil and phosphoric acid. It is the only Indian port to handle large volumes of chemical products such as propane, Naphtha, acetic acid, superior kerosene oil and high speed diesel. A joint venture has been established between the Adani Group and Petronet Limited for the development of a multipurpose commercial berth, with an investment of Rs 3 billion. The Government of Gujarat has recently granted approval for the development of the Gujarat Maritime Board's Dahej Jetty, which has been lying unused, to Welspun-Gujarat Stahl Rohren limited. Once completed, the jetty would handle both commercial and captive cargo. To improve connectivity between the port and the hinterland, a four-lane highway connecting Dahej with Bharuch is under construction. The port handled cargo traffic of 3.84 million tonnes in 2003-04.

Table. 3.3: Cargo Traffic at Indian Ports (State-Wise): 2002-03

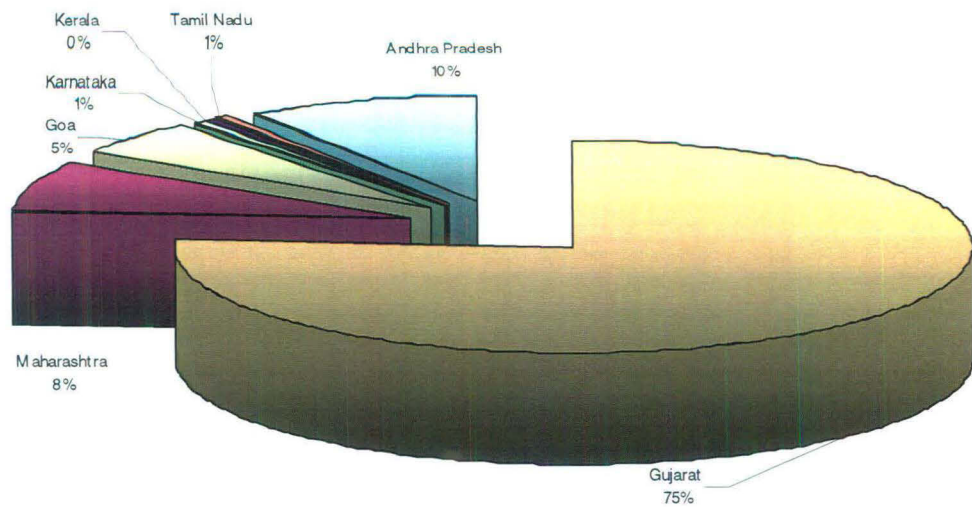
Name of the State	Major Ports	Minor Ports	Total	% share of Minor Ports
Gujarat	40.63	81.56	122.19	75.48
Maharashtra	53.64	8.31	61.95	7.69
Goa	23.65	5.57	29.22	5.15
Karnataka	21.43	0.67	22.10	0.62
Kerala	13.02	0.09	13.11	0.08
Tamil Nadu	55.47	0.60	56.07	0.56
Andhra Pradesh	46.01	10.24	56.25	9.48
Orissa	23.90	-	23.90	-
West Bengal	35.80	-	35.80	-
Others	-	1.02	1.02	0.94
Total	313.55	108.06	421.61	100.00

Source: Basic Port Statistics (1991-2003), MOST, GOI.



Statewise cargo traffic at Indian ports (Table 3.3) shows that maximum cargo handled by state of Gujarat followed by Maharashtra and Tamilnadu respectively in 2002-03.

Fig. 3.4: Statewise Share of Traffic by Minor Ports (2002-03)



Cargo handled by minor ports is highest by state of Gujarat followed by Andhra Pradesh. While maximum number of minor ports is in the state of Maharashtra, which clearly indicates the role of corporatisation and privatisation. Among the states, Gujarat has the largest coastline (29%) with the largest share of Traffic handling about 75 percent of the total cargo of all minor ports of India. Gujarat is the first maritime state in the country to have constituted a Gujarat Maritime Board (GMB) to administer, control, manage and develop minor ports of the state. It is also having the maximum number of privatized ports.

3.7. Proposed Models for Privatisation

- Built Operate and Transfer Model of Central Government
- Built Operate Own and Transfer Model Of Govt. of Gujarat, Maharashtra and Tamilnadu
- Joint Venture Model

3.7.1. BOT Model of Central Government¹⁶

Central government has laid down clear and transparent and policy guidelines for private sector participation in the following areas in major ports-

The areas identified for private sector are:

- a. Leasing out of the existing assets of the ports.
- b. Construction and operation of storage facilities such as break-bulk, bulk, multipurpose container and other specialised terminals.
- c. Construction and operation of storage facilities such as ware houses, open stockyards, tank farms and container freight stations.
- d. Cranage and handle equipments.
- e. Setting up of captive power plants.
- f. Dry docking and ship repair facilities.
- g. Taking on lease equipments and port crafts.
- h. Pilotage
- i. Captive facilities of port industries.

Guidelines indicate that leasing out of existing assets of a port would be considered only if proposal leads to an augmentation of facilities or equipment or investments and if it would thereby result in higher productivity.

The salient features of these guidelines are:-

Ports will continue to discharge their regulatory role under Major Port Trust Act 1963. Ports will also take steps to frame regulations consistent with the guidelines in order to enable private participation¹⁷.

- Fixation and revision of port tariffs would be by an independent Tariff Authority that has already been established.

¹⁶ Perspective Plan for Indian Port Sector, Vision 2020, Volume II, Apr. 2001, Rites Ltd, New Delhi, pp.11-42.

¹⁷ "Private Participation in Ports: Picking up at Last", *Indian Infrastructure*, July 2001, pp.24.

3.7.2. BOOT Model of State Government (States of Gujarat, Maharashtra and Tamilnadu)

Majority of State (minor) ports has nearly Greenfield locations and therefore State Government has mostly offered development of complete ports. Gujarat and Maharashtra have come out with their own models. There are several similar features in these models, which are given here under:-

- a. Governments perform only a limited regulatory role essentially in respect of safety, security, environment etc.
- b. The arrangements of privatisation are BOOT/BOOST/BOST (B-Build, O-Own/ Operate, S-Share of gross revenue and T-Transfer). The land and water frontage are always owned by the governments. The ownership rights are essentially for facilitating financing of the project. At the end of the license/ concession period generally all assets are transferred to the Government. In all the arrangement as above a payment called either royalty or port dues or share is made by the developer to Government out of its annual revenues. Thus the basic arrangement is same but the basis and quantum of payment to Government by developer varies in each model. Compensation for transfer of assets on completion of awards period also varies in each model.
- c. The Governments do not give any guarantee with regard to financial returns and traffic volumes.
- d. Complete freedom is given to developer for fixation and collection of port tariff. However, in Gujarat model there is provision of independent Regulatory Authority to act as a forum where representations with regard to unfair/monopolistic behaviour relating to tariff can be made by various parties.
- e. Developer has complete freedom of formulating its own man power policies within the labour laws of the country.
- f. Developer is given full freedom to plan the port development, market its services and operate its facilities.
- g. Developer is permitted to raise the capital on the basis of License/Concession Agreement between him and Government. Transfer of

Agreement with prior approval of Government is permitted. Also, sub-contracting and sub-leasing of port facilities/services with the prior approval of Government is also permitted.

- h. The developers provide all port services including pilotage.
- i. The developer is responsible for obtaining all relevant clearances from concerned Central Government and State Governments agencies.
- j. Governments generally follow a transparent competitive bidding procedure for selection of developers for ports offered.

3.7.3. Joint Sector Model

Joint Sector Company is intended to be a form of partnership between private sector and Government. According to guidelines laid down, in a joint sector company (without foreign participation) the share holding of the Government, private partner and public should be 26 percent, 25 percent, and 49 percent respectively. Government has option to disinvest 15 percent of its share of 26 percent in future. In this type of organization, generally, day to day management rest with the private partner and overall control and supervision is exercised by Board of Directors in which Governments is adequately represented. This model has been used in the past for setting up of industries by Governments¹⁸.

For port development this model has been used for the first time in the country for Pipavav Port by the Government of Gujarat. Initially Gujarat Maritime Board (GMB) developed Pipavav Port. However, in 1992 it was decided to under take development and operation of this port through a Joint Sector Company. Accordingly Joint Sector Company 'Gujarat Pipavav Port Ltd (GPPL)' was formed. The important features of this company according to shareholders agreement are as under:

- a. Prior written approval of other party is required for transfer, selling or encumber etc. of its share holding.

¹⁸ "Guidelines for Private Sector Participation in Ports Through Joint Ventures and Foreign Collaboration Issued by the Central Government", *Indian Ports*, Vol. XXX, No. 1, July 1998, pp.15-18.

- b. Both Government of Gujarat (represented by GMB) and private partner will have 4 directors each. Chairman will be from Government and Managing Director from Private partners' side.
- c. Certain decisions are required to be taken at Board's meeting only. These decisions relate to tariff, appointment of agents, purchase policy, contracts beyond specific limits, personnel policy, expansion and diversification, budget, dividends, borrowings, foreign collaborators and capital goods, public issues, appointment of auditors etc.
- d. GMB is entitled to carry out annual inspections.
- e. Consent of GMB is required for expansion and diversification.
- f. Employment to one person in a family from whom land is acquired for company's project.
- g. Joint sector guidelines as issued by Government of Gujarat will be compiled.
- h. A separate agreement will be entered into between company and GMB for matters related to conservancy and safety of port, land lease, port tariff, ferry service and port facility at Pipavav by other party. Such an agreement will be subject to approval by Government of Gujarat.

Table 3.4: Capacity Augmentation Schemes in Tenth Five-Year Plan

Schemes	Capacity (MT)
Joint Venture Basis	
Construction of berth at Vasco Bay of Mormugao Port	2.0
Container off shore berths at Mumbai	4.0
Private Sector	-
Berth for clean cargo at Paradip	0.6
Vallarpadam Container terminal of Cochin	5.0
LNG/LPG facilities at Cochin	2.5
Container Terminal for transshipment at New Mangalore	5.0
Captive coal jetty for NPCL at New Mangalore	3.0
Modification to bulk berth at JNPT	9.0
Two coal berth at Ennore	8.0
Two chemical and LNG berths at Ennore	5.0

Source: 10th Five-Year plan document, Planning Commission, GOI

GPPL has completed phase one development of the port and it has commenced cargo operation. Government of Gujarat is in the process of developing few more ports on this model. GMB have also awarded the part at Mundra in the Gulf of Kutch to Gujarat Adani Port Ltd. On similar terms, very recently, a project for development of a Special Economic Zone was awarded to Sea King Infrastructure Ltd to which the development of the port at Positra is attached. The Joint Sector Partners in all these cases were not selected through an open invitation.

3.8. Privatisation Options

In India as per guidelines issued by central government, privatisation can be done by following modes:-

3.8.1. Gradual Privatisation

Ports like Chennai and Visakhapatnam can adopt this model since most of the possible developments have already taken place¹⁹.

The ports which are not likely to be commercially viable even on privatisation/corporatisation should continue as major ports under the Major Port Trust Act 1963 till their closure becomes possible.

3.8.2. Via- Corporatisation Route

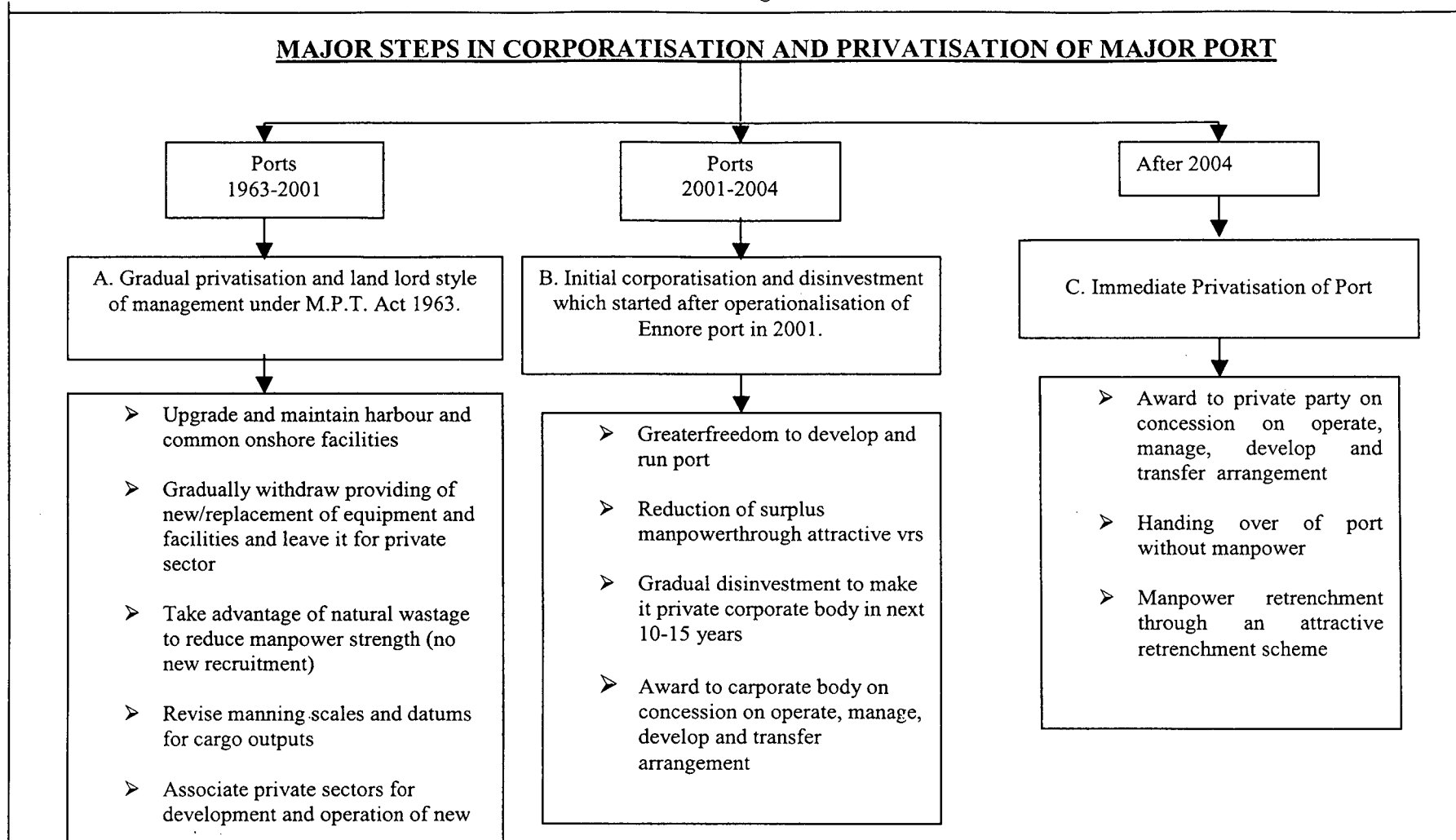
The major ports which have good financial strength in terms of reserves and revenue surplus should be corporatised. The structure of proposed model for privatisation of major ports through corporatisation is given in Figure. The Government has already corporatised Ennore Port and have programme to soon corporatise Haldia and JNPT.

3.8.3. Immediate Privatisation

The Ennore Port on completion of its present development has a good potential to come under this category due to the following reasons:

¹⁹ Perspective Plan for Indian Port Sector, Vision 2020, Volume II, Apr. 2001, Rites Ltd, New Delhi, pp.42.

Fig. 3.5



Source: Prepared on the Basis of Perspective Plan for Indian Port Sector Vision 2020, Vol.II, Apr.2001, Rites Ltd.

- It has good market potential that can be fully exploited.
- As it is a new port, it does not have labour problem and legacy of the Trust System.
- Further expansion of port will be faster under privatized arrangement, which would enable fulfilling fast the growing traffic needs.
- It would set an example that may motivate private sector for developing deepwater multi-user ports at green field locations.

However, the Government has chosen to adopt Corporatisation Route for this port and has already corporatised it. As such no other port qualifies to come under this mode. The main purpose behind corporatisation of ports is to secure autonomy for ports and their total privatisation over a period of time. For each port a new company should be established by an administrative decision of the Government under Indian Company Act 1956. Initially, it would be wholly owned Government of India Company. All the assets (land excluded) and liability is of a port trust shall get transferred to this new company.

Table 3.5: Containerisation at Indian Ports by Indian Partner and Global Player

Name of the Port	Indian Partner	Global Player
Kandla	AGB Industries	Voltri Terminals (PSA)
Mundra	-	MICT (P&O Ports)
Pipavav	(Foreign Institutional Investor)	APM Terminals
JNP		
-JNPCT	100% government owned	-
-NSICT	-	P&O Ports
-Gateway Terminals India	CONCOR	APM Terminals
Cochin	-Transworld Group -Chakiat Agencies Pvt. Ltd.	Dubai Ports International
Tuticorin	SICAL	PSA
Chennai	-Chettinad Logistic -Eduljee Cassinath Pvt. Ltd.	CCT (P&O Ports)
Visakhapatnam	United Linear Agency	Dubai Ports International

Source: Compiled from Lok Sabha Starred Question No. 311, dated 11.12.2002 and IPA Report.

3.9. Performance of Private Port

Comparison between JNPCT and NSICT for 2002-03 reveals that the private port has performed much better than the public port on a number of parameters. The total traffic handled by NSICT in 2002-03 stood at around 120,111,2 TEUs while JNPCT reported traffic of only 728,412 TEUs in the same period. The average turnaround time at JNPCT was 1.19 days while it was only 0.69 days at NSICT.

3.10. Expected benefits of Corporatisation

1. Functional Autonomy.
2. Increased productivity and efficiency.
3. Quicker and timely decision making.
4. Accountability and management.

3.11. Impact of Port Privatisation

1. Attracts new technology.
2. Introduce better managerial practices.
3. Expedite implementation of schemes.
4. Faster strategic alliance with major as well as minor ports for creation of optimal ports infrastructure.
5. Enhance confidence of private investors in funding of ports.
6. Construction of new port facilities within the existing port.
7. Improving productivity of an existing port facility by upgrading or improving managerial practices.
8. Development of new ports.
9. A joint venture company may be incorporated under the Indian Company Act with Equity participation from major port trust. The major port trust will, at all time, maintain a controlling stake in the JVC necessary for blocking a special resolution.

3.12. Issues Concerning Port Privatisation

The response for terminals and services through privatisation is reasonably good as compared to total port development at green field location due to:

- Lesser traffic risk. Users are surer about coming up of facilities due to short gestation period and acceptability of tariff as facility is being developed in the existing port that is already providing services to other users.
- Rail/road linkages already exist and it can be further upgraded with small investments.
- The investment needed is not large.
- Risk to profitability is reasonable.

3.13. Limitations of Private Sector Participation

Despite liberalized rules for private participation and several incentives offered by the government, financing port projects remains a grey area. Uncertainties cloud such crucial issues as the rate of return and the level of comfort available to banks and financial institutions supporting private port projects. As tariff levels are already on the higher side, there is not much hope of increased earning on this score.

CHAPTER IV

MEASURES AND INDICATORS OF PORT PERFORMANCE

“Performance of a port depends on many factors which may be broadly divided into internal and external factors. External factors may be composed of trade orientation of the region in which the port is located, objectives of the local as well as central governments, and the geographical importance of the concerned location on the global map”¹.

4.1. Introduction

The last five decades have experienced rapid changes in ocean transportation. Shipping has moved towards specialised vessels of larger size and higher speed². These modern vessels are of high cost and therefore in order to increase vessel utilization³ for journey, there has been increasing pressure to reduce loading and unloading times at sea ports. Methods of cargo handling have therefore been modified from manual to automatic. In order to facilitate automatic handling utilised packaging or containerization has been gaining popularity. About 60 percent of the bulk cargo movement is in containerized form today. Large container vessel capacity is around 10,000 twenty Equivalent Units (TEUs) today, in place of less than 1000 TEUs in 1970s.

As the shipping demand increased, demand for servicing them at ports also increased, which has resulted in the development of a large number of new ports and upgradation of existing ports⁴. Ports function as an interface between the land and the sea, providing facilities to handle the cargo to and from ships. Ships typically spend around 20 percent of their time in ports. Any reduction in this time releases more time

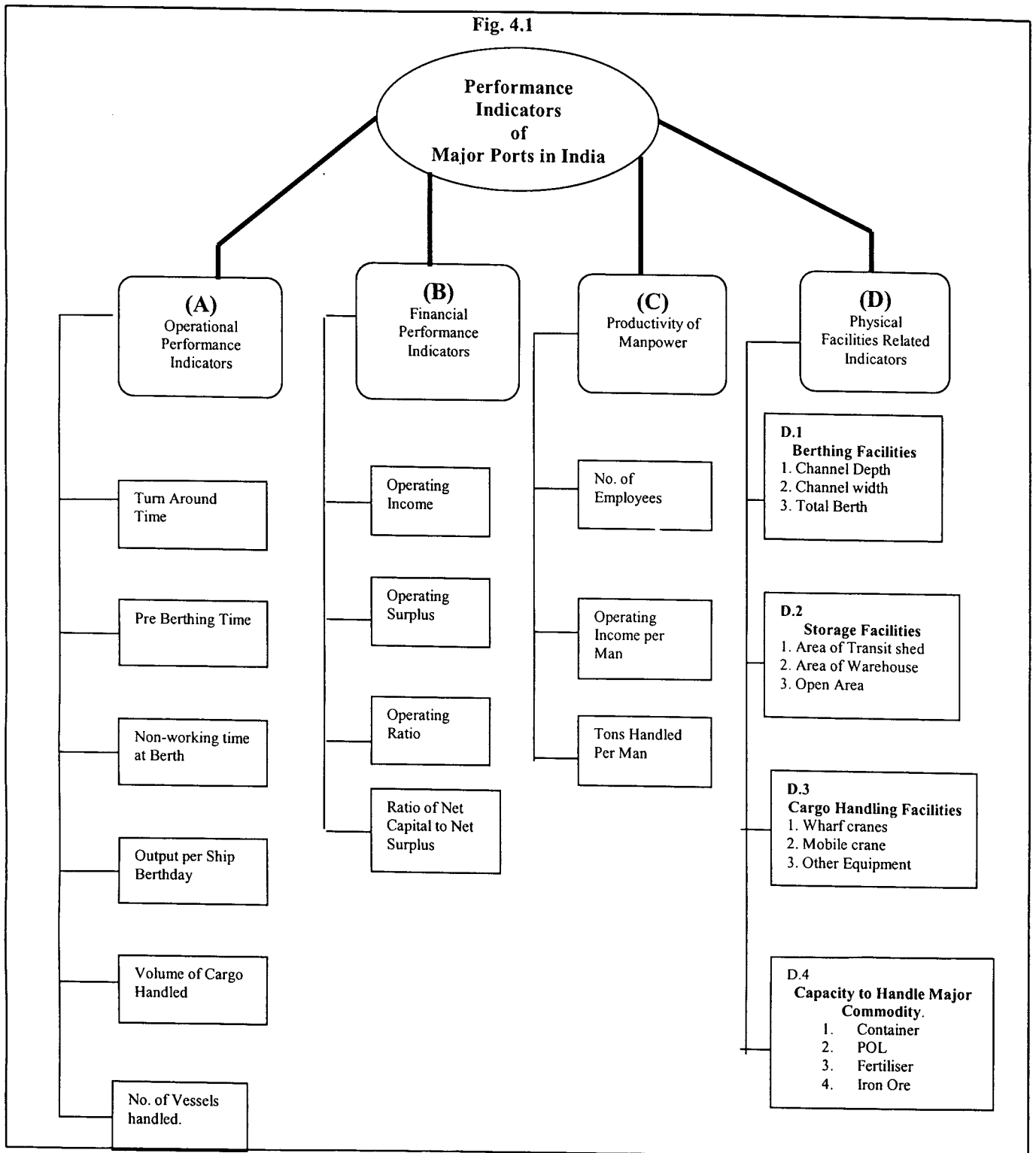
¹ Ghosh, Buddhadeb and De, Prabir, “Indian Ports and Globalisation Grounding Economics in Geography”, *Economic and Political Weekly*, August 25, 2001, pp.3271-3283.

² Interim Report of Major Ports Reforms Committee, Ministry of surface transport, Department of Surface Transport, New Delhi, GOI, 1985.

³ Kumar, Sasi and Bhasi, M. “A Comparative Study of Performance of India Major Sea Ports”, *Indian Ports*, Vol 36(2), Oct., 2004, pp.9-18.

⁴ Dasgupta, M.K. and Mukhopadhyay, P.S., “Minor Ports of India a Profile”, *Indian Institute of Port Management*, Kolkata, 1996.

Fig. 4.1



Source: Prepared on the basis of R. Sasi kumar and Dr.M Bhasi, "A Comparative Study of Performance of India Major Sea Ports", Indian Ports, Vol 36 (2), Oct. 2004, p 11.

for journey, which is revenue generating. Hence the speed of service of ships at ports is very important.

The scenario has changed in India after 1991, the chain reactions of growth in world trade, consequent to growth in sea borne trade, increase in shipping demand, and need for development of ports was noticed in India also⁵. This demand for port development has further intensified after 1991 due to the new economic policy of globalization implemented by India⁶. The volume of traffic through Indian ports has increased from 23.11 MT in 1955 to 152.67 MT in 1990 and to 383.765 MT 2004-05. The number of major ports increased from five at the time of independence to twelve in 2004. The performance of Indian ports is still poor when compared with other ports in the same region, such as ports of Colombo and ports of Singapore⁷. Indian ports are facing problems related to facility upgradation, high manning scales, planning and operations etc.

4.2. Model for Ranking of Major Ports

A model for ranking of all Major ports has been developed for comparing, computing and understanding the changing position of ports after post reform era, on the basis of operational performance indicators. Except operational performance indicator other indicators are also identified and classified into separate categories for example financial performance indicators, productivity of manpower and physical facilities related indicators. Proposed model is shown by Figure 4.1.

By using operational performance indicators, I have found out overall performance for each port at three point of time 1991-92, 1996-97 and 2003-04. Composite index is used to determine the performance of each port. This is done for all six operational performance indicators.

For obtaining performance of major ports, I have used six important operational performance indicators. These indicators are Turn Around Time (in days), Pre-Berthing Detention Time (in days), Non-Working Time at Berth (in days). All

⁵ Ghosh, Buddhadeb and De, Prabir; op. cit, 70.

⁶ Cornell group, INC, "Draft Final Report-Enhanced India Port Policy Implementation", New Delhi, 1998.

⁷ Interim Report of Major Ports; op. cit, 70.

these three are negative indicators of port performance on one side while on other side positive indicators are Output per Ship Berthday (in tonnes), Cargo (in MT) by the port in a year and Number of Vessels Sailed by ports in a year.

To make all the indicators unidirectional negative indicators are converted into positive indicators. By negative indicator means a lower value represents a higher performance viz. Turn around Time, Average Pre Berthing Detention and Non Working Time at Berth. While positive indicators imply that higher value represent higher efficiency or performance viz. Cargo Throughput, Output per Ship Berthday and Number of Vessels Handled in year by the port.

Table 4.1: Operational Performance Indicators of Major Ports (2003-04)

Ports	TRT (Days)	PBWT (Days)	NWTB (Days)	OSBD (Tonnes)	Cargo (MT)	No. of Vessels Sailed
Kolkata	4.29	0.51	1.14	3384	8.69	765
Haldia	2.84	0.97	0.73	8280	32.57	1889
Visakhapatnam	3.33	0.76	0.59	11712	47.74	1704
Chennai	4.85	2.28	1.03	9517	36.71	1656
Tuticorin	2.52	0.70	0.76	5084	13.68	1517
Cochin	2.22	0.43	0.59	7799	13.57	1133
New Mangalore	2.35	0.55	0.53	17955	26.67	879
Mumbai	4.07	0.87	0.47	5911	29.92	1800
JNPT	1.85	0.76	1.23	9845	31.27	3681
Kandla	5.06	2.03	0.45	8659	41.52	1823
Paradip	3.43	0.53	0.99	10257	25.31	1041
Mormugao	4.47	2.60	0.50	16746	27.87	677
Ennore	2.11	0.07	0.49	32777	9.28	166
All Ports	3.45	1.10	0.73	9079	344.80	18731

Source: Compiled from Basic Port Statistics of India, MOST, GOI. and Indian Infrastructure, March 2005.

Sarkar⁸ in her thesis, she had selected indicators like, operating surplus per tonne of cargo, Net surplus per tonnes of cargo, capital intensity, labour productivity, capital productivity, container traffic to total traffic etc. Her analysis is for period upto

⁸ . Sarkar, Kakali. (2000), "The Port System in India; An analysis of the hierarchical changes and port performance (1950- 1995)", Unpublished, Ph.D Thesis, CSRD, SSS, JNU, New Delhi.

the 1995, till when the impact of corporatisation and privatisation was not visible. So there is an urgent need arises to know the significant changes during 14 years of reform. This study is an effort in this direction.

Table 4.2: Composite Indices of Major Ports (2003-04)

Ports	C.I 1	C.I 2	C.I 3	C.I 4	C.I 5	C.I 6	Composite Index
	TRT (Days)	PBWT (Days)	NWTB (Days)	OSBD (Tonnes)	Cargo in MT	No. of Vessels Sailed	
Kolkata	-0.88	-0.09	-1.30	-1.05	-1.46	-0.79	-5.56
Haldia	0.20	-0.35	-0.33	-0.41	0.49	0.52	0.13
Visakhapatnam	-0.27	-0.27	0.30	0.04	1.73	0.31	1.85
Chennai	-1.13	-0.51	-1.12	-0.24	0.83	0.25	-1.91
Tuticorin	0.61	-0.24	-0.44	-0.82	-1.05	0.09	-1.86
Cochin	1.10	0.00	0.30	-0.47	-1.06	-0.36	-0.49
New Mangalore	0.87	-0.13	0.68	0.86	0.01	-0.65	1.64
Mumbai	-0.77	-0.32	1.15	-0.72	0.28	0.42	0.05
JNPT	1.91	-0.27	-1.43	-0.20	0.39	2.61	3.02
Kandla	-1.20	-0.50	1.34	-0.36	1.22	0.44	0.95
Paradip	-0.35	-0.11	-1.04	-0.15	-0.10	-0.47	-2.21
Mormugao	-0.97	-0.52	0.90	0.70	0.11	-0.89	-0.67
Ennore	1.31	3.28	0.98	2.80	-1.41	-1.48	5.48

Source: Compiled from Basic Port Statistics of India, MOST, GOI. and Indian Infrastructure, March 2005.

4.3. An Analysis of Port Performance at Major Ports (1991-2004)

The weighted score of each operational performance indicator is calculated separately to find out composite index, is shown in Table 4.2. From the table it is very clear that the port of Ennore is operating with maximum operational performance followed by Jawaharlal Nehru Port. The most striking fact here is that both ports are very recent in their origin as well as Ennore is the only corporatised port of India while JNPT is in the process of corporatisation and it is expected that in the next few years it will be corporatised. So my basic assumption that Corporatisation and privatisation enhances port performance is true and also it is the need of today's globalised era. Visakhapatnam and New Mangalore come in the third and fourth

position respectively. Here it is worthwhile to mention that though the cargo handling capacity of Visakhapatnam is maximum it is the one and only port of India which crossed the mark of 50 Million Tonnes in 2004-05, it does not perform well because other parameters of port performance viz. TRT, PBWT, NWTB, OSBD have not performed up to desired mark.

Table 4.3: Performance of Major Ports in India (1991-2004)

Ports	2003-04		1996-97		1991-92	
	Value of C.I	Ranking	Value of C.I	Ranking	Value of C.I	Ranking
Ennore	5.48	1				
JNPT	3.02	2	-0.37	6		
Visakhapatnam	1.85	3	3.64	1	4.32	1
New Mangalore	1.64	4	0.18	4	-1.41	10
Kandla	0.95	5	-0.70	9	-0.64	8
Haldia	0.13	6	-1.13	10	0.27	7
Mumbai	0.05	7	0.16	5	1.21	5
Cochin	-0.49	8	1.96	2	3.30	2
Mormugao	-0.67	9	-2.89	12	2.70	3
Tuticorin	-1.86	10	-0.60	8	-0.91	9
Chennai	-1.91	11	-0.45	7	1.86	4
Paradip	-2.21	12	0.83	3	0.46	6
Kolkata	-5.56	13	-1.54	11	-4.20	11

Source: Compiled from Basic Port Statistics of India, MOST, GOI. and Indian Infrastructure, March 2005.

The performance of Kolkata port as usual is poorest when compared with other ports in India, followed by Paradip and Chennai from below. The maximum improved performance is noticed by JNPT in the last ten years, the reason being that JNPT is the only port of India which comprises above 50 percent mark of Containerisation which decreased Turn Aroud Time of ship significantly and also to Pre-Berthing Waiting Time for ships. The maximum down fall in performance is noticed by the port of Cochin during 1991-2004. Chennai port has also noticed a remarkable slide because Ennore port started operation since 2001, which is just 24 Km north of Chennai port. Ennore has overtaken the role of Chennai port within a period of four years only. In the same sequence second most acute slide was experienced by Port of Paradip, here Visakhapatnam has marginalised the importance

because of containerisation and upgraded infrastructure. Ports like Tuticorin and Haldia have not recorded any significant changes in their position.

Table 4.4: Comparative Performance of Major Ports in the Post Reform Era

Improved	Static	Declined
Ennore	Haldia	Kolkata
JNPT	Tuticorin	Cochin
New Mangalore		Chennai
Kandla		Paradip
		Mormugao
		Mumbai
		Visakhapatnam

Source: Compiled on the basis of Table 4.3.

Satellite ports like Haldia, JNPT and Ennore have posed major challenges to the master ports of Kolkata, Mumbai and Chennai respectively. The Overall performance of Mumbai port is very poor due to the emergence of JNPT which is near to Mumbai Port with all modern technological facilities. Port of Kolkata could survive because of the timely decision of development of a new port, Haldia which is more convenient to the customers. It is seen that slowly the activities of Kolkata port came down and Port of Haldia went up. Kolkata, Haldia and Kandla have the advantages of large port hinterlands where most of the industries are developed and where a good part of agricultural products are produced.

One very interesting phenomena in history of port performance is that modern ports have always performed well in the initial years of their setup, like port of Cochin performed very well after its inception and at a time (in 1991-92) it ranked second, JNPT which minimizes the load of Mumbai port and worked as a responsible port from the date of operation. Same way Ennore port has performed over years and today it is the premier port by in operational performance and efficiency. Changes in the performance recorded by other ports are summarized in Table 4.5.

Table 4.5: Summary of Major Port Performance

Ports	Year	Better Performing Years
KOLKATA	1870	Initially conceived to promote and protect the British colonial interest. But with the advent of freedom in 1947, the port was called upon to play the opposite to champion the national cause and rightly called “gateway to Eastern India”. Its performing efficiency has reduced because of old infrastructure, low manpower productivity and high cost of cargo handling.
MUMBAI	1873	It is known as the “Gateway of Modern India” or “the Nations Window to the outside World” solely because of its performance for several decades, but its role has taken by JNPT.
CHENNAI	1881	Performed well in 1991-92 with ranked four after Visakhapatnam, Cochin and Mormugao.
COCHIN	1930	Performed exceptionally well in 1990’s, having with second position since 1991-92 to 1996-97.
VISAKHAPATNAM	1933	Constantly best performed in year 1991-92 to 1996-97, with rank first.
KANDLA	1955	Best performance was in 1985-86, rank first and also better performed in 2003-04.
MORMUGAO	1963	Performed very well in 1991-92 and reached to the third position. The port today accounts for about 50 percent of India’s iron ore export and ranks within the first ten leading iron ore exporting ports of the world.
PARADIP	1965	Better performing years for the port was 1991-92 to 1996-97.
NEW MANGALORE	1975	Improving its position since inception and in 2003-04, rank fourth.
HALDIA	1977	Performed well in 1980’s and rank third in 1985-86.
TUTICORIN	1979	Never achieved any significant position, only in initial years performed better.
JNPT	1989	Better years or performance after 1996-97, when containerisation rapidly taken place and also was best performed in sometime 2000 to 2002. ⁹
ENNORE	2001	Best performance in year 2003-04.

Source: Based on Ghosh, Buddhadeb and De, Prabir¹⁰ and the data used for this study.

⁹ . Ghosh, Buddhadeb and De, Prabir; op. cit, 70.

¹⁰ . Ibid.

Table 4.6: Operational Performance Indicators of Major Ports (1996-97)

Ports	TRT (Days)	PBWT (Days)	NWTB (Days)	OSBD (Tonnes)	Cargo (in MT)	No. of Vessels Sailed
Kolkata	7.7	0.95	2.66	1188	6.02	874
Haldia	6	2.19	1.55	5855	17.1	947
Visakhapatnam	5.66	1.6	0.83	6696	34.5	1437
Chennai	7.8	4.07	1.82	5131	31.85	1681
Tuticorin	5.16	1.56	1.48	3026	9.18	905
Cochin	3.9	1.12	1.26	5438	11.74	784
New Mangalore	4.43	1.51	1.35	7172	12.45	644
Mumbai	10.67	4.57	2.21	2605	33.73	2616
JNPT	6.3	2.14	0.71	2987	8.07	640
Kandla	10.56	6.61	1.18	7066	33.73	1527
Paradip	4.9	1.61	0.8	6406	11.58	557
Mormugao	6.3	2.2	3.03	8540	17.31	507
All Ports	7.5	3.1	1.45	4497	227.26	13119

Source: Compiled from Basic Port Statistics of India (1996 and 1997), MOST, GOI.

In 1996-97 best performed by port of Visakhapatnam, followed by port of Cochin and Paradip. While the poorest performance is noticed by port of Mormugao, Kolkata and Haldia from below respectively. JNPT has improved its position by building its infrastructure to international standards with a high level of automation and computerized functioning while no improvement is recorded by Kolkata port because of very old infrastructure which is also deteriorating day by day. One major change which comes out of calculation that JNPT has improved its efficiency through Privatisation, Corporatisation and Containerisation but the importance of Mumbai port has fallen down. One very important factor for low performance of Indian ports is that the financial position is not good for future growth and development, except for ports of JNPT, Ennore and Chennai. This is mainly due to the high expenditure incurred by the ports. Besides these the real culprit is the non-productive expenditure, which has to be contained in the case of Cochin and Mumbai.

Other reason for low performance of Indian ports is that all old ports have higher staff strength because, port sector was considered as an important employment sector after independence. Now the situation has totally changed and a port like JNPT has least manpower followed by New Mangalore and Tuticorin. So the latest

developed ports have less staff strength due to change in technology of material handling system. Old ports are now changing the technology towards automation. So it is very difficult to reduce their staff strength all of a sudden due to the resistance from all corners.

Table 4.7: Composite Indices of Major Ports (1996-97)

Ports	C.I 1	C.I 2	C.I 3	C.I 4	C.I 5	C.I 6	Composite Index
	TRT (Days)	PBWT (Days)	NWTB (Days)	OSBD (Tonnes)	Cargo in MT	No. of Vessels Sailed	
Kolkata	-0.80	1.90	-1.13	-1.78	-1.15	-0.35	-1.54
Haldia	-0.07	-0.31	-0.36	0.30	-0.16	-0.24	-1.13
Visakhapatnam	0.13	0.31	1.24	0.68	1.39	0.56	3.64
Chennai	-0.84	-1.09	-0.63	-0.02	1.15	0.95	-0.45
Tuticorin	0.48	0.37	-0.27	-0.96	-0.87	-0.30	-0.60
Cochin	1.73	1.31	0.07	0.12	-0.64	-0.50	1.96
New Mangalore	1.11	0.45	-0.08	0.89	-0.58	-0.73	0.18
Mumbai	-1.53	-1.19	-0.91	-1.15	1.32	2.46	0.16
JNPT	-0.23	-0.27	1.82	-0.98	-0.97	-0.73	-0.37
Kandla	-1.51	-1.44	0.22	0.84	1.32	0.70	-0.70
Paradip	0.68	0.30	1.37	0.55	-0.66	-0.87	0.83
Mormugao	-0.23	-0.32	-1.26	1.50	-0.15	-0.95	-2.89

Source: Compiled from Basic Port Statistics of India (1996 and 1997), MOST, GOI.

JNPT has the best operating ratio and best ratio of net capital employed to the net surplus. Hence, it can be said that the total expenditure (both operating and Non-operating) of JNPT is under control. Chennai came in the third position as far as the financial performance indicators are concerned. The financial performance indicator of Cochin and Mumbai ports are in the last two positions (tenth and eleventh) respectively¹¹.

To overcome the above problems proper planning and development scheme must be evolved for success of the Major Ports in India. At the same time old ports have to re-structure their infrastructure facilities as well as new technological input have to be added.

¹¹ . Basic Ports Statistics of India, 2002-03, MOST, GOI. P.249.

Table 4.8 Operational Performance Indicators of Major Ports (1991-92)

Ports	TRT (Days)	PBWT (Days)	NWTB (Days)	OSBD (Tonnes)	Cargo in MT	No. of Vessel Sailed
Kolkata	10.52	0.75	3.44	612	4	717
Haldia	5.96	1.52	1.62	5861	12	703
Visakhapatnam	5.58	1.02	1.23	6120	21.52	928
Chennai	5.98	1.56	2.14	4579	25.05	1381
Tuticorin	5.19	1.26	1.63	2196	5.87	724
Cochin	3.95	0.79	1.44	4124	7.48	621
New Mangalore	5.5	1.67	1.83	4564	8.27	452
Mumbai	7.48	1.55	3.05	2825	26.26	2106
Kandla	8.59	3.56	1.61	5322	21	1022
Paradip	6.08	1.17	1.15	4919	7.3	347
Mormugao	5.96	0.87	2.42	10343	15.1	601
All Ports	6.65	1.54	2.13	20584	153.85	1970

Source: Compiled from Basic Port Statistics of India (1991 and 1992), MOST, GOI.

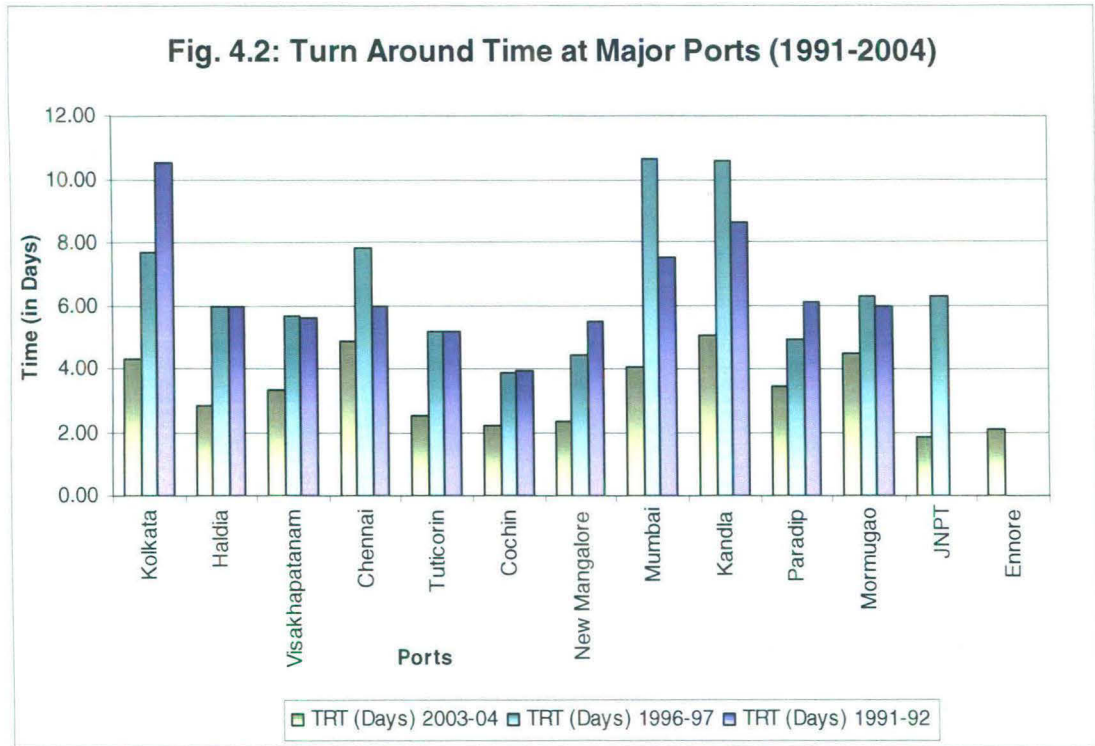
Table 4.9: Composite Indices of Major Ports (1991-92)

Ports	C1	C2	C3	C4	C5	C6	Composite Index
	TRT (Days)	PBWT (Days)	NWTB (Days)	OSBD (Tonnes)	Cargo in MT	No. of Vessels Sailed	
Kolkata	-1.62	1.70	-1.31	-1.55	-1.16	-0.25	-4.20
Haldia	0.19	-0.41	0.41	0.55	-0.18	-0.28	0.27
Visakhapatnam	0.48	0.59	1.44	0.65	0.98	0.17	4.32
Chennai	0.18	-0.47	-0.38	0.03	1.41	1.09	1.86
Tuticorin	0.82	0.01	0.35	-0.92	-0.93	-0.24	-0.91
Cochin	2.33	1.49	0.81	-0.15	-0.74	-0.44	3.30
New Mangalore	0.55	-0.60	0.03	0.03	-0.64	-0.78	-1.41
Mumbai	-0.66	-0.45	-1.12	-0.67	1.56	2.54	1.21
Kandla	-1.09	-1.59	0.43	0.33	0.92	0.36	-0.64
Paradip	0.11	0.20	1.73	0.17	-0.76	-1.00	0.46
Mormugao	0.19	1.12	-0.67	2.34	0.20	-0.48	2.70

Source: Compiled from Basic Port Statistics of India (1991 and 1993), MOST, GOI.

In the beginning of the reform era, Visakhapatnam was operating with maximum operational performance followed by Cochin. Mormugao and Chennai had

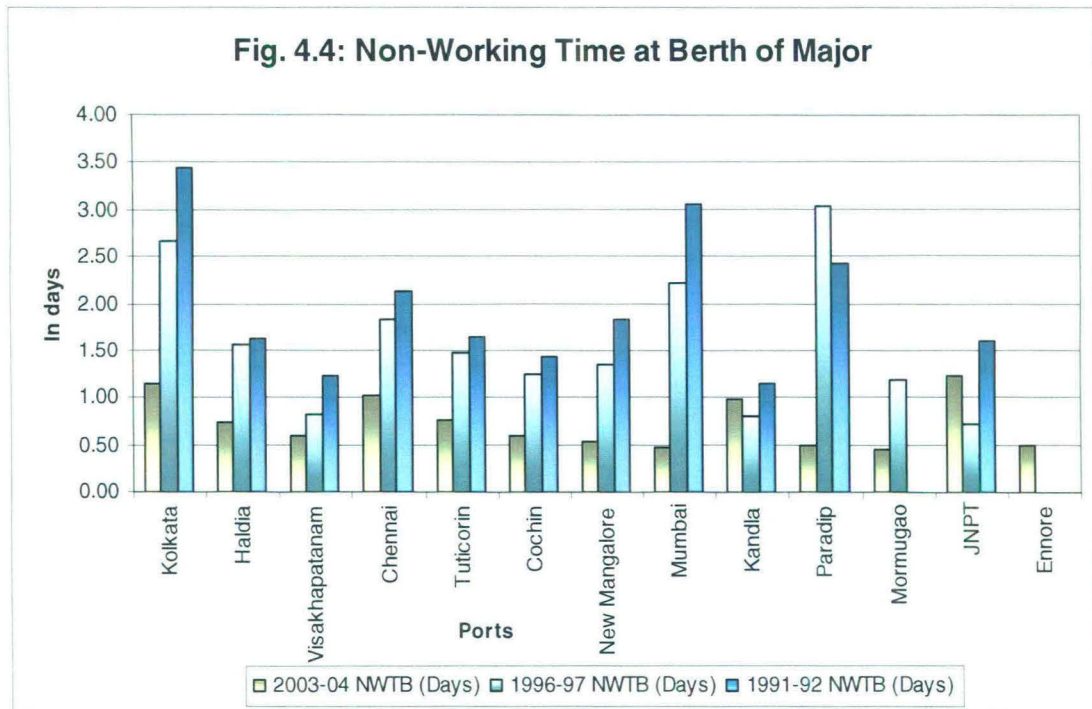
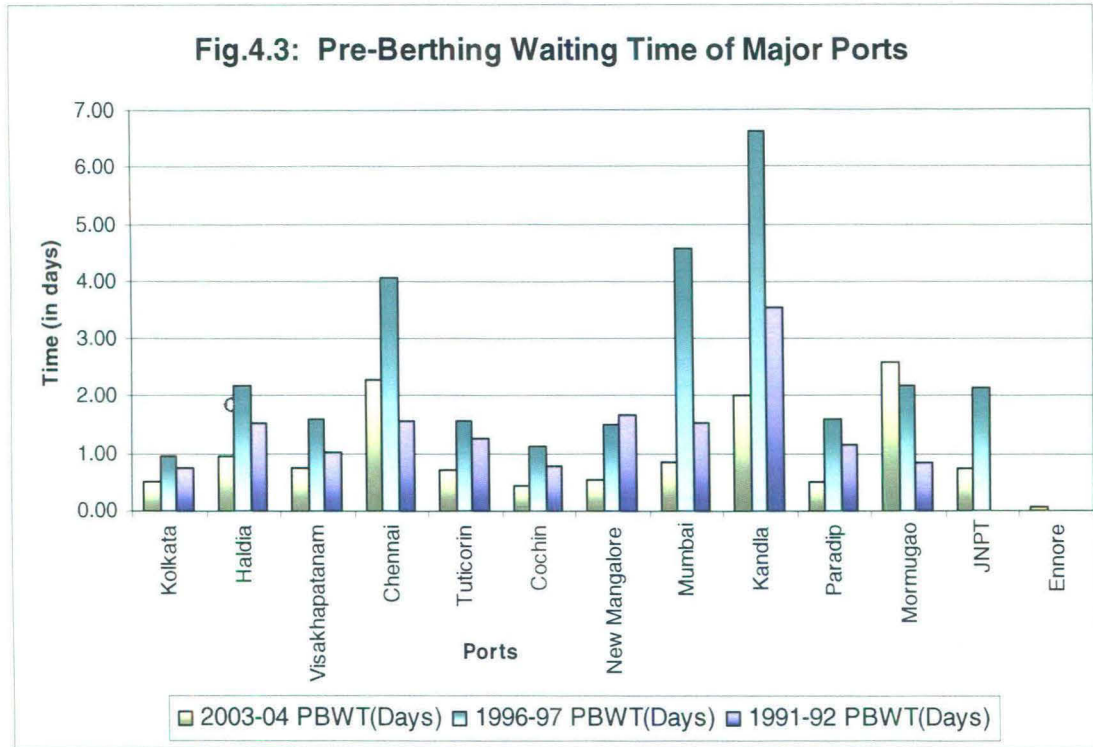
the third and fourth position respectively. The operational performance of port of Kolkata was poorest when compared with other ports in India, which is followed by New Mangalore (second poorest performer).



There has been general reduction in the average turn around time (TRT) at all major ports in the country during the last 10 years. The average turn around time was 6.7 days in 1991-92 at all ports. The level has declined over the years to reach a level of 3.45 days in 2003-04. Ports which have shown considerable improvement in TRT include JNPT followed by Ennore and Cochin ports. The maximum TRT is observed by port of Kandla in the same sequence followed by Chennai and Mormugao. The average TRT is influenced by a number of factors like type of cargo, parcel size, PBD, entrance channel, etc. In 2003-04, the TRT has been the least in the case of container vessels.

At the individual port level, ports which recorded average TRT higher than all other ports (average 3.45 days in 2003-04) were Kolkata, Chennai, Mumbai, Kandla and Mormugao. The lowest was in the case of JNPT followed by port of Ennore.

Average pre-berthing detention (PBD) has exhibited an increasing trend since 1991-92 (1.54 days) to attain a high of 3.1 days in 1996-97. This has been reversed since then and was 1.10 days in 2003-04.



All the ports recorded decrease in pre berthing detention in 2003-04, the lowest PBD time for the port of Ennore followed by Cochin Port. Average PBD depends on variety of factors attributable to port account and non-port account. The marginal increase in PBD in 2001-02 to 1.4 days, as compared to 1.2 days in 2000-01 could be attributed mainly to non port account-reasons.

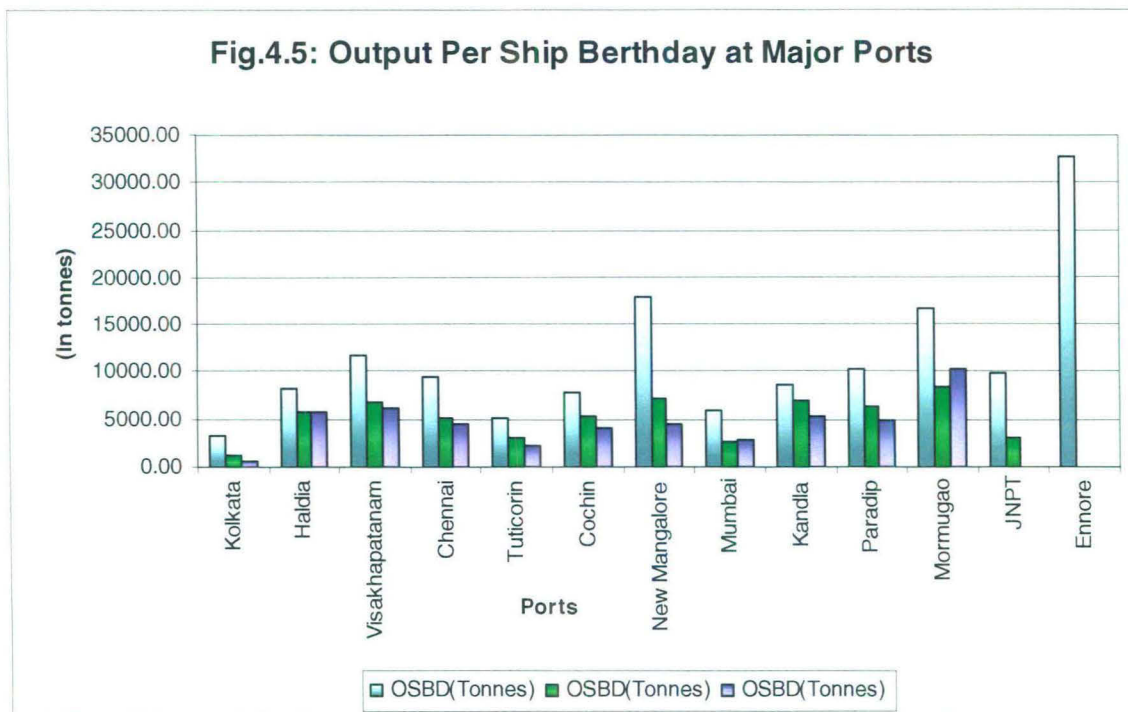
Table 4.10: Negative Operational Performance Indicators of Major Ports

Ports	TRT (in Days)			PBWT (in Days)			NWBT (in Days)		
	2003-04	1996-97	1991-92	2003-04	1996-97	1991-92	2003-04	1996-97	1991-92
Kolkata	4.29	7.70	10.52	0.51	0.95	0.75	1.14	2.66	3.44
Haldia	2.84	6.00	5.96	0.97	2.19	1.52	0.73	1.55	1.62
Visakhapatnam	3.33	5.66	5.58	0.76	1.6	1.02	0.59	0.83	1.23
Chennai	4.85	7.80	5.98	2.28	4.07	1.56	1.03	1.82	2.14
Tuticorin	2.52	5.16	5.19	0.70	1.56	1.26	0.76	1.48	1.65
Cochin	2.22	3.90	3.95	0.43	1.12	0.79	0.59	1.26	1.44
New Mangalore	2.35	4.43	5.5	0.55	1.51	1.67	0.53	1.35	1.83
Mumbai	4.07	10.67	7.48	0.87	4.57	1.55	0.47	2.21	3.05
Kandla	5.06	10.56	8.59	2.03	6.61	3.56	0.99	0.8	1.15
Paradip	3.43	4.90	6.08	0.53	1.61	1.17	0.50	3.03	2.42
Mormugao	4.47	6.30	5.96	2.60	2.2	0.87	0.45	1.18	
JNPT	1.85	6.30		0.76	2.14		1.23	0.71	1.61
Ennore	2.11			0.07			0.49		
All Ports	3.45	7.50	6.65	1.10	3.1	1.54	0.73	1.45	2.13

Source: Compiled from Basic Port Statistics of India, MOST, GOI. and Indian Infrastructure, March 2005.

There has been gradual decrease in non-working time at berth. In 1991-92 it was 2.13 days which decreased to 1.45 days in 1996-97 and in 2003-04 reached to the level of 0.73 days. Though a decrease has been noticed over a period of time but if we compare it to international levels India is far –far behind the Port of Singapore and port of Rotterdam where there is no concept of non-working time at berth as well as Pre berthing detention period for ports.

compared to 2002-03, the year-on-year increase in the average output per ship berthday in 2003-04 was of the order of around 1 percent. The performance of individual ports which performed well are JNPT, New Mangalore, Visakhapatnam, Chennai and Ennore.



4.4. Causes of Poor Performance of Major Ports

The reasons for the slow-down in Indian port development are many. One of the main reason is the low plan investment in the transport sector as a whole, and only a very insignificant part of it devoted to ports over the half century after independence. The share of the transport sector in total plan outlay has fallen from 22.10 percent during the First Five Year Plan to 13.10 percent during the Eighth Five Year Plan. Moreover, the share of ports in the transport sector has fallen from 7.31 percent in the First Five Year Plan to 6.34 percent in the Eighth Five Year Plan. It is surprising to note that such a crucial infrastructure sub-sector like ports is the worst affected area in terms of both allocation and utilization of development fund during the eighth plans. Again, in all the plans except the fourth, fund utilization in port sector has always been marred by inefficiency. Failure to utilise the disbursed funds may have been responsible for reduced allocation in the subsequent period. And as a matter of fact, due to this low investment, adequate capacity has not been created. In

may have been responsible for reduced allocation in the subsequent period. And as a matter of fact, due to this low investment, adequate capacity has not been created. In fact, the government has failed to understand the crucial role the port sector can play in the liberalized regime. But this sort of reasoning cannot go beyond the proximate explanation. The more fundamental cause must be sought in the lack of export orientation of our investment policies starting from the second plan to the Ninth Plan and this is more so far a country where ports account for more than 90 percent of tangible trade¹².

Apart from low plan investment, awareness, direction and understanding of the port industry has been lacking. Port authorities must understand both the revenue earning capacity and the catalytic role of ports. There is an urgent need for a coordinated policy for regulating and encouraging investments from both public and private sectors in ports. One may be surprised to note that although all the 12 major ports are controlled by the government of India through the Ministry of Surface Transport, the government still does not have a coordinated port policy. It has only some guidelines issued from time to time on adhoc basis. Again, some of the maritime states like Gujarat and Maharashtra have some port policies of their own but they too lack the required direction. There is no doubt that the country needs a commercial revolution in the port industry. But to do this Indian Ports need to go through a process of technological development which demands monetary and fiscal policies which are no less than revolutionary.

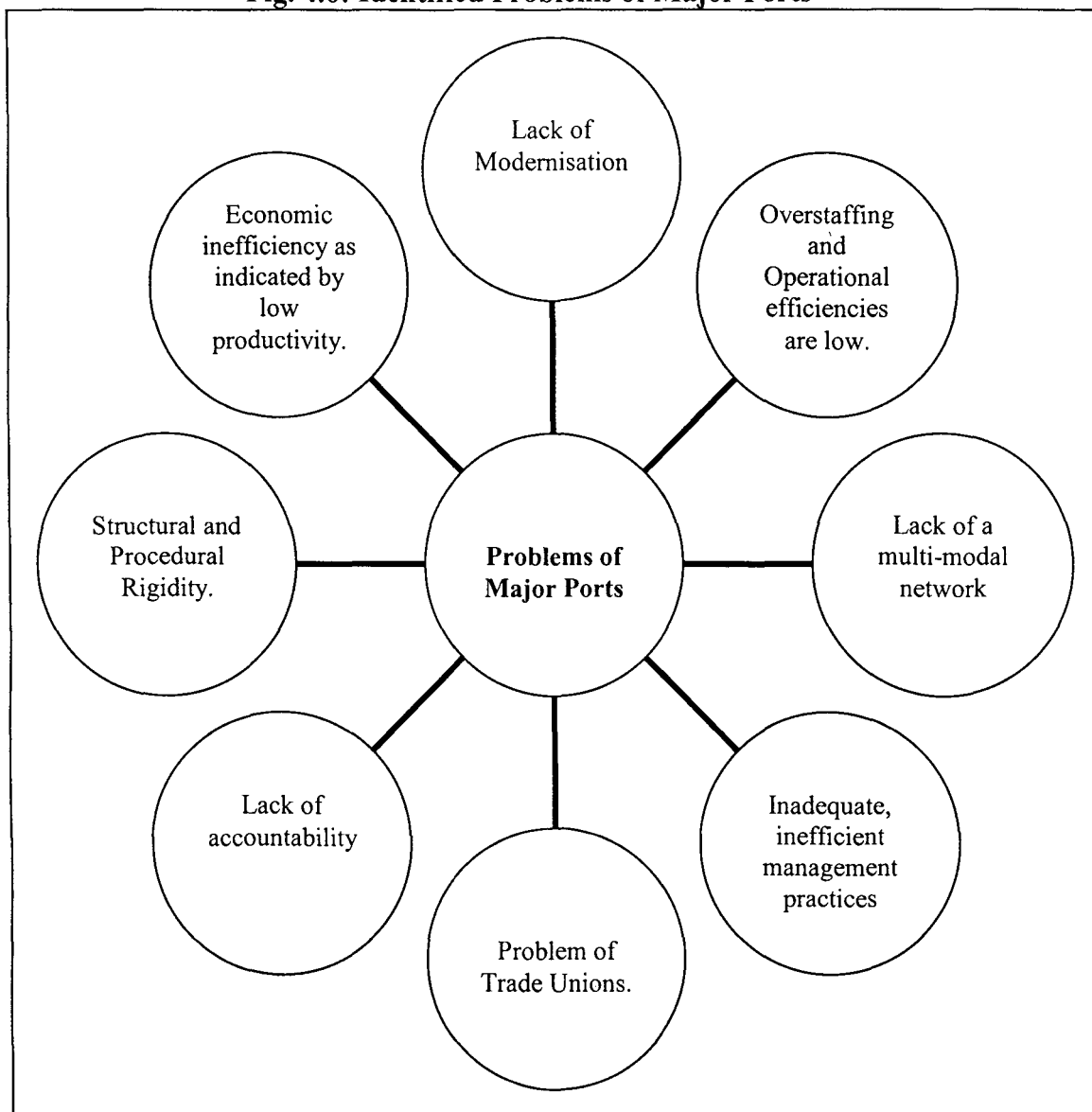
Many studies reveal that although the federal government and its respective maritime states have opened the sector for private investment, experience suggests that investors face an unwilling bureaucracy in getting the projects cleared. The major trouble is that quite a large number of clearances are required which are controlled by union and state governments and there is lack of transparency.

Another very critical factor that has accounted for poor performance in India's waterfront industry is the absence of inter port competition which has been the source of substantial productivity increases in national port systems in many countries.

¹² Ghosh, Buddhadeb and De, Prabir, "Indian Ports and Globalisation Grounding Economics in Geography" *Economic and Political Weekly*, August 25, 2001, pp.3271-3283.

The consequence of all these shortcomings for the Indian economy continues to be severe. In liner trades very few carriers serve India's ports through direct calls. Because of the high costs of operation of modern deep-sea line haul, tonnage carriers cannot accept the long waiting times at Indian ports.

Fig. 4.6: Identified Problems of Major Ports



Most general cargo traffic, particularly container traffic, takes place through transshipment at Colombo, Dubai or Singapore. The extra transit time and additional costs incurred by Indian importers and exporters are substantial. The cost of excessive ship waiting times in ports due to slow cargo processing in the case of bulk trades are passed on to the ultimate user thereby raising the price of imports

unnecessarily and undermining the competitiveness of Indian exports in the international markets.

4.5. Conclusion

A comparative analysis of the major ports in India has been done by using Composite Index. From the above it is found that Ennore ranked first followed by JNPT. The port of Visakhapatnam ranked in the third position and the port of Paradip, Chennai, Tuticorin and Kolkata ranked tenth, eleventh, twelfth and thirteen respectively. The analysis reveals very clearly that the overall performances, of new ports in India is comparatively better than the old ports of India except the port of Visakhapatnam. After 55 years of planning and protected industrial regime, although there was a fall in inequality among major ports, India has failed to strengthen her port sector.

Geographically, the ports of eastern India have stagnated, while the same in west and south coast have flourished. Contrary to conventional belief, performance of a port has been proved to be significant depending upon overseas cargo. Allocation of funds by both union and state governments over the plan period has been found to be too low to utilise the potential of the huge coastline through development of transport infrastructure.

CHAPTER V

SAGARMALA PROJECT: A NEW VENTURE IN INDIA'S MARITIME TRADE

“The Sagarmala project will be spread over a period of ten years. It will cover ports, shipping, inland waterways, infrastructure and development of connectivity at ports. If it becomes a reality, the project will put India back on the global maritime map”¹.

“Implementation of the Sagarmala Project will ensure India’s quantum leap into national and Global connectivity”².

5.1. Introduction of Sagarmala Project

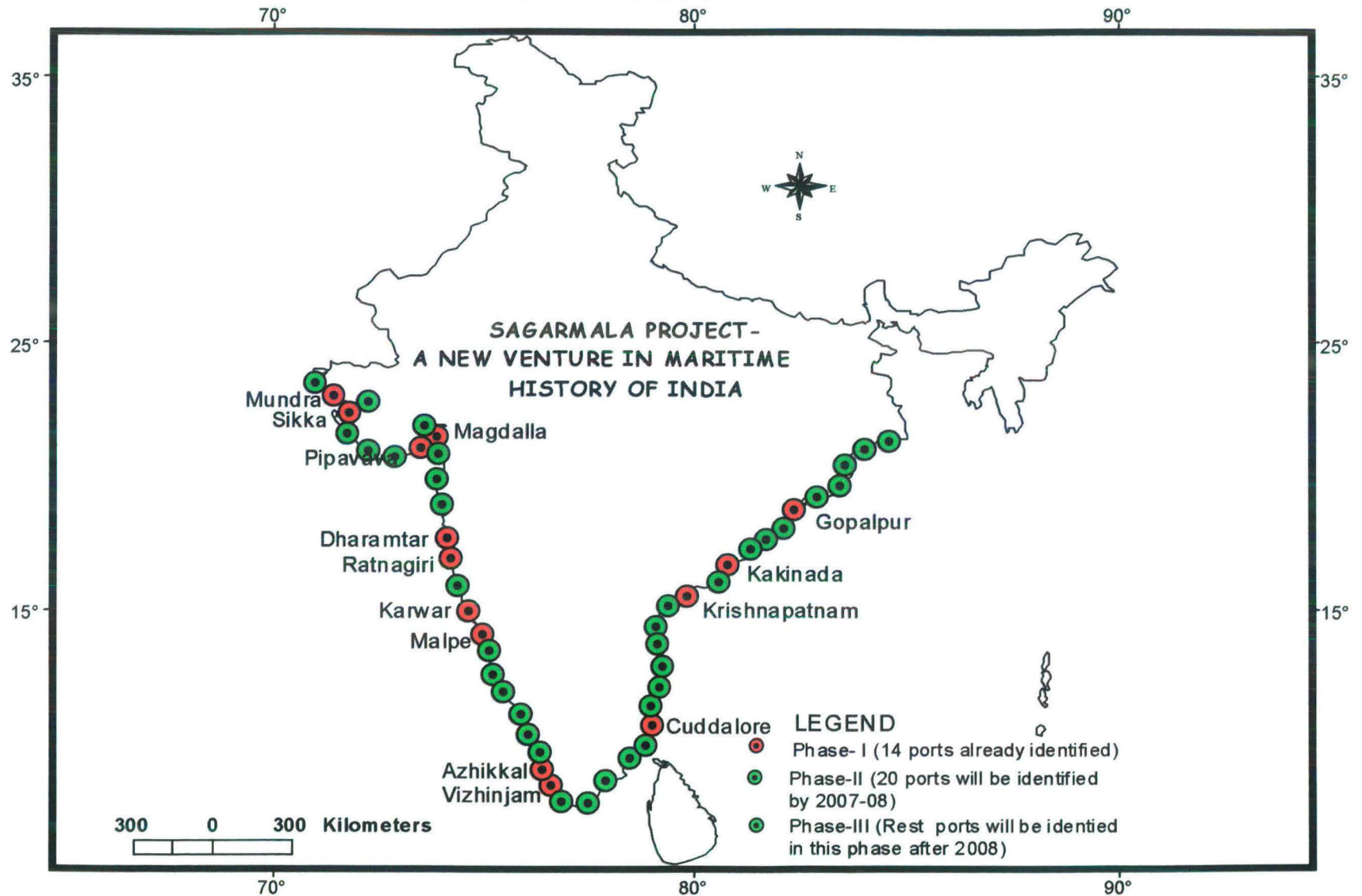
Sagarmala is not a solitary project. It is a long-term visionary programme of many projects aimed at bringing about rapid capacity expansion and modernisation of the Indian maritime infrastructure, including ports and shipping, along our country's east and west coasts. It will also include shipbuilding, inland waterways, coastal shipping and maritime education and training. The project will revitalize shipbuilding and ship repair activities by creating demand for more vessels. Inter-port connectivity to augment coastal shipping to reduce transaction costs is also envisaged. The objectives of this project would be achieved within a decade. Under the ambitious Sagarmala project, ports, shipping and inland waterways will be developed in an integrated manner. The objective of this grand project is to facilitate movement of cargo via the shortest possible route. Equal emphasis will be given to private and public ports as well as major and minor ports. The Sagarmala project aims to create a port-studded coastline for India, focusing on developing all major and minor ports in the country, with an outlay of around Rs 100,000 crore. At the time of announcement of Sagarmala project on 15 August 2003 the actual cargo handling was 412 MT, which is expected to reach 565 MT by 2006-07, which could be possible only if we

¹ “The Sagarmala Project: Maritime Master Plan”, *Indian Infrastructure*, Vol. 6(7), Feb.2004, pp.26-27.

² “Sagarmala Project to bring about Sea Change in Indian Maritime Sector”, *The Link Global trade and Freight Review*, Vol. 9(1), Jan. 2004, p. 6.

Map. 2

INDIA SAGARMALA PROJECT



adopt projects like Sagarmala³. The basic aim of Sagarmala project is rapid capacity expansion and modernization of existing ports and establishment of new ports. It encompasses the development of inland navigation including river terminals.

5.2. Table 5.1: Scope of Sagarmala Project

Ports	Shipping
Setting up of new ports	Increase the fleet size
Capacity Expansion	Promotion of coastal shipping
Productivity improvement	Navigation aids
Modernisation	Maritime training
Improvement in draught	Shipbuilding and ship repair yards
Hinterland connectivity	Offshore development

Source: The Link Global trade and Freight Review Vol. 9(1), Jan 2004, pp. 7.

5.3. Objectives of the project

- Capacity expansion and modernization.
- Connectivity from coast to hinterland and promote coastal shipping.
- To provide quality service comparable with international standards.
- Reduce transactions cost to benefit trade and consumer.
- Development of inland waterways to promote environment-friendly and cost-effective mode of transport.
- Promote India as a major supplier of maritime personnel.
- Improvement in quality and quantity of Indian tonnage.
- Modernisation of navigation aid system.

5.4. Thrust Areas of the Project

The thrust areas are augmentation of capacity, efficiency, productivity and connectivity of the ports, increase in shipping tonnage, increase in share of inland water and promotion of coastal shipping, maritime training and navigational safety. India's share in global merchandise trade is currently pegged at around 0.7 per cent, which is to be raised to at least 1 per cent by 2007 and 1.5 percent by 2009 as decided

³ "Ports of Future", *Geography and You*, 3 (9), Sep., 2003, pp 31-32.

by the country's foreign policy in 2004-05⁴. This would translate into an addition of Rs 180,000 crore per annum of international trade. Since 90 per cent of India's international trade by volume and 70 per cent by value is carried through the ports, it calls for massive upgradation of maritime infrastructure with a holistic approach resulting in an integrated system of transport, including sea, road, rail and inland water⁵. Sagarmala is expected to string together the coastal assets around our landmass into a 'mala' studded with ports.

5.5. Broad principles of Sagarmala Project

The basic idea behind Sagarmala project came out because of India's low investment in port sector as well as weak infrastructural development. To overcome such existing problem by low investment from Indian economy, the only option is to invite private sector participation more and more on same legal and basic principle which safeguard the legitimate interest of the Indian consumers as well as foreign investors. To improve in port infrastructure by encouraging competition within the port authority by development of new ports where a natural draught of 6-8 metres available for shipping and 4-6 metres for fishing harbour. As the basic fundamental of the project that the development of the port not exceeding the distance of 75 kms from the coastline will reduce the gap from one port to the other, under the project a separate provision of the bridges to link the gateway ports on eastern and western coasts, and hinterland connectivity in one side while in another side tie-up of landlocked states and union territories with ports and investment sharing. Creation of capacity at major ports, which exceeds the projected traffic by at least 20 percent by setting up an administrative mechanism for implementation of Sagarmala project through internationally comparable taxation regime for the maritime sector⁶. Cargo to travel the shortest route and focus will shift to commodity oriented planning in addition to transportation oriented planning for this more Inland Container Depots (ICDs) and Container freight stations (CFS) in each state capital or major industrial centres. There is also provision for the separate fund for the development of coastal shipping and inland water transport. A national authority will be set up for co-

⁴ Economic Survey (2004-05), Government of India, Ministry of Finance, Economic Division, p. 116.

⁵ "Sagarmala likely to strengthen cargo infrastructure of South Indian Ports", *The Link Global Trade and Freight Review*, Vol. 9(5), May 2004, p.27.

⁶ "Sagarmala Project : Pump-Priming the Port Sector", *Indian Infrastructure*, June 2004, p.38.

ordination and regulation of multi nodal transport agency. Most of the ports under the project will be declared as Special Economic Zone (SEZ)⁷.

The project would, in principle, treat private and public ports or terminals alike without any bias in favour of public ports. Under the project capital dredging and channel maintenance will be the responsibility of the states, labour practices will be rationalized and private sector participation will be made easier.

The project will be financed via public-private partnership. Public funding will be restricted to around 15 percent of the total cost and will be drawn from diverse sources like budgetary support, internal and extra budgetary support, inter-corporate loans and external funding. Private investment is expected to meet the remaining 85 percent of the requirement. Private sources will include FDI, investment through formation of Special Purpose Vehicles (SPVs) and a proposed maritime development cess.

5.6. Implementation of Sagarmala Project

An empowered committee headed by the secretary (shipping) would be set up with representations from the Planning Commission, the ministries of finance, commerce and industry and others for approval of investment proposals for projects up to Rs 500 crore. Besides, a steering committee under the chairmanship of secretary (shipping) would be constituted to finalise the project plan, priorities and the phased manner of project implementation.

It is already proposed that an empower committee will be set up on the basis of fast tract for working of project. A national sea water ways development programme for setting up of new ports. A delegation of powers to grant environmental clearance for maritime projects to the ministry of shipping. Rationalisation of taxation for Indian sea farers as well as introduction of tonnage tax to increase the revenue of ports, which is likely to be five paise per kilogram of cargo. Ports to be members of special purpose vehicles (SPV) for rail and road connectivity with contribution up to 30% of equity or as may be required. Creation of a separate fund for development of coastal shipping and inland water transport infrastructure. To

⁷ Mr. Shatrughan Sinha, Union Ministetr of Shipping, *Indian Express* dated 27th August 2003.

be set up Sagarmala development authority to channelise budgetary support for setting up new ports.

Development of national sea water ways, state waterways and formulation of an offshore policy fixed schedule services on national waterways. Integration of fishermen/fisher folk into maritime community, establishment of two maritime universities, modernisation of navigation aid system.

5.7. Projects already identified

- Integrated development of Jawaharlal Nehru Port and Cochin Port.
- Development of two offshore container berths at Mumbai port.
- Setu Samudram Ship Canal Project.
- Replacement of wagon tippler systems at Mormugao, Chennai and Kolkata (Haldia Dock Complex) Ports.
- Creation of additional facilities for handling iron ore at Vishakhapatnam, New Mangalore, Ennore, Haldia and Paradeep Ports.
- Development of Chennai Port as hub port for handling large size container vessels, car carrier terminal and cruise terminal.
- LPG cavern project at Vishakhapatnam Port.
- Construction of a new container terminal, LNG jetty, Coal Berth and Jetty for POL.
- New terminal at Saugor Island for Kolkata port.
- Terminal and associated facilities to promote cruise tourism in Mumbai, Mormugao, New Mangalore, Cochin and Tuticorin Port.
- Development and operation of container terminal at Kandla port.
- River regulatory measure for improvement of draught in Hooghly estuary.
- Construction of clean cargo berth at Paradip port.
- Development of foreshore area at Junglee Ghat harbour at Andaman.
- Providing eastern side embarkation facilities at Amini, Agathi, Minicoy and Kavaratti Islands of Lakshadweep.
- Building jetty at Shalimar on Hooghly River at Hawra side for inland water transport.
- Establishment of vessel traffic service in the Gulf of Kutchh and Khambat.

- Establishment of static sensors at strategic location.
- Establishment of Maritime Universities, one each in the eastern and western ports of India. An expenditure of Rs 20 billion is planned for maritime education; of these Rs 8 billion will be spent on the two Maritime Universities. Four training ships would also be acquired at a cost of Rs 6 billion.
- Setting up of two major international size shipyards one on the eastern coast and other on the west coast.
- Upgradation of the existing shipyards in the public sectors.
- Development of the strategically located non-major ports of Gopalpur, Cuddalore, Vizhinjam, Azzsikal, Malpe, Karwar. Ratnagiri, Dharamtar, Magdalla, Kakinada deep water port and Krishnapatnam, particularly for coastal shipping (appendix I).
- Acquisition of four training ships.
- Acquisition of simulators and other state of the art training equipments.
- Infrastructure development of existing national waterways and six new national waterways.
- Development of state waterways (4,000 kilometres).

5.8. Financial Outlay of Sagarmala

The project is estimated to cost over Rs 1,00,000 crore and is envisaged to be executed through public-private investment and partnership, out of which expenditure on ports will be around Rs 550 billion, shipping Rs 390 billion and inland water transport around Rs 160 billion⁸. Government policy allows 100 per cent foreign direct investment in the port, shipping and inland water transport sector and there appears to be considerable interest among international investors in maritime projects, which needs to be tapped better. Exploration of funding by international lending institutes will be needed.

The government is envisaging the imposition of a nominal maritime cess on all cargo passing through Indian ports for a specific period to augment budgetary resources for Sagarmala. For the project in its entirety, a cess of Rs 50 per tones of

⁸ “The Sagarmala Project: Maritime Master Plan” , op.cit, 88.

cargo is proposed on the lines of the fuel cess, which is being used to develop national highways. A separate act will be acquired, on the lines of the Central Road Fund Act for highway development, to ensure that the cess is used only for development work under Sagarmala⁹.

5.9. Works under Progress of Sagarmala Project

It is Government proposal that the JNPT to be developed as a hub port under Sagarmala project. Sagarmala so far and as the first stage of the nearly 8-10 years project-envisaging modernization and expansion of the Cochin and JNPT at a cost of Rs 7,500 crore. Coastal shipping will be promoted. The Ministry has already identified a list of 14 strategically located minor ports, under the control of respective states, which will be developed exclusively for the purpose of coastal shipping. These minor ports are Cuddalore, Vizhinjam, Azzhikal, Karwar, Ratnagiri, Krishnapatnam, Kakinada deep water port, Malpe, Gopalpur, Dharamtar, Magdalla, Sikka, Pipavav and Mundra. The cost of this phase of minor port development will be around Rs 4.2 billion. Another Rs 8 billion will be spent in the second phase to develop 20 more minor ports.

The Sagarmala project envisages integrated development of the JNPT and Kochi ports for handling containers. The liquid berth at JNPT will be converted a container berth. Two offshore container berths will be set up at Mumbai port while a new container terminal will be constructed at Ennore port. Chennai port will be developed as a hub for handling large-size container vessels. Terminals and associated facilities to promote tourism will be developed at the Mumbai, Mormugao, New Mangalore, Kochi and Tuticorin ports.

The development of waterways is another priority. Sagarmala encompasses infrastructure development on the three existing national waterways, the Ganga, Brahmaputra and West Coast Canal, which have a combined length of 2700 km. Six new national waterways will be developed. The combined cost will be around Rs 57 billion. The development of state waterways will be undertaken through centrally sponsored schemes. Poor port connectivity is to a certain extent responsible for the

⁹ "Port Financing: Still a Trickle", *Indian Infrastructure*, July 2001, pp.28-29.

under utilization of port capacity. All major ports and other important ports will therefore be connected with the national highways network and rail connectivity will be strengthened. This will help to speed cargo movement.

5.10. Issues

Financing is a major bottleneck. The Government proposes to contribute only 10-15 percent towards the project's equity. It is questionable whether enough funding can be raised from other sources. The government hopes to address this issue by offering fiscal incentives and making a few reforms. It proposes the replacement of corporate taxes with tonnage tax. A long-standing demand of the shipping industry. It has also said that withholding tax on external commercial borrowings by shipping companies will no longer be applicable. Another proposal suggests increasing the limit for ECBs without RBI approval with specific reference to shipping companies.

5.11. Challenges

Many questions have been raised, for example, about the viability of the project proposal to build 50 non-major Ports at a distance of not more than 75 kilometres from each other. Doubts have been expressed whether ports so close to each other would have the requisite 6-8 metres draught for them to be feasible and whether major cost factors such as those pertaining to hinterland connectivity and building breakwaters have been taken into consideration.

To find financing on such a grand scale will be a challenging task. The government will invest in the equity component of various subprojects and is likely to restrict its own investment to around 10-15 percent of the total cost of the project. It is also argued that expecting the private sector participation to 85 percent of the project investment is a bit far-fetched. Besides, some experts have even expressed reservations about the ability of the government to fund its share of the cost, pointing out that the proposed cess of 5 paise per kg of cargo will raise no more than Rs.2800 crore and this would be in spite of cargo traffic increasing to the estimated 565 million tonnes by 2006-07.

Another expected Challenge that since the project involves coordination between different agencies like port trusts, state maritime boards, the inland Waterways Authority will also need the freedom to function independently, which is not very easy in reality. This is essential to ensure that all key areas benefit equally from the project. The National Highway Development Project (NHDP) has already proved skeptics wrong, simply by staying more or less on track.

CHAPTER VI

CONCLUSIONS

The port in general and major ports in particular, now, stands at the crossroads in maritime trade of India. India has endowed with an extensive coastline of about 6,100 kms along nine coastal states having with 12 major ports and 185 minor ports. At the time of independence India had five major ports namely Kolkata, Mumbai, Chennai, Cochin and Visakhapatnam. The other major ports came up after independence in following chronological order, Kandla, Mormugao, Paradip, New Mangalore, Tuticorin, Haldia, JNPT and Ennore. Central government plays policy and regulatory functions for major ports while minor and intermediate ports are guided by state governments.

Ports handle 90 percent of India's foreign trade in terms of volume and 70 percent in value terms. The capacity of the Indian Ports increased from 20 MT of cargo handling in 1951 to 390 MT as on 31st March 2004. At the beginning of the Tenth Plan, the capacity of major ports was about 344 MT. It is proposed to be increased to 470 MT by the end of the plan.

The discussion on the objective "Structural Parameters of Port Performance" have been tested

1. The year 2004-05 has been another good year for growth of traffic volumes at major ports. Traffic handled by major ports increased by 11.3 percent to 383.77 million tonnes during this year as against 344.7 MT in the previous year. This has been the highest growth in traffic during the last decade. The growth touched 10.74 percent in 1996-97 (previous highest). The New Mangalore Port recorded the highest growth of 27.06 percent, followed by Chennai Port, Which saw a 19.31 percent growth, and Paradip port with 18.9 percent. The decadal growth rate of traffic at major ports has been recorded 8.46 for all ports in 1991-2001.
2. Chennai Port set an all-time high record in cargo throughput by handling 43.80 MT during 2004-05. The achievement constituted 11.41 percent of the cargo handled by all major Ports and an increase of 19.31 percent over 2003-

04. With this excellent performance, the Port has moved from its earlier fourth position to the third position among all major ports in terms of total tonnage of throughput.
3. Visakhapatnam Port has retained its premier position among Major Ports for the fifth consecutive year by handling the highest-ever quantity of 50.15 MT of cargo in 2004-05. In the process, it has achieved a growth rate of 5 percent over the 47.74 MT registered in 2003-04. Visakhapatnam excelled in all efficiency parameters.
 4. Kolkata Port handled a record 46.16 MT of cargo during 2004-05, thus achieving the second position among all Major Ports in cargo handling. The Port expects to handle more than 50 MT of cargo during 2005-06. The Port had handled 41.26 MT of cargo in 2003-04, 35.80 MT in 2002-03 and 30.40 MT in 2001-02.
 5. Ports are classified as export or import-based, depending on the net directional flow of trade which passes through them. At present, there are only seven export-based ports, i.e., Kandla, Chennai, Haldia, Mumbai, Tuticorin, Cochin, Ennore and Kolkata while Mormugao and Paradip are import-based. In the three exceptions, namely Visakhapatnam, JNPT and New Mangalore, of which import and export flows are almost, balance.
 6. In India, Containerisation started in 1973 in a limited way with the creation of interim container handling facilities at Mumbai and Cochin Ports. Since then, container traffic has steadily increased over the years more specifically after 1992-93. This traffic which was .68 million TEUs in 1991-92 has increased over the years to 3.9 million TEUs in 2003-04.
 7. At present nearly 1.4 million TEUs of container traffic is being handled through the ports of Mumbai, JNPT and Kandla. This constitutes nearly 72% of the Indian container traffic. These are mostly being transhipped through Singapore, Colombo, Dubai and other foreign ports.
 8. In containers, JNPT topped the list, though with a 10 percent growth on a throughput of 2.37 million TEUs. The highest growth of 20.86 percent was posted by Tuticorin at 3.07 lakh TEUs followed by Chennai 14.65 percent in 2004-05.

The second objective of my study that corporatisation and Privatisation of Major Ports” enhance the port performance have been tested

9. Corporatisation of major ports rooted date back of Major Port Trust Act of 1963 but real process started only after 1990's. The basic assumption behind corporatisation and privatisation of Major Ports of India is to overcome challenges like improvement in productivity, enhance efficiency of port operation and reduction of cost as well as workforce rationalization via the induction of modern technology, improved managerial efficiency, quality services and to bring competitiveness in port services.
10. In 1997, the Ports Laws Act modified both the Indian Port Act 1908 and The Major Port Trust Act 1963. This also paves the way for setting up an independent regulatory body for setting tariff. Further modifications were made in port policy on June 1998 to allow for the setting up of joint ventures and collaborations between a major port and company/consortium and between a major and minor port. It also allowed ports to enter into bi-lateral agreements with foreign Governments. Initially 51 percent FDI was allowed in the sector. In 1999, the FDI limit was increased to 100 percent. Another significant move was the finalisation and issue of a model concession agreement in March 2000.
11. Most of the private interest is concentrated on the development of containers. Container terminals are being given to private operators on a BOT basis for a period of thirty years. Very few seem interested in cargo terminals or infrastructural facilities. The cause is obvious that containerisation will provide quick return as compared to other infrastructures like cargo terminals which have long-gestation period.
12. The Minor Ports have found it comparatively easier to attract private investment. The Adani Group is developing the Mundra Port, in which P&O is developing a container terminal. Similarly, Gujarat Pipavav Port Limited has invested in Pipavav Port along with a number of private investors, including Maersk. Reliance has set up Jamnagar Port. Shell Hazira is developing an all weather port and in LNG regassification terminal at Hazira.
13. The three clearly distinct phases of port corporatisation and privatisation are 1963-2001, 2001-2004 and 2004 onward. First phase based on landlord style

of management under M.P.T Act of 1963 termed as gradual privatisation, the second phase (2001-2004), which started operationalisation of Ennore port in 2001 emphasized grater freedom to develop and to run port, reduction of surplus manpower strength through attractive V.R.S. Gradual disinvestment to make it private corporate body in next 10-15 years. Also, award to corporate body on concession on operate, manage, develop and transfer arrangement. The third and last phase (2004 onward) is more or less continuation of provisions of second phase which will be opted in a phased manner.

14. In brief, we can say corporatisation will bring functional autonomy, increased productivity, timely decision making, accountability and managerial efficiency in one side while privatisation will augment new technology, faster strategic alliance, construction of new port facilities within the existing ports etc.

The objective " Measures and Indicators of Port Performance" tested on the background that it is the function of many interplay-

15. The port of Ennore is operating with maximum operational performance followed by JNPT. The most striking fact here is that both ports are very recent in their origin. Ennore is only major corporatised port of India, while JNPT is in the process of corporatisation and it is expected that in the few years it will be corporatised.
16. Visakhapatnam and New Mangalore come in the third and fourth position respectively. Here, it is worthwhile to mention that though the cargo handling capacity of Visakhapatnam is maximum, it is the and only port of India which crossed the mark of 50 Million Tonnes in 2004-05, it does not perform well because other parameters of port performance viz. TRT, PBWT, NWTB, OSBD have not performed up to desired mark.
17. The performance of Kolkata port as usual is poorest when compared with the other ports in India. This poor performance of Kolkata is followed by Paradip and Chennai. The maximum improved performance is noticed by JNPT in the last ten years. The reason being that JNPT is the only port of India which comprises above 50 percent mark of Containerisation which has decreased Turn Around Time of ship as well as Pre-Berthing Waiting Time for ships significantly. The maximum down fall in performance is noticed by the port of

Chennai because Ennore port which is just 24 Km north of Chennai port has started its operation since 2001. Ennore has overtaken the role of Chennai port within a period of four years only. In the same sequence second most acute slide was experienced by Port of Paradip, here Visakhapatnam has marginalised the importance because of containerisation and upgraded infrastructure. Ports like Tuticorin and Haldia have not recorded any significant changes in their position.

18. Satellite ports like Haldia, JNPT and Ennore have posed major challenges to the master ports of Kolkata, Mumbai and Chennai respectively. The Overall performance of Mumbai port is very poor due to the emergence of JNPT which is near to Mumbai Port with all modern technological facilities.
19. One very interesting phenomena in history of port performance is that modern ports have always performed well in the initial years of their setup, like port of Cochin performed very well after its inception and at a time (in 1991-92) it ranked second,. But, in due course of time, these ports start performing poorly because of their inability to upgrade their infrastructural inputs and technology as per the time.
20. There has been general reduction in the average turn around time (TRT) at all major ports in the country during the last 10 years. The average turn around time was 6.7 days in 1991-92 at all ports. The level has declined over the years to reach a level of 3.45 days in 2003-04. Ports which have shown considerable improvement in TRT include JNPT followed by Ennore and Cochin ports.
21. Average pre-berthing detention (PBD) has exhibited an increasing trend since 1991-92 (1.54 days) to attain a high of 3.1 days in 1996-97. This has been reversed since then and was 1.10 days in 2003-04. The waiting time of ships at ports should be practically eliminated and pre-berthing time should be reduced to bare minimum. In future port scenario, the berths should wait for ships and not the other way. There has been gradual decrease in non-working time at berth. In 1991-92, it was 2.13 days which decreased to 1.45 days in 1996-97 and in 2003-04 reached to the level of 0.73 days. The average output per ship berthday more than doubled during 1991-92 to 2003-04 from 3942 tonnes to over 8000 tonnes, growing at a yearly of 5.95%.

“Sagarmala Project” will be a grand project for future in maritime trade-

22. The ambitious Sagarmala project is a new venture in maritime history of India as a long term visionary programme for rapid capacity expansion and modernization of infrastructure. The project includes shipbuilding, inland waterways, coastal shipping, maritime education and training, which will be developed in an integrated manner.
23. The objective of this grand project is to facilitate movement of cargo via the shortest possible route. Equal emphasis will be given to private and public ports as well as major and minor ports. The Sagarmala project aims to create a port-studded coastline for India, focusing on developing all major and minor ports in the country, with an outlay of around Rs 100,000 crore.
24. The project would, in principle, treat private and public ports or terminals alike without any bias in favour of public ports. Under the project capital dredging and channel maintenance will be the responsibility of the states, labour practices will be rationalized and private sector participation will be made easier.
25. Financing is a major bottleneck of Sagarmala project. The Government proposes to contribute only 10-15 percent towards the project's equity. It is questionable whether enough funding can be raised from other sources. The government hopes to address this issue by offering fiscal incentives and making a few reforms. It proposes the replacement of corporate taxes with tonnage tax.
26. Many questions have been raised, for example, about the viability of the project proposal to build 50 non-major Ports at a distance of not more than 75 kilometres from each other. Doubts have been expressed whether ports so close to each other would have the requisite 6-8 metres draught for them to be feasible and whether major cost factors such as those pertaining to hinterland connectivity and building breakwaters have been taken into consideration.
27. Another expected challenge that since the project involves coordination between different agencies like port trusts, state maritime boards, the inland Waterways Authority will also need the freedom to function independently, which is not very easy in reality.

There is an urgent need for a coordinated policy for regulating and encouraging investments from both public and private sector in ports. One may be surprised to note that although all the 12 major ports are controlled by the government of India through the ministry of surface transport, the government still does not have a coordinated port policy. It has only some guidelines issued from time to time on adhoc basis. Again, some of the maritime states like Gujarat and Maharashtra have some port policies of their own but they too lack the required direction. There is no doubt that the country needs a commercial revolution in the port industry. But, to do this, Indian Ports need to go through a process of technological development which demands monetary and fiscal policies which are no less than revolutionary.

Suggestions

1. In order to become a world class trader and independent of large foreign transshipment ports, India will have to develop very large privatized container terminals and ports equipped with appropriate intermodal infrastructure that can efficiently serve Indian containerised foreign trade from door to door.
2. Surplus labour should be introduced to retire voluntarily with liberal retirement benefits.
3. Private sector participation in all activities of the port including marine, cargo handling and related activities should be introduced.
4. All major ports should be gradually corporatised and subsequently disinvested.
5. Joint Venture structure can be developed following corporatisation.
6. Port tariff should be set free from all controls in order to provide for effective competition between ports. Any tariff regulation if practiced should be as an appellate authority to consider cases where unfair treatment/practice has been adopted by the developer.
7. All ports should develop modern streamlined management structure with clear lines of delegation and suitable levels of authority with empowerment extended to all posts as appropriate to the functions carried out.
8. Within the vision 2020 period, all the Major Ports should have been corporatised and with a majority of disinvestment of the Government's participation.

9. Central Government should not retain powers of intervention in the corporatised ports neither in their marine operations, nor in their port, cargo handling and commercial operations. Residual regulatory functions will continue as now will be functions to be carried out external to the corporatised port entities.
10. Ports like Chennai and Visakhapatnam can adopt the gradual privatisation model since most of the possible developments have already taken place. They can go for landlord pattern by privatizing individual terminals. Ports that cannot be commercially viable even though privatisation should continue as Major Ports under the MPT Act till their closure becomes possible.
11. Major Ports, which have good financial strength, can take the corporatisation model for privatisation.
12. State ports can go for Immediate Privatisation Model.
13. Any new major port to be developed should be a corporate body like Ennore Port and should not be notified under the MPT Act, 1963.
14. Approach of negotiations with single party may be adopted on case to case basis for development of privatized ports at Greenfield locations in preference to the competitive bidding process.

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GLOSSARY

BERTH: A loading or discharging anchorage allowing a ship to go alongside.

BERTH-DAY: A day of occupation of a berth by a ship.

BERTH OCCUPANCY: Time in hours or in days spent at berth. Berth occupancy rate is arrived at by dividing the time (in hours) spent by ships at berth by the total berth hours available during the month.

BUILD, OPERATE AND TRANSFER: Private operators build or rehabilitate facilities, which are eventually transferred to public ownership, also known as concessions.

CABOTAGE: Coastal trade, the movement of cargoes by ship between ports of the same coast or between ports of the same coast or between ports of the same country.

CELLULAR SHIP: Ship which is dedicated to the carriage of shipping containers.

COMBI: A combined ship. A ship specifically designed to carry both containers and conventional cargoes.

CONTAINER: Box, designed to enable goods to be sent from door to door without the contents being handled. The most common size of containers is the 20 footer which measures about 20 feet long by 8 feet wide by 8 feet 6 inches high.

CRANAGE: The hire charges for providing a port crane for cargo handling.

DRAUGHT (DRAFT): The depth necessary to submerge a ship to their load line.

ENTREPORT: A transit port where imported goods can be stored for a time to be re-exported without paying any customs duty. Such stores are termed as transshipment cargo. Entreport is a French word, which literally means a warehouse or store.

FREIGHT: Charges quoted by the owners for the carriage of cargo.

FULL PRIVATIZING: All assets and liabilities are transferred to the private sector.

IDLE TIME: Non-Working time of a ship (without loading or unloading of cargo) at berth.

JETTY: Light structure, which can only support pipelines, conveyors and light vehicles.

JOINT VENTURES: Operators create a new independent company. This type of agreement arises when two or more parties with common interests join forces.

LEASING: The port authority leases port assets to private operators for a given period. In contrast with a concession, the private operators do not usually make investments, and therefore they only assume commercial risks.

LICENSING: Private operators provide services requiring basic equipments, which they own. The port authority owns the port infrastructure and super infrastructure and charges the private operators for their use.

MANAGEMENT CONTRACT: The port authority remains the owner of the port, but the port is running by a private firm, which provides more efficient management of operations.

OUT PUT PER BERTH DAY: Total tonnage handled distributed over the total number of berth days.

PILOTAGE: A port charge for guiding a ship in or out of a harbour through channels, passages or other waters by an authorised pilot.

PORT DUES: A levy of port authority on a ship.

PRE-BERTHING DETENTION: The time for which a ship waits before getting entry into a berth.

SHIP-DAY: A day spent in harbor by a ship.

SHIPYARD: Place where ships are built.

STEVEDORE: Person running a business, whose functions are to load, stow and unload ships often used synonymously with docker.

TRAFFIC: A scalar with only magnitude but no direction such as the total of exports and imports or loaded and unloaded cargo.

TRAFFIC FLOW: A vector with magnitude and direction such as passengers embarked/diseembarked or cargo exports/imports.

TURN-ROUND TIME: Total time spent by a ship since its entry till its departure.

WHARF: Structure built alongside the water where ships berth for loading or discharging goods.

WHARFARE: A port charge on the ships for all cargo conveyed on over or through a wharf/berth.

Appendix I
List of Minor Ports

<p>Gujarat:</p> <ol style="list-style-type: none"> 1. Mandvi 2. Navlakhi 3. Bedi 4. <i>Sikka</i> 5. Jafarabad 6. Okha 7. Porbandar 8. Veraval 9. Bhavnagar 10. Bharuch 11. <i>Magdalla</i> 12. Koteswar 13. <i>Mundra</i> 14. Jakhau 15. Jodia 16. Salaya 17. Pindhara 18. Beyt 19. Rupen 20. Mangrol 21. Kotda 22. Madhwad 23. Navabandar 24. Rajpara 25. <i>GPPL</i> (Pipavav) 26. Mahuva 27. Talaja 28. Ghogha 29. Khambhat 30. Dahej 31. Bhagwa 32. Onjal 33. Vansi-Borsi 34. Billimora 35. Valsad 36. Umarsadi 37. Kolak 38. Maroli 39. Umergaon 40. Mul-Dwarka 	<p>Maharashtra:</p> <ol style="list-style-type: none"> 1. Dahanu 2. Tarapur 3. Nawapur 4. Satpati 5. Kelwa-Mahim 6. Arnala 7. Datiware 8. Uttan 9. Bassein 10. Bhiwandi 11. Manori 12. Kalyan 13. Thane 14. Versova 15. Bandra 16. Trombay 17. Ulwa-Belapur 18. Panvel 19. Mora 20. Mandwa 21. Karanja 22. Thal 23. Rewas 24. Alibag 25. Dharamtar 26. Revdanda 27. Borli/Mandla 28. Nandgaon 29. Murud-Janjira 30. Rajpuri 31. Mandad 32. Kumbharu 33. Shriwardhan 34. Bankot 35. Kelshi 36. Harnai 37. Dabhol 38. Palshet 39. Borya 40. Jaigad 41. Tiwari-Varoda 	<ol style="list-style-type: none"> 42. Purnagad 43. Jaitapur 44. Vijaydurg 45. Deogad 46. Achara 47. Malvan 48. Niwti 49. Vengurla 50. Redi 51. Kiranpani 52. <i>Ratnagiri</i> 53. Dighi <p>Karnataka:</p> <ol style="list-style-type: none"> 1. Mangalore 2. <i>Malpe</i> 3. Hangarkatta 4. Kundapur 5. Bhatkal 6. Honavar 7. Tadri 8. Belekeri 9. <i>Karwar</i> <p>Andhra Pradesh:</p> <ol style="list-style-type: none"> 1. Bhavanapadu 2. Calingapatanam 3. Bheemunipatnam 4. <i>Kakinada</i> 5. Narsapur 6. Machilipatanam 7. Vadarevu 8. Nizampatnam 9. <i>Krishnapatnam</i> 10. Gangavara 11. Mutyalammappalem 12. Rewa <p>Lakshadweep:</p> <ol style="list-style-type: none"> 1. Agatti 2. Amini 3. Andrott <p>Goa:</p> <ol style="list-style-type: none"> 1. Panaji
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<p>4. Bitra 5. Chetlat 6. Kavaratti 7. Kadmat 8. Kiltan 9. Kalpeni 10. Minicoy</p> <p>Andaman and Nicobar:</p> <p>1. Port Blair 2. Mus 3. Car Nicobar 4. Havelock 5. Mayabunder 6. Diglipur 7. Rangat 8. Hut Bay 9. Katchal 10. Campbell bay 11. Neil Havelock 12. Dugong Creek 13. Nancowry 14. Chowra 15. Teressa</p>	<p>16. Kondul 17. Pillow Millow 18. East Island 19. Cinque Island 20. Jolly Bouy Island 21. Tillonchong 22. Castle Bay 23. South Bay</p> <p>Tamilnadu:</p> <p>1. Cuddalore 2. Nagapattinam 3. Rameswaram 4. Pamban 5. Colachel 6. Valinokkam 7. KanyaKumari 8. Ennore © 9. Punnakayal © 10. Thirukkadaiyur © 11. PY-3 (oil field) © 12. Kattupalli © 13. Thiruchopuram 14. Manappad ©</p> <p>Pondicherry:</p> <p>1. Pondicherry</p> <p>West Bengal:</p> <p>1. Kulpi</p>	<p>2. Chapora 3. Betul 4. Talpona 5. Tiracol</p> <p>Orissa:</p> <p>1. Gopalpur 2. Behrabalpur (Balasore)</p> <p>Daman and Diu:</p> <p>1. Daman 2. Diu</p> <p>Kerala:</p> <p>1. Alappuzha 2. VadaKara 3. Kannur 4. Kasargode 5. Kodungallore 6. Ponnani 7. Thalassery 8. Thiruvananthapuram 9. Quilon 10. Kozhikode/Beypore 11. Neendakara 12. Azhikkal 13. Koavalam/Vizhinjam</p>
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© Captive Ports, *Ports Identified Under Sagarmala Project.*

Appendix II

Traffic Handled at Major Ports (2004-05)

(Commodity-wise in tonnes)

Port Name	POL	Iron Ore	Fertiliser	Coal	Port Name	container TEUs	Other cargo	Total	% variation 2003-04
Kolkata	21951.00	5403.00	519.00	8262.00	4366.00	288.00	5656.00	46157.00	11.87
Paradip	840.00	9051.00	2605.00	14209.00	31.00	2.00	3368.00	30104.00	18.94
Visakhapatnam	14628.00	16523.00	2069.00	9663.00	635.00	46.00	6629.00	50147.00	5.05
Ennore	104.00	520.00	0.00	8866.00				9480.00	2.19
Chennai	11699.00	9598.00	869.00	7510.00	9864.00	618.00	4266.00	43806.00	19.33
Tuticorin	743.00	42.00	961.00	5374.00	3205.00	307.00	5486.00	15811.00	15.59
Kochi	10278.00		546.00	210.00	2315.00	186.00	747.00	14096.00	3.86
New Mangalore	21434.00	10275.00	358.00	315.00	136.00	9.00	1373.00	33891.00	27.06
Mormugao	1010.00	24717.00	172.00	3015.00	117.00	11.00	1628.00	30659.00	9.99
Mumbai	19333.00		574.00	0.00	271.00	219.00	12647.00	35125.00	17.10
JNPT	2470.00		6.00	0.00	28888.00	2371.00	1584.00	32948.00	5.64
Kandla	22121.00		956.00	229.00	2744.00	180.00	15491.00	41541.00	0.04
All ports	126611.00	76129.00	9635.00	57653.00	54872.00	4237.00	58875.00	383765.00	11.30
% share	32.99	19.84	2.51	15.02	14.30	1.10	15.34	100.00	

Source: Compiled from Profile of Major Ports of India, 2003-2004, Indian Ports Association and Indian infrastructure in May 2005.

Appendix III

Projected Capacity and Traffic at Major Ports

(In MT)

Port Name	Capacity Planned to be	Projected Traffic in
	Achieved as on 31.3.2007	2006-07
Kolkata	43.6	54.8
Mumbai	49	30.4
Jawaharlal Nehru	43	34.5
Chennai	32.07	40
Cochin	27.9	17.2
Visakhapatnam	46.7	60
Kandla	60.55	51
Mormugao	26.98	26.3
Paradip	38.05	28.9
New Mangalore	40.45	32.7
Tuticorin	18.3	18.7
Ennore	29	20.5
Total	455.60	415

Source: Lok Sabha Starred Question No. 311, dated 11.12.2002.

Appendix IV

Export and Import of Major Ports (1996-97 to 2003-04)

(In tones)

Port Name	2003-04				1996-97				% Variation (2003-04 to 1996-97)
	Export	Import	Transhipment	Total	Export	Import	Transhipment	Total	
Kolkata	3102	1007	4514	8693	4054	1662	307	6023	44.33
Haldia	22676	9890	1	32567	11993	5108	-	17101	90.44
Paradip	6705	18606	0	25311	3847	7721	12	11580	118.58
Visakhapatnam	19306	21369	7061	47736	14515	13284	6699	34498	38.37
Chennai	20302	16408	0	36710	21423	9405	1020	31848	15.27
Tuticorin	10184	3494	0	13678	7611	1563	-	9174	49.10
Cochin	11118	2448	6	13572	9487	2255	-	11742	15.59
New Mangalore	13045	13624	4	26673	4426	7974	53	12453	114.19
Mormugao	4468	23406	0	27874	1761	15361	190	17312	61.01
Mumbai	16469	10861	2665	29995	17556	15191	980	33727	-11.07
JNPT	13886	15578	1726	31190	4537	3259	273	8069	286.54
Ennore	9277	0	0	9277					
Kandla	31080	10308	135	41523	27063	4464	2203	33730	23.10
Total	181618	147069	16112	344799	128273	87247	11737	227257	51.72

Source: Compiled from Profile of Major Ports of India, 2003-2004, Indian Ports Association, Indian infrastructure in May 2005 and the Link April 2005.

Appendix V

Traffic Capacity and Percentage of Capacity Utilisation of the Major Ports during various Plan Periods

Plan	Capacity in MT	Traffic	% of Utilisation
1st. Five Year Plan	25.00		
2nd. Five Year Plan	37.77	39.50	105.00
3rd. Five Year Plan	54.20	50.21	95.00
4th. Five Year Plan	71.20	63.55	89.00
5th. Five Year Plan	101.31	70.30	69.00
6th. Five Year Plan	132.73	105.82	80.00
7th. Five Year Plan	161.32	147.20	99.00
8th. Five Year Plan	190.00	-	-
9th. Five Year Plan	343.95	-	-
10th. Five Year Plan	470.00	-	-

Source: IPA Report, New Delhi and Tenth Five Year Plan 2002-07, Volume-II, Planning Commission, GOI.

Appendix VI

Container Traffic Projections: Major and Minor Ports (Million TEUs)

	2001-02	2006-07	2011-12	2016-17	2021-22
All-India	3	4.5	8	12	18
Major ports	3	3	5.25	8.25	9.25
Minor ports	0	1.5	2.75	3.75	8.75

Source: Indian Ports Association.

Appendix VII

All-India Projections: Share of Container traffic in break bulk

(In MT)

Year	Present/Projection traffic break bulk+container	Container traffic projections	Presented/Projected % of containerization
1999-00	51.91		53
2001-02	60.54	33.3	55
2006-07	90.6	54.4	60
2011-12	139.4	90.68	65
2016-17	210.58	147.4	70
2021-22	303.4	212.4	70

Source: Indian Ports Association.

Appendix VIII

Operational Performance Indicators of Ports (1991-2004)

Ports	OSBD (In tonnes)			Cargo in MT			No. of Vessels Sailed		
	2003-04	1996-97	1991-92	2003-04	1996-97	1991-92	2003-04	1996-97	1991-92
Kolkata	3384.00	1188	612	8.69	6.02	4	765.00	874	717
Haldia	8280.00	5855	5861	32.57	17.1	12	1889.00	947	703
Visakhapatnam	11712.00	6696	6120	47.74	34.5	21.52	1704.00	1437	928
Chennai	9517.00	5131	4579	36.71	31.85	25.05	1656.00	1681	1381
Tuticorin	5084.00	3026	2196	13.68	9.18	5.87	1517.00	905	724
Cochin	7799.00	5438	4124	13.57	11.74	7.48	1133.00	784	621
New Manglore	17955.00	7172	4564	26.67	12.45	8.27	879.00	644	452
Mumbai	5911.00	2605	2825	29.92	33.73	26.26	1800.00	2616	2106
Kandla	8659.00	7066	5322	41.52	33.73	21	1823.00	1527	1022
Paradip	10257.00	6406	4919	25.31	11.58	7.3	1041.00	557	347
Mormugao	16746.00	8540	10343	27.87	17.31	15.1	677.00	507	601
JNPT	9845.00	2987		31.27	8.07		3681.00	640	
Ennore	32777.00			9.28			166.00		

Source: Compiled from Basic Port Statistics of India, MOST, GOI. and Indian Infrastructure, March 2005.

Appendix IX

Master Table for Computing Performance of Major Ports (2003-04)

Ports	TRT (Days)	1/TRT	x-mean /S.D	PBWT (Days)	1/PBWT	x- Mean /S.D	NWTB (Days)	1/NWTB	x- Mean /S.D	OSBD (Tonnes)	x- Mean /S.D	Cargo in MT	x- Mean /S.D	No. of Vessels Sailed	x- Mean /S.D
Kolkata	4.29	0.23	-0.88	0.51	1.98	-0.09	1.14	0.88	-1.30	3384.00	-1.05	8.69	-1.46	765.00	-0.79
Haldia	2.84	0.35	0.20	0.97	1.03	-0.35	0.73	1.37	-0.33	8280.00	-0.41	32.57	0.49	1889.00	0.52
Visakhapatnam	3.33	0.30	-0.27	0.76	1.32	-0.27	0.59	1.69	0.30	11712.00	0.04	47.74	1.73	1704.00	0.31
Chennai	4.85	0.21	-1.13	2.28	0.44	-0.51	1.03	0.97	-1.12	9517.00	-0.24	36.71	0.83	1656.00	0.25
Tuticorin	2.52	0.40	0.61	0.70	1.42	-0.24	0.76	1.32	-0.44	5084.00	-0.82	13.68	-1.05	1517.00	0.09
Cochin	2.22	0.45	1.10	0.43	2.30	0.00	0.59	1.69	0.30	7799.00	-0.47	13.57	-1.06	1133.00	-0.36
New Manglore	2.35	0.43	0.87	0.55	1.82	-0.13	0.53	1.89	0.68	17955.00	0.86	26.67	0.01	879.00	-0.65
Mumbai	4.07	0.25	-0.77	0.87	1.15	-0.32	0.47	2.13	1.15	5911.00	-0.72	29.92	0.28	1800.00	0.42
JNPT	1.85	0.54	1.91	0.76	1.32	-0.27	1.23	0.81	-1.43	9845.00	-0.20	31.27	0.39	3681.00	2.61
Kandla	5.06	0.20	-1.20	2.03	0.49	-0.50	0.45	2.22	1.34	8659.00	-0.36	41.52	1.22	1823.00	0.44
Paradip	3.43	0.29	-0.35	0.53	1.89	-0.11	0.99	1.01	-1.04	10257.00	-0.15	25.31	-0.10	1041.00	-0.47
Mormugao	4.47	0.22	-0.97	2.60	0.38	-0.52	0.50	2.00	0.90	16746.00	0.70	27.87	0.11	677.00	-0.89
Ennore	2.11	0.47	1.31	0.07	14.29	3.28	0.49	2.04	0.98	32777.00	2.80	9.28	-1.41	166.00	-1.48
S.D		0.11			3.65		0.28	0.51		7639.69		12.25		858.84	
Average		0.33			2.30		0.73	1.54		11378.92		26.52		1440.85	

Source: Compiled from Basic Port Statistics of India, MOST, GOI. and Indian Infrastructure, March 2005.

Appendix X

Master Table for Computing Performance of Major Ports (1996-97)

Ports	TRT (Days)	1/TRT	x- Mean /S.D	PBWT (Days)	1/PBWT	x- Mean /S.D	NWTB (Days)	1/NWTB	x- Mean /S.D	OSBD (Tonnes)	x- Mean /S.D	Cargo in MT	x- Mean /S.D	No. of Vessels Sailed	x- Mean /S.D
Kolkata	7.7	0.13	-0.80	0.95	1.05	1.90	2.66	0.38	-1.13	1188	-1.78	6.02	-1.15	874	-0.35
Haldia	6	0.17	-0.07	2.19	0.46	-0.31	1.55	0.65	-0.36	5855	0.30	17.1	-0.16	947	-0.24
Visakhapatanam	5.66	0.18	0.13	1.6	0.63	0.31	0.83	1.20	1.24	6696	0.68	34.5	1.39	1437	0.56
Chennai	7.8	0.13	-0.84	4.07	0.25	-1.09	1.82	0.55	-0.63	5131	-0.02	31.85	1.15	1681	0.95
Tuticorin	5.16	0.19	0.48	1.56	0.64	0.37	1.48	0.68	-0.27	3026	-0.96	9.18	-0.87	905	-0.30
Cochin	3.9	0.26	1.73	1.12	0.89	1.31	1.26	0.79	0.07	5438	0.12	11.74	-0.64	784	-0.50
New Manglore	4.43	0.23	1.11	1.51	0.66	0.45	1.35	0.74	-0.08	7172	0.89	12.45	-0.58	644	-0.73
Mumbai	10.67	0.09	-1.53	4.57	0.22	-1.19	2.21	0.45	-0.91	2605	-1.15	33.73	1.32	2616	2.46
JNPT	6.3	0.16	-0.23	2.14	0.47	-0.27	0.71	1.41	1.82	2987	-0.98	8.07	-0.97	640	-0.73
Kandla	10.56	0.09	-1.51	6.61	0.15	-1.44	1.18	0.85	0.22	7066	0.84	33.73	1.32	1527	0.70
Paradip	4.9	0.20	0.68	1.61	0.62	0.30	0.8	1.25	1.37	6406	0.55	11.58	-0.66	557	-0.87
Mormugao	6.3	0.16	-0.23	2.2	0.45	-0.32	3.03	0.33	-1.26	8540	1.50	17.31	-0.15	507	-0.95
S.D		0.05			0.27			0.35		2239.24		11.20		618.62	
Mean		0.17			0.54			0.77		5175.83		18.94		1093.25	

Source: Compiled from Basic Port Statistics of India, MOST, GOI. and Indian Infrastructure, March 2005.

Appendix XI

Master Table for Computing Performance of Major Ports (1991-92)

Ports	TRT (Days)	1/TRT	x-Mean /S.D	PBWT (Days)	1/PBWT	x-Mean /S.D	NWTB (Days)	1/NWTB	x-Mean /S.D	OSBD (Tonnes)	x- mean /S.D	Cargo in MT	x- mean /S.D	No. of Vessels Sailed	x- Mean /S.D
Kolkata	10.52	0.10	-1.62	0.75	1.33	1.70	3.44	0.29	-1.31	612.00	-1.55	4.00	-1.16	717.00	-0.25
Haldia	5.96	0.17	0.19	1.52	0.66	-0.41	1.62	0.62	0.41	5861.00	0.55	12.00	-0.18	703.00	-0.28
Visakhapatnam	5.58	0.18	0.48	1.02	0.98	0.59	1.23	0.81	1.44	6120.00	0.65	21.52	0.98	928.00	0.17
Chennai	5.98	0.17	0.18	1.56	0.64	-0.47	2.14	0.47	-0.38	4579.00	0.03	25.05	1.41	1381.00	1.09
Tuticorin	5.19	0.19	0.82	1.26	0.79	0.01	1.65	0.61	0.35	2196.00	-0.92	5.87	-0.93	724.00	-0.24
Cochin	3.95	0.25	2.33	0.79	1.27	1.49	1.44	0.69	0.81	4124.00	-0.15	7.48	-0.74	621.00	-0.44
New Mangalore	5.50	0.18	0.55	1.67	0.60	-0.60	1.83	0.55	0.03	4564.00	0.03	8.27	-0.64	452.00	-0.78
Mumbai	7.48	0.13	-0.66	1.55	0.65	-0.45	3.05	0.33	-1.12	2825.00	-0.67	26.26	1.56	2106.00	2.54
Kandla	8.59	0.12	-1.09	3.56	0.28	-1.59	1.61	0.62	0.43	5322.00	0.33	21.00	0.92	1022.00	0.36
Paradip	6.08	0.16	0.11	1.17	0.85	0.20	1.15	0.87	1.73	4919.00	0.17	7.30	-0.76	347.00	-1.00
Mormugao	5.96	0.17	0.19	0.87	1.15	1.12	2.42	0.41	-0.67	10343.00	2.34	15.10	0.20	601.00	-0.48
S.D		0.04			0.32			0.19		2500.00		8.18		497.03	
Mean		0.16			0.79			0.54		4497.08		13.50		841.59	

Source: Compiled from Basic Port Statistics of India, MOST, GOI. and Indian Infrastructure, March 2005.

