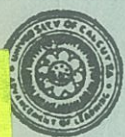


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SOME ASPECTS OF CALCUTTA PORT

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CENTRE FOR URBAN ECONOMIC STUDIES

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ABSTRACT

The Calcutta port constituted the economic basis of the city in the formative years, and even today the relative stagnation of Calcutta can be to a great extent attributed to the decay and stagnation of its port. The port still accounts for a substantial portion of land in the city and a vast array of jobs and economic activities. This study looks into the present stage of the causes for its decline and points to what the future holds for the port, and its implications for the economy of the city.

This is a revised version of a paper on Calcutta port prepared by the author for the Task Force for Perspective Planning for Calcutta set up by the Calcutta Metropolitan Development Authority.



SOME ASPECTS OF CALCUTTA PORT

Arun Prasad Sen

I. Introduction

Calcutta port is the lifeline of the city. If this statement is not entirely valid today, it was only a few decades ago. In fact, the port was the raison d'etre of the city which grew up in a hitherto neglected and unknown marshy area, after the British traders made it their home. During the British rule, the port was the hub of the colonial economic system of the entire country, all the other major economic activities being subsidiary to its interests. Railways were initially built to link the port to the sources of raw materials which were to be exported or processed, or to the markets to which the British imports were to be sold.

Even at the time of the independence of the country, more than two-fifths of the total volume of trade of the country passed through this port. The past four decades have seen a continuous decline in the importance of the port, Calcutta now occupying a mere sixth place among the ports of the country, far behind the leading ones such as Bombay, Madras or Visakhapatnam. Still, it continues to hold an important position in the economy of the eastern region.

In this study we are looking into the present state of this port examining some of the causes for its decline, and pointing out what the future holds for the port and its implications for the economy of the city of Calcutta.

There can be no doubt that the port constituted the economic basis of Calcutta's life in the formative years, and even today the decline of Calcutta can be to a great extent attributed to the decay and stagnation of its great port. We will see in a latter part of this paper that the port still accounts for a substantial proportion of land in the city and a vast array of jobs and economic activities which are now subject to pressure as speculations are mounting as to the future of the port and the attitude of the central government towards it.

The story of rise and fall of Calcutta port is a truly fascinating one. Founded in 1690, until 1860 the port of Calcutta had served a very small hinterland comprising mainly Howrah, Hooghly, 24-Parganas and a small part of Eastern Bengal. By 1900 it supplied the whole of Bengal, Bihar, Assam and a portion of North-Western provinces.¹ This extension of the hinterland was primarily due to the opening of new lines of communication, precisely railways, which had enabled the British government to distribute European manufactured goods throughout North India from Calcutta.² But increasing importance of Calcutta port was not only due to the extension of the hinterland, but also to the development of the core hinterland. The growing cultivation of cash crops like opium, jute and tea and the establishment of jute and cotton factories in Calcutta and suburbs added a new dimension to the economy of Calcutta's hinterland.³ Rapid development of coal industry, since 1870, also helped much⁴ though in course of time the extension of the Calcutta's hinterland was somewhat curbed by the development of other major ports like Visakhapatnam. At the time of independence Calcutta's traffic represented 40 per cent of total imports and 45 per cent of total exports of India.⁵ Even at the end of the

first five year plan, with an average of 65 to 70 ships a day in her docks and jetties and eight million tonnes of cargo passing through her berths and moorings a year, Calcutta could still claim a place among the first ten ports of the world.⁶ Since then its relative position has been deteriorating continuously and in 1983-84 its share dropped to about 10 per cent of total sea-borne cargo.⁷

A major cause of the decline is that, unlike other major ports of India, Calcutta is a riverine port, 125 nautical miles away from the sea,⁸ thus hindering the access of international shipping to the port. Further, due to geological and other natural factors, the river has practically disappeared from this riverine port, as the tidal flow dominates at its location. Moreover, numerous tortuous and sharp bends have developed within the port's life-line to the sea, and have made it difficult for ships with a length of more than 565 feet to negotiate the approaches to the port.⁹ At the same time, the almost total absence of fresh water supply (main flow is now to river Padma) and continuous deposit of sand and rocks received from the sea tide have led to alarming losses of draft and also to a very significant increase in the incidence of the bore tide in the port. The river Ganga, draining a basin of 47,000 square miles, brings down large quantities of sediments in its water that has formed a delta having a sea face of about 250 miles through which it flows to the sea by way of a number of branches.¹⁰ The river exhibits the peculiar conjunction of condition of being tidal for many miles above the outlet and terminating into a delta which has promoted the growth of 16 sand bars between Calcutta and Sandheads.¹¹ Bores, bars and bends have become some of the main headaches during the current period of the port's history.

To eliminate the problems, and for the revival of Calcutta port, two schemes, construction of Farakka barrage and development of a subsidiary port at Haldia in the down stream, were undertaken in the sixties. It was expected that while the Farakka barrage would improve the draft of the Calcutta Port, the subsidiary port at Haldia would handle the giant ships which would not otherwise come to Calcutta due to sharp bends and shallow water.

In fact, the establishment of a subsidiary port nearer the sea had been considered from time to time during the past hundred years or more and the suitability of different locations had been examined. The records show that a scheme for setting up a subsidiary port at Diamond Harbour was considered in 1875.¹² In this century the idea was revived in 1903, when a satellite port was sought to be established at Luff point.¹³ The matter was again considered, in 1954, by the Coal Export Committee.¹⁴ At last Haldia, 56 miles downstream of Calcutta, was chosen as the site for the development of a subsidiary port in 1959.¹⁵

The development of an ancillary port is not unique to Calcutta. The towns of London, Bordeaux, Antwerp, Bremen, Cologne and Hamburg too were established far inland for strategic considerations of the time. Some others like Rome, Paris and Cologne have since ceased to be seaports.¹⁶ In their cases, there has also been a trend all over the world for riverine ports to move towards the sea with new docks, e.g., the Tibury docks in case of London. Development of Haldia as an extension of the port facilities nearer the sea is thus in keeping with a world wide trend. Haldia was to be Calcutta's Tilbury.

Benefits¹⁷ expected from the subsidiary port at Haldia were :

(1) There would be only two or three bars downstream of Haldia.

(2) The approaches to this port would be free from sharp bends and, therefore, there would be fewer restriction on the length of the ships using the port.

(3) Deeper draft ships would be able to use the port.

(4) There would be no bore tides to contend with.

(5) There would be fewer restriction on the number of deep draft ships entering or leaving the port.

(6) There would be considerable saving in time taken by the ship to visit and then leave.

(7) It would be safe from any blockage by sinking of a ship, accidental or otherwise.

(8) It would be possible to unload bulk of the deep-laden ships at Haldia before proceeding to Calcutta and this would avoid the need for them to go to Vishakhapatnam or to Madras for lightening. Similarly, it would be possible to top up and lead to the maximum capacity for ships outgoing from Calcutta.

(9) Shifting of the coal, iron ore and foodgrains traffic to Haldia would reduce strain on the capacity of the existing docks and on other services in Calcutta and, thus, would permit growth of other traffic in the present port.

(10) The use of larger ships, the full or much larger utilisation of their capacity and the saving of time would result in lower freight, which would encourage the growth of traffic at a much faster rate than in the past, and would facilitate further economic development of the vast hinterland served by the Calcutta-Haldia combine.

(11) Haldia would also be a counter-magnet town easing to some extent the pressure of population on Calcutta.

A major objective of this study is to examine the consequence of the setting up of this satellite port, for the combined port of Calcutta as also for the eastern region as a whole.

In section II we examine the comparative performance of the major ports of India and the relative decline and stagnation of Calcutta port during the post-independence period. This provides us with the national perspective, highlights the factors responsible for the decline and stagnation and suggests the remedies for improving the performance of this once premier port of the country.

In section III we analyse the various aspects of the proposal to delink Haldia port from Calcutta and constitute it as an independent port. Here we look into the broader economic implications of such proposal particularly for employment and land use and also for the economic and social life of the metropolis itself.

II. The comparative performance of the major Indian ports

With a string of ports spread over her vast coastline of nearly 4,000 miles,¹⁸ India has always occupied an important place in the maritime world. Throughout the ancient and medieval periods, the ports and harbours of India played a crucial part in the expansion of Indian commerce and culture.

From the earliest time to the end of the Moghul period, spices, pepper, oils, silks, ivory, precious stones and other luxuries of life went from the ports of India to Alexandria, Rome and other cities of West Asia and Europe.¹⁹ The story of the struggle for the control

of Indian trade between the Portuguese, Dutch, French and British, and the eventual success of the East India company is well known. Despite political vicissitudes, from the ancient time the balance of trade with the outside world was generally in India's favour, until a few decades ago when the national need for heavy imports reversed the position.

With the advent of industrialisation under the British rule, Indian ports began to be modernized and the development of port capacity kept pace with the growth of foreign trade. After independence, however, the modernisation and expansion of port facilities presented many problems. Equipments and facilities at the major ports had deteriorated due to the strain of the second world war. Karachi was no longer available owing to partition and India was left with only five major ports - Bombay, Madras, Visakhapatnam (Vizag), Calcutta and Cochin - with an aggregate capacity of about 20 million tonnes of traffic a year, which was quite inadequate for the country's expanding needs.²⁰ The immediate priority was to develop another major port in order to make good the loss of Karachi, for which Kandla on the west coast was chosen. Mormugao became the seventh major port when Goa was liberated in 1961,²¹ Paradip, Orissa, the eighth, was commissioned in 1966,²² while two other major ports - one at Mangalore and another at Tuticorin - were developed and commissioned in 1974.²³ In addition to these ten major ports Haldia, a satellite port of Calcutta, was commissioned in 1977 though its oil jetty was operating since 1968, to feed the oil refinery installed there.²⁴

Performance

The performance of a port can be judged by several indicators, such as the following :

: 8 :

- (i) absolute cargo handling,
- (ii) capacity utilisation,
- (iii) surplus earning, and
- (iv) growth rate.

All these indicators do not point to the same thing. From the level of absolute cargo handling of a port we can judge the relative importance of a port, but this does not necessarily imply good performance of a port, unless the capacity is fully utilised. Surplus earning indicates the financial position and thus the economic viability of a port, ports with higher capacity utilisation and cargo handling may very well be the ports with negative profit. Changing importance of a port may also be judged by the growth rate of a port, though high growth rate may also be due to having a lower base. These four, taken together, provide a good indication of the state of health of a port.

In case of absolute cargo handling (Table 1) we observe that, except Calcutta port the cargo handling at all other major ports has been increasing. Only two ports, Bombay and Mormugao, manage to stay among the top four in every year (see Appendix, Table A1). Some other ports like Calcutta, Cochin, Vizag and Madras managed to engrave their name among the top four once or twice, but failed to maintain that position consistently. The situation with respect to Calcutta port is most depressing; its relative position in terms of cargo handling is declining over time. It ranked first in 1951-52 and second in 1961-62, but came down to sixth in 1981-82. Though the new ports - Paradip, Kandla, Tuticorin and New Mangalore - have failed to register their names among the top four, their position is improving over time in terms of absolute cargo handling.

Analysing the available data of capacity utilisation (Table 1), we observe that :

(i) Only Bombay port utilised its full capacity. Again only four ports out of the major ten have performed well in the sense that they registered more than 80 per cent utilisation figures - Bombay, Madras, Kandla and Mormugao. Two ports, Haldia and Vizag, are more or less close to the mark while others operating at figures which are far below that level.

(ii) Newly developed ports are relatively less successful, e.g. Tuticorin, Paradip and New Mangalore.

(iii) The positions of Calcutta and Cochin, two old ports, are also unsatisfactory. In case of Calcutta, actually we find a declining level of capacity utilisation since independence, only recently, after the installation of Haldia, has its position somewhat improved.

Making a detailed analysis of cargo-wise capacity utilisation, we observe a lack of consistency among ports; that for the same cargo, some ports are underutilised while several other ports remain overutilised. Another general observation is that the newly developed ports, specially those installed after 1965, are more underutilised coupled with some old ports like Calcutta and Cochin (Appendix, Table A2).

According to the surplus earning criteria most successful ports are Bombay and Kandla. (Table 1). These ports enjoy substantial increases in surplus, particularly Bombay. The position of Mormugao is medium because, even though it earns positive profit, its amount is decreasing over time. In case of Vizag and Calcutta - Haldia port complex, we observe a complete switch from positive profit to negative profit over time. In case of the latter, this

negative profit is mainly due to the heavy loss of the Calcutta dock, which is not counterbalanced by the surplus generated by the Haldia dock.²⁵ However, revenue does not depend only on the amount of cargo handled or the number of ships accommodated, but also upon port charge and demurrage charges. If the last two go sufficiently high, then even if the number of ships accommodated or amount of cargo handling declines over time, the port revenue can increase, as has been the case of Calcutta port.²⁶

The growth rate figures (Table 1) indicate that -

(i) Those ports which ranked among the top four on the basis of growth rates during the period 1951-61 have failed to do so during the last two decades, except Madras.

(ii) During 1971-81 the top four ports in terms of growth rate were mainly the new ports, i.e., those constructed after the independence, which began with a low base.

(iii) Even though the absolute amount of cargo handling has increased at Bombay port, the growth rates for New Mangalore and Tuticorin were relatively higher during 1971-81.

(iv) Except Madras other large ports have failed to register their name more than once among the top four.

(v) The striking result regarding the Calcutta port is that the growth rate is negative for the first two decades and then increases slowly during 1971-81.

The sum up, the ports which have improved their position over time in absolute cargo handling like Bombay, Mormugao and Kandla are also those with higher capacity utilisation. Similarly, the ports with a very low level of absolute cargo handling like Paradip, New Mangalore,

Tuticorin etc. are also those with a low level of capacity utilisation. Vizag, Cochin and Calcutta stand between these two categories. Madras port holds a middle position in terms of absolute cargo handling, but in terms of capacity utilisation its position is high. Newly constructed ports, beginning with a low or zero base, have relatively high growth rates, while the older ports handle larger cargo and often record higher levels of absolute increase in cargo. Taking all the indicators of port performance into consideration, we observe that west coast ports generally perform better than their east coast counterparts. Why this is so?

In view of the importance of 'container revolution' for the development of ports, let us also briefly examine the available facilities for container traffic in various ports. From the available data (Table 2) we observe that in India, Bombay port handles the major part of the container traffic, but, surprisingly, Kandla, Vizag and Paradip ports had no container traffic upto 1980-81.²⁷ Calcutta's position is also poor though it has a lot of potential for container operations, particularly in view of the fact that engineering goods, jute, tea, yarn, etc. originate from the Calcutta-Haldia port complex. Container facilities at Calcutta-Haldia are underutilised at present. There are several reasons for this, as²⁹:

- i. lack of infrastructure for handling containers,
- ii. reluctance of container vessels to call at this complex due to draft problem, and
- iii. absence of suitable economic transport system between Haldia and Calcutta.

For the convenience of the analysis, we propose to group the major ports into several categories, using their ranks in terms of absolute cargo handling, capacity utilisation and surplus earned. Table 3 gives the ranks on the basis

of each of these, and the aggregate ranking based on those ranks. We can classify the ports into the following three categories :

Group A : Bombay, Mormugao, Madras and Kandla.

Group B : Calcutta-Haldia, Cochin and Vizag.

Group C : Tuticorin, New Mangalore and Paradip.

Incidentally the ports in group A also happen to be the ones holding top four positions in terms of cargo handling in 1984-85 (Appendix, Table A3).

Why group-A ports are performing better?

Here we are considering two types of constraints, e.g. supply constraints and demand constraints, on the assumption that supply factors are internal to the port, while the demand factors are external to the port. The prominent supply factors are : (1) turn-round time, (2) draft, (3) infrastructural facilities, (4) labour problems, (5) productivity, and (6) port charge; while the prominent demand factors are (1) competition from other modes of transport, (2) direction of trade, and (3) unbalanced growth in the economy. In most cases these factors are closely interrelated and carry the influence of others. For example, the higher turn-round time may be due to longer navigational channel or low labour productivity. Similarly, labour problems, infrastructural facilities and productivities, draft, and port charges are interrelated. Again in case of the demand factors, one may find some relationship between the unbalanced growth in the economy and the direction of trade.

Let us now examine these factors one by one.

Turn round time

By this we mean the time spent by a ship in the process of entering ports, discharging cargo, reloading and leaving. Table 4 reveals that turn-round times (TRT)

of Bombay and Mormugao, two most successful ports, are much higher than these for Vizag and Cochin. Kandla, the port which is becoming increasingly important, has one of the highest TRTs.

Higher TRT may result from several factors :

(i) pre-berthing detention, (ii) long navigational channel along with tidal problems, and (iii) longer time required in unloading, because the ship concerned is large. If higher TRT is due to the third factor, then it may not lead to the decline of a port, e.g., Kandla. The second factor is not much important in India except for Calcutta port which is 232 kilometres away from the sea. Again, long navigational channel does not necessarily imply higher TRT unless there is some draft problem; in that case ships have to wait at the time of entering or leaving the port. So it looks that draft is more important than TRT. The role of the first factor is ambiguous, since pre-berthing detention can occur due to several factors, such as (a) bunching of ship arrivals (due to non-availability of berth); or (b) delayed unloading of cargo due to storage capacity constraint or labour problems.

From Table 5 we observe that at Bombay congestion is high and increasing while at Madras and Calcutta port it is declining. The level of congestion at Calcutta is almost half that of Bombay. Now congestion can arise due to several factors : (i) if the ships suffer pre-berthing detention beyond the reasonable time; (ii) if the unloaded cargo is not removed from the docks/storage places expeditiously, (iii) if storms, heavy rains, strikes and procedural factors cause the delay.

Available information shows that at Bombay congestion occurs due to pre-berthing detention and bunching arrivals of ships.²⁹ It is reported that goods not destined for

Bombay are also brought to Bombay because of the preference of importers for this port.³⁰ This happens because of its rich and expanding hinterland and also due to a well connected railway system which the Bombay port possesses.³¹ But, at Calcutta congestion occurs due to the non-availability of adequate drafts; ships have to wait until the proper draft is available both for entry and exit purposes.³²

Draft³³

Adequate draft is essential for the operational efficiency of ports as well as of the vessels. Generally speaking, a port should maintain a draft of 33 ft. at all times. From the available data (Table 6) we observe that, except Madras, Vizag, Paradip and Mormugao, no other port has the required draft. It is striking that even though Madras and Vizag have no draft problem, their performance is inferior to that of Bombay which does not possess the required draft. Further, while Bombay, Haldia, New Mangalore and Cochin have more or less the same draft, Bombay is by far the busiest port, while the figures for capacity utilisation at Haldia and Cochin are not so good. Finally, even though Haldia's available draft is more or less comparable to those for other major ports, the draft at Calcutta port is the lowest in the country, mainly because, unlike others, it is a riverine port.

Infrastructural deficiencies

The services produced by ports fall into three categories :

(i) Sea-related services : provision of access to the port by buoys and moorings, berths, pilots, tugs and lighters.

(ii) Land-related services : cargo handling by port labour, port's cranes, other equipments and vehicles and storage space (in sheds or open).

(iii) Delivery-related services: handling (e.g. customs or consignee's vehicle), container freight station (stuffing or stripping), warehousing and port's transport.

The list of services supplied in each category is far from exhaustive, but it indicates some of the main substitution possibilities that exist in ports. Some users demand only the services of one department such as vessels calling for bunkers or for shelters. For most of the users, however, demand for port services is joint, that is to say, most of them require a combination of berth space, tug-towing, cargo handling, warehousing and so forth. But the proportions in which they require each of these services varies considerably between ports.

In case of warehouse, transit sheds etc. we observe no positive association with performance (Table 7). In case of Mormugao, the second most successful port, facilities appear to be inadequate, while, at the same time, in Calcutta, Cochin and Vizag, ports with poorer performance, we observe availability of a significant amount of space for dry cargo storage despite a decline between 1973 and 1982.

Table 8 gives figures relating to different equipments - mobile cranes, wharf cranes and forklift truck - which are in the possession of various ports, and also some information relating to their age, but the capacities of individual equipments might vary from port to port. These are not found to be closely correlated with the performance of the ports in terms of cargo-handling.

Labour disputes

The intensity of labour disputes can be judged by the resulting figures of lost man days and lost ship days.³⁴ The lost man days figures is calculated by

multiplying the total work force with the number of days lost due to labour problem, thus the port with a larger work force may have higher lost man days figure even if the number of days lost is proportionately low, compared to other ports. So, exclusive use of the lost man days figures, might be misleading.

Table 9 shows that labour problems are more acute in group A ports compared to group B ports (except Calcutta port) and, similarly, more acute in group B ports than in group C ports. So, instead of getting negative correlation, we get a positive relationship between labour problems and cargo handling. This may be due to the fact that the trade unions are stronger at the busier ports (because of higher work force) and also that the labourers are more aware of their rights.

Productivity

Here we will examine whether success is correlated with productivity. Productivity can be measured in two ways :

- (a) By comparing the absolute amount of cargo handling and total employment.
- (b) By measuring the average service time required to handle 1000 tonnes of different commodities.

But the first one is not a good indicator, since those ports which have a longer navigational channel, wider area, larger network of railway lines and warehouses require a larger work force. In the present analysis, the average service time to handle one thousand tonnes of commodity has been taken as an indicator of labour productivity.

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From the available data (Tables 10 and 11) we observe that Cochin has the highest productivity in mineral oil handling and the next is Bombay. But the amount of mineral oil handled by Bombay is the highest and in case of Cochin, it is one of the lowest. In Kandla and Madras productivities are lower compared to Cochin, but these ports handle larger amounts.

Similar things occur in case of iron ore and fertiliser handling, i.e., on the one hand highly productive ports are handling, smaller amounts, while, on the other, lower-productivity ports are handling larger amounts. Hence we do not find any significant relationship (positive) between productivity and the amount of cargo handled. So we may say that productivity is not an important factor for the observed performances of Indian ports.

Port charge

The prices charged by ports fall broadly into two categories : (i) user charges, and (ii) service charges. User charges include dues levied on ships for each call, which vary continuously with one or more of the vessel's dimensions and discontinuously with the length of the stay. river conservancy dues, dues falling on cargo (wharfage) levied usually on the quality of cargo moved, and storage fees which cover sheds and warehouses. Service charges include charges for the use of labour and ancillary equipment, which vary with the amount of services used in moving the cargo; crainage charges which vary with the amount of crane services consumed; mooring and berthing charges, pilotage, which vary normally with the quantity of the vessels, towage and tugging.

Now the question arises, to what extent port charges influence the choice of port.

To determine the port through which the cargo should be routed, the primary consideration of the user is to minimise the transportation cost. Three elements of transportation costs of routing the cargo through a port are : (i) internal transport costs, (ii) port costs, and (iii) shipping costs. The least cost situation based on the sum total of these three elements of transportation costs influences the routing of the cargo through the given ports. Hence port charge is an important factor in determining the supply of ships to a port. If it is reasonable then even if the other two costs are moderately high, the total cost might be small. But higher port charge alone would not influence the performance of a port. If we assume that the port of delivery of cargo is the port nearest to the place for which goods are imported, then savings made on the internal transport cost would offset the higher port charges.

The total port charge consists of several separate charges such as wharfage charge,³⁵ port dues, pilotage, crainage charge, etc. Let us discuss some of these one by one.

Table 12 reveals that port dues charged at different ports are similar, except for Cochin for coastal trade. But, for foreign trade, Bombay shows the lowest dues. Also Bombay and Mormugao are the two most cost effective ports, regarding the wharfage rate (Table 13), in all goods except iron and steel and chemical; Vizag and Kandla are cheaper for these two.

Considering Table 13 and Table 14 together we get some striking results :

(i) Even though Kandla is cheaper for the handling of chemical goods Bombay is used more often.

(ii) Iron ore handling involves larger amount in Vizag and Mormugao than in ports like Kandla and Bombay which are more cost-effective. In case of Vizag, this may be due to the minimisation of internal transport cost³⁶ and shipping cost since Japan is the main buyer of iron ore. But in case of Mormugao it is surprising since it is preferred over the eastern ports despite the latter's proximity to Japan. But this port has lower internal transport and shipping costs compared to Bombay and Kandla and lower port charges than Vizag and Madras.

(iii) For iron and steel the nearest port is Vizag and it is also the most cost-effective one. Even then, Bombay handles more of iron and steel than Vizag.

From the above three cases it is noted that the choice of port has not been made solely on the basis of port charge. Thus port charge does not appear to be crucial, even though important, for the choice of a port.

Demand constraints

In the present paper a distinction has been made between demand and supply constraints on the assumption that demand factors are external to the port. Major demand factors which will be analysed here are as follows:

- (i) competitions with the railways,
- (ii) direction of foreign trade, and
- (iii) unbalanced growth in the economy.

While the first factor leads to the decline in the coastal trade, the last two explain the decline in foreign trade.

Competition with the railways

This question has kept cropping up from time to time since the full-scale opening of the railway lines in India. In 1933-34 this rivalry assumed serious proportions. The loss of traffic was especially marked in cases of coal and wheat. Other coastal traffic, like tea, piece-goods and gunnies were also affected by the exceptionally low railway rates for transport between Calcutta and Bombay.³⁷ After independence a massive expansion of rail and road networks has taken place (Appendix, Tables A4 and 5A) along with the expansion of inland water transport. Table A6 reveals that, inspite of the above expansion, coastal cargo handling at each port has increased, though this does not imply that ports have remained unaffected by the expansion of railways.

Table 15 reveals the clear supremacy of the west coast ports over the east coast ones in the matter of handling coastal traffic.³⁸

Further, it is observed : (i) Mormugao and Paradip are foreign-trade oriented while Tuticorin is coastal-trade oriented. Two ports, Cochin and New Mangalore, have recently switched over to the former category. (ii) Bombay and Calcutta-Haldia port complex accounted for higher level of both coastal and foreign cargo traffic. Kandla has joined with them recently. (iii) Whereas most of the ports have consolidated their position in terms of coastal traffic handling, the positions of Calcutta and New Mangalore port have deteriorated over time.

Coastal shipping is required mainly for the internal movement of domestic commodities and for the distribution of imported goods. In both cases competition from the other two modes of transport, railways and roadways, is expected. But the reason behind the extremely low level of coastal traffic (Appendix, Table A7) is not the competition but the inability of the government to exploit this mode even though it is cost-effective for longer movement.³⁹

Relative importance of different ports in terms of coastal cargo handling may be significantly explained by the policy factors. Mormugao and Paradip were developed mainly for the export (foreign) of iron ore while Tuticorin for the export (coastal) of salt and cement.⁴⁰ Popularity of New Mangalore arises due to its proximity to Laccadive and Amindive islands wherefrom coir and other coconut products are brought for sale.⁴¹ In case of Bombay its importance is due to the handling of coastal trade in oil while, at Calcutta, this is due to the coastal export and import of coal and salt, respectively. The decline in coastal traffic at Calcutta is due to the diversion of traffic to the railways.

Table 16 reveals that railways handle much more cargo than the coastal cargo carried by the ports. However, the growth rate over time is higher for the ports and, as a result, the ratio of cargo handled by the railways to that handled by ports has declined. While this is the general picture, in case of Calcutta Port, there seems to have been a significant diversion of some important items traditionally handled by it, e.g. coal, iron and steel, salt and cement, to the railways (Table 17).

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For this diversion of traffic to railways both the expansion of tracks and routes and also the freight equalisation for iron and steel and telescopic freight rate for coal by the central government are responsible. Sometimes both of these two factors operate together, e.g. with the doubling of railway track in southern zone, railways had decided, in 1963, to carry most of their coal requirement in the south by all-rail route.⁴² Similarly, with the opening of the new rail link, the Kandla-Desa railway, large quantities of salt were moved by the railways.⁴³ This diversion was helped by the railways offer of concessional rates for these traffic movements.

Direction of trade

Direction of trade can also affect the performance of a port. Table 18 reveals that, over time, the relative importance of America and Africa have declined, while Europe and Asia have increased their share. Again, if we divide Asia into two parts as Western Asia and Eastern Asia, we observe that (Appendix, Table A8) the importance of Western Asia has increased particularly in case of import. This may be an important factor explaining the higher level of activity of the west coast ports, particularly Bombay, Mormugao and Kandla.

Unbalanced growth in the economy

Performance of any port depends on the economic condition of its hinterland. If the hinterland is rich in terms of the levels of income and industrialisation, then the cargo handling both for import and export purposes would also likely to be higher.

Table 19 reveals that the absolute level of state domestic product (SDP) and the growth rate in SDP are higher in the western and north-western states compared to eastern and southern states. Even though the differences in SDP were not very substantial among Maharashtra, West Bengal and Tamil Nadu in 1960-61, Maharashtra came to hold a far superior position by 1981-82.

43 Further, Table 20 shows that not only the western and southern states are industrially richer - e.g., Maharashtra, Gujarat and Tamil Nadu - but also the performances of the industries belonging to western and southern states (e.g., chemical, coffee, petroleum, oil and lubricants) appear to be better compared to those belonging to the eastern states (e.g., jute, tea and coal). This can be judged from the export and import figures of those industries (Table 21 and Table 22).

Our objective was to identify those factors which are responsible for the lop-sided performances of the Indian ports. From the analysis we have observed that no single factor is crucial. Only in case of Calcutta port the relationship between port charges, T.R.T. and draft holds. Among the demand factors, though the competition from the railways is not important (except Calcutta), other two factors, i.e., direction of trade and unbalanced growth in the economy significantly explain the performances of ports.

Performance of Calcutta port

Analysing the available data, we observe that whereas the absolute cargo handling at different major ports are increasing, there is a declining trend in case of the Calcutta Port Trust and, only recently, after the installation

of the Haldia port, this downward tendency has been, more or less, checked. Not only this makes the growth rate either negative or very low, but also leads to a fall in Calcutta's share of total foreign trade traffic. This share has come down from 48.5 per cent in 1960-61 to 10.1 per cent in 1985-86.⁴⁴ The share of this port in the country's container traffic was only 8 per cent during 1984-85⁴⁵. Capacity utilisation is also quite low in the Calcutta-Haldia port complex compared to other major ports. Regarding surplus earning, the Calcutta-Haldia complex shows a huge deficit.

Making a comparison between Calcutta and Haldia ports over time, we observe that whereas the absolute cargo handling in Calcutta port is declining, that at Haldia is increasing and has ultimately surpassed Calcutta's figure in 1979-80. As a result, whereas the growth rate of the Calcutta port is negative, it is very high (due to a lower base) at the Haldia port. Capacity utilisation in Haldia is also far higher than that for Calcutta. Regarding surplus earning, we observe that whereas Calcutta is continuously making losses since 1965,⁴⁶ Haldia is earning surplus since its emergence (Table 23).

There are problems with the Haldia port too. In the mid-sixties, the Haldia Planning Cell⁴⁷ observed that the future of Haldia port was almost assured and that the uneconomic operation of the Calcutta port would be more than offset by the profit likely to accrue from the first few years of Haldia's operation. It was also said that Haldia would also reduce the total burden of traffic on the Calcutta port. It was also hoped that the state economy would be boosted up by coastal shipping, thus reducing the overall cost of transport, by a considerable amount of saving, which would be generated due to the cheaper cost of handling of the traffic at Haldia than that in Calcutta.

As far as the growth of the surrounding areas

As far as the growth of the surrounding areas is considered, we get mixed results. Though some industries have been located there, e.g., fertiliser, or oil refinery, many more were expected. The likely development of a petrochemical industry, with its enormous forward and backward linkages, may turn the situation in its favour in future. Its surplus earnings have, however, failed to offset Calcutta's deficit. Table 24 shows how far Haldia was lagging behind the target fixed for 1975-76 even in 1984-85.

Thus, even the combined operation of Calcutta and Haldia ports have failed to avoid the stagnation of the Calcutta port. We may note three sets of factors which are mainly responsible for this sluggish performance of the Calcutta-Haldia port complex⁴⁸ : (i) physical and technological factors, (ii) economic factors, and (iii) policy factors. Whereas all these factors are important for the Calcutta port, the first one is not very important for Haldia.

Among the physical and technological factors the most important are draft and infrastructural deficiencies. The main current of the river Ganga now flows along the tributary of Padma and, as a result, the river in Calcutta does not receive fresh water for practically nine months in a year. What we see Calcutta now is a tidal creek fed by and entirely dependent on the sea tide from the Bay of Bengal.⁴⁹ The long stretch of 125 miles up to the sea is now entirely at the mercy of the flow condition of this tide, but the sand and rocks received from the sea tide have led to alarming losses of draft (Appendix, Table A9). While the national target is to achieve a draft of 33 feet⁵⁰ the availability of this is rare at Haldia and is totally

non-existent in Calcutta. Also bores, bars and bends (due to which ships of more than 565⁵¹ feet length can not access the port) are the other main headaches. Though the available draft is higher at Haldia compared to Calcutta, it is far below the original target (40 feet).⁵² In case of infrastructural deficiencies, shipping lines point out that the Calcutta port has hardly any major handling equipment in order. Forklifts, trailers and tractors are not available when needed. Out of 29 mobile cranes in the Calcutta dock 14 were purchased in 1957-58 and a substantial number between then and 1964-65.⁵³ Of the 37 forklifts, 20 were purchased in 1973-74, 10 in 1974-75 and 7 in 1975-76.⁵⁴ Of the 45 tractors, 27 are 14 to 20 years old.⁵⁵ In the Kidderpore docks, the cranes at certain berths were purchased in 1942-43, while in Netaji Subhas dock, out of 43 cranes, 23 were brought in 1929.⁵⁶ These are apart from the fact that no special repairs of the docks were done since 1965, because of its serious financial problems, even though it is urgently required.⁵⁷

Among the economic factors the most important is the stagnation of the hinterland. It is well known that since the mid-sixties the entire eastern part of India, specially West Bengal, is facing a serious industrial recession. Not only the new industries are absent, but also the performance of the existing industries is far from satisfactory, apart from the higher port charges prevailing at the Calcutta Port Trust (Appendix, Table A10), which have led to the diversion of traffic to other ports.

Policy factors are no less important, particularly for the decline of coastal traffic. Transport policy has been formulated in such a way that the transport of coal by railway becomes economical upto 1761 kilometres and for salt upto 2850 kilometres.⁵⁸ For coal this occurs due

to the introduction of a telescopic freight rate structure, while iron and steel are subjected to the freight equalisation policy. All these are diverting the potential coastal cargo from Calcutta to the railways.

III. The issue of delinking of Haldia port from Calcutta port and other issues

Delinking of Haldia

The suggestion of delinking Haldia port from Calcutta Port Trust and the development of the former as a major port is on paper for a long time.

Let us discuss the possible advantages which the economy and that the Haldia port are expected to enjoy after delinking. For the convenience of our analysis it is assumed here that Haldia port is self-sufficient regarding its infrastructural facilities. Possible advantages are as follows :

First, since at Haldia 93 per cent of the total cargo is handled mechanically⁵⁹ and also the work force is small, we may hope for a higher labour productivity and a lower level of labour disputes there. These factors, coupled with the shorter navigational channel, may make the turn round time significantly lower at Haldia compared to the Calcutta port.

Secondly, though Haldia was originally developed as a subsidiary port, it has now become the main partner. But it lacks the necessary administrative power and is suffering when on-the-spot decisions are required. Eastern India Shippers Association (EISA) has argued that increasing number of shippers, particularly of tea, are switching

over to ports in the south on account of severe pilferage on the way from Calcutta, inadequate equipments for the rising volume of containers and higher handling costs.⁶⁰ It is also argued that the Calcutta Port Trust lacks interest in promoting Haldia as a major satellite port.⁶¹ According to this view, delinking is the only answer to Haldia's administrative problems.

Thirdly, because of the tie-up of Haldia with the Calcutta port, the latter is handling more container than Haldia inspite of its poor facilities, though, on economic grounds, much more of the container traffic should be from Haldia; the cost-differential being up to Rs. 1500 per container. Opposition to such diversion of container traffic comes mainly from the stevedores and the Dock Labour Board lobby in Calcutta, as the shifting of cargo from Calcutta to Haldia would make them redundant. Some of them are in business for more than hundred years with the shipping companies and have developed vested interests. However, the entire government container cargo is handled through Haldia since no middleman is involved. The problem lies, therefore, in an artificial attempt to keep the Calcutta port alive at the expense of the Haldia port, according to this view.⁶²

Fourthly, presently Haldia's surplus earnings are eaten away by the deficit incurred by its parent body - the Calcutta port. After delinking this surplus could be utilised for the overall development of Haldia port alone.

Lastly, such delinking would help to keep port charges of Haldia at a low, competitive level, and would thus encourage further demand for its services, as well as discourage the diversion of traffic to other ports because of high port charges.

Some of these arguments have been hotly contested by the Calcutta port authorities. They have argued that several steps have been taken to make Haldia efficient such as (i) reduction in pilotage,⁶³ (ii) development of container terminal at Haldia,⁶⁴ (iii) linking of Haldia with Gauhati (proposed) through waterway,⁶⁵ apart from the necessary autonomy given to Haldia.

Further, analysing the available data (Appendix, Tables A11 and A12), we observe that, for some commodities, not only the labour productivity in Calcutta is higher than that in Haldia inspite of the latter's higher level of mechanisation, but also the labour disputes are no less important at Haldia, and the Calcutta port enjoys a lower turn round time (Table A13) inspite of various difficulties.

On the other side, some of the possible disadvantages have also been indicated by those who are opposed to such delinking and would prefer the existing arrangement to continue. Their arguments are as follows:

First, both Calcutta and Haldia ports are located on the same river which makes it possible to economise on administration, pilotage and maintenance if the integrated set-up is continued.

Secondly, delinking would give rise to serious problems of coordination in the functioning of the common navigation channel, its dredging, maintenance and operation.

Thirdly, the delinking would lead to the certain death of the Calcutta port with its attendant consequences, while the two, taken together, would make the Calcutta Port Trust economically viable. Further, this would

prejudicially affect the growth and marketing prospects of the new free trade zone. Similar problems would also arise in the cases of industries concentrated in the Calcutta Metropolitan District (CMD) area.

Lastly, serious concern is being expressed regarding the possible impact of delinking on the economy and employment in the Calcutta Metropolis. Since this is a major issue, we are now taking a close look at this in the following paragraphs.

Employment

The direct employment offered by the port in Calcutta can be classified into the following categories: (i) port labourers, (ii) stevedores' steamer and clearing agents and their office employees, (iii) employment in ship building and repairing industries, and (iv) employment at depots and warehouses.

Table 25 gives figures on direct employment by Calcutta Port Trust alone, for the recent years. It shows how such employment has declined from 34328 in 1980 to 23962 in 1986.

Table 26 gives details of direct employment generated by the port besides those employed by the Port Trust. Here the port labourers have been divided into two components - those employed by the stevedores through the Dock Labour Board and those directly employed by the port authorities. It is seen that between 1961 and 1981 there has been a massive drop in direct employment, largely because of a decline in cargo handling. The fall has been severest in case of those engaged as dock labourers. The

total number directly employed now is around 45000, whose job would be directly threatened by any further decline of the port.

More important, perhaps, are the indirect employments generated by the activities of the port. A survey undertaken by the Port Commissioners in 1961 revealed that about one-third of Calcutta's population were dependent, directly or indirectly, on the port for their jobs.⁶⁶ This might have been an overestimation, and in any case both the importance of the port and its capacity to provide employment have declined since. One estimate shows that in 1961 about 171500 were engaged in depots, sheds and warehouses; but there is no firm data on this for subsequent years. Table 27 shows that the volume of indirect employment increased from 95000 in 1961 to about 150000 in 1981.

Land use in Calcutta port

Out of 36.92 square miles of Calcutta municipal area, the Port Trust owns about 4 square miles of land spreading from Cossipore to Taratala road.⁶⁷ On the north the Port Trust lands are mainly a riverside corridor. On the south, abutting Garden Reach road, Circular Garden Reach road, Hide road, Ninak Mahal road, Taratala road, Port Trust owns a very large area, which makes it the single biggest landowner in Calcutta today.⁶⁸ In totality the Port Trust estate, including Howrah and Budge Budge part, covers an area of 3370 acres of which 2037 acres are used by the port for its own purposes.⁶⁹ Some of the well known industries are located on the land owned by the CPT. Land has been made available for the construction of private warehouses in addition to warehouses built by

CPT itself around the Netaji Subhas and Kidderpore docks and jetties along the river.⁷⁰ Sites have been provided for community facilities such as recreational areas, clubs, play grounds, retail shopping and wholesale markets. CPT has also developed land in the past for the residential quarters for its own employees. The development work undertaken by CPT over the years in the past has in turn generated extensive private development in areas close by.⁷¹

The entire port area can be divided into four zones.⁷² Zone A comprises the river front property between Muttylal Seal Ghat and Cossipore Gun and Shell factory measuring approximately 150 acres.⁷³ Zone B is the property around Kidderpore docks (excluding the Kidderpore dock proper) and what once used to be the Boat canal and consists of approximately 1090 acres.⁷⁴ Zone C covers the south west part of the port estate and is bound on the north by Garden Reach road and Netaji Subhas dock, on the south by Taratala road, on the east by Hide road and Hide road extension and on the west by Taratala road. This sector is 1317 acres in area.⁷⁵ Zone D comprises the Shalimar-Ramkistopur area and the Timber pond area, together accounting for approximately 360 acres.⁷⁶

Table 28 shows that, compared to the city as a whole, residential use of land is severely restricted in the port area, as also the open space, while more of the port land is devoted to transport and communications and industrial activities. Table 29 gives zonewise breakdown of various uses, which also more or less confirm this finding, despite some variations between zones.

One positive consequence of the decline of the port and the cessation of some of the activities linked with the port would be that more of the land under the

control of the port could then be released for other uses. In fact, even without assuming such further decline a case can be made out for such diversion in use in a large part of the port area. The river-front area (Zone A) can be more optimally used if many of the existing warehouses, which are in dilapidated conditions are demolished and replaced by taller and newer structures. Another possible alternative is to take the river-front as a major resource of the city and then to plan for open space, promenades, recreational facilities and so on. The National Commission on Urbanisation also holds the view that a good part of the land presently under the control of the port might be released for some urgent uses. Some of the other uses of Zone A land, such as bathing ghats, burning ghats and temples can be combined with such recreational use, while the big Posta Bazar can be relocated.

A good part of the port land around the Kidderpore dock (Zone B) can also be released for alternative uses. The bustees can be redeveloped, warehouses can be rebuilt on a smaller space, while the industrial use of the land along the Hide Road may be retained.

Zone C mostly consists of low-lying water-logged areas with no effective use. Already a proposal is under consideration to redevelop it with residential, office and other facilities. A part of Zone D is subject to flooding and is used by the timber merchants to bring boats filled with timber during high tide. This is a suitable site for boat-repairing and boat-building activities, but not for other purposes. Other parts of the zone are covered by flour mills, godowns, coal siding and a variety of activities.

In short, it is possible to divert a substantial part of the existing land under the port authorities for other uses, even if the port is assumed to suffer no further decline in future mainly for residential and recreational purposes, and partly for commercial and industrial activities. The demise of Calcutta Port would help to release a massive amount of land for other purposes.

However, the overall economic impact of further decline or the demise of the Calcutta port can not be assessed without hard statistical data on the linkage between port activities and those related to banking, insurance, commerce and industries in the city. The data we have given so far highlight the severe impact of such delinking on direct employment and indirect employment connected with industries which are dependent on the port, but are by no means exhaustive. There is every likelihood that the advantage in terms of more land being released for other uses would be more than outweighed by the negative impact of the shock of the decline of the port on the rest of the economy. On the other hand, a substantial turn in the fortune of the port is unlikely in the near future without a massive economic revival in its hinterland.

Notes and References :

1. ~~Prasenjananda~~ Banerjee, Calcutta and its hinterland (1833-1900) Progressive Publishers, Calcutta, 1975, p. 24.
2. Ibid.
3. Ibid.
4. Ibid.
5. Nilmani Mukherjee, The port of Calcutta - a short history, The Commissioners for the port of Calcutta, Calcutta, 1968, p. 202.
6. Ibid. p. 193.
7. Calcutta Port Trust, Planning and Research Department.
8. The Commissioners for the port of Calcutta, The port of Calcutta, Centenary Publication, 1970, p. 6.
9. Ibid.
10. Ibid.
11. Ibid.
12. Government of India, Third Lok Sabha, Estimates Committee (1964-65), 67th Report, p. 68.
13. Ibid.
14. Ibid.
15. Government of West Bengal, Development and Planning (Town and Country Planning) Department, An outline development plan for Haldia industrial urban complex, 1975, p. 1.
16. Nilmani Mukherjee, Op. Cit., p. 216.
17. Estimates Committee (1964-65), 67th Report, Op. Cit., pp. 69-70.
18. Government of India, Seventh Lok Sabha, Estimates Committee (1981-82), 32nd Report, p. 1.
19. Ibid.
20. Ibid.

21. Government of India, Seventh Lok Sabha, Estimates Committee (1981-82), 32nd Report, p. 1.
22. Ibid.
23. Ibid.
24. Economic Time, 28th February, 1987.
25. For example, in 1985-86 Calcutta's loss was Rs. 12.87 crores whereas Haldia's surplus was Rs. 10.96 crores (Calcutta Port Trust, Research and Planning Dept.).
26. The demurrage earning of Calcutta Port, in 1982, was Rs. 30 crores, (Financial Express, 18th April, 1983).
27. Govt. of India, Ministry of Shipping and Transport, Transport Research Division, Basic Port Statistics of India, 1979-80.
28. Government of India, Seventh Lok Sabha, Op. Cit., p. 87.
29. Ibid, p. 19.
30. Ibid., p. 32.
31. Ibid., p. 24.
32. Ibid., p. 19.
33. The depth necessary to submerge a ship to her load line.
34. Ship day lost means a day lost by a ship delayed. This may be due to several factors, as labour problems, non-availability of berth, etc. To get the information of labour problems one should take the lost figure due to labour problems.
35. A port charge on the ship for all cargo conveyed on, over or through a wharf/berth. It is called harbour dues at Madras and landing charge at Vizag.
36. Ore comes from Bailadila mines, Vizag is nearest to it. (Economic Times, 16th September, 1986, p. 47).
37. Nilmani Mukherjee, Op. Cit. p. 151.
38. This is also true for handling of foreign cargo traffic.

39. For Coal, movement by Railway is economical upto 1761 kilometres and for salt upto 2850 kilometres (Government of India, Planning Commission, Transport Policy Planning Project, 1977, p. 36).
40. (i) Government of India, Fifth Lok Sabha, Estimates Committee (1972-73), 23rd Report, p. 4 and, (ii) Government of India, Fourth Lok Sabha, Estimates Committee (1967-68), 31st Report, p. 7.
41. Government of India, Ministry of Information and Broad Casting, Op. Cit., p. 41.
42. Sachinandan Sau, 'Problems of Calcutta Port', (a paper presented to the conference on Metropolitan Development at Calcutta University's Centre for Urban Economic Studies, 1984), p. 14.
43. Ibid.
44. Calcutta Port Trust, Planning and Research Development, Development of Calcutta Port, A paper presented to the students of Centre for Urban Economic Studies, University of Calcutta, 1986, p. 5.
45. Calcutta Port Trust, Planning and Research Department.
46. Government of West Bengal, Development and Planning (Town and Country Planning) Department, Haldia Planning Cell, Interim Strategy Plan, 1971, p. 2.
47. Ibid., p. 4.
48. Arun Prasad Sen, 'A survey of major Indian ports,' one of the series of papers prepared by the Task Force (Perspective Plan), Calcutta Metropolitan Development Authority.
49. Calcutta Port Trust, The Commissioners for the port of Calcutta, Op. Cit., p. 6.
50. Government of India, Seventh Lok Sabha, Estimates Committee (1981-82), 32nd Report, p. 118.
51. Calcutta Port Trust, The Commissioners for the port of Calcutta, Op. Cit., p. 6.

52. Government of West Bengal, Haldia Planning Cell, Op. Cit., p. 2.
53. Estimates Committee (1981-82), 32nd Report, Op. Cit., pp. 63-64.
54. Ibid.
55. Ibid.
56. Ibid.
57. Ibid.
58. Government of India, Planning Commission, Transport Policy Planning Project, A synopsis on report of studies on model costs and traffic flows Railways, Highways and Coastal shipping, 1977, p. 36.
59. Estimates Committee (1981-82), 32nd Report, Op. Cit.
60. Business Standard, 7th September, 1986.
61. Ibid.
62. The Telegraph, 27th April, 1986.
63. The Telegraph, 10th December, 1984.
64. Estimates Committee (1981-82) 32nd Report, Op. Cit., p. 89.
65. The Telegraph (1984), Op. Cit.
66. Nilmani Mukherjee, Op. Cit., p. 208.
67. A.K. De and Associates, Consulting Engineer (33, Brabourne Road, Calcutta), Report on land use survey and valuation, Calcutta Port Trust Estate, 1983, p. 1. (The study was done on the request of Calcutta Metropolitan Development Authority).
68. H.K. Sen and Associates, Consulting Engineer (28, Shakespeare Sarani, Calcutta), Calcutta Port Trust Land Use Plan, 1983; p. 2.
69. A.K. De and Associates, Op. Cit., p. 3.

70. H.K.SSen and Associates, Op. Cit., p. 2.
71. Ibid.
72. Ibid., p. 3.
73. Ibid.
74. Ibid.
75. A.K. De and Associates, Op. Cit., p. 4.
76. H.K. Sen and Associates, Op. Cit., p. 3.

TABLE - 1
PERFORMANCES OF INDIAN PORTS

Ports	Absolute cargo handling (in 100000tonnes)					Percentage growth rate				
	1951-52	1961-62	1971-72	1981-82	1951-62	1961-72	1971-82	1981-82	1951-82	
Bombay	75.2 ^p	139.1	162.0	193.9	85.20	16.47	16.48			
Wormugao	-	65.0	117.0	149.7	-	80.00	27.89			
Madras	20.5	34.7	68.0	114.0	69.27	95.96	67.64			
Vizag	11.4	27.6	86.0	109.9	14.21	211.59	27.78			
Cochin	16.1	22.8	47.0	55.0	41.61	106.14	17.02			
Calcutta	94.5	92.0	73.0	94.7 ⁿⁿ	-2.63	20.87	29.72 ^{pp}			
Haldua	-	-	-	-	-	-	-			
Kandla	1.3	13.9	20.0	96.9	968.88	43.88	384.50			
Paradip	-	-	10.0	22.3	-	-	17.36			
Tuticorin	-	-	2.8 ⁿⁿ	26.7	-	-	935.01 ⁿⁿⁿ			
New Mangalore	-	-	3.4 ⁿⁿ	16.4	-	-	519.66 ⁿⁿⁿ			

TABLE - 1 (Contd.)

Ports	Surplus earning (in Rs. 10 millions)		Capacity utilisation
	1960-61	1983-84	1984-85
Bombay	3.41	45.99	100
Mormugao	1.01 ^η	0.04	90
Madras	0.49	0.49	93
Vizag	0.35	-4.48	77
Cochin	-0.04	-6.35	56
Calcutta	0.43	-11.42 ^{φφ}	50
Haldia	-	-	81
Kandla	0.04	6.31	92
Paradip	-	-8.52	44
Tuticorin	-	-	69
New Mangalore	-	-	36

φ Including Tuticorin

φφ Including Haldia

η For 1968-69

ηη For 1975-76

ηηη For the period 1975-76 to 1981-82

- Sources - (1) Government of India, Ministry of Shipping and Transport, Pocket book on transport in India 1969-70.
- (2) Government of India, Ministry of Shipping and Transport, Transport Research Division, Basic Port Statistics 1982-83.
- (3) Government of India, Ministry of Shipping and Transport, India-Ports and Shipping Statistics 1970.
- (4) Calcutta Port Trust, Research and Planning Department.
- (5) Business Standard, 11th April, 1984.

TABLE - 2

CONTAINER TRAFFIC HANDLING AT MAJOR PORTS IN TEUs^φ 1980-81

Port	Loaded	Unloaded
Bombay	50144	51137
Mormugao	-	30
Madras	4685	4668
Cochin	10910	9857
Calcutta-Haldia	7352	8116
Tuticorin	4505	4820
New Mangalore	212	177

φ Twenty foot equivalent unit

Source - Government of India, Ministry of Shipping and Transport, Transport Research Division, Basic Port Statistics of India, 1979-80.

TABLE - 3

RANKS OF PORTS IN TERMS OF PERFORMANCES

Port	Absolute cargo handling 1984-85	Capacity utilisation 1984-85	Surplus earning 1983-84	Total of ranks	Overall ranking
Bombay	1	1	1	3	1
Mormugao	4	4	4	12	4
Madras	3	2	3	8	3
Kandla	2	3	2	7	2
Vizag	5	6	5	16	5
Cochin	7	9	6	22	6
Calcutta-Haldia	6	8	8	22	6
Haldia	-	5	-	-	-
Tuticorin	8	7	-	-	-
New Mangalore	9	11	-	-	-
Paradip	10	10	7	27	8

Source - Based on Table 1 and Appendix Table A3.

TABLE - 4
TURN ROUND TIME OF SHIPS AT MAJOR PORTS
(in days)

Ports	1967-68	1980-81
Bombay	7.75	8.43
Mormugao	7.16	9.40
Madras	8.39	4.90
Kandla	9.72	10.19
Vizag	7.47	6.14
Cochin	6.18	5.17
Calcutta ⁿ	12.20	16.21
Paradip	-	9.30

ⁿ Sandhead to sandhead

- Source - (1) Government of India; Ministry of Shipping and Transport; Pocket book on transport in India, 1972-73.
- (2) Government of India, Seventh Lok Sabha; Estimates Committee (1981-82), 32nd Report on Ministry of Shipping and Transport.

TABLE - 5
CONGESTION FIGURES AT MAJOR PORTS

Port	Maximum number of ships waiting		Maximum waiting periods (days)	
	1980	1981	1980	1981
Bombay	38(Sept)	30 (April)	20(Jan)	45(July)
Calcutta-				
Haldia	19(Jan)	19(Jan)	29(Jan)	6(Jan)
Madras	47(Aug)	27(Aug)	19(Jan)	18(Aug)

Source - Government of India, Seventh Lok Sabha, Estimates Committee (1981-82), 32nd Report on Ministry of Shipping and Transport.

TABLE - 6

DRAFT FIGURES AT MAJOR PORTS, 1981
(feet)

Port	Actually maintained	To be maintained
Bombay (<u>Indira Dock</u>)	30.0	34.0
Mormugao	39.6	40.3
Madras (<u>Jawahar Dock</u>)	35.3	35.3
(<u>Outer harbour</u>)	46.2	46.2
Vizag (<u>Inner harbour</u>)	33.7	33.7
(<u>Outer harbour</u>)	50.5	50.5
Cochin	29.7	30.0
Calcutta	22.1	26.1
Haldia	29.1	39.9
Kandla	27.4 - 30.1	32.0
Paradip	34.0 - 39.0	39.0
Tuticorin	27.0	30.0
New Mangalore	30.0	30.0

Source - Government of India, Seventh Lok Sabha, Estimates Committee (1981-82), 32nd Report on Ministry of Shipping and Transport

TABLE - 7
 DRY CARGO STORAGE ACCOMMODATION AT SEVERAL PORTS
 (area in square metre)

Port	Transit shade		Warehouses		Total No. of berths
	1973	1982	1973	1982	1970
Bombay	220.6	247.4	65.3	132.5	54
Mormugao	7.5	7.2	12.7	10.9	7
Madras	47.0	53.7	78.0	78.0	18
Vizag	22.0	33.8	27.0	8.1	14
Cochin	33.8	31.8	15.7	19.1	13
Calcutta	280.2	83.0	475.3	397.0	50
Kandla	27.3	25.2	44.0	22.3	4
Paradip	-	10.2	-	3.1	1
Tuticorin	8.0	18.0	-	5.4	-
New Mangalore	2.0	7.6	20.0	4.4	-

Sources : (1) Government of India, Ministry of Shipping and Transport, Pocket book on transport in India, 1972-73.

(2) Government of India, Ministry of Shipping and Transport, Transport Research Division, Basic Port Statistics of India, 1982-83.

TABLE - 8
MECHANICAL FACILITIES AVAILABLE AT VARIOUS PORTS (1980)

Port	Mobile cranes		Wharf Cranes		Fork lift trucks	
	Total No.	Less than 15 years old	Total No.	Less than 30 years old	Total No.	Less than 10 years old
Bombay	44	10	194	104	75	66
Mormugao	3	1	15	6	6	0
Madras	29	16	48	41	76	76
Vizag	11	6	30	21	54	42
Cochin	9	4	24	17	52	32
Calcutta	37	17	127	69	49	48
Kandla	4	3	26	26	10	8
Paradip	6	4	3	3	18	18
Tuticorin	7	5	10	10	18	18
New Mangalore	6	6	8	0	5	5

Source - Government of India, Seventh Lok Sabha, Estimated Committee (1981-82),
32nd Report on Ministry of Shipping and Transport.

TABLE - 9
SHIP-DAYS LOST DUE TO LABOUR PROBLEMS AT MAJOR PORTS

Ports	1978	1980
Bombay	510	259
Mormugao	176	7
Madras	99	131
Vizag	1	0
Cochin	96	174
Calcutta	2198	375
Kandla	77	129
Paradip	38	70
Tuticorin	0	61
New Mangalore	0	32

Source - Government of India, Seventh Lok Sabha,
Estimates Committee (1981-82), 32nd Report
on Ministry of Shipping and Transport.

TABLE - 10
 AVERAGE SERVICE TIME TO HANDLE 1000 TONNES OF SEVERAL
 COMMODITY AT MAJOR PORTS (1980-81)
 (in hours)

Port	Mineral oil	Iron ore	Fertiliser
Bombay	1.74	-	24.03
Mormugao	2.68	2.83	29.96
Madras	2.25	0.51	17.16
Vizag	2.29	0.33	25.83
Cochin	1.48	-	26.70
Calcutta	1.97	5.50 ^a	29.48
Kandla	2.20	-	19.99
Paradip	-	1.14	30.42
Tuticorin	2.81	-	15.24
New Mangalore	3.34	7.80 ^b	24.12

a. Upto September 1980

b. Upto February 1981

Note - Yearly average has been obtained from monthly data.

Source - Vizag Port Trust, Research and Planning Department,
Statistical Bulletin 1980-81, No. 12.

: 50 :

TABLE - 11 ✓

CARGOWISE HANDLING OF TRAFFIC AT MAJOR PORTS (1980-81)
(in 100000 tonnes)

Port	Mineral oil	Iron ore	Fertiliser/ rock phos- phate/ sulphur
Bombay	82	-	13
Mormugao	6	126	2
Madras	46	28	8
Vizag	24	57	8
Cochin	40	-	7
Calcutta-Haldia	52	-	7
Kandla	64	-	7
Paradip	-	18	1
Tuticorin	-	-	-
New Mangalore	3	5	2

Source - Government, Ministry of Shipping and Transport,
Transport Research Division, Basic Port
Statistics of India, 1980-81.

TABLE - 12
 PORT DUES FROM SHIPS/STEAMERS IN COASTAL AND FOREIGN TRADE, 1969
 (rate per ton of net registered tonnage)

Port	Type of vessels	Coastal Frequency of payment	Rate (paise)	Foreign Frequency of payment	Rate (paise)
Bombay	Steamer	once in a month	12	once in a month	12
	Ships	once in a month	12	once in a month	12
Madras	Steamer	once in 60 days	25	on each entry	40
	Ships	once in 60 days	9	on each entry	25
Cochin	Steamer	once in 30 days	25	on each entry	25
	Ships	once in 60 days	10	on each entry	25
Calcutta	Steamer	once in 60 days	25	on each entry	25
	Ships	once in 60 days	25	on each entry	25
Kandla	Steamer	once in 30 days	15	once in 30 days	19
	Ships	once in 30 days	15	once in 30 days	19

Source - Government of India, Ministry of Shipping and Transport, Directorate of Transport Research, Port Transport Statistics of India, 1969-70.

WHARFAGE RATES AT PORTS FOR SOME GOODS EXCLUSIVE OF SURCHARGES, 1969-70

(Rs./ton)

TABLE - 13

Port	Sulphur	Food grains (rice import)	Iron ore	Oil cakes ^φ	Iron and Steel import	Iron and Steel export
Bombay	5.00	2.50	2.20	2.80	7.00	7.00-9.00
Mornugao	5.87	2.52	2.52	-	5.87	5.87
Madras	6.00	9.00	5.00	8.47	9.00	9.00
Vizag	5.40 ^a 4.40	3.20	3.75	4.90	5.35	5.35
Cochin	5.00	5.00	5.00	-	7.50	7.50 ^b
Calcutta	9.00	5.00	4.80	11.60	9.00	3.00
Kandla	3.00	4.00	1.00	3.60	4.95	3.95
New Mangalore	-	-	-	13.00	-	-

^φ for 1980; (a) in bulk; (b) per cubic meter

Sources- (1) Government of India, Ministry of Shipping and Transport, Directorate of Transport Research, Port Transport Statistics of India, 1969-70.

(2) Government of India, Seventh Lok Sabha, Estimates Committee (1981-82),

32nd Report on Ministry of Shipping and Transport, Government of India.

TABLE - 14

CARGOWISE TRAFFIC HANDLING AT MAJOR PORTS (1970-71)
(in million tonnes)

Port	Fertiliser/ rock phos- phate/sul- phur	Food grains	Iron ore	Mineral oil ^φ	Iron, steel and machinery
Bombay	11	10	-	83	6
Mormugao	1	-	76	6	-
Madras	5	7	21	46	2
Vizag	6	2	49	24	4
Cochin	3	2	-	40	-
Calcutta- Haldia	-	9	4	52	6
Kandla	2	3	-	64	-
Paradip	-	-	22	-	-
Tuticorin	-	-	-	-	-
New Mangalore	-	-	-	3	-

^φ For 1980-81 Including coastal traffic.

Sources - (1) Government of India, Ministry of Shipping and Transport, Pocket Book on Transport in India, 1972-73.

(2) Government of India, Ministry of Shipping and Transport, Transport Research Division, Basic Port Statistics of India, 1982-83.

TABLE - 15

TRENDS IN COASTAL AND FOREIGN CARGO TRAFFIC AT MAJOR PORTS
(in million tonnes)

Port	Coastal	Foreign	Coastal	Foreign
	(1960 - 61)		(1982 - 83)	
Bombay	3.294	11.055	9.561	13.648
Mormugao	-	6.401 ^φ	.445	12.369
Madras	.818	2.221	1.056	11.018
Vizag	.601	2.162	.748	9.468
Cochin	1.063	.947	1.469	4.241
Calcutta- Haldia	2.889	6.502	2.880	7.364
Kandla	.400	1.173	4.884	7.474
Paradip	-	-	-	1.572
Tuticorin	.712	.247	2.186	1.042
New Mangalore	.259	.146	.227	2.045

φ Including coastal traffic.

Sources - (1) Government of India, Ministry of Shipping and Transport, Pocket book on transport in India, 1969-70.

(2) Government of India, Ministry of Shipping and Transport, Transport Research Division, Basic Port Statistics of India, 1983-84.

TABLE - 16
RELATIVE IMPORTANCE OF PORTS AND RAILWAYS
(in 10 million tonnes)

Year	Railways cargo	Ports' coastal cargo	Ratio of railway to coastal cargo
1960-61	15.62	1.15	13.37
1982-83	25.60	2.53	10.11

Sources - (1) Government of India, Ministry of Shipping and Transport, Pocket book on transport in India, 1972-73.

(2) Government of India, Ministry of Shipping and Transport, Transport Research Divisions, Basic Port Statistics of India, 1982-83.

TABLE - 17
STUDY OF DIVERSION OF CALCUTTA-HALDIA PORT'S TRAFFIC TO
RAILWAYS (in 100000 tonnes)

Mode of transport	Year	Coal, coke	Iron and Steel ^η	Salt
Railways	1951-52	202.03	17.37	12.64
	1978-79	381.01	70.69	25.16
Calcutta-Haldia	1951-52	31.67	1.73	5.11
	1978-79	10.50	5.66 ^{φφ}	1.49 ^{φφφ}

η Bars, sheets, girders and other forms.

φφ For 1975-76.

φφφ Including inland traffic.

Sources - (1) Government of India, Central Statistical Organisation, Statistical Abstract, 1982.

(2) Research and Planning Department, Calcutta Port Trust.

TABLE - 18
 PERCENTAGE DISTRIBUTION OF INDIAN EXPORTS AND IMPORTS

Continent	1951-52		1976-77	
	Export	Import	Export	Import
America	28.2	36.3	12.5	24.6
Europe	36.8	31.5	45.2	31.4
Africa	7.2	9.5	6.1	4.3
Asia and Oceania	27.8	22.7	36.2	39.7

Source - Ruddar Datt and K.P.M. Sundharam, Indian Economy,
 1981, pp. 639, 640.

TABLE - 19
NET STATE DOMESTIC PRODUCT AT CURRENT PRICES
(Rs. in million)

State	Absolute S.D.P. 1960-61	1981-82	Percentage 1960-61	of Total ^φ 1981-82
Assam	3,360	27,984	2.69	2.66
Bihar	9,930	70,400	7.97	6.70
Orissa	3,741	34,891	3.00	3.32
West Bengal	13,394	87,953	10.76	8.38
Pubjab	4,038	55,391	3.25	5.08
Haryana	2,450	33,731	1.97	3.21
Rajasthan	5,594	50,065	4.49	4.77
Gujarat	7,382	75,420	5.93	7.19
Maharashtra	15,974	1,57,406	12.83	14.99
Uttar Pradesh	18,431	1,47,550	14.79	14.06
Andhra Pradesh	9,832	83,356	7.89	7.94
Madhya Pradesh	8,073	65,496	6.49	6.24
Kerala	4,322	37,177	3.46	3.54
Karnataka	6,916	57,949	5.55	5.53
Tamil Nadu	11,118	66,919	8.93	6.39

φ Total SDP of these 15 states.

Source - Government of India, Ministry of Planning,
Department of Statistics, Central Statistical
Organisation, Estimate of State Domestic Product,
June, 1984.

TABLE - 20

LEVEL OF INDUSTRIALISATION OF VARIOUS STATES

State	Number of registered factories 1976-77	Share of secondary sector in S.D.P. 1974-75
Assam	466	18.7
Bihar	723	18.0 ^φ
Orissa	186	14.8 ^φ
West Bengal	1632	26.2
Punjab	513	18.3
Haryana	-	23.3
Rajasthan	331	17.3
Gujarat	1792	31.0
Maharashtra	3180	32.1
Uttar Pradesh	1429	15.8
Andhra Pradesh	1352	16.7
Madhya Pradesh	1230	22.8
Kerala	714	19.3
Karnataka	960	18.7
Tamil Nadu	2780	29.4

φ For 1970

- Sources - (1) Government of India, Central Statistical Organisation, Statistical Abstract, 1982.
 (2) Rudder Datt and K.P.M. Sundharam, Indian Economy, 1981, p. 37.

TABLE - 21

EXPORT OF SOME PRODUCTS FROM INDIA IN 1960-61 AND 1980-81

Product/Unit	1960-61	1980-81
Jute bags and fabrics (1000 tonnes)	784	647
Raw cotton (1000 tonnes)	33	132
Cotton fabrics (100000 metres)	63,00	14,12
Coal (1000 tonnes)	11,48	1,08
Tea (1000 tonnes)	1,99	2,29
Coffee ^φ (1000 quintals)	19	66,80 ^η
Tobacco (1000 tonnes)	46	79
Iron ore and concentrates (1000 tonnes)	31,91	224,03
Raw sugar (1000 tonnes)	2,93 ^{ηη}	97

φ Unroasted

η For 1979-80

ηη For 1965-66

Source - Government of India, Central Statistical Organisation,
Statistical Abstract, 1982.

TABLE - 22

IMPORT OF SOME PRODUCTS TO INDIA IN 1960-61 AND 1980-81

Product/Unit	1960-61	1980-81
Raw Jute (1000 tonnes)	101	14
Fertiliser (1000 tonnes)	622	4832
Raw Cotton (1000 tonnes)	237	-
Petroleum (Rs. 100000)	69,47	52,63.47
Organic chemical (Rs. 100000)	24,83	201,79
Aluminium (1000 quintals)	2,54	12,41

Source - Government of India, Central Statistical
Organisation, Statistical Abstract, 1982.

TABLE - 23

PERFORMANCE OF CALCUTTA AND HALDIA PORTS

Port	Absolute cargo handling (million tonnes)			Capacity utilisation (%)	Growth rate (%)	Surplus earning (Rs. 10 million)
	1970-71	1979-80	1984-85			
Calcutta	5.80	3.60	3.38	50	-34.80	-12.87
Haldia	0.21	4.95	6.53	81	+309.52	+10.96
Calcutta Port Trust	6.01	8.55	10.31	66	+71.54	-1.91
						+2.79

Source - Calcutta Port Trust, Planning and Research Department.

TABLE - 24
TARGET AND ACHIEVEMENT: HALDIA PORT (million tonnes)

Commodities	Target for 1975-76	Actual handling in 1984-85
Petroleum, oil and lubricants	5.00	3.78
Fertiliser, rock phosphate	2.20	0.27
Foodgrains	2.00	0.02
Iron ore	5.00	(nil)
Coal	5.00	1.6.
Salt	0.90	(nil)
Total	21.60	6.53

- Sources - (1) Government of West Bengal, Development and Planning (Town and Country Planning) Department, Haldia Planning Cell, Interim Strategy Plan, 1971.
- (2) Calcutta Port Trust, Planning and Research Department, Review of Port Performance, 1985-86.

TABLE - 25

DECLINING EMPLOYMENT IN CALCUTTA PORT

Year	Employment
1980	34,328 ^φ
1983-84	29,251
1985	26,511
1986	23,962

φ Including Haldia

Source - Calcutta Port Trust, Research and Planning
Department.

TABLE - 26

DIRECT EMPLOYMENT GENERATED BY CALCUTTA PORT TRUST
IN CALCUTTA DOCK

Activities	1961	1981
1. Port labour		
a. Under direct pay role of CPT	42,000	23,962 ^a
b. Registered in the Dock Labour Board	19,000	8,848 ^b
2. Stevedore agents	3,400	800 ^φ
3. Steamer agents	4,800	2,600 ^φ
4. Clearing agents	6,000	Not available
5. Ship building and repairing	1,003	2,173
6. Depots, sheds and warehouses	1,71,500 ^η (1272 ^{ηη})	6,453 ^{ηη}

(φ) This is for 1986. Data are collected on the basis of door to door visit of 50 per cent Agents. (There were 16 Stevedore agents and 45 Steamer agents in 1984).

(η) Including indirect employees also.

(ηη) Only direct employment as reported in Census of India.

(a) Calcutta Port only; for 1986.

(b) For 1982.

- Sources -
1. Nilmani Mukherjee, The Port of Calcutta - A short History, The Commissioners for the Port of Calcutta, Calcutta, 1968, p-208.
 2. Census of India 1961, Vol. XVI. W. Bengal and Sikkim, Part-II B(i) General Economic Tables, Table B - IV, Part C.
 3. Census of India, 1981, Series-23, W. Bengal, General Economic Tables, Part-III A and B (ii) Table B - 12.
 4. Government of India, Ministry of Shipping and Transport, Transport Research Division, Basic Port Statistics of India, 1981-82.

TABLE - 27

INDIRECT EMPLOYMENT GENERATED BY CPT IN CALCUTTA

Activities	1961	1981
1. Jute	13,872	12,453
2. Leather	14,987	24,543
3. Chemical	18,588	22,705
4. Iron and steel	7,025	6,973
5. Engineering	22,866	75,608
6. Tea	2,364	1,472
7. Trucks (using the port)	16,000 ⁿ	5,600 ^{nm}

(n) There were four thousand trucks running with the Port Commissioners permit.

(nm) There were 1400 trucks using the port daily. In both cases it is assumed that four persons per truck is required.

- Sources -
1. Census of India 1961, Vol. XVI, W. Bengal and Sikkim, Part-II B(i), General Economic Tables, Table B-IV, Part C.
 2. Census of India 1981, Series 23, W. Bengal, Part - III-A and B (ii) General Economic Table, Table - B12.
 3. Nilmani Mukherjee, The Port of Calcutta - A Short History, The Commissioners for the port of Calcutta, Calcutta, 1968, p. 208.
 4. Calcutta Metropolitan Development Authority, Employment and Economy (Seminar Report), 1983, p. 330.

TABLE - 28

LAND USE IN THE PORT AREA AND THE CITY OF CALCUTTA

Mode of use	Percentage of Calcutta's land used, 1983	Percentage of port's land used, 1980
Transportation ^φ and communication	11.55	25.57
Commercial	4.13	2.61
Institutional	1.70	2.95
Industrial	3.84	20.08
Residential	42.01	3.54
Open space	29.32	14.40

φ Includes railway lines.

- Sources - 1. H.K. Sen and Associates, Consulting Engineer (28B, Shakespeare Sarani, Calcutta), Calcutta Port Trust Land Use Plan, 1983. (Work made on the request of CMDA).
2. A.K. De and Associates, Consulting Engineer (33, Brabourne Road, Calcutta), Report on land use survey, valuation, Calcutta Port Trust Estate, 1983. (Work made on the request of CMDA).
3. Calculated on the basis of data, provided by : Calcutta Metropolitan Development Authority, Area Planning and Development Control Circle, Directorate of Planning, Calcutta Metropolitan District, Existing Land Use 1980, Report No. 126, Volume 1, p. 4.

: 67 :

TABLE - 29

LAND USE OF CALCUTTA PORT AREA IN 1983
(in acres)

Mode of use	Zone A		Zone B	
	Land	% of zone A total	Land	% of zone B total
Transportation	42.00	27.45	530.00 ^φ	48.71
Commercial	37.50	24.50	38.00	3.49
Institutional	2.00	1.30	97.50	8.96
Industrial	0.50	0.32	295.00	27.11
Residential	0.50	0.32	67.50	6.20
Docks and Jetties	4.50	2.94	Area excluded	
Open space	31.00	20.26	-	-
Warehousing, godowns and open storage	22.00	14.38	60.00	5.39
Total (+)	153.00		1088.00	

TABLE - 29 (Contd.)

Mode of use	Zone C		Zone D	
	Land	% of zone C total	Land	% of zone D total
Transportation	182.00	31.81	108.00	30.00
Commercial	-	-	12.5	3.47
Institutional	-	-	-	-
Industrial	249.40	18.92	132.00	36.66
Residential	50.49	3.83	1.00	0.27
Docks and jetties	285.69	21.69	-	-
Open space	406.00 ^{φφ}	30.82	48.50	13.47
Warehousing, godowns and open storage	142.46	10.81	28.00	7.77
Total	1317.00		360.00	

(+) Percentage figures do not make 100, since some uses are excluded from the study.

φ Including open space.

φφ Including water bodies.

Sources - 1. H.K. Sen and Associates, Consulting Engineer (28B, Shakespeare Sarani, Calcutta), Calcutta Port Trust Land Use Plan, 1983. (Work made on the request of Calcutta Metropolitan Development Authority (CMDA).)

2. A.K. De and Associates, Consulting Engineer (33, Brabourne Road, Calcutta), Report on land use survey, valuation, Calcutta Port Trust Estate, 1983. (Work made on the request of CMDA).

APPENDIX

TABLE - A1

RANKING OF PORTS ON THE BASIS OF ABSOLUTE CARGO HANDLING

Rank	1951-52	1961-62	1971-72	1981-82
1	Calcutta	Bombay	Bombay	Bombay
2	Bombay	Calcutta	Mormugao	Mormugao
3	Madras	Mormugao	Vizag	Madras
4	Cochin	Madras	Calcutta	Vizag
5	Vizag	Vizag	Madras	Kandla
6	-	Cochin	Cochin	Calcutta
7	-	Kandla	Kandla	Cochin
8	-	-	Paradip	Tuticorin
9	-	-	-	Paradip

Source - Based on Table 1.

TABLE - A2
 PORT CAPACITIES AND TRAFFIC HANDLED AT MAJOR PORTS (1980-81) (million tonnes)

Port	Iron Ore		Coal		Petroleum, oil, lubricants	
	Capacity	Traffic	Capacity	Traffic	Capacity	Traffic
Bombay	-	-	-	-	10.50	8.18
Mormugao	14.00	12.42	-	-	1.50	0.59
Madras	8.00	2.75	-	-	4.00	4.58
Vizag	8.00	5.66	-	-	2.00	2.39
Cochin	-	-	-	-	3.50	3.94
Calcutta	-	-	1.00	0.22	0.50	0.69
Haldia	4.00	0.01	2.00	0.66	3.50	4.46
Kandla	-	-	-	-	11.00	6.32
Paradip	3.00	1.82	-	-	-	-
Tuticorin	-	-	-	-	1.00	0.45
New	-	-	-	-	-	-
Mangalore	-	-	-	-	1.80	0.21

TABLE - A2 (Contd.)

Ports	Fertiliser		General Cargo	
	Capacity	Traffic	Capacity	Traffic
Bombay	-	-	6.00	8.55
Mormugao	-	-	0.35	0.75
Madras	0.60	0.76	2.40	2.31
Vizag	0.30	0.13	2.10	2.08
Cochin	0.30	0.61	1.65	0.72
Calcutta	-	-	4.00	2.93
Haldia	-	-	0.76	0.32
Kandla	0.90	0.66	1.15	1.34
Paradip	-	-	0.35	0.47
Tuticorin	-	-	1.70	2.18
New Mangalore	-	-	0.55	0.75

Source - Government of India, Seventh Lok Sabha, Estimates Committee (1981-82), 32nd Report, on Ministry of Shipping and Transport.

TABLE - A3

CARGO HANDLED BY MAJOR PORTS (1984-85) (thousand tonnes)

Port	Cargo
Bombay	25,770
Mormugao	14,511
Madras	15,005
Vizag	12,873
Cochin	4,074
Calcutta-Haldia	10,524
Paradip	2,137
Kandla	15,745
Tuticorin	3,774
New Mangalore	3,382

Source - Calcutta Port Trust, Research and Planning Department.

TABLE - A4
EXPANSION OF RAILWAY

	1950-51	1969-70
Rail route length (kilometre)	53,396	59,684
Wagon number	205,596	383,891

Source - Government of India, Ministry of Shipping and Transport, Pocket book on Transport in India, 1969-70.

TABLE - A5
PUBLIC SECTOR PLAN EXPENDITURE ON TRANSPORT SECTOR
(Rs. 10 millions)

	First plan	Second plan	Third plan	Fourth plan	Fifth plan	Annual budget 1982-83
Railways	217	723	1326	934	2063	1320
Roads	131	224	440	862	1701	709
Road Transport	147	242	27	128	503	226
Ports	28	33	93	249	488	152

Source - Government of India, Ministry of Shipping and Transport, Transport Research Division, Basic Port Statistics of India, 1981-82.

TABLE - A6
TRENDS IN COASTAL CARGO TRAFFIC AT MAJOR PORTS
(thousand tonnes)

Ports	1960-61	1970-71	1982-83
Bombay	3,294	2,816	9,561
Mormugao	6,401 ^φ	267	445
Madras	818	607	1,056
Vizag	601	387	748
Cochin	1,063	1,069	1,469
Calcutta	2,889	1,650	2,880
Kandla	400	705	4,884
Paradip	-	1	-
Tuticorin	712	280	2,186
New Mangalore	259	232	227

φ Total traffic

- Sources - 1. Government of India, Ministry of Shipping and Transport, Pocket book on transport in India, 1969-70.
2. Government of India, Ministry of Shipping and Transport, Transport Research Division, Basic Port Statistics of India, 1983-84.

TABLE - A7
MODEWISE INTER-REGIONAL COMMODITY FLOWS (1978-79)
(million tonnes)

Mode	Tonnes	% share of the originating mode
Railways	185.00	65.65
Highways	96.00	34.07
Coastal shipping	0.70	0.28

Source - Government of India, Planning Commission, Transport Policy Planning Project, 1977, A Synopsis on Report of Studies on model costs and traffic flows - Railways, Highways and Coastal Shipping, p. 12.

TABLE - A8
CHANGING DIRECTION OF INDIAN TRADE WITH ASIA
(Rs. 10 million)

	1955-56		1978-79	
	Import	Export	Import	Export
Western Asia	642.44	196.76	11,019.14	4,167.61
Eastern Asia ^φ	1075.95	1139.11	9,271.41	10,500.60

^φ Excluding Sri Lanka

Source - Government of India, Central Statistical Organisation, Statistical Abstract, 1982.

TABLE - A9
AVAILABLE DRAFT IN CALCUTTA AND HALDIA PORT

Year	Number of days open to			
	21 feet draft vessels	26 feet draft vessels	32 feet draft vessels	32 feet draft vessels
	Calcutta	Haldia	Calcutta	Haldia
1954	276	-	148	-
1964	123	-	40	-
1975-76	N.A.	N.A.	89	-
1985-86	70	N.A.	4	164
				Haldia

φ For 1976-77

- Sources - 1. The Commissioners for the Port of Calcutta, The Port of Calcutta, Centenary Publication, 1970.
2. Calcutta Port Trust, Planning and Research Department, Review of Port Performance, 1985-86.

TABLE - A10
PORT CHARGES AT SEVERAL MAJOR PORTS (1980)

(Rs. per tonne)

Port	Oil cake	Sugar	Sulphar	Cement	Fertiliser
Bombay	2.80	3.50	7.00	4.90	4.90
Madras	8.47	15.84	23.76	11.88	15.84
Vizag	4.90	6.60	9.20	7.80	7.80
Calcutta	11.60	8.10	27.20	18.20	21.60
Kandla	3.60	9.00	9.00	8.00	13.00

Source - Government of India, Seventh Lok Sabha, Estimates Committee (1981-82),
32nd Report on Ministry of Shipping and Transport.

TABLE -- A11
 AVERAGE SERVICE TIME PER THOUSAND TONNES OF CARGO
 (total time at berth in days)

Cargo	1984-85	
	Calcutta port	Haldia port
Mineral oil	0.61	0.03
Foodgrains	3.72	3.22
Fertilisers	2.14	2.55
Raw materials for fertiliser	1.46	1.76
Coal	3.25	0.20

Source - Calcutta Port Trust, Planning and Research
 Department, Review of Port Performance, 1985-86.

TABLE - A12
 LABOUR SITUATIONS IN CALCUTTA AND HALDIA PORTS

Port	Mandays lost		Total work force	
	1984-85 ^φ	1985-86	As on 31.12.85	As on 31.12.86
Calcutta	2012	2833	26,511	23,962
Haldia	1866	5746	3,439	3,218

^φ Excluding all India port strikes.

Source - Calcutta Port Trust, Planning and Research Department.

TABLE - A13
AVERAGE TURN ROUND TIME OF VESSELS (SANDHEAD TO SANDHEAD)

Commodity	1984-85	
	Calcutta	Haldia
Mineral cargo	6.13	2.53
Foodgrains	31.28	23.43
Fertiliser	23.94	40.25
Raw material for Fertiliser	14.37	25.31
Coal	40.47	12.93

Source - Calcutta Port Trust, Planning and Research
Department, Review of Port Performance, 1985-86.



TABLE - A14
ALLOCATION OF FUNDS AMONG PORTS IN SEVENTH PLAN
(Rs. 10 millions)

Port	Amount
Bombay	106.15
Marmugao	20.30
Madras	72.15
Vizag	45.95
Cochin	51.25
Calcutta	47.00
Haldia	61.95
Kandla	25.15
Paradip	42.40
Tuticorin	18.75
New Mangalore	18.40

Source - Financial Express, 31st August, 1985.