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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

AUDIT OF CALCUTTA PORT PROJECTS

November 2, 1973

Operations Evaluation Department



## PREFACE

As one in an experimental series of studies of individual projects that the Operations Evaluation Division is currently carrying out, this audit deals with Bank assistance to the Port of Calcutta, principally concentrated in the ten years 1958-68. Two loans were made — Loan 198-IN of June 25, 1958 in the amount of \$29 million and Loan 294-IN of August 17, 1961 in the amount of \$21 million — and others were considered, but finally not made.

The main purpose of an audit, as presently conceived, is to answer, as profoundly as is possible within a limited period of time and with attention consequently confined to the particular project under review, the question of whether the objectives of the Bank's lending were achieved and, if not, why not. A particular effort is made to reappraise retrospectively the economic validity of the investments supported by the Bank. Institution-building objectives are covered as well as physical objectives, especially in cases where several loans have been made so that development over time can more effectively be traced. Consideration of the reasons why particular objectives may not have been achieved naturally leads into some treatment of how important those objectives seem in retrospect and whether they were sought in the best manner.

While this audit gives considerable attention to the performance of the Bank in its lending for the Port of Calcutta, it does not deal to any significant extent with procurement, although this was a matter of major discussion between the Indian authorities and the Bank at certain times. Detailed issues of procurement policy, important as they are, are nevertheless somewhat peripheral to the main purpose of an audit and can better be analyzed in a study focussing on this particular subject.

Lending to the Port of Calcutta came up for audit because disbursements out of the second loan ended in 1968, and, in order to obtain a random sampling of past Bank projects, the Operations Evaluation Division had decided arbitrarily to analyze projects for which loan disbursements were completed in that year. The five years that have elapsed since 1968 should be sufficient time for the results of a project to have materialized fairly fully, even though benefits should normally continue to accrue much longer.

This study is based on a review of Bank files and discussions with Bank staff who had been involved with the project, followed by a one-month mission to India with a port expert who had had no previous involvement with the Bank's lending for Calcutta.

The very full cooperation extended by the Commissioners for the Port of Calcutta and their staff and the support of the Government of India are deeply appreciated.

LIST OF ABBREVIATIONS

CMPO:	Calcutta Metropolitan Planning Organization
CPC:	Commissioners for the Port of Calcutta
DLB:	Dock Labor Board (of Calcutta)
DWT:	Deadweight Tons
GOI:	Government of India
HSD:	Hydraulic Studies Department (of CPC)
KGD:	King George's Dock
KPD:	Kidderpore Docks
POL:	Petroleum, Oil and Lubricants

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NOTES:

Fiscal Years: Most figures are cited in this report for fiscal years, which run from April 1 to March 31.

Currency Equivalents: 1957 - June 28, 1966: US\$1.00 = Rs. 4.76  
June 28, 1966 - 1972: US\$1.00 = Rs. 7.50 (approx.)

TABLE OF CONTENTS

	<u>Page No.</u>
Summary	4
Audit of Calcutta Port Projects	9
The Port of Calcutta and the Bank	9
Project Implementation	14
Operation and Maintenance	17
Traffic Forecasts	19
Appraisal Economics	21
Economic Evaluation	23
Institutional Development	29
Long-Term Planning	31
Accounting Reform	33
Financial Performance	34
Conclusions	39

LIST OF APPENDIX TABLES

1. Cargo Handled at Major Indian Ports 1957/58 - 1971/72
2. Second-Plan Projects Supported by IBRD Loan 198-IN of 6/25/58:  
    Costs, Construction Schedules and Procurement
3. Third-Plan Projects Supported by IBRD Loan 294-IN of 8/17/61:  
    Costs, Construction Schedules and Procurement
4. Port of Calcutta: Traffic, Forecast and Actual
5. Increases from 1960 through 1970 in Selected Conference Line  
    Freight Rates for Some Major Indian Ports
6. Port of Calcutta: River Dredging, Drafts and Ship Detention
7. Calcutta Port: Employment, Wages and Labor Productivity
8. Port of Calcutta: Revenues and Expenditures, Forecast and Actual
9. Calcutta Port Commissioners: Investment Programs and Their  
    Financing, Projected and Actual
10. Calcutta Port Commissioners: Investment and its Financing,  
    Projected and Actual
11. Commissioners for the Port of Calcutta: Balances Sheets 1970-72
12. Calcutta Port Commissioners: Tariff Increases 1957/58 - 1971/72

CHARTS AND MAPS

Commissioners for the Port of Calcutta - Organization Chart  
Commissioners for the Port of Calcutta - Hooghly Drafts  
Haldia Port Project - Location Map  
Port of Calcutta

SUMMARY

The Bank made loans of \$29 million in 1958 and \$21 million in 1961 to the Commissioners for the Port of Calcutta (CPC), for rehabilitation and modernization of Calcutta Port, after Bombay the most important port in India, serving a hinterland of some 500,000 square miles and 200 million people. Disbursement of the loans ended in 1965 and 1968 respectively, after several deferrals of the closing dates and cancellation of \$2.1 million from the second loan. In 1965-66 the Bank gave consideration to a third loan of \$16 million for Calcutta and a loan of some \$40 million for the Haldia satellite dock project, but these loans never came to fruition.

Both loans made, which were for foreign exchange costs, were intended to be spent mainly on floating craft and civil works designed to maintain and improve access up the River Hooghly to the Port of Calcutta and on equipment and facilities to rehabilitate and modernize the docks. Project composition was substantially changed after loan signature in light of evolving circumstances — particularly hydraulic conditions in the Hooghly river — and, in the case of the second loan, cost underestimates. The equipment and works included in the revised projects (total costs, as executed, \$47 million equivalent and \$30 million equivalent, respectively) were procured as agreed, but with serious delays in some cases due to a variety of reasons — delays in final design, interim changes in the programs, foundation problems, slow Government approval of foreign procurement, bankruptcy of a British supplier and local contractors' difficulties in obtaining materials. Vessels, mainly dredgers, accounted for more than 50% of planned loan expenditures and more than 70% of actual expenditures. Equipment and works are generally operating satisfactorily and being maintained well, although outage times for repair tend to be long, mainly due to shortages of domestic supplies of materials such as steel, and import license problems for spare parts.

Traffic has fallen drastically short of the levels projected — in 1970/71, the worst year, it amounted to only 6 million tons compared with 14 million tons forecast — mainly due to prolonged industrial recession and lagging investment in Calcutta's hinterland, with Hooghly draft restrictions also being an important constraint in the case of ore traffic and railways replacing coastal vessels for much of the coal traffic. The Bank-assisted projects did not achieve their major objectives — elimination of ship detention and maintenance of 26 foot draft up to Calcutta — the former because other factors, especially labor strikes and shortage of appropriate railway wagons, have continued to cause serious congestion for prolonged periods, and the latter because the problem proved more intractable than expected. Despite this, the projects seem by and large to show satisfactory economic returns because they helped to halt the

deterioration of the Port of Calcutta and its access, which, if it had been allowed to continue, would likely have eliminated iron-ore exports altogether and involved very much more costly handling of a large proportion of other traffic (especially general cargo), mainly by lighterage and lightening. The main portions of the project show an economic rate of return of some 25%, on the basis of analysis at market prices, and at least 10% even with very rigorous assumptions about scarcity values of labor and foreign exchange. However there are some minor components of the projects which seem economically questionable — mainly the Libyan Tea Warehouse and the King George's Dock Extension (each with a total cost of some \$1.7 million equivalent) due to limited utilization to date. A superior alternative to the projects that were financed by the Bank would have been an earlier start on the satellite dock at Haldia, but, due to repeated delays in preparation, this scheme was not ready for financing until 1965, at which time other factors came into play which eventually caused the Government of India to withdraw its request for Bank assistance and to undertake the project in 1968 without direct foreign assistance.

CPC has generally adhered to all commitments made to the Bank. A Depreciation Study, required by the Bank in connection with the first loan, was completed on schedule in 1959 and the Renewals and Replacement Fund which it suggested duly established. Stores inventories and Revenue Reserve Fund were both reduced significantly after 1961, as agreed by CPC in connection with the second loan. A plan for increasing income from CPC's property holdings, provided in response to Bank requests in 1961 negotiations, was closely adhered to through 1967.

The Bank placed considerable emphasis on the need to carry out more basic hydrological and hydraulic studies and to do more long-term planning for the development of port facilities to serve Calcutta's large hinterland. As agreed with the Bank, CPC established its own Hydraulic Studies Department in 1962. This department has worked effectively and contributed substantially to improving dredging operations and helping both operational and long-term investment planning. The history of the last ten years shows that this was an important need and a well-chosen focus for Bank effort.

The Bank also gave considerable attention, in connection with both loans but especially in 1965/66 during discussion about a possible loan for Haldia, to reform of CPC's accounting system onto a modern commercial base. Difficulties were experienced with the large-scale changes involved, but these changes were eventually accomplished and the new system came into full operation for accounts of the year 1969/70. While data are now classified in a new and improved manner, it cannot be said that introduction of the commercial system has induced a more commercial outlook on the part

of the port authorities nor has it led to the production of regular management information reports or costing studies. It does not appear to have affected management and operation of the port.

The Bank was also concerned about maintaining and further strengthening the financial position of the CPC, although no financial performance targets were agreed in connection with the loans, because the Bank relied on Government support of the Port Commissioners in the last resort. The financial position has seriously deteriorated. Reserves which amounted to some \$30 million equivalent at the time of the second loan agreement were virtually used up by 1969 and the Government of India has had to provide some \$30 million equivalent of operating subsidies over the last four years, mainly on a non-repayable basis, and to finance virtually the whole of CPC's on-going investment program in Haldia and works related to this project and Farakka Barrage. Large operating subsidies will continue to be needed at least through March 1974 when Haldia is scheduled to be completed.

Traffic through Calcutta does not appear to have been responsive to the level of port charges, even though they are considerably higher than those at any other Indian port. They could almost certainly have been raised more rapidly than they were in the early 1960s without affecting traffic, and the Bank should probably have been more demonstrably reluctant to finance replacements with new loans without a sharp improvement in current financial performance; the Bank seems to have been unduly impressed at the outset with the apparently strong financial structure of CPC — debt-equity ratio of 51/49 in 1958 and large liquid reserves. Equally, in the most recent years, subsequent to the large tariff increases of 1966/67, port charges could probably have been raised somewhat more and more frequently than they have been. But there is clearly some level at which port traffic would begin to drop off, and this level may well be substantially short of the large (50-70%) tariff increase that would be necessary to attain reasonable financial viability under current conditions. Severe discouragement of traffic through the Port of Calcutta would be economically undesirable at the present time when the economy of north-east India is tending to recover from prolonged recession and political problems, when the Haldia docks are about to be opened and when underemployment of CPC workers remains considerable. It is not clear who is the final beneficiary of the large Government subsidies provided, but they have probably been necessary, in approximately the amount provided, to cope with this temporary situation. The Bank strongly favored the provision of subsidies since 1967.

Despite the severe squeezes which it has faced — between falling traffic (some 40% down in the last five years) and rising costs merely to keep the port open (some 50% up in the last five years) and between rapidly

rising real wage-rates, nationally imposed for the class of labor in most excessive supply, and the regional impossibility of drastic cut-backs in the labor-force — CPC probably has had somewhat more flexibility than it has used. Bank supervision missions were helpful in making suggestions, and CPC seems to have considered carefully every constructive suggestion that emanated from such missions.

In retrospect it appears that then, in the late 1960s, and earlier, the Bank might have helped more if it had given less, or at least different, emphasis in connection with accounting reform and much greater attention to questions of personnel and personnel management. A less costly and perhaps more expeditious, if basically less satisfactory, way to get to the improved costing, better tariffs and greater efficiency orientation — which the Bank sought and which are still barely achieved — might have been to focus on asset reclassification and revaluation and, for individual tariff services, time-and-motion type studies rather than the overall and fundamental accounting reform actually undertaken. Emphasis on the particular questions which needed to be answered and followed regularly in management reports might have shown that the most important of them could be satisfactorily answered by the existing accounting system, together with measures of the type suggested above; it would likely have helped considerably to get a quicker benefit than has actually occurred, whatever accounting reform was undertaken. The Bank had not set a good example, with project appraisal documents almost totally lacking in time targets and performance criteria, whether operational or financial.

Studies of time-and-motion type would have helped not only to cost individual tariff services but also to identify ways for more effective use, by labor, of the equipment actually available, in order to speed operations and enable more careful handling. Shore labor has been cut substantially, although there remains much too little work to occupy fully all those remaining; but there has been a very large inflation of employment in maintenance. With some initiative, it would seem that CPC might have been able to bring more of its excessive labor-force into use by diversification of operations — for instance, pallet-making, beneficiating land and property for leasing out, mending and improving access roads and quay aprons. More effort on training would have been required for this and would have been needed to get fuller benefit from some of the machinery, such as mechanical cargo-handling equipment, provided under the Bank loans. To make training effective would probably have required more emphasis on performance in promotion policy and less on seniority. And to undertake most of these initiatives — as well as other planning and costing and pricing studies which the Bank sometimes recommended and which would have helped to expand CPC's scope for choice — would almost certainly have required a larger body of well-qualified junior officers than CPC seems to have been able to acquire, with its salary-levels (by contrast with wage-levels) lagging severely behind inflation.

While the Bank devoted considerable effort to the Port of Calcutta and it was generally quite responsive and flexible in its relationship with CPC, the case does also suggest various specific ways in which lending administration might have been better. From the beginning the Bank was generally a strong and persistent proponent of the need for a satellite port as the only long-term solution to Calcutta's draft problems and its assistance in the establishment of the Hydraulic Studies Department was a crucial indirect contribution to the realization of such a project. But hindsight suggests that on three occasions the Bank missed key opportunities to expedite the scheme — first, in 1958, when it turned down a mission recommendation to provide technical assistance and make appropriate studies a condition of the first loan; second, in 1961, when it failed to specify the need for economic as well as technical studies; and third, in 1965, when it diverted attention from the main issue to subsidiary problems of accounting and tariff-making. Administration of the second loan of 1961 would have been sharply improved if loan negotiations had been postponed a year, until schemes were more fully prepared and there was better possibility of reaching agreement on concrete financial targets; and also if full consideration had been given in 1967 to the possible adverse consequences on project completion and operation, especially in Indian circumstances of foreign exchange stringency, of refusal to permit further extension of the closing date.

AUDIT OF CALCUTTA PORT PROJECTS

The Port of Calcutta and the Bank

The Port of Calcutta, which was established in its modern shape mainly in the 1880s and 1920s, serves a hinterland of some 500,000 square miles containing more than a third of India's population, nearly 200 million people; it provides the only commercial access to the sea for most of them. Within Calcutta's hinterland lie most of India's producing mineral fields (including particularly iron ore, coal and oil), almost the entire steel and heavy engineering industries, and the majority of producing areas and processing plants for jute and tea.

Calcutta's share of total traffic through Indian ports has fallen steadily over the last 25 years. A major part of its original hinterland was lost with Partition in 1947, but it still accounted for 40% of freight tonnage through all major ports in 1950. This share fell to some 33% by 1957, 20% by 1965 and only a little more than 10% in 1971 (Appendix Table 1). But its traffic has always been of somewhat higher average value than that of other ports and this characteristic has been reinforced with the decline in its share of total tonnage, so that even in 1971 it still accounted for nearly 25% of the value of Indian exports and better than 15% of imports. In freight tonnage Calcutta was overtaken by Bombay in the early 1950s and by Visakhapatnam, on the east coast, and Mormugao, on the west coast, in the late 1960s. But most of the tonnage of the last two ports is low-value iron-ore, and Calcutta remains more important than any other port except Bombay in general cargo.

Calcutta contrasts with other major Indian ports in that it lies at a substantial distance from the sea — 126 miles up the River Hooghly. This fact accounts for a substantial part of its loss of relative importance in Indian trade. Calcutta has been squeezed between two conflicting trends: on the one hand, deterioration of the Hooghly River channel, due to natural forces and engineering works upstream on the Hooghly and the Ganges, so that increasing expenditures have been required in an only partially successful effort to maintain the traditional 26-foot draft (enough for ships of some 10,000 DWT fully laden and 15,000 partially laden); and, on the other hand, decreasing adequacy of even a 26-foot draft as ships have become larger and the economies of larger ships have become a more significant factor in certain very important trades. Calcutta has also suffered over the last ten years from significantly slower economic growth in most of its hinterland than in India as a whole. The 1950s and early 1960s, when much of the heavy industry was being built up under India's Five Year Plans, was a time of relative economic boom. The subsequent difficulties in operating and maintaining these plants effectively,

the declining attraction of the region for private investment and the acute political difficulties in the area in the late 1960s have not only cut the traffic through the port but also exacerbated the Port's traditionally difficult labor problems.'

The Bank first became involved with Indian ports in 1956. A major economic mission to review the draft Second Five Year Plan (for 1956/57-60/61) identified transport as a key constraint in India's development. In October 1956 the Government of India (GOI) approached the Bank for assistance with port projects in the Second Plan. After correspondence and exchange of information, the Bank decided to mount a mission, headed by a specially hired Dutch expert, to examine the overall ports situation in India, with special emphasis on Calcutta, for which the project proposed was largest and seemed best prepared and most urgent. The mission took place in October-November 1957, and it produced appraisal reports for projects in both Calcutta and Madras; loans were negotiated in March, approved in April and signed June 25, 1958 (Loan 198-IN of \$29.0 million for Calcutta and Loan 199-IN of \$14.0 million for Madras). The loan to the Commissioners for the Port of Calcutta (CPC), which was in support of a five-year program of port rehabilitation and modernization, became effective in October 1958. Substantial changes were subsequently made in the program, with the Bank's agreement, and final loan disbursements occurred in 1965, after several deferrals of the closing date.

In 1960 CPC applied for a second loan to provide further resources in pursuit of essentially the same objective of rehabilitation and modernization. This project was appraised early in 1961. Loan negotiations extended throughout the month of June. Loan 294-IN, in the amount of \$21.0 million, was signed August 17, 1961 and became effective in September. Disbursements were substantially delayed, partly due to minor changes in the four-year investment program to be covered but mainly due to delays in final design and difficulties in reconciling the Bank's preference for international competitive bidding and the GOI's principle of not procuring abroad anything that could be produced at home. The list of goods under the loan was changed several times, and \$2.2 million of the loan were eventually cancelled. Disbursements ended in 1968, three years beyond the original closing date.

Aside from details of the coverage of the two loans, two matters dominated the negotiations for each and were reflected in the principal supplementary letters to the Loan Agreements. The first was financial performance. Agreed overall targets, such as operating ratio, were not established in connection with either loan. But the Bank was quite concerned in 1958 about the inadequate depreciation allowances that it felt the Commissioners had been making. It was agreed that consultants,

including foreign specialists, would be hired to study the matter. Their recommendations were partially implemented in 1959, but CPC's financial performance deteriorated and fell substantially short of what had been projected. There was considerable discussion of possible ways to strengthen the financial situation at the 1961 negotiations. The GOI was not prepared to make any formal commitments since a committee (Ratnam Committee) which it had set up to study the matter had not yet reached final conclusions. Agreement was finally reached on a supplementary letter in which CPC committed itself to try to strengthen its financial performance, particularly in certain areas, and to improve its accounting system by the introduction of auxiliary accounts. The inadequacies of CPC's accounting system, especially in respect of depreciation, was a common underlying theme throughout these discussions, and, in the negotiations for the second loan, the Bank urged retention of consultants to help with a major overhaul; CPC promised to introduce changes, but without outside help.

The other matter which came to occupy an increasingly important place in discussions related to the longer term future of Calcutta port. The 1956 economic mission and the 1957 ports mission were both concerned by the lack of decisive action to prepare for the increasing traffic that was to be expected at Calcutta. The latter stressed the need for studies along three lines — the economics of additional mechanization of cargo handling to increase throughput on existing berths, the possibilities of expanding the King George Dock (KGD) system in the port, and, most particularly, the feasibility of a satellite port in deeper water downstream of Calcutta. The mission itself recommended that the loan should be conditional on only one point — a firm commitment by CPC to carry out these studies. But it was finally decided by the Bank that it would be inappropriate to make the loan conditional on a commitment not directly related to execution of the works being financed. These topics were however discussed at negotiations and the GOI hired the Bank's Dutch expert to advise. But the Bank continued to express the view that the hydrological and engineering studies required to settle the satellite port question were not being pressed hard enough.

By 1960 CPC's investigations were converging to show that the Haldia site, about half way between Calcutta and the sea on the other side of the Hooghly (see map), would be the best of the various alternatives considered for a satellite port, and the worsening siltation problems in the upper Hooghly were making the need for some such development, outside Calcutta, increasingly plain. A provision of Rs. 75 million for a start on a Rs. 250 million scheme at Haldia (including two riverside berths and three bulk and general cargo berths in a Dock system) was included in the draft Third Five Year Plan (for the years 1961/62 - 65/66). The Bank's major mission to review the Plan pointed out that Calcutta's 26 foot

draft, even if maintainable, would be quite insufficient for bulk cargoes and it urged a larger provision in the Plan for Haldia, with a view to at least partial completion by the end of the Plan period. CPC's preliminary feasibility study on Haldia was issued in September 1960 and its second loan application included a major component for the new port. Late 1960 saw a major debate within the Bank between those favoring an early start on Haldia, at least riverside jetties, and those adopting a more cautious approach, pointing out the need for further studies, especially on hydraulic aspects, to reduce the risk of a major mistake. Early in 1961, GOI, CPC and the Bank agreed that substantial further studies were needed before major investment started.

Funds were included in the second loan for engineering work on Haldia by foreign consultants and, even more importantly, for the equipping of a Hydraulic Studies Department (HSD) that CPC was to set up. CPC had previously relied for such studies on the Central Water and Power Research Institute at Poona, on the other side of India, and the Bank, concerned at slow progress on these studies since its first loan, made the establishment of CPC's own HSD, originally suggested by consultants, the major issue in negotiations for the second loan. GOI and CPC refused the Bank's suggestions that establishment of HSD be made a condition of loan effectiveness and that a foreign institute or firm be brought in to give the new department major support in its early years. But they signed a supplementary letter promising that HSD would be set up, with a foreigner who had been advising under UN auspices as initial Director.

Late in 1961 the Bank informally approved a tentative schedule of actions, mainly studies, drawn up by CPC and designed to enable submission to the Bank in September 1963 of a satisfactory loan application for Haldia. CPC pressed ahead with execution of the scheduled actions, the Bank was impressed with the effectiveness of the new HSD, and by Spring 1963 HSD had successfully accomplished the various studies relating to Haldia feasibility which had been requested by the eminent hydraulic engineer hired by the Bank as a special advisor. These studies had shown that, with the assistance of the Farakka Barrage which GOI had decided in 1961 to build on the Ganges to control flows into the Hooghly (see map) and with a reasonable amount of dredging, it should be possible to develop and maintain a stable channel in the estuary up to Haldia to a depth of at least 20-22 feet at low water, sufficient for vessels of about 35 foot draft at high tide (enough for ships of some 35,000 DWT fully laden). Late in 1963 CPC submitted to the Bank its application for a loan for the project.

Just at this time the Bank learned, somewhat to its astonishment, that the GOI had given approval to a major project, promoted by

enterprising officials in the state of Orissa and being financed with large contractor credits, for construction of a new port at Paradeep only some 200 miles south of Calcutta (see map). The port was designed initially to handle mainly iron-ore exports, its advantage being that it would have substantially less draft restriction even than Haldia, being designed for 38 foot draft initially, with possibilities of subsequent increase. At the same time, with trends in ship economics as they were, the Bank began to fear that Haldia's 35 feet, while quite adequate for coal and general cargo traffic, might leave eastern India uncompetitive in the potentially important iron-ore trade. These developments gave rise to a second major round in project preparation work on Haldia. In response to the Bank's questions, GOP set up a committee (Bhatia Committee) which prepared a major economic study, including a very thorough traffic analysis, concluding that Haldia should be proceeded with.

Early 1965 saw the completion of the Bhatia Committee report on Haldia and a new application to the Bank from CPC for \$16 million financing of additional works and vessels for the Port of Calcutta itself. The Bank offered to consider the latter request after Haldia had been dealt with, and at the end of 1965, shortly after the Indo-Pakistani war of September, it sent a major mission to appraise Haldia for a \$40 million loan. The Rs. 400 million scheme now proposed represented a considerable modification from that initially suggested in 1960; it included a river-side jetty only for oil, and the heart of the project was an impounded dock system with 7 deep-water berths, 4 for bulk traffic and 3 for general cargo. The mission found the basic economics of the scheme highly convincing. But it took a rather stricter attitude than previous Bank missions on the poor financial performance of CPC and it strongly espoused certain principles, for instance on management, accounting and tariff-making, which the Indian authorities found unpalatable. Compromise on most of the major points was reached by hard negotiations before the mission ended. Nevertheless, after having checked in detail the feasibility of building the project without foreign assistance, the GOI withdrew it from Bank consideration in 1966. Detailed design work continued and an important revision, to enable the dock system to take vessels up to about 44 feet draft, was made late in 1967. Major construction, by Indian contractors and with Indian-made equipment, got under way early in 1968. A rather unrealistic completion target of 1972 had been established, but it now seems that the project, including 3 bulk cargo berths, 1 container berth, 1 general cargo berth and a finger jetty, all in an impounded dock system, should be completed by middle or late 1974, a few months after the Farakka Barrage which has also been delayed from its original target completion date of 1971.

After 1966 the Bank's attention was mainly concentrated on the Port of Calcutta proper, where works financed under the second loan were still

underway. In face of CPC's rapidly deteriorating financial situation, the Bank adopted the practice of following up supervision missions with detailed letters outlining the operational deficiencies identified and, later, proposing possible ways to increase efficiency and strengthen the financial situation. The Haldia discussions had raised again the matter of CPC's accounting system, and in 1966-68 major efforts were made by GOI and CPC to develop and apply an appropriate commercial system. The last supervision mission took place in February 1969, but the Bank's follow-up letter of suggestions never received more than a formal acknowledgment.

### Project Implementation

The Bank's loans were intended essentially to cover the foreign exchange costs of items in CPC's overall investment program which involved foreign exchange. These items accounted for most of CPC's total investment at Calcutta, but there was always some investment going on outside the Bank projects. CPC saw the Bank loans as a kind of line of credit, and the Bank was quite flexible in accepting changes in the investment program in the light of intervening events, permitting reallocation of funds and changes in the list of goods. The Bank funds were disbursed entirely against foreign exchange expenditures, including expenditures for supplies to Indian manufacturers making equipment for CPC.

There were in fact substantial changes between the investment programs presented in appraisal reports and those actually executed. Full details for the items actually financed by the Bank and for those expected to be so financed but subsequently dropped — either because the need for them had become less urgent or because they proved to be obtainable without expenditure in foreign exchange — are given in Appendix Tables 2 and 3; projected time schedules for letting and completion of contracts are not normally given, since the appraisal reports contained no more than an approximate terminal date for the project as a whole. The location of the fixed works is given in the maps. The following table summarizes planned and actual allocations of loan funds among major categories.

Table 1

Planned and Actual Allocations of Loan Funds by Major Purpose  
(in US\$ millions)

	<u>Loan 198 (1958)</u>		<u>Loan 294 (1961)</u>	
	<u>Planned</u>	<u>Actual</u>	<u>Planned</u>	<u>Actual</u>
<u>River Navigation</u>				
Civil Works	6.54	4.31	-	0.06
Vessels	6.40	12.09	10.15	7.84
<u>Docks and Berths</u>				
Civil Works	3.61	2.19	1.47	0.39
Vessels	5.07	7.62	3.95	6.54
<u>Shore Facilities</u>	4.36	2.27	1.44	1.33
<u>Studies &amp; Consultants</u>	0.35	0.52	2.16	2.68
<u>Contingencies/Cancellations</u>	<u>2.67</u>	<u>-</u>	<u>1.83</u>	<u>2.16</u>
Total	29.00	29.00	21.00	21.00

Vessels, mainly dredgers, accounted for more than 50% of planned expenditures out of the two loans and for more than 70% of actual expenditures. Efforts to improve Hooghly River navigation account for half of all loan funds, and expenditures within the dock area, except for dredging vessels, were cut substantially from original plans.

1958 saw a sharp and unexpected deterioration in Hooghly drafts, partly due to exceptionally low river flows, so that by the end of the year, in the season when they are normally worst, they were some 2-3 feet less than normal (see chart). Depth across the Balari Bar (see map) was only some 7 feet, enough at high tide for vessels drawing no more than about 20 feet. CPC took emergency measures, putting a dredger full time on the bar, but by October 1959 drafts were back at the same level. Moorings provided under the Bank loan were laid at Haldia to permit off-loading from larger ships to lighters. But it was clear that longer-term measures to restore the channel up to Calcutta were required, and CPC revised its investment program, dropping replacement or expansion items that were now of lesser priority than equipment required merely to preserve access to the port. In June 1960 a revised list of goods was agreed between CPC and the Bank, including 3 additional river dredgers and 1 more port dredger, to be financed by deletions of certain items, savings on the foreign costs of others, and loan contingencies.

Some of the works and equipment financed out of the first loan had been ordered long before the loan was made, according to bidding procedures broadly acceptable to the Bank, and most of the major contracts, including those incorporated with the revision of the list of goods, were completed by the end of 1963 (see Appendix Table 2). But there were delays in letting of some contracts and in the execution of some work, so that a few important items were not completed until 1965 and 1966. The largest single item in the project (actual foreign exchange cost \$4.3 million) was the Fulda Point river training scheme, involving straightening of the river bank and large-scale contract dredging; work started slowly, and in November 1960 the contractor's dredger sunk and lives were lost, but the project was eventually completed on schedule in 1961 and with a large saving on expected foreign exchange costs. Nearly \$10.0 million was eventually spent on procurement and repairs for a total of five large suction hopper dredgers. \$5.7 million was spent on port dredgers and ancillary vessels. \$1.8 million each was spent on a major scheme for reconditioning Kidderpore Dock (KPD) No. 1, including replacement of old hydraulic cranes by 59 electric cranes (see map), and on procurement of two floating cranes for heavy lifts. Other items were various other floating craft, diesel locomotives for the Port Railways, a small amount of mechanical cargo-handling equipment, conversion and modernization of certain berths in King George's Dock and various improvements to the dry docks, repair facilities and port workshops.

Deterioration at Balari again required modification of the second loan shortly after it was signed, but this time of lesser magnitude. CPC had been working to open up the Rangafalla channel on the east side of the Balari Bar with a view to its becoming the main access route; but, contrary to past experience, it began to silt seriously on opening in October 1961. The Bank agreed to meet the foreign exchange costs involved in having the Dutch dredging contractor who had been working at Fulta Point dig a new channel diagonally across Balari Bar, a move which proved very successful. But most of the works to be covered by the second loan seem to have been at a much earlier stage of preparation when the loan was signed than in the case of the first loan, there were considerable delays in finalizing designs due to shortage of qualified staff, and a Bank supervision mission reported that no tenders were out even one year after the loan had become effective. Most of the orders were placed only in 1964 and 1965. Deliveries were mainly in 1966 and 1967, after the original closing date, and some projects were not completed until the late 1960s and early 1970s. Delivery of several craft was severely delayed by the bankruptcy of the British builder who had won the orders.

Original cost estimates proved inadequate for many of the items in the list of goods, and the delays in procurement, in an inflationary situation especially domestically, increased the deficiency. This, as well as changing priorities within CPC's investment program, caused a number of items to be dropped from the project (see Appendix Table 3). Principal items eventually financed were further dredgers (\$8.0 million) and two pilot vessels (\$3.5 million). About \$2.8 million was spent on a survey vessel and craft and instruments for HSD, \$1.3 million on four dock tugs, and about \$1.0 million on consultant engineering, both for the project itself and for Haldia. Other smaller items were various civil works in the port's repair shops.

Early in 1967 disbursements were terminated for all but a few specific items, the Bank refusing further extension of the closing date for some other items, as GOI and CPC urged. The rather rigid attitude that the Bank adopted at this point — by contrast with earlier periods — apparently stemmed mainly from frustration with procurement procedures in India generally and in CPC in particular and from a feeling that discipline in loan administration should be tightened. As pointed out in the Preface, procurement aspects have not been thoroughly studied in this audit. But it is noteworthy that several of the cases of alleged poor performance by CPC and its Indian suppliers which were cited in Bank documents at this

time seem to have been misconceived. <sup>1/</sup> In fact the loan itself had almost certainly been committed too early, in view of the relatively poor state of preparation of most of the component projects in 1961. Secondly, there is no question that the refusal to extend disbursements did cause CPC some difficulties. Necessary spares could not be obtained under the loan for the No. 2 Swing Bridge and the KPD Water Recirculation Plant which had been built under the project, and the advancing of final payments to the contractor for the latter, to fall within the Bank's deadline, left CPC with no lever to ensure completion of the work after problems arose. A large order for machine tools, letting of which had been delayed by the Bank's dissatisfaction with the bidding procedures used by CPC's British consultant and insistence on retendering, had to be withdrawn.

### Operations and Maintenance

All equipment provided under the loans appears to have been operating satisfactorily. There were initial difficulties with some, such as the quay cranes in KPD and, more seriously, the KPD Water Recirculation plant, but these have been overcome with the aid of the suppliers. The domestically produced equipment has generally proved rather less sturdy than that procured abroad and gave greater teething troubles, but otherwise compares well and does have the advantage in Indian circumstances that spares are usually somewhat easier to obtain. Not all the craft and equipment provided under the Bank's loans could be inspected during the course of the audit, but those that were suggested that maintenance is quite good.

However, out-of-commission time for maintenance, repairs and vessel survey does seem to be on the high side, especially for some items — and the principal reason appears to be the difficulty in getting spares and certain crucial materials expeditiously. The following table gives data for the principal floating craft procured under the Bank's loans, which may be compared with a reasonable upper limit of some 20% or 70 days a year. <sup>2/</sup>

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<sup>1/</sup> For instance, with regard to the two locally procured dock tugs, the order for which had been greatly delayed by Bank refusal and eventual acceptance of procurement domestically, the scheduled delivery date had long been known to be beyond the loan closing date and it was actually adhered to quite closely, comparing well with foreign delivery dates, despite the difficulties of local manufacturers in getting supplies. Another delay highlighted by the Bank mission was in the KGD extension which had been included in the loan originally mainly at the Bank's urging, which was being executed by CPC with its own equipment at a considerable saving in foreign exchange and which now seems a component of somewhat dubious economic validity (see below).

<sup>2/</sup> 12 hours a week for running maintenance and 1-3 weeks a year in dry dock and/or alongside for repairs.

Table 2

Floating Craft: Percent of Time Out-of-Commission for Maintenance, Survey & Repair

	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>	<u>Period Average</u>
Maitena (1947/60) <u>a/</u>	32.9	40.5	23.6	100.0	49.3
Bhagirathi (1957)	25.8	23.0	27.9	19.7	24.1
Churni (1961)	17.3	11.0	35.1	35.6	24.8
Ajoy (1961)	n.a.	14.2	47.1	31.5	30.9
Maha Bahu (1963)	13.7	33.7	n.a.	27.4	24.9
Vir Bahu (1963)	34.0	24.4	n.a.	40.3	32.9
Grab Dredger 1 (1964)	n.a.	27.7	45.2	1.9	24.9
Hopper Barge 2 (1964)	n.a.	4.7	25.5	1.4	10.5
Hopper Barge 3 (1964)	n.a.	20.8	1.4	26.3	16.2
Mohana (1965)	24.4	21.1	34.2	20.8	25.1
Hopper Barge 11 (1965)	n.a.	31.0	29.3	70.4	43.6
Hopper Barge 12 (1965)	n.a.	35.1	32.9	30.7	32.9
Subarnarekha (1966)	21.9	14.0	21.1	27.9	21.2
Grab Dredger 2 (1967)	n.a.	37.5	3.6	48.8	30.0
Hopper Barge 6 (1967)	n.a.	19.2	39.2	29.0	29.1
Hopper Barge 7 (1967)	n.a.	24.1	26.0	10.7	20.3
Hopper Barge 4 (1968)	n.a.	9.9	26.3	11.5	15.9
Hopper Barge 5 (1968)	n.a.	21.6	10.4	33.4	21.8

a/ Year shown is year of construction.

Cases are quoted of a simple repair that would normally require 3 days in fact taking 3 weeks; major repairs and four-year survey can take 3-5 months. Crucial stores can take several months to obtain, when available domestically, and up to a year or two if they have to be purchased from abroad. Unavailability of special materials often requires substitution by less appropriate ones, as for example mild steel for boiler quality plate, which tends to increase future outage for repair. Very much the same problems apply to important items of shore equipment. Of the average of 36 fork-lift trucks that CPC had in 1971-72 more than 25% were out of commission for repairs at any one time; of the 40 registered in November 1972 16 or 40% were out of commission, 9 of them awaiting spares. Tires have been a particular problem. Beyond high outage time for repairs an obstacle to optimum utilization of some vessels seems to be unduly long periods at base for crew holidays and rest; it is likely that effective working time of this expensive equipment could be increased somewhat by appropriate administrative measures.

### Traffic Forecasts

Traffic through the Port of Calcutta has declined drastically in recent years, amounting to only about 6 million tons in total in 1970/71 compared with 11 million tons in 1964/65, the peak year since the Second World War. All Categories of traffic have fallen, coal and ore exports and general cargo imports particularly severely and POL imports and general cargo exports least severely. Details are given in Appendix Table 4.

Actual traffic has fallen below appraisal report forecasts in almost all years, but the really large divergences began to appear only after 1964/65. Up to that time import traffic kept fairly close to forecasts, but the Bank, and the CPC, whose traffic forecasts appear to have been accepted without change, proved persistently over-optimistic about the growth of export traffic. Actual dry cargo exports in 1965/66, the last year of the Third Plan, for instance, were about 4.5 million tons compared to 7.3 and 7.9 million tons forecast in the first and second project appraisal reports respectively. The shortfall was not only a matter of foreign exports; actually the most important single shortfall, in terms of tonnage, was for coal which was by this time primarily a coastal trade. But there were also sizeable shortfalls, particularly against second appraisal projections (which apparently assumed completion of Haldia by 1971), in foreign exports of iron-ore and general cargo, especially iron and steel, and in imports of general cargo, especially machinery. By 1970/71 total traffic was less than half the level of 14 million tons projected in the Bank's 1961 appraisal report; it recovered sharply in 1971/72 but remained only slightly above 50% of the projection. The major item which has kept close to forecasts and quite often exceeded them has been import of foodgrains.

What are the reasons for the shortfalls? They differ between the major categories of traffic. We can illustrate by using the magnitudes of 1970/71, when the total shortfall from projected level was 8 million tons. Ore exports, mainly iron-ore, accounted for about 2 million tons, virtually entirely attributable to Calcutta's draft problem and, to some extent, the fact that Paradeep had been opened up in 1966 and was taking some 2 million tons of ore annually. Coal traffic, in which the shortfall was 2.4 million tons, has suffered to a slight extent from the draft problem but much more important have been the carrying capacity and pricing policy of the railways; in the early 1960s they were short of capacity for carrying coal from India's coalfields, in the Calcutta area, to the south but by the end of the decade they had sufficient capacity and the strongly tapered freight rate structure encouraged this traffic; it is not clear whether this is more economic than movement by ship. General cargo exports account for 1.6 million tons of the shortfall, and

general cargo imports for 1.9 million tons; for these the dominant factor has been lagging investment and slower than expected growth of the Indian economy and particularly of Calcutta's hinterland, illustrated by the fact that West Bengal and Bihar regional product grew at only 2% p.a. in the second half of the 1960s compared with 4.5% for Indian national income.

Although the Indian authorities and CPC in particular appear to know less than would be useful about Calcutta's traffic hinterland<sup>1/</sup> and changes that may have been occurring in it, available information suggests that there may not have been very much diversion of traffic from Calcutta to other ports, except in the case of ore, where it was actually more a case of Calcutta becoming uneconomic in international competition so that traffic that India might have retained was lost. There have been a few cases of diversion to other ports — for instance foodgrains entering via Visag and tea exports from Assam using the meter-gauge railway right across northern India to Kandla — but these cases appear to have been temporary shifts in response to physical bottlenecks and labor strikes at Calcutta rather than structural changes resulting from cost/price trends. It is surprising in some ways that more traffic has not been lost, for port charges at Calcutta have risen on average more than those at other Indian ports and are now about twice those at Bombay and Madras and greatly above those at many of the smaller principal ports, liner freight rates to Calcutta have tended to rise more than those to other ports, particularly Bombay (see Appendix Table 5), and stevedoring charges are generally a multiple of those at other Indian ports. Nevertheless Calcutta still receives significant amounts of traffic originating in Delhi and central India, tea exports appear to have come back from Kandla, and the prospect now is rather for potential expansion of Calcutta's hinterland — with the forthcoming completion of Haldia and also of Farakka, the latter opening up possibilities of long-distance barge traffic down the Ganges. Among the factors accounting for Calcutta's retention of most of its traditional hinterland appear to be the weakness of domestic long-distance road transport, the continuing concentration of many business houses and services in Calcutta, the absence of any strongly competing port for general cargo traffic in north-east India, and Calcutta's location and import/export balance both making it convenient as the terminal port for much of the liner trade. But had the political instability of the late 1960s in West Bengal continued, with its resultant labor difficulties, traditional patterns of traffic flow might well have been more permanently changed.

Could or should the Bank's traffic forecasts have been better? It would be hard to argue that the recent declines in general cargo traffic, closely related to economic and political developments in north-east India,

<sup>1/</sup> A complaint made in the Bank's appraisal reports and still seemingly valid.

could have been predicted in 1960. It probably would have been better to distinguish in the Bank's 1961 forecasts between that traffic which would likely continue to go to Calcutta itself and that which would materialize only if a deeper-draft port became available, since the investments financed were not really related to the latter. It might also be argued that the 1-2 million ton overestimates typical for the years before 1965/66 could have been avoided had attention been given to national plans and traffic trends, for it is notable in these years that all-India port traffic generally kept up well with all-India projections and sometimes exceeded them, even while there were shortfalls at Calcutta.<sup>1/</sup> But due recognition must be given to the great difficulty of forecasting traffic through Calcutta even on a short-term basis, illustrated by the fact that 1957/58 traffic turned out quite unexpectedly at 10.2 million tons compared with 8.4 million tons expected in March 1957 and 1967/68 traffic turned out at 9.0 million tons compared with 11.1 million tons expected in March 1967. As in some ways a residual in the overall economy, perhaps especially under Indian conditions, port traffic has been particularly unstable — and much more so than, for instance, railway traffic. It has reflected, often in amplified manner, fluctuations in crop production, in foreign exchange availability, in performance of India's heavy industry and in investment in the Calcutta region.

#### Appraisal Economics

Actually the Bank's projects really depended very little for their economic justification on the assumption of rising overall traffic, and it is not at all obvious that major alterations would have been made in them had the recent decline in traffic been precisely foreseen; a few elements might have been dropped and some emphases changed, but the same basic structure would probably have been retained. Both projects were largely of a rehabilitation/modernization nature, designed to result in a more efficient and economic operation of the basic facilities already existing; the draft difficulties of 1958-61 reinforced the emphasis, in the major restructuring of the first loan in 1960 and in the 1961 loan, on simply trying to keep the port open and operating.

Many of the items covered by the Bank's loans were straight replacements, of more modern and efficient design, of equipment that was overage and had very high maintenance and operating costs. This was true of virtually all the floating craft originally intended to be provided under the first loan, most of which were eventually purchased, out of either the first or the second loan. It also applies to the various works in KPD financed under the first loan, including the replacement of hydraulic with electric quay cranes, and the No. 2 Swing Bridge at KPD covered by the second loan.

<sup>1/</sup> However, for the latest plan (Fourth Plan 1969/70-73/74) Calcutta's problems and the delay in Haldia account for 80% of the cut-back that has recently had to be made in the all-India port traffic forecast for 1973/74 from 77 to 66 million tons.

Beyond essential replacements, the first appraisal report put main emphasis on the reduction of congestion that was expected to result from the various improvements to be financed. Congestion was a very serious problem at Calcutta at the time of the appraisal mission's visit in November 1957 and it was attributed mainly to the growing quantity of difficult and heavy cargo such as machinery and steel imports and to navigational problems on the Hooghly, compounded by the bunching of ship arrivals. The mission emphasized that congestion was not a temporary problem and could not be easily relieved. It paid particular attention to possibilities of speeding up cargo handling by better labor management and use of incentive schemes, and concluded that the potential here was quite limited without provision of substantially more and improved mechanical equipment; at the same time it was recognized that labor opposition would prevent very rapid progress on mechanization of cargo handling.

Many of the items covered by the loan were oriented to overcoming or reducing the congestion problem — the Fulda Point scheme to ease navigation and reduce time spent waiting for high tides, various conversions and small extensions in KGD to increase berthing capacity, the floating cranes to help deal with heavy-lift cargo, the new quay cranes and a more than 50% increase in CPC's fork-lift and mobile crane park to speed cargo handling, improvements in repair facilities to make repairs quicker, and purchase of locomotives and realignment of track lay-out to hasten the passage of cargo through the port. The mission identified the main cost of congestion as the days spent by ships waiting at the mouth of the Hooghly, which it estimated at more than 5,000 days between October 1956 and October 1957. Relating the saving to be obtained by eliminating this detention to the one-third of project investment considered to be more of expansion than replacement nature, the mission concluded that this would yield a rate of return of at least 15%.

The appraisal report for the second project, which was seen essentially as a stop-gap pending Haldia which would nevertheless remain useful after Haldia as general cargo continued to pass through Calcutta, did not attempt any quantification of economic benefits. The floating craft, which accounted for about two-thirds of the project, were considered essential to preserve access to the port and keep the docks dredged. Replacement items, which included some of the floating craft as well as other equipment, were expected to pay for themselves by savings in maintenance and repair costs, and the small amount of additional cargo-handling equipment included would bring benefits in the form of faster loading and discharge of general cargo.

Within six months of signature of the first loan a Bank supervision mission found that congestion had in fact been 'virtually eliminated.'

Available records unfortunately do not go back beyond 1958/59, but the trends since then in congestion, at least as measured by the ship waiting time, suggest that numerous factors have been involved and that among the most important have been labor strikes and availability of suitable railway wagons for removing imports, neither of them much related to the items financed under the Bank loans. Appendix Table 6 gathers key data on ship waiting time and corresponding indicators on navigational conditions and numbers of vessels calling; data on cargo-handling are provided in Appendix Table 7; unfortunately no information is available on crucial indicators such as average freight clearance time. The figures show little correlation with one another except for 1966/67, the worst year as regards ship detention, when the problem arose particularly from sharp increase in grain imports required and a near doubling in foodgrain vessels visiting Calcutta; the problems were compounded by labor unrest and refusal to make optimum use of the bulk foodgrain handling facilities installed with US AID assistance in 1965 (reflected in labor productivity figures) and by shortage of appropriate railway wagons. The fact is that congestion, which may occur at any one of a number of stages — access up the Hooghly, berthing, loading and discharge, evacuation of goods from the port area — has resulted at different times from a large range of factors, under each of these stages, ranging from accidents temporarily blocking the river channels to delays by exporters in bringing their cargo to port. But the sharp increases in 1963/64 and 1964/65 seem to have been due mainly to labor problems and strikes (particularly in the latter year: pilots' go-slow March 1964 to January 1965 and two-month strike January-March 1965) and to shortages of railway wagons for heavy lifts rather than to the fact that total traffic reached new peaks in those years. Again in 1966-68 the main problems were strikes and go-slows (shore labor and stevedores) and rail wagon shortage.

### Economic Evaluation

With the multiplicity of factors at work and the highly complex nature of the Bank projects themselves, it was not easy to choose an appropriate framework for retrospective economic analysis of the investments. What would have happened if none of the investment supported by the Bank had been undertaken — and Calcutta port had been allowed entirely to die — is a question with such enormous ramifications that it would be almost impossible to answer; it would also not be very useful to answer since Calcutta port was far too important an installation for the economy of India and especially of north-east India, not to be kept in basic operating order with necessary replacements, at least until a substitute was available. We have tried instead to deal with certain discrete parts of the projects, which might be considered to lie at the margin in

decision-making about how far to maintain or expand the port in particular respects, with the idea that if these investments prove to have been economically valid then a fortiori the rest of the investments were also.

Within the Bank-assisted program as a whole we have focussed principally on the objective, which dominated in the revision of the first loan and the making of the second loan, of keeping the port of Calcutta itself accessible to an expanding trade of ocean-going vessels. Essentially this meant trying to maintain 26 foot draft permanently right up to Calcutta. Except on days of very low tides this had been maintained fairly successfully, mainly by natural forces, in most years up to 1957. Drafts dropped sharply in 1958 and further through 1961 when the average was down to about 22 feet (see chart). In 1962-63 dredging and the related civil works began to have some effect in stabilizing the level at an average draft of some 23 feet, with normally some 35-75 days per year above 26 feet instead of almost none as in 1958-62 (Appendix Table 6). This large dredging effort has been sufficient to maintain Calcutta as an important port for ocean-going vessels, carrying traffic in the amounts discussed earlier, even though it did not fully meet the hopes held in 1960.

A great deal of this effort was concentrated on the 60-mile stretch of the river between Haldia and Calcutta, and it is reasonable to ask what would have happened to Calcutta traffic if this had not been undertaken, and it had been accepted in 1960 that Calcutta itself would gradually become inaccessible to the larger ocean-going vessels. This is the economic question upon which we have focussed. About 40% of the investments<sup>1/</sup> partially financed by the Bank related directly to this part of the effort, and we have analyzed the return to these investments in the form of net cost savings that they made possible on traffic that would probably have continued even if drafts had further deteriorated and in the form of net value to India of traffic that would probably have been lost altogether under these circumstances.<sup>2/</sup>

<sup>1/</sup> i.e. Fulda Point training works, cutting of Balari channel, dredgers Churni, Maitena and Subarnarekha, and the launches for them, the Grab Dredgers and related Hopper Barges provided in the second loan, KGD conversion of "D" berth and extension, and appropriate shares of consultant costs and of workshop equipment provided.

<sup>2/</sup> The basic judgment underlying the analysis is that, if the additional work between Haldia and Calcutta that the Bank's loans made possible had not been done, then Hooghly drafts would have deteriorated after 1961 from average 22 feet in that year to about 20 feet in 1966 and 18 feet by 1971; they would begin to improve again

(footnote continued on page 25)

This analysis can only be illustrative, but the results are interesting. They indicate that, at market prices (as described in the footnote), the internal rate of return to the investment involved would be around 25%. And, using severe shadow prices of Rs. 12.00 per US dollar for foreign exchange and zero for unskilled labor, the return would still be 10%. These results show that the effort to keep Calcutta accessible to ocean-going ships by heavy dredging, even if not as successful as originally hoped, was clearly worthwhile.

Another alternative to the dredging of the upper Hooghly, besides the mainly lighterage/lightening operation assumed in this analysis, would have been early construction of riverside jetties at Haldia, as planned in the earlier schemes for Haldia and strongly favored by some in the Bank

2/ (continued from page 24)

only in 1975 when Farakka should begin to have some effect on the upper Hooghly; average draft might be back at about 20 feet in 1980. With an effective draft of 18 feet it was assumed that the following would be the disposition of traffic: iron-ore exports would have tapered off rapidly as available drafts went down, and terminated in 1966; coal exports would have gone entirely to smaller vessels, increasing freight rates by an average of \$1.00/ton; the same would have happened to the bulk of oil imports, but a portion would have been lightered from Haldia anchorage; all foodgrains (other than those which have actually been transferred to smaller ships at Haldia and Saugor) would have been so transferred, adding about \$4.70 (Rs. 35) per ton costs; about 65% of foreign general cargo imports and exports and 35% of coastal general cargo would have been treated in the same way, at a cost of \$5.33 (Rs. 40) per ton. A small offsetting factor in cases where lighterage/lightening was involved would be reduced ship turnaround time due to elimination of the need to negotiate the upper Hooghly; on the other hand no allowance was made for any reduction from actual historical ship detention times. The proportions of traffic to which these premia were applied were gradually scaled up from 0 in 1961 to the proportions cited above by 1971 when the average draft was assumed to have declined to 18 feet. The treatment afforded different kinds of traffic was based on inspection of all available data and particularly information on the size-distribution of ships visiting Calcutta, and their cargoes, for different classes of traffic. The analysis was carried through 1980, using CPC traffic projections for 1973-80, allowing for effective operation of Haldia from 1975 on and including a figure for residual value of the Bank-assisted investments by 1980. To allow for price inflation from the early 1960s, when most of the investments were made, to 1972 the Indian wholesale price index was used.

in the 1960 discussion. This hypothesis was not tested because of the following principal considerations, suggesting that it would not in fact have been more economic: (a) there is limited frontage at Haldia appropriate for riverside jetties, beyond the oil jetty that was built, without preempting the area needed for the enclosed dock now under construction, (b) costs would probably have been quite high, about Rs. 25 million (\$3.3 million) for a single general cargo jetty and (c) due to fast tides in the area, throughput of an unprotected riverside jetty at this location would probably have been quite limited — to about 125,000 tons a year. Early construction of such a jetty would also have required earlier investment to improve land transport facilities out of Haldia than actually took place.

There are a few specific small components of the investment programs assisted by the Bank about which some doubts arise as to economic justification, and these we tried to check in some detail in the course of the audit. In total they amount to only about 8% of the total investment made. The first is the KGD Western Arm extension which, to the extent it was implemented, cost a total of Rs. 12.6 million or about \$1.7 million equivalent. A scheme similar to this was dropped from the first loan when the draft problems arose in 1958-60. The Bank strongly urged its inclusion in the second project and pressed for its early execution as a means to provide protected berthing capacity for more ships. Rather than expedite the project with the aid of outside contractors CPC seems in practice to have kept to its original intention of moving slowly ahead with the scheme; it was accomplished mainly with CPC's own equipment, at a large saving over original estimates in foreign exchange, and completed to its present stage only in 1968 instead of 1966 as planned. Quay walls have not been built, but some dolphin berths installed. It has been used only to a limited extent and merely as a holding area; this is partly because traffic has been so unexpectedly low in the years since it was finally completed. However, even in earlier years ship traffic never exceeded the level reached in 1959/60, which had been satisfactorily coped with without additional berthing capacity, and Bank supervision reports of the middle 1960s persistently complained about the rather large amounts of berthing space that were unutilized even when congestion and detention problems were serious.

A second small item, which has been of some use but less than originally envisaged, is the large 'Libyan' Tea Warehouse included in the first project and finally completed in 1966 at a total cost of Rs. 12.7 million (about \$1.7 million equivalent), slightly less than expected but also with less equipment installed than planned. The 600,000 square foot warehouse was originally planned in the second half of the 1950s in connection with the Tea Board's effort to bring more tea auctions from London to Calcutta. The Tea Board guaranteed occupation for 60 years at a

satisfactory rental. By the time it was completed Tea Board plans had changed and more reliance was being placed on privately owned warehousing capacity. The Board arranged for the new warehouse to be temporarily occupied by a local tea merchant firm, which retained it until the end of 1971. Available figures on this firm's monthly stock position and warehousing capacity suggest that up to about 30-40% of the Libyan Warehouse has provided essential capacity in the peak months (December-February) for the years 1966-71; but it is not clear whether even this amount of capacity might not have been available elsewhere. There have been some disputes about the rental payments, and CPC has not received to date the full amount guaranteed by the Tea Board. In July 1972 a new arrangement was reached in principle for the warehouse to be taken over by the Central Inland Water Transport Corporation (CIWTC), a Government concern, for warehousing river freight, but details of the transfer have not yet been finalized.

Third is the KPD Water Recirculation scheme, whose economics are thrown in doubt mainly by the long delay between incurrence of the major costs and effective operation. Investment, which took place mainly between 1965 and late 1967, amounted to some Rs. 7.8 million (about \$1.0 million equivalent). The purpose of the scheme was to enable recirculation of water at the entrance lock to KPD, reducing the need for make-up water from other sources and hence the intrusion of silt into the dock; the benefits would occur mainly in the form of reduced expenditure on dredging within the docks. Whether or not the scheme will be effective remains to be seen. Delays in project execution and, more importantly, design faults of which the effect was somewhat exacerbated by the Bank's 1967 'guillotine' on the second loan prevented the scheme from operating until late 1971.

Fourth and finally there is the mechanical cargo handling equipment provided under the Bank loans — principally 15 mobile cranes and 20 fork-lift trucks under the first loan and 9 mobile cranes and 10 fork-lifts under the second — at a total delivered cost of some Rs. 10.3 million, or about \$1.3 million equivalent. The expectation was that the equipment would significantly speed up cargo-handling operations. The consignment under the first loan was delivered mainly in 1958 and that under the second loan mainly in 1964. Unfortunately, detailed records on cargo-handling do not go back beyond 1962; these records indicate no impact of the 1964 consignment. Data on average discharge and loading per ship per day do indicate a sharp improvement between 1957/58 and 1958/59 (see Appendix Table 7), but this improvement was only partially sustained and it is not clear how representative the single year 1957/58 is of the situation prior to the large increase in cargo-handling equipment that the Bank made possible. The available data on shore labor gang productivity

indicate no significant change between the early 1960s and early 1970s. CPC itself takes the view that the handling equipment did not affect productivity or speed of operation but only reduced the drudgery involved. But it may be that a significant improvement in the overall figures should not have been expected for, even though the equipment represented large increases to the existing stock that CPC had, it was small in absolute terms — enough for fully mechanized operation at only three or four of the 33 general cargo berths in the port.

If the Bank-supported projects were, with a few possible minor exceptions, economically worthwhile the question still arises whether greater or earlier effort on Haldia would not have been more so. Overriding political and economic problems in Calcutta's hinterland have been such that the mere availability of a more efficient modern port would probably not have greatly affected the quantum of general cargo traffic offered, but it would have enabled additional iron-ore exports, at least in recent years, and it might have held more coal traffic to the sea route; in addition there would have been some significant cost-savings on traffic transferred from Calcutta, due to the larger size of vessel that Haldia can take and reduced ship turn-around time. These benefits would add to a substantial amount. In general terms it is clear that the earlier Haldia would have been completed the better. However in 1960-61 Haldia was not really an alternative, the decision to carry out further studies of an impounded dock scheme there — rather than to invest immediately on river-side jetties — was probably correct, and most of the components of the Bank's second project seem indeed to have been warranted irrespective of Haldia, as the Bank argued at the time. But the Bank, in its preoccupation with the hydraulic complexities of the Hooghly, failed to insist on simultaneous study of economic aspects of the Haldia scheme. Had it done so, fully satisfactory feasibility studies could probably have been completed by the end of 1963, final design could have been done in 1964 and construction might well have been able to start as early as 1965 and be completed in 1970. This would clearly have been desirable.

Instead, the process of project preparation dragged out and the GOI decided in 1966, mainly in light of overall balance of payments considerations and aid prospects at the time, to build the project without foreign assistance. Construction is likely to take 7 years (1968-74) instead of the 5 years expected by the Bank in 1965 and the 6 years that would probably actually have been feasible with the participation of foreign contractors and the availability of foreign assistance to enable freer import of supplies. Total construction costs are now estimated at about Rs. 800 million, including 7-8% (Rs. 60 million) foreign exchange, compared with Rs. 560 million, including nearly 40% (Rs. 205 million) foreign exchange, for the slightly larger scheme appraised by the Bank in

1965; more than half of the difference between these total figures is accounted for by interim price inflation. In theory, then, a simple analysis could be made to show whether the benefits (principally additional ore exports) from having Haldia operating one year or more earlier than is actually likely would have been sufficient to justify the additional foreign exchange cost of the foreign-assisted scheme, or at what shadow price of foreign exchange the two alternatives would have been equally good. A thorough study of this question — taking account of indirect foreign exchange costs, likely cost overruns on the Bank-appraised scheme, the value to CPC and its Indian contractors of the training and experience gained from present methods — might be worthwhile. It is not clear which way the analysis would fall, but there is no doubt that construction of Haldia is a major feat of Indian engineering.

Even when Haldia is completed CPC will at best be able to offer 34-35 foot drafts, but the hope is, by the combined effects of the channel stabilization made possible by diversions at Farakka together with intensive capital dredging, to reach 40 foot draft in the approach to Haldia by 1980. This would permit bulk carriers of some 60,000 DWT, a reasonable size at present but no larger than Paradeep is already able to accommodate, and less than what may be becoming the normal size for such vessels in the early 1980s.

#### Institutional Development

The basic organizational structure of the Port of Calcutta has not changed substantially over the past twenty years. The port is run by a 24-member Board of Commissioners, with the Chairman and Deputy Chairman appointed by the Ministry of Transport in Delhi and the other members appointed, nominated or elected to represent a fairly broad range of central, regional and local Government, labor, and local business and commercial interests; the latter have the largest representation. The Chairman, a senior civil servant appointed from outside, and the Deputy Chairman, an engineer long with CPC, are directly responsible for the day-to-day running of the port and now have 13 department heads reporting to them, of whom some 5 represent an informal executive committee. A current organization chart is given at the end of this paper. Powers to approve contracts (up to Rs. 10,000 by the Chairman and up to Rs. 700,000 by the Commissioners) have remained unchanged since 1957, so that they have more than halved in real terms, and all capital expenditures, of whatever size, have to receive prior approval of Central Government authorities.

CPC's Chairman is also ex-officio Chairman of the Dock Labor Board (DLB) which was formed in 1953 to decasualize the stevedore companies'

casual labor. Cargo-handling ashore is thus done by CPC labor while that on board ship (except for coal) is done by workers registered with the DLB and temporarily hired out to the stevedore companies. Over the last decade various other groups of workers, previously employed directly by private companies, have come under DLB registration. Total DLB labor now numbers some 15,000 (see Appendix Table 7).

Direct CPC employees have increased from some 40,500 as of December 31, 1957 to 42,600 as of December 31, 1971. With the decline in traffic overall productivity, measured in terms of tons of dry cargo handled per employee, has of course declined sharply from peaks above 220 tons for 1957/58 and 1964/65 to the range of 100-130 tons in the last three years (Appendix Table 7). Measured in terms of gross port revenues per employee, adjusted for price inflation, overall productivity was about the same in 1971/72 as in 1957/58.

There have however been important changes in the distribution of the CPC labor force. Operational staff, although still the largest group, has dropped substantially from over 25,000 in 1960 to less than 21,000 in 1972. Most of this reduction has been in shore labor, some 20-40% of whom have nevertheless had normally to be sent home without work in recent years. But the reduction in operations staff still represents an important achievement in view of the increase in CPC's fleet of vessels over the period and consequent need for more staff in that sector. Administrative departments have increased staff by some 20% since 1960 to reach 5,300 in 1972. But the really large increases in employment have been in the engineering departments mainly responsible for maintenance. They have grown nearly 60% from about 10,400 employees in 1960 to about 16,400 in 1962. A significant part of this increase is due to inclusion of CPC employees concerned with Haldia construction but even if these are left aside, and no allowance is made for those in the engineering departments in 1960 who were concerned with capital construction, we still find a 42% increase in maintenance staff over the period. This seems extremely large, even allowing for the admittedly substantial increase in CPC's fleet over the same period. A calculation relating maintenance staff to gross operating assets in constant prices suggests that this ratio has steadily risen in the last three years.

The Bank encouraged CPC to reduce its labor force, although it generally tempered its emphasis on this point in view of the extreme poverty and widespread unemployment so evident in Calcutta. In 1968, in face of CPC's increasingly acute financial difficulties, the Bank urged that the GOI should take over responsibility for paying those shown by scientific studies to be redundant. This was not done. Except on one occasion, the Bank seemed to be thinking almost entirely of cargo-handling labor — where important reductions have been underway, both

among CPC and among DLB workers, despite the fact these groups remain seriously underemployed. The persistent rise in maintenance employees and the overstaffing that is visible in the maintenance shops would probably have warranted more attention.

There has been a strong trend toward equalization of wages in CPC, partly as a result of the large increases for lower-paid workers decreed by Central Government Wage Boards. The average wage of the lower-paid workers (Classes III and IV) has risen from only a little over 15% of that of officers (Classes I and II) in 1961/62 to nearly 30% in 1970/71 (Appendix Table 7). In terms of current Rupees the average wage of the lower-paid has risen about 105% over this period, that of officers less than 20%, compared with a rise in the cost-of-living index over the same period of 70-80%.<sup>1/</sup> This does not seem seriously to have affected the caliber of CPC's higher grade staff, but it has made it difficult to recruit and retain younger officers of high quality; this is particularly so in the pilotage service but it seems to be true of other branches of CPC activity too. Even with the port's financial problems, more rapid increase of salaries for higher-grade staff would probably have been in the port's long-run interests.

In the two areas in which the Bank concentrated its effort in regard to institutional development — long-term planning and accounting — important changes have been accomplished. In both areas there are weaknesses as well as strengths in what has been achieved.

#### Long-Term Planning

In the field of long-term planning the Bank's principal focus and impact was on hydraulic aspects. As promised in connection with the second loan, CPC set up its own Hydraulic Studies Department in 1962, with Dr. McDowell, an expert previously provided by the UN, as first Director. Under contract with the Bank, various Dutch experts made brief visits to advise on the structure and early work programs of HSD — particularly on the questions that needed to be answered in connection with Haldia. Since 1964 the department has been run by the man who was initially McDowell's deputy, and no foreign specialists have been hired on a long-term basis. Several supervision missions in the late 1960s considered HSD to be the best run of all CPC's departments. It now has a staff of slightly under 250, divided among four departments — hydraulic engineering, dredging research, river research and special assignments. Its principal work has been for CPC but it has also successfully carried out a few assignments, on a consultancy basis, for other Indian ports, the West Bengal State Government and other entities.

<sup>1/</sup> According to the Reserve Bank of India indices for Calcutta, 67% for urban non-manual employees and 78% for working class.

The Department has set up and maintained an effective system for gathering, collating and analyzing hydrological data. It has an extensive network of gauging stations for measuring tides, velocities, density and silt load; it carries out regular hydrographic surveys and tracer experiments. Analysis of the data collected provides a detailed knowledge of the behavior of the river bed, tidal streams and siltation processes. A large tidal fixed bed model of the river and its tributaries is expected to be completed and calibrated during 1973.

HSD produces analyses of short-term operational importance — draft forecasts and advice on dredging, for instance — but its main effort has been in connection with planning of capital projects such as Haldia and related works and the measures that are being taken to prepare for completion of Farakka. Among the principal benefits of HSD operations over the last ten years are:

- recommendations to optimize the use of dredging plant and reduce ineffective dredging,
- predictions of shoaling so that pre-dredging can be undertaken,
- availability of extensive and detailed knowledge about river Hooghly,
- confirmation that adequate depths could be maintained at Haldia, even under adverse stream-flow conditions,
- detailed schemes to enable advantages of Farakka to be maximized,
- planning of progressive river training works to stabilize the river channel and reduce dredging requirements,
- determination of the correct location of the oil jetty and the new lock entrance at Haldia.

HSD works closely with other departments of CPC. It has had major impact on all the principal investment schemes that CPC presently has under way — Haldia itself, the Bhagirathi-Hooghly training works underway at a cost of Rs. 100 million to prepare for Farakka, procurement of a large estuarine dredger (Rs. 100 million) to assist in deepening the access channel to Haldia and a further project under consideration to expedite the deepening of this access channel.

In other aspects of long-term planning, which the Bank sporadically discussed but never seems to have followed up in detail, CPC remains relatively weak. The small planning cell, located in the Secretary's Department, seems to suffer from shortage of dynamic staff, and the small number of highly qualified officers is overburdened with urgent current problems and production of statistics. Longer-term planning, to the extent it is done, seems to be dispersed among the main operating departments. Traffic forecasting machinery remains weak, and traffic promotion and

generation scarcely receive attention. Issues such as how to use the direct inland water route up the Ganges that will be opened up by Farakka to generate traffic for the port, what to do with the Calcutta coal and ore berths when Haldia is completed, whether and when to sell the Calcutta Jetties, how to employ CPC's large labor force more productively, whether and when to build a deep-water facility for bulk cargoes at Saugor Island, would warrant hard pursuit by a strong central planning unit.

#### Accounting Reform

Accounting reform is less of a success story than hydraulic studies, even though major changes have been accomplished here too. After CPC's Chief Accountant had been unable to fulfill the commitment made in the 1961 loan to develop auxiliary accounts, to show costs and revenues by service, a new CPC Chairman brought in a local accounting firm in 1963 to review the situation. It proposed a set of auxiliary accounts and an appropriate method for classifying expenditures and receipts for this purpose, and it dealt with the revaluation of assets to replacement values. But the report, issued in October 1963, was more a proposal than a solution, and despite spasmodic questions from the Bank as to the action to be taken, the matter lay largely dormant in inconclusive discussions between GOI, the Comptroller and Auditor General of India, CPC and the Bombay Port Trust which, at the Bank's advice, had also hired a consultant firm to deal with accounting reform. Then in November 1965 GOI set up a cell in the Ministry of Transport, headed by a senior officer of the Indian Audit and Accounts Service, to go into the matter of accounting reform for ports, with a view to coming out with a standard system for all ports.

The Bank pressed the matter hard during the appraisal of Haldia and in subsequent discussions, making a loan for Haldia (which was at that time still expected to be made) contingent on concrete evidence of progress in introducing reforms at Calcutta. The main theme of the Bank was the need to reassess asset values at their replacement costs and to charge to revenue depreciation allowances based on these asset values and reasonable standard lives. At Bank urging, CPC produced a target schedule of steps designed to enable application of a modernized accounting system, incorporating this feature, starting in 1967/68, and advisory assistance was obtained from the accounting firm that had done the 1963 report. With a very large effort in reclassification of assets and establishment of appropriate service lives and in reorganization of accounting categories on the basis of a system of 999 cost centers, a modernized accounting system was applied informally in 1968/69 and officially from 1969/70 on. This was mainly the achievement of a former Chief Accounts Officer of CPC,

kept on expressly for the job, and of the Accounts Officer specially assigned to the Ministry of Transport. Similar systems have also been applied in the other major ports of India.

With minor modifications introduced over the last three years, the new accounting system is working smoothly and the staff is becoming accustomed to it; audit, which is carried out by the Government Auditor General, was completed about 8 months after the end of the year for 1971/72 compared with 15 months for 1970/71. The main advantages of the new system are that it presents revenue and expenditure accounts (including depreciation based on reasonable service lives) by major service category and also by responsibility centers and that it provides a more meaningful consolidated balance sheet. Assets are given at historic costs in the main accounts, and depreciation allowances are calculated on this basis. But replacement value of assets other than land is given in a footnote to the accounts.

While the new accounting system classifies figures in a new and potentially more useful way, it is very hard to identify ways in which this has affected modes of managing and operating the port. It does not seem to have induced or assisted the development of a more commercial outlook on the part of management. By a quirk of circumstance effective depreciation allowances are actually slightly lower than they would have been had the old system been retained. Regular management reports based on the new system do not appear to be produced, and the useful monthly Performance Report issued by the Planning Cell since two or three years ago contains no financial data. Experiments have started with quarterly reports on actual revenues and expenditures as compared with budget, by department, but management seems to have shown little interest. The major service categories used can show very broadly which areas of port operation are losing money, but this was largely known before at a general level. The finer breakdown by particular tariff-service that would be necessary to provide the most useful information, or the time-and-motion type of studies by particular operation that might be more appropriate, do not appear to be done, certainly not on a regular basis. There is no evidence so far of any major management decision having been significantly affected by the new accounting system.

#### Financial Performance

Although the Bank-assisted investment projects appear by and large to have been economically worthwhile the financial performance of CPC has been very disappointing compared with Bank appraisal report projections. The appraisal report for the first loan projected debt-service coverage of some 2.0-2.5 and financing of over 50% of the investment

program by internally generated funds; actual debt-service coverage for this period, through the early 1960s, was only about 1.2-1.3 and self-financing less than 25%. The much lower levels of debt-service coverage and internal self-financing projected in the second appraisal report (about 1.2-1.3 and 10% respectively) were more nearly attained for a while, but performance dropped sharply in 1965/66 and never recovered. (See Appendix Tables 8 and 9).

CPC's accounts show losses after interest and depreciation for each year since 1965/66 and they would show losses for each year since the early 1960s had depreciation been charged on a replacement cost basis. The accounting losses of 1965/66-67/68 were covered by drawing down CPC's reserve funds. Since 1968/69 they have been covered by large Government operating subsidies and by capitalization of losses in the balance sheet. The following table shows the situation for the last four years.

Table 3

CPC Losses 1968/69-1971/72 and Their Coverage (Rs. million)

	<u>1968/69</u>	<u>1969/70</u>	<u>1970/71</u>	<u>1971/72</u>	<u>Total</u>
Net Deficit in Accounts	37.7	95.9	89.8	58.3	281.7
Government Op. Subsidy	—	<u>50.0</u>	<u>29.0</u>	<u>97.1</u>	<u>176.1</u>
Losses Capitalized	<u>37.7</u>	<u>45.9</u>	<u>60.8</u>	<u>-38.8</u>	<u>105.6</u>
Depreciation not charged	n.a.	16.2	15.3	14.9	46.4

The last line reflects the difference between depreciation on historical cost basis, as actually charged, and depreciation on replacement cost basis and should really be added to losses to provide a truer picture. The subsidy payments are shown according to the year in which they were committed. GOI agreed to a subsidy at the rate of 50% of CPC's expenditures on river dredging and conservancy in 1969 and at the rate of 80% in 1972, and the payments shown for these years reflect adjustments to make up the full 80% with effect from 1968/69. CPC has been able to capitalize losses by spending less on capital works than what was secured for these, mainly from Government (see Appendix Table 9) and by using reserve funds. The effective debt-equity ratio, on the basis of the official accounts, has been around 99/1 (see Appendix table 11).

CPC has maintained its debt-service payments to the Bank and to other creditors on schedule. In May 1967 the Bank informed the GOI that it might have to start meeting CPC's debt obligations. Formally, they have continued to be met from CPC's earnings. But in reality CPC's expenditures on river dredging and conservancy are of little benefit to others than users of the port. Hence it is an arbitrary matter whether CPC debt-service obligations, amounting to some Rs. 260 million over the past four years, are considered to have been met mainly from Government subsidy and capitalized losses or from earnings.

The drastic deterioration in CPC's financial condition has been mainly a phenomenon of the last 7 years, and it is hard to see that CPC, given its labor situation, could have done very much more at this stage to prevent it than it did in fact do. Between 1965/66 and 1970/71 traffic dropped nearly 40% at the same time as operating expenditures increased more than 50%, almost entirely due to increases of equivalent size in the wage bill (53%, with less than 2% increase in employment), which accounts for more than 70% of CPC operating costs. Despite the fall in traffic gross revenues increased some 25%, mainly due to large tariff increases between mid-1966 and mid-1967. Tariffs could probably have been increased more, but there is clearly some limit to the extent this can be done without affecting traffic, and CPC's large property holdings could probably have been exploited to yield more rapidly rising revenues, but the property market in Calcutta was not at all strong in this period due to political problems. These same problems made substantial reduction of the labor force an impossibility and required that centrally decreed wage increases be met.

Whenever Bank supervision missions made constructive and specific suggestions in these years, CPC seems to have examined them carefully and, if it found them practicable and within its capabilities, it took action. For instance, it cut back its railway trackage a little, as suggested by the 1968 mission, and it has been encouraging unprofitable short-haul railway operations to die, as recommended by the 1969 mission; port charges for exports, which had been increased much less than those for imports in order to encourage export trade, were partially adjusted in 1970, as recommended by the 1969 mission, but, on the other hand, the very thorough study of the price-elasticity of actual and potential traffic which the 1968 mission usefully recommended does not seem to have been attempted, because CPC lacked the requisite staff. These steps, however, could not have been sufficient greatly to alter the situation, and the Bank was by this time strongly promoting the large Government subsidies which some in the Bank had favored as early as 1960.

CPC has in fact adhered closely to its undertakings to the Bank in regard to financial performance. The depreciation study required by the

Bank in connection with the first loan was carried out by a team including foreign experts as the Bank recommended and delivered by the due date of April 1, 1959. The Renewals and Replacements Fund which this study recommended was established with effect from 1960/61 and tariffs were increased significantly in January 1960, including increases on coal and foodgrains as proposed by the consultants. At the time the second loan was made, CPC undertook to try to strengthen its financial position "with a view to earning sufficient revenue to cover all operating expenses, including adequate depreciation, and to leave a reasonable margin to meet unexpected increases in expenditures as they arise," and it promised to give particular attention to four items — development of land holdings, reduction of stores, use of Revenue Reserve Fund to reduce borrowing requirements and revision of rate structure. These areas of emphasis were largely reiterated in the Ratnam Committee Report completed in September 1961.

Late in 1961 CPC produced a plan for increasing revenues from its property holdings which the Bank seems to have found acceptable. It was proposed to rent out an additional 200 acres between 1962 and 1967 and, by this together with increase of existing rentals, to raise gross revenues from property to Rs. 18.3 million in 1966/67. Both targets were very closely adhered to. A more tentative longer-term plan given in the 1961 note and proposing a further increase of some 300 acres in the area rented out between 1967 and 1972 has not been fulfilled, but this seems to have been largely because of the weakness in the local land market in this period and partly because CPC did not have the funds to undertake the land-fill and other works required to beneficiate the land. The Bank raised the matter in 1968, but CPC did not feel much more could be done at that time. CPC now has about 2,200 tenants occupying 3.8 million square feet of warehouse space and some 1,200 acres of land, out of the total of 3,360 acres it owns at Calcutta and Budge-Budge.<sup>1/</sup> Average gross annual rental on the land is about Rs. 13,000 per acre. According to a CMPO<sup>2/</sup> map most of this land falls within a range of Rs. 3,000-5,000 per Katha (or Rs. 180,000-300,000 per acre) registered value, and some in higher categories. CMPO officials suggest that current market values are at least double these registered values, which would mean that CPC's leased out land may be worth some Rs. 500,000/acre (\$66,000) and the gross return currently being earned is only some 2.5%. With the renewal of growth in Calcutta there should be scope for substantially increasing rents; the limits on periodic rental increases built into earlier rental agreements did not allow for inflation and seem to require revision.

<sup>1/</sup> It has another 9 square miles approximately at Haldia.

<sup>2/</sup> Calcutta Metropolitan Planning Organization.

With regard to stores, the Ratnam Committee suggested trying to reduce them to a ceiling of Rs. 18.0 million and CPC, in reviewing the recommendation, felt that Rs. 20.0 million would be an appropriate target. These estimates were presumably in relation to 1961 prices and volume of work underway. They would have meant bringing down stores from some 16% of combined annual expenditures on port operation and capital works to about 10-11% and from some 120% of annual expenditures on stores to about 70-75%. Stores have in fact been steadily reduced, to such an extent that today they may well be too low, at only about 5% of combined annual expenditures on port operation and capital works and about 66% of annual expenditures on stores. These figures are fairly high, but so are delays in procurement in India.

CPC also steadily drew down its Revenue Reserve Fund, starting in 1962, in order to reduce the need for borrowing. The Fund fell from Rs. 53.0 million as of March 31, 1961, by steps, to Rs. 38.0 million by March 31, 1965, after which date it was rapidly depleted to help cover the operating deficits of succeeding years.

As regards revision of rate structure the Ratnam Committee recommended a general increase of charges for the year 1963/64, with particular emphasis on foodgrains and coal, and such a change was introduced with effect from April 1, 1963.

The Bank recognized, from 1958, the need for larger tariff increases than emanated from the various consultant studies and Government committees, and it was persistently concerned about CPC's poor financial performance, but it never seems to have pursued the matter effectively or to have convinced the Indian authorities of the need for action. In retrospect it appears to have been unduly impressed with the apparently strong financial structure of CPC — debt-equity ratio of 51/49 in 1958 and large liquid reserves — and insufficiently concerned with poor current financial performance. While it certainly recognized the problem of inadequate depreciation, it does not seem to have appreciated the full financial implications of an entity's taking on more debt to pay for replacements in a situation where traffic expansion was expected to be fairly moderate. Had this been fully appreciated the Bank would probably not have been prepared to lend with such modest financial performance as CPC was then giving. In 1961 CPC made a rough revaluation of its assets, as of March 31, 1960, which the Bank used in its appraisal report, but it did not point out the magnitude of the difference between the 1.7% return CPC was actually earning on these assets, after inadequate allowance for depreciation, and the 5 or 6% plus adequate depreciation which would have conformed more closely to normal standards. The structure of Bank forecasts seems always to have erred on the optimistic side,

with revenues growing more than traffic and operating costs less. The Bank was not always consistent with regard to depreciation and asset-revaluation and seems sometimes to have been confused by CPC financial statements. It may have been a tactical error to negotiate the 1961 loan at a time when the Indian authorities could refuse to make any firm financial commitments on the grounds that the Ratnam Committee report was not yet ready.

The combination of reasonable economic results and poor financial performance for a single scheme usually means that the entity responsible for it has not been able to appropriate the benefits to itself, and this is clearly true in this case. Yet who has benefitted from the poor financial performance of CPC is very hard to say. A proper treatment of this would require a much more detailed analysis than has been possible here of CPC's wage rates relative to those of other employers of similar labor, of CPC's rather complex tariff structure, of the short- and long-run marginal costs of its different tariff services, and of changes in wholesale and retail prices and transport mark-ups for various goods going through the port. From a purely financial standpoint, it may be noted that CPC's gross revenues in 1971-72 would have had to be about 66% higher than they actually were to enable all operating costs (including the minimum wage for underemployed labor) to be covered, an adequate provision for depreciation and a 6% return on revalued assets. Those benefitting most from the subsidized services would appear to be coal-shippers, foodgrain merchants, most general cargo exporters (excluding tea and gunnies), users of the railway services and those renting CPC property; but whether or not these benefits are passed on to, or shared with, producers and final consumers is impossible to say. Foreign shipping lines are also benefitting directly from CPC's subsidized rates but CPC's fear that increased charges to them would be quickly passed back to India in the form of higher freight rates, in foreign exchange, is probably justified. These benefits are being financed mainly by the Government in the form of its operating subsidy and other assistance and to some extent at the expense of future generations, by inadequate allocations for replacement and use of reserve funds and capitalization of losses.

### Conclusions

The assistance provided by the Bank to CPC made it possible to keep Calcutta open as a port for ocean-going vessels of medium size, and this was less expensive than other alternative ways of handling cargo to and from most of Calcutta's very large hinterland. The Bank-assisted projects were economically worthwhile in broad concept and in detail, with the

possible exception of a few minor elements, chiefly the KGD extension and the Libyan Tea Warehouse, due to low utilization. Port charges that are high by comparison with those of other Indian ports but substantially below the high costs of operating Calcutta port do not seem to have distorted traffic allocation on India's transport system.

CPC's poor financial performance has however laid very heavy financial burdens on the Government — in the form of operating subsidies of some Rs. 200 million and almost total reliance on Government for financing of CPC's large on-going investment program, mainly in Haldia and works related to this project and to Farakka. The prospect is for further substantial deficits,<sup>1/</sup> at least until Haldia begins to handle a large volume of bulk traffic, and the GOI has already undertaken to sustain the 80% of river dredging and conservancy costs at least through 1973/74. While there must still be a limit to the extent to which port charges can be raised without affecting traffic and it would not be opportune to discourage traffic at a stage, as now, when it is just recovering and when Haldia is about to be completed, it would seem that port charges could and should have been raised substantially more quickly than they were in the early 1960s and that there has in recent years been room for raising them somewhat more again. Although it was concerned about the problem, the Bank did not find an effective way of convincing the Indian authorities to take more substantial and expeditious action.

The Bank made a significant contribution to development of CPC and to India more broadly with its insistence on the creation of the Hydraulic Studies Department and its financial and technical assistance to this end. The experience of the last ten years and of the complex hydraulic problems which CPC has to face leaves no doubt that this was a high-priority need and a correct focus of Bank attention.

The Bank's broader hope that CPC would become a more streamlined and commercially oriented organization seems to have been only very partially realized. Knowledge of, and contact with, the traffic hinterland apparently remains very small, and there is little or no effort at traffic promotion. Little centralized long-term planning is done. Initiative seems to be less encouraged than deference to Delhi. By a major effort, the new commercial accounting system has been introduced, but the usual budget and management information reports, studies and analyses are not being produced, and it is having little effect on the management and operation of the port. Partly this is because of the great constraints under which the port has been functioning — a long decline in the demand for its services due to the economic recession, nationally imposed wage increases of major magnitude for the very class of labor which is in most abundant and excessive supply, extreme difficulty in discharging any labor, and rising costs of keeping the port open at all to ships of moderate size.

<sup>1/</sup> A small Rs. 12.5 million tariff increase was to be approved in December 1972, but most of this will be required simply to meet extra labor costs arising from a new central wage award.

It is a question, in retrospect, for the Bank whether change of the accounting system warranted quite the emphasis it was given, at least in the form that this emphasis took. Actually, in the 1961 negotiations, the Bank's representatives decided that a wholesale reform of the accounting system was too large a job to insist upon, and it was this that led to the reference to the need for preparation of auxiliary accounts. When the subject was taken up again in the middle 1960s it seems to have been assumed that in order to produce such auxiliary accounts the whole accounting system would have to be changed. And certainly the new system provides the framework and the basis for many useful management applications. But a simpler change, emphasizing the necessary work on asset reclassification and revaluation for depreciation purposes together with time-and-motion type studies, more loosely linked to the accounting system, for analysis of individual tariff services might have led to quicker and more useful results for application in improving efficiency and in setting tariffs — which were the Bank's end objectives. Irrespective of this, it does seem that whatever changes were agreed upon in the accounting field, more attention should have been given to the types of reports that would result from the changes and the questions that these reports might help to answer — on costs and profitability of individual services, budget performance, financial trends, etc. More generally, in the matter of management reporting, the Bank did not set the example it might have done through its loans, with their lack of agreed schedules for execution of project works, absence of targets of financial and technical performance, and very little identification of indicators which would show whether the improvements financed were having the desired effect. Reasonable performance data could have been collected without any reform of the accounting system and would have helped to identify bottlenecks and scope for improvement of operations with the equipment and facilities available.

If less emphasis might well have been given to overall accounting reform it does seem that more emphasis should have been given to personnel and labor matters. Given the great difficulty — and doubtful desirability in Calcutta conditions — of substantial cut-backs in the labor force, attention could usefully have been given to expanding CPC's areas of activity to peripheral activities, making use of facilities as well as labor presently underemployed, and meeting needs not now being met: for example, pallet-making, surfacing quay aprons, repairing and upgrading access roads, filling and beneficiating vacant CPC land, and warehousing (the recent transfer of Libyan Warehouse to CIWTC seems questionable from this point of view). Such operations might well have required some effort on training and retraining, which appears a weak area of CPC activity, largely confined at present to the Mechanical Engineering Department. Training is virtually non-existent in the

operational departments; supervisors have been increased relative to supervised in the shore labor, but deficiency of training and supervision still seem to mean that less advantage is being obtained from mechanical cargo handling equipment than would be possible. Time-and-motion studies also have a role to play here in identifying better ways to handle particular jobs, as well as the costs of carrying them out. The DLB made breakthroughs in 1970 in several respects, including introduction of greatly improved incentive schemes which had a major effect on stevedore productivity and speed (see Appendix Table 7), but incentive arrangements for CPC labor, cargo-handling and other, seem poor; promotions depend on seniority rather than performance or training. If CPC is to get enough high-quality officers to apply imagination to these possibilities for improving labor use and extending opportunities, as well as to the other needed studies of hinterland, traffic-elasticity, improved exploitation of CPC property, planning of the next development after Haldia, etc., it will almost certainly have to increase salaries for higher-level staff considerably. More Bank attention to these personnel matters could probably have played a useful role, both directly and indirectly, to make the constraints of which CPC is so well aware seem less tightly binding.

CPC executed the Bank-assisted projects quite effectively and adhered closely to the commitments it made to the Bank; equally, the Bank, which devoted considerable effort to the Port of Calcutta, was generally responsive and reasonably flexible in handling its side of the relationship. There were delays in project execution, but many of them were unavoidable in light of the changing needs of the situation and the Bank's inability under policies of the time to finance local procurement except under special circumstances. There are a few points connected with loan administration where, in retrospect, it seems as though it would have been better if the decision in the Bank had gone the other way. Three of these relate to opportunities that the Bank had for expediting construction of a satellite port, of which it was generally — and, in retrospect, rightly — a strong proponent. First, it would seem that two or three years would have been gained had the Bank followed the 1957 mission's recommendations and provided technical assistance for execution of hydraulic studies in connection with the first loan, instead of the second. And secondly, time on Haldia could again have been gained if the Bank had raised in 1960-61, along with the technical questions about the project, the economic questions whose resolution took most of 1964-65. Thirdly, it seems unfortunate, given the great importance of the project and the excessively long delays to which it had already been subject, that the Bank in 1965 prolonged negotiations on secondary issues to a point at which other considerations came into play to cause construction finally to be started only in 1968. Aside from Haldia, it is clear that, especially if the issue of hydraulic

planning had been dealt with in connection with the first loan, but probably even in the absence of this, the second loan should have been negotiated a year later than it actually was, when the component projects had been better prepared and had full Government approval and when the Ratnam Committee recommendations were available as the basis for more meaningful agreement on financial performance targets. Finally it seems that more attention should have been given in advance to the negative effects on project completion and operation of the refusal in 1967 to extend the second loan's closing date for most items. These points may have some relevance when parallel decisions have to be made in the administration of other lending.



## CARGO HANDLED AT MAJOR INDIAN PORTS - 1957/58-1971/72

(in '000 metric tons, excluding bunker fuel)

	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72
<b>CALCUTTA</b>	10,132	9,227	9,676	9,391	9,199	10,091	10,800	10,928	9,729	9,974	8,878	7,863	6,820	5,965	7,294
Imports - Coastal	1,227	1,269	1,298	1,483	1,722	1,845	2,119	2,019	1,624	1,417	1,500	1,297	1,341	1,375	1,700
Foreign	4,377	3,879	3,735	4,009	3,163	3,635	3,909	4,064	3,660	4,375	3,385	2,703	2,058	1,872	3,051
Total	5,604	5,148	5,033	5,492	4,885	5,480	6,028	6,083	5,284	5,792	4,885	4,000	3,399	3,267	4,751
Exports - Coastal	1,274	1,185	1,249	1,406	1,866	2,214	2,007	1,759	1,344	974	755	680	826	275	675
Foreign	3,254	2,894	3,394	2,493	2,468	2,397	2,765	3,086	3,101	3,208	3,238	3,183	2,595	2,443	1,868
Total	4,528	4,079	4,643	3,899	4,314	4,611	4,772	4,845	4,445	4,182	3,993	3,863	3,421	2,718	2,543
<b>BOMBAY</b>	13,167	11,759	13,342	14,349	13,911	15,966	17,354	18,878	17,910	17,007	16,923	19,022	15,172	14,103	14,214
Imports - Coastal	1,284	1,309	1,367	1,363	1,436	1,581	1,538	1,343	1,466	1,480	1,682	1,728	1,500	1,700	1,169
Foreign	8,427	7,329	8,560	9,357	8,594	9,826	10,734	12,011	11,398	10,480	10,905	13,044	10,196	8,955	10,174
Total	9,711	8,638	9,927	10,720	10,030	11,407	12,272	13,354	12,864	11,960	12,587	14,772	11,696	10,655	11,343
Exports - Coastal	752	1,550	1,824	1,931	2,105	2,339	2,876	3,167	2,908	2,899	3,120	2,248	1,614	1,738	1,940
Foreign	2,704	1,571	1,591	1,698	1,776	2,220	2,206	2,357	2,138	2,148	2,216	2,002	1,862	1,710	1,431
Total	3,456	3,121	3,415	3,629	3,881	4,559	5,082	5,524	5,046	5,047	5,336	4,250	3,476	3,468	3,371
<b>MADRAS</b>	2,544	2,479	2,763	3,039	3,468	3,785	4,166	4,398	4,872	5,856	5,863	6,378	6,440	6,926	5,551
Imports - Coastal	668	618	769	768	878	1,027	1,117	1,145	1,126	972	985	906	530	183	122
Foreign	1,247	1,147	1,072	1,360	1,391	1,561	1,472	1,848	2,173	2,896	2,808	3,116	3,006	3,555	3,297
Total	1,915	1,765	1,841	2,128	2,269	2,588	2,589	2,993	3,299	3,868	3,793	4,022	3,536	3,738	3,419
Exports - Coastal	38	51	48	50	63	60	56	52	50	45	38	31	343	428	210
Foreign	591	663	874	861	1,136	1,137	1,521	1,353	1,943	2,032	2,325	2,561	2,760	1,922	1,922
Total	629	714	922	911	1,199	1,197	1,577	1,405	1,993	2,070	2,363	2,904	3,188	2,132	2,132
<b>VISHAKHAPATNAM</b>	2,476	2,485	2,391	2,763	2,756	3,121	3,396	3,741	4,460	5,878	6,445	8,050	8,312	8,766	8,669
Imports - Coastal	18	8	11	13	16	31	27	32	21	23	25	23	98	111	67
Foreign	1,146	1,346	1,211	1,373	1,380	1,687	1,822	1,877	1,887	2,204	2,388	2,669	2,231	2,208	2,712
Total	1,164	1,354	1,222	1,386	1,396	1,718	1,849	1,909	1,908	2,227	2,413	2,692	2,329	2,329	2,779
Exports - Coastal	324	554	585	588	622	715	619	678	669	604	481	570	334	289	294
Foreign	988	577	584	709	738	688	928	1,154	1,883	3,047	3,551	4,788	5,649	6,138	5,596
Total	1,312	1,131	1,169	1,297	1,360	1,403	1,547	1,832	2,552	3,651	4,032	5,358	5,982	6,427	5,890
<b>COCHIN</b>	1,828	1,808	1,977	2,010	2,285	2,362	2,455	2,711	2,871	3,670	5,474	5,189	4,795	4,843	4,276
Imports - Coastal	816	806	853	913	1,018	1,031	1,157	1,074	1,050	698	228	230	243	156	242
Foreign	610	549	696	709	859	928	877	1,186	1,362	2,374	3,504	3,552	3,126	3,292	2,943
Total	1,426	1,355	1,549	1,622	1,877	1,959	2,034	2,260	2,412	3,072	3,732	3,782	3,369	3,468	3,185
Exports - Coastal	140	137	146	150	168	146	156	191	195	320	1,027	906	916	966	747
Foreign	262	316	282	238	240	257	265	260	264	278	665	501	510	449	344
Total	402	453	428	388	408	403	421	451	459	598	1,692	1,407	1,426	1,395	1,091
<b>KANDLA</b>	858	1,087	1,162	1,573	1,387	1,742	1,779	2,312	2,506	2,661	2,465	2,035	2,110	1,605	2,033
Imports - Coastal	265	369	355	335	399	409	474	451	493	549	531	579	766	676	795
Foreign	354	528	486	896	713	1,000	1,017	1,603	1,844	1,875	1,729	1,130	1,038	791	1,004
Total	619	897	841	1,231	1,114	1,409	1,491	2,054	2,337	2,424	2,260	1,709	1,804	1,467	1,799
Exports - Coastal	51	46	44	65	114	98	90	74	86	94	153	53	34	56	56
Foreign	188	144	257	277	159	235	198	168	95	151	111	173	253	104	178
Total	239	190	301	342	273	333	288	258	169	247	205	326	306	138	234
<b>MORMUGAO</b>	-	-	-	6,401	6,497	5,459	5,956	6,620	7,860	8,086	8,132	8,778	9,029	11,004	11,700
Imports - Coastal	-	-	-	-	19	96	108	144	156	711	210	209	185	266	356
Foreign	-	-	-	184	143	15	7	83	186	208	160	56	86	80	
Total	-	-	-	184	162	111	115	217	239	397	418	369	261	352	436
Exports - Coastal	-	-	-	-	-	2	2	1	1	1	15	-	3	-	-
Foreign	-	-	-	6,217	6,335	5,346	5,839	6,402	7,620	7,688	7,699	8,409	8,788	10,652	11,264
Total	-	-	-	6,217	6,335	5,348	5,841	6,403	7,621	7,689	7,714	8,409	8,788	10,652	11,264
<b>PARADIP</b>	-	-	-	-	-	-	-	-	-	67	896	1,238	1,731	2,157	1,906
Imports - Coastal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Foreign	-	-	-	-	-	-	-	-	-	-	42	9	-	-	
Total	-	-	-	-	-	-	-	-	-	-	42	9	-	-	
Exports - Coastal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Foreign	-	-	-	-	-	-	-	-	-	67	854	1,229	1,731	2,157	1,906
Total	-	-	-	-	-	-	-	-	-	67	854	1,229	1,731	2,157	1,906
<b>Total (All Eight Ports)</b>	31,005	28,845	31,291	39,526	39,503	42,526	45,906	49,588	50,208	53,199	55,026	58,553	54,409	55,369	56,143
Imports - Coastal	4,278	4,379	4,653	4,875	5,488	6,020	6,540	6,208	5,936	5,350	5,161	4,972	4,663	4,487	4,451
Foreign	16,161	14,778	15,760	17,888	16,245	18,652	19,838	22,662	22,407	24,390	24,969	26,383	21,711	20,759	23,261
Total	20,439	19,157	20,413	22,763	21,733	24,672	26,378	28,870	28,343	29,740	30,130	31,355	26,374	25,246	27,712
Exports - Coastal	2,579	3,523	3,896	4,190	4,938	5,574	5,806	5,938	5,261	4,929	4,530	4,588	4,089	3,710	3,922
Foreign	7,987	6,165	6,982	12,573	12,832	12,280	13,722	14,780	16,624	18,530	20,366	22,610	23,946	26,413	24,509
Total	10,566	9,688	10,878	16,763	17,770	17,854	19,528	20,718	21,865	23,459	24,896	27,198	28,035	30,123	28,431

Source: Statistical Abstract of the Indian Union (1967)  
 Statistical Handbook of the Indian Union (1969)  
 Central Statistical Organization  
 Department of Statistics, Government of India



SCHEME/EQUIPMENT		C O S T S (\$ or Ru. '000s)			Total (in Rupees)	Total % cost increase	D A T E S (year or month/year)			Elapsed Time, Order to Completion (months)	Nationality of main Contractors	Tendering	Remarks
		Foreign Exchange To 30 %	In Ru. 0-7.5%	Local Currency (Ru.)			Planning & Design	Pricing Order	Completion or Operation				
Civil Works for Navigation Fulda Point Training Works	Forecast	6,030	45,224	20,600	65,854	-	1954-58	1958	1961	60	Dutch/Indian	global/local	Local costs of overrun due original under-estimate; foreign cost saving by reduced scope of work. Poor initial performance dredging contractor made also start & led to loss of one dredger & lives.
	Actual	4,310	32,325	28,696	61,021	- 7%			1961				
KGD Wharving Jetty	Forecast	510	3,825	2,500	6,335	-							This scheme, which was to ease the difficult access into KGD, was deleted in 1959/60 to free resources for coping with the more urgent problem of dredging in the river.
	Actual	-	-	-	-	-							
Floating Craft for Navigation Salvage tug cum Despatch vessel: Seva (240 ft.)	Forecast	1,834	13,755	-	13,755	-							Design changed during construction, mainly to include two rudders.
	Actual	1,619	12,142	148	12,290	-11%	7/61		1/64	30	UK	global	
Pilot vessel	Forecast	1,834	13,755	-	13,755	-							Intended to replace existing worn-out pilot vessel, but dropped in 1959/60 to free resources for dredging.
	Actual	-	-	-	-	-							
2 Pile-dredgers cum Dredgers: Agnijoy & Agnijiit (116 ft. each)	Forecast	1,290	9,675	2,000	11,675	-							Domestic construction reduced costs, especially foreign exchange, but delayed completion due difficulties procuring materials. Agnijoy work 8/72, but will be recovered.
	Actual	427	3,202	4,868	8,070	-31%	3/60		11/62 & 9/63	32 & 42	Indian		
2 Anchor vessels: Bheesa & Arjun (112 ft. each)	Forecast	212	1,590	2,800	4,390	-							Procured entirely locally and hence deleted from loan project by CPC.
	Actual	-	-	-	-	-			1959 & 1961		Indian		
Suction Hopper Dredger: Bhadrathi (372 ft.)	Forecast	1,230	9,235	1,400	10,625	-							Large local cost overrun due major modifications required on delivery to provide additional accommodation, and interim increase in import duties.
	Actual	1,194	8,935	9,663	18,558	-75%	6/55		3/58	33	UK	global	
Suction Hopper Dredger: Churni (372 ft.)	Forecast	3,451 *	25,883 *	2,000 *	27,883 *	- 2%							Some minor modifications added, inc. air-conditioning.
	Actual	3,273	25,297	2,507	27,804	- 2%	9/59		8/61	23	UK	negot'n.	
Estacado Dredger: Mohana (405 ft.)	Forecast	1,093 *	8,198 *	-	8,198 *	(+265%)							Only covers part of costs, remainder under loan 294-IN. Voyage repairs and allocations due contractor's departure from specifications delayed availability of vessel.
	Actual	3,992	29,960	-	29,960		1/63		3/66	38	Dutch	global	
River Suction Dredger, Second-hand: Matsana (240 ft.) built 1947	Forecast	1,260 *	9,450 *	1,500 *	10,950 *	-							Purchased second-hand from international contractor (French) & brought from Hong Kong.
	Actual	1,206	9,045	886	9,731	-11%	5/60		8/60	3		negot'n.	
Repair Dredger Gunga, incl. change to diesel (built 1921)	Forecast	230 *	1,705 *	-	1,705 *	-45%							Vessel sold to Cochin port in 1966.
	Actual	125	928	-	928						Indian	local	
3 Launches for Dredgers (67 ft. ea.) Lakshmana, Dhara, Saccubha	Forecast	210 *	1,375 *	1,700 *	3,275 *	- 6%							Local construction reduced costs, especially foreign exchange.
	Actual	198	1,185	1,822	3,077	- 6%	11/58		10/60	23	Indian		
Improvements for Docking/Berthing KGD Conversion: B & C Berths to general cargo and C berth to oil	Forecast	446	3,345	19,000	22,345	-							Work executed, but details unavailable.
	Actual	219	1,643	23,080	24,723	+11%			late '60		Indian		
KGD Extension: 1 new general cargo and 1 new laying up berth	Forecast	915	6,863	15,500	22,363	-							Eliminated from loan project in 1959/60 to free resources for dredging program.
	Actual	-	-	-	-	-							
KPD No. 1 Dock: Recondition Walls & install electric cranes	Forecast	2,050	15,375	20,000	33,375	- 5%	1956-58	1958/59	1963		c.works: local	global for	Badly deteriorated dock walls were re-manned under water & civil works for new cranes executed. Foreign costs reduced by local assembly of cranes. Cranes worked well after initial difficulties & small delays.
	Actual	1,815	13,613	20,020	33,633	- 5%			1964		German: 25 cranes Japan: 37 cranes	cranes	
Improve XPD Berths 22-26	Forecast	110	825	300	1,125	-							Work consisted mainly of crane electrification and related works, reurfacing of quay, and provision of goods lifts in transit sheds, but details unavailable.
	Actual	83	622	1,801	2,423	+115%			1961				
Laying Mooring at Diamond Harbour	Forecast	90	675	75	750	-							Deterioration of depths in Balarji/Kangasalla Channel led to decision to lay moorings not at Diamond Harbor but further down river at Halda where they have been useful for lightening/ropping up.
	Actual	73	548	-	548	-27%			n.a.				
Bucket Dredger, w. 2 hopper barges: Ajay (185 ft.) IB 11 & IB 12	Forecast	2,320	17,400	200	17,600	-							Some increase in overseas building costs and import duties, but main cost increase & very long delays on IBs due inability to obtain from overseas & local shortages of plate & other materials.
	Actual	2,196	16,470	6,710	23,180	+32%		Ajay: 5/59 IBs: 8/60	9/61 & 1/66	28 56 & 65	UK	India	
2 Hopper barges: IB 2 & IB 3 (210 ft. ea.)	Forecast	1,260 *	9,450 *	1,500 *	10,950 *	-							Large foreign cost increase due initial understructure, local costs and delivery time increased by repairs necessary after voyage. IB No. 2 subsequently sold to OIL for oceanographic research.
	Actual	1,975	14,812	2,112	16,924	+55%	4/62		7/64	27	UK	global	
Jet Dredger: Jharna (73 ft.)	Forecast	85	658	600	1,238	-							Delivery on schedule.
	Actual	195	1,463	278	1,741	+41%	1959-62	1962	1963		German	global	
3 Dock-Master Launches Keya, Karabi, Ketaki (51 ft. ea.)	Forecast	212	1,590	1,000	2,590	-							Local manufacture reduced costs but extended delivery schedules.
	Actual	109	818	548	1,366	-47%	1/61		11/63, 12/63, 1/64	34, 35, 36	Indian		
4 Salvage Cantele	Forecast	331	3,983	-	3,983	-							CPC decided not to extend own salvage facilities & this item was hence deleted in 1959/60.
	Actual	-	-	-	-	-							
Grab Dredger: C.D. No. 1 (224 ft.) grab	Forecast	840 *	6,320 *	1,300 *	7,800 *	-							Delivered on schedule; no data on reasons for cost overrun. Item added in 1959/60 in order to replace an existing worn-out grab dredger.
	Actual	1,306	9,795	1,406	11,199	+44%	8/62		5/64	21	UK	global	
2 Floating Cranes: Vir Bahu (100 tons, 160 ft.) Moha Bahu (60 tons, 180 ft.)	Forecast	1,920	14,400	-	14,400	-							
	Actual	1,842	13,615	1,968	15,783	+10%	12/60		5/63	29	Dutch	global	
Shore Facilities Improve Dry Dock Facilities, KGD and KPD (incl. cranes)	Forecast	306	2,295	1,100	3,395	+ 2%							Project included three 3-ton cranes and one 25-ton crane (included in total numbers shown above). Small delay in completion due to problems with cranes which have since worked well.
	Actual	249	1,868	1,605	3,473	+ 2%	1958	1959	1963		Indian-c.works -local Germ.& Jap.-cranes-global		
Modernize Ship Repair Shops: KPD, Saw Mill & Island Workshops	Forecast	232	1,890	1,052	2,942	-18%							Project included const'n. new marine workshop (for CPC vessels) at KPD No. 14 Berth, equipment thereof, and other extensions at Saw Mill Workshop and Island Workshop. Delays in steel sections' supply.
	Actual	126	945	1,460	2,405	-18%	1958	1959	1960/61		Indian-c.works -local UK - equip't.-global		
Modernize Diesel & Railway Repair Shops	Forecast	237	1,778	1,264	3,042	+25%							Delays due to also availability problems and additional piling required, wh. also increased local costs; also one contract re-ordered because failure contractor. Principal equip't. was 250 ton Chain Trawler.
	Actual	176	1,370	2,466	3,786	+25%	1958	1959 & 1964	1962/63 & 67		Indian-c.works -local Germ.,UK-equip't.-global		
9 Diesel Locom and Running Shed at Sonapur	Forecast	610	4,575	500	5,075	+29%							
	Actual	745	5,508	846	6,334	+29%	1958/59		1959/61	10-14	Canada-locos.-global		
Rearrangement Rly. Lines and Majherat Bridge	Forecast	820	6,150	20,000	26,150	-							This ongoing scheme was substantially cut back in 1959/60 to free resources for coping with dredging problem, and the essential minimum was accomplished outside scope of loan project.
	Actual	-	-	-	-	-							
Ship Water Supply Improvement (incl. 2 new water boats)	Forecast	204	1,530	4,958	6,488	-							Project included sinking of tubewells, erection of tanks and installation of pump facilities, as well as acquisition of two water boats (Jaladhi & Berdhis), of which delivery delayed by more than a year.
	Actual	145	1,087	4,719	5,806	-10%	(boats) 3/60		6/62 11/63	44	Indian		
Improve Fire Protection, KGD & CD Jetty	Forecast	49	368	1,250	1,616	-							Project involved new pipeline in KGD and new pumps at several locations. Delays were due difficulties in obtaining appropriate pipes and fittings locally.
	Actual	10	75	452	627	-67%	1958-60	1961	1964 1965	48	Indian	local	
Conversion of DC to AC at KPD	Forecast	128	980	612	1,572	-							
	Actual	59	443	785	1,228	-22%	(receivers) 8/59		11/61	27	UK	global	
Reconstruction No. 1 C.R. Jetty Shed	Forecast	61	307	2,500	2,807	-							Scheme delayed in 1959/60 in view of changed priorities.
	Actual	-	-	-	-	-							
New Tea Warehouse ('Libyan')	Forecast	730	5,400	8,065	13,465	- 6%							Some delay in commissioning foreign equipment, but main problem was unequal settlement of floor slab, involving redesign and remedial work including cellular construction, adding to cost.
	Actual	181	2,357	11,332	12,689	- 6%	1956-59	1959	1963 1966	85	Indian-c.works -local UK- chuto/elec.-global		
Mechanical Cargo Handling Equipment	Forecast	990	7,425	1,800	9,215	-							Principal items were 15 mobile cranes and 20 fork lift trucks, most of which still operating. Foreign exchange saving mainly due omission and rack stipper in view Halda prospects.
	Actual	577	4,327	2,376	6,703	-27%	1957/58		1958/59		UK	global	
Consultant Engineering Rendell, Falder & Tritton	Forecast	350	2,429	-	2,625	-							
	Actual	513	3,862	-	3,862	+47%					UK		
Contingencies	Forecast	2,674	20,036	12,900	32,954	-							
	Actual	-	-	-	-	-							
T O T A L	Forecast	29,000	217,500	141,976	359,476	- 3%			1963				
	Actual	29,000	217,500	132,502	350,002	- 3%			1965				

\* Item not included in original project but added later by agreement between CPC and the Bank. The forecast amounts for those items represent forecast as of the time the Lists of Goods for the loans were modified to include them and are not included in the forecast total amounts shown at the bottom of the page.

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CALCUTTA PORT COMMISSIONERS: THIRD-PLAN PROJECTS SUPPORTED BY IBRD LOAN 294-TN OF 8/17/61:  
COSTS, CONSTRUCTION SCHEDULES AND PROCUREMENT

APPENDIX TABLE 3

		C O S T S (\$ or Rs. '000s)		Local Currency (rs.)	Total (in Rupees)	Total % cost increase	D-A-T-E-S (year or month/year)			Elapsed Time Order to Completion (months)	Nationality of main Contractors	Tendering	Remarks	
		Foreign Exchange					Total % cost increase	Planning & Design	Placing Order					Completion or Operation
		In US \$	In Rs. @ 7.5/\$											
<b>Civil Works for Navigation</b>														
Cutting new channel over Belari Bar	Forecast Actual	59 * 59	443 * 443	2,115 * 2,031	2,558 * 2,474	- 3%	-	1961	1962	-	Dutch	negot'n.	This scheme added to project late in 1961, by agreement with Bank, to deal with emergency situation created by Rangafalla channel siltation soon after opening in Oct. 1961.	
<b>Floating Craft for Navigation</b>														
Estuarine Dredger: Mohana (405 ft.)	Forecast Actual	3,678 416	27,584 3,120	1,500 10,379	29,084 13,499	(-54%)		1/63	3/66	38	Dutch	global	Shows only the portion of total costs not covered under Loan 198-TN project. Total actual costs were Rs. 43.4 mln, compared with Rs. 37.3 mln estimated, an increase of 16%, mainly accounted for by import duty liability.	
River Suction Dredger: Subarnarekha (295 ft.)	Forecast Actual	1,890 2,651	14,175 19,883	1,000 5,657	15,175 25,540	+68%		4/65	3/67	23	German	global	Cost increases due to vessel being designed larger than originally planned, and subsequent alterations; also increase in import duty.	
2 Pilot Vessels (274 ft. each): Sagar & Samudra	Forecast Actual	3,572 3,476	26,790 26,069	1,000 409	27,790 26,478	- 3%		11/62	9/64 & 10/64	22 & 23	UK	global	Some alterations were made on arrival in Calcutta, to enable attainment of contractual performance conditions, and boarding boats replaced.	
Light Vessel (117 ft.)	Forecast Actual	588 -	4,410 -	200 -	4,610 -	-		-	-	-	-	-	Deferred by CPC and eliminated from project by agreement with CPC in 1964/65.	
Survey Vessel: Tribeni (200 ft.)	Forecast Actual	420 1,298	3,150 9,735	1,500 809	4,650 10,544	+127%		12/63	10/65	22	UK	global	Substantial increase in vessel size decided after original cost estimate.	
<b>Improvements for Docking/Berthing</b>														
KCD Western Arm Extension	Forecast Actual	630 64	4,725 480	7,000 12,087	11,725 12,567	+ 7%	1961	1961	1966 1968	84	Indian & deptal.	local/deptal.	This scheme, which was cut back when need for additional berths seemed less urgent, was eventually carried out mainly departmentally, saving foreign exchange and using CPC dredgers.	
KPD Water Recirculation	Forecast Actual	840 326	6,300 2,445	2,500 5,321	8,800 7,766	-12%	1962	1965	1966 1971	72	Indian-c. works-local UK -pumps	global	Scheme intended to reduce siltation in KPD, still not completely implemented. Installation of pumps was delayed to late 1967 by local contractor difficulties, and then oil lubrication had to be changed for water lubrication.	
Grab Dredger: GD No. 2 (224 ft.)	Forecast Actual	527 1,309	3,953 9,818	1,500 3,536	5,453 13,354	+145%		10/64	4/67	30	UK	global	High cost overrun & long delivery mainly due liquidation UK builder, & breakdowns.	
Grab Dredger (224 ft.)	Forecast Actual	527 -	3,953 -	1,500 -	5,453 -	-		-	-	-	-	-	Eliminated from project in 1964/65 by CPC in agreement with IBRD.	
2 Hopper Barges: HB 6 & HB 7 (220 ft. ea.)	Forecast Actual	630 1,929	4,725 14,467	5,000 4,570	9,725 19,037	+96%		11/64	3/67 & 4/67	28 & 29	UK	global	High cost overrun & long delivery due liquidation of UK builder, long delivery voyage and breakdown.	
1 Hopper Barge (220 ft.)	Forecast Actual	315 -	2,363 -	2,500 -	4,863 -	-		-	-	-	-	-	Eliminated from project in 1964/65 by CPC in agreement with IBRD.	
2 Hopper Barges: HB 4 & HB 5 (181 ft. ea.)	Forecast Actual	630 2,015	4,725 15,112	5,000 5,020	9,725 20,132	+107%		3/67	11/68 & 3/69	20 & 24	UK	global	These were originally to be supplied in Nov. 1966 by same UK builder as HB 6 & 7 but builder's liquidation required that they be re-tendered.	
4 Dock Tugs: Golep & Tegar (89 ft. ea.) & Bakul & Hena (99 ft. ea.)	Forecast Actual	965 1,292	7,088 9,690	3,500 7,004	10,588 16,694	+58%	(G&T: 9/65 (B&H: 1/66)	6/67 12/67 & 2/68	21 23 & 25	UK India	global local	Costs were originally underestimated, UK vessels required repair after trials in Calcutta. Indian vessels were delivered close to schedule.		
3 Launches (78 ft.)	Forecast Actual	378 -	2,835 -	1,200 -	4,035 -	-		-	-	-	Indian	-	Procured locally, outside loan project.	
<b>Shore Facilities</b>														
Replace No. 2 Swing Br. (KPD)	Forecast Actual	590 522	4,425 3,915	1,200 8,826	5,625 12,741	+127%	1961-62	7/64	3/66 11/66	28	Austrian	mainly global	Small delay due to periodic rescheduling of work to fit with traffic needs. Large Rupee cost overrun due to additional foundation work required and import duty liability.	
Workshop/Shipyard Equipment	Forecast Actual	450 485	3,375 3,638	1,850 8,435	5,225 12,073	+131%		1963-66	1964-67	6 - 24	mainly UK & German	global	Satisfactorily operating.	
Mechanical Cargo Handling Equipment	Forecast Actual	400 318	3,000 2,385	100 1,176	3,100 3,561	+15%		1963-66	1964-67	6 - 24	UK and some Japanese	global	Principal items were 9 mobile cranes and 10 fork lift trucks. Satisfactorily operating.	
<b>Consultants and Studies</b>														
Hydraulic Studies (and Equipment therefor)	Forecast Actual	1,110 1,514	8,325 11,355	4,200 7,825	12,325 19,180	+53%		-	-	-	-	-	Including procurement of Research Launch 'Investigator', delivered July 1962, and Research Vessel 'Amasandhani', delivered October 1963.	
Consultant Engineering (for project and Haldia)	Forecast Actual	1,050 1,163	7,875 8,723	1,000 1,248	8,875 9,971	+12%			6/67		UK	-		
Contingencies	Forecast	1,830	13,724	4,150	17,874									
<b>T O T A L</b>	Forecast Actual	21,000 18,837	157,500 141,278	47,400 84,333	204,900 225,611	+10%			1965 1968				Outstanding balance of loan finally cancelled July 14, 1969.	

\* Item not included in original project but added later by agreement between CPC and the Bank. The forecast amounts for these items represent forecasts as of the time the Lists of Goods for the loans were modified to include them and are not included in the forecast total amounts shown at the bottom of the page.



PORT OF CALCUTTA (Incl. HALDIA starting 1968/69 for POL only): TRAFFIC, FORECAST AND ACTUAL (Incl. bunker fuel)  
(in '000 metric tons)

	1938/39	1949/50	1954/55	1955/56	1956/57	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72
<b>IBRD First Appraisal Forecast (1957)</b>																				
<b>DRY CARGO</b>																				
Exports	8,943	8,120	6,933	7,027	7,719				9,366					11,292						
Bulk-Coal (incl. bunker)	6,852	5,008	4,616	4,657	4,527				5,408					7,320						
Bulk-Ores	2,922	3,067	2,826	1,977	2,135				2,596					3,048						
General Cargo	616	108	565	882	786				1,067					1,626						
Jute	3,294	1,833	1,613	1,798	1,602				1,965					2,656						
Gunnies	656	219	1	1	1				1					1						
Scrap	1,030	985	933	951	952				914					965						
Tea	62	1	104	149	127				51					152						
Sugar	101	163	181	168	192				203					203						
Iron & Steel	12	1	2	4	29				203					254						
Pig Iron	526	64	23	23	23				574					1,082						
Other	907	359	350	503	291															
Imports	2,111	3,112	2,319	2,370	3,192				3,758					3,062						
Bulk-Salt	479	615	462	499	426				508					711						
Bulk-Foodgrains	295	1,067	462	209	732				711					813						
General Cargo	1,337	1,430	1,415	1,662	2,036				2,539					2,418						
Machinery	104	132	78	104	194															
Iron & Steel	105	140	215	412	792				1,422					613						
Rly. Plant & Materials	-	58	71	81	80															
Chemicals & Soda	-	53	97	113	130				203					406						
Other metals	16	54	63	54	94															
Fertilizer	55	104	24	29	10				914					1,219						
Other	1,057	909	907	869	731															
<b>WET CARGO (POL)</b>																				
Exports (incl. bunker)	400	796	1,006	1,132	1,291				1,910					630						
Imports	-	-	-	-	-				81					172						
TOTAL SEA-BORNE	9,343	8,915	7,939	8,159	9,010				11,276					11,922						
<b>IBRD Second Appraisal Forecast (1961)</b>																				
<b>DRY CARGO</b>																				
Exports						9,031	8,138	8,324	7,727	9,172	9,686	10,297	11,618	11,557						10,435
Bulk-Coal (incl. bunker)						4,715	4,199	4,751	3,840	5,471	6,232	6,761	7,257	7,859						8,773
Bulk-Ores						2,174	1,885	1,705	1,422	2,438	2,642	2,642	2,845	2,845						3,048
General Cargo						1,003	786	1,116	660	1,116	1,016	1,727	1,930	2,032						2,540
Jute						1,528	1,528	1,528	1,758	2,012	2,067	2,169	2,680	2,680						3,185
Gunnies						933	914	1,004	985	985	985	985	985	985						46
Scrap						40	92	180	178	173	203	203	122	132						152
Tea						162	176	175	163	183	183	183	203	203						234
Sugar						90	31	16												
Iron & Steel						10	21	43												
Pig Iron						-	46	6												
Other						320	288	419												1,768
Imports						6,316	3,939	3,583	3,927	3,708	3,654	3,556	3,861	3,698						3,662
Bulk-Salt						1,129	1,313	1,329	1,829	1,524	1,524	1,422	1,524	1,321						914
Bulk-Foodgrains						2,716	2,236	1,884	2,108	2,186	1,830	2,136	2,337	2,377						2,748
General Cargo						400	438	261	203	203	203	305	406	406						508
Machinery						152	250	173	406	406	406	508	508	305						203
Iron & Steel						125	132	216	190	190	181	175	175	175						160
Rly. Plant & Materials						195	104	114	102	102	102	102	102	102						102
Chemicals & Soda						60	51	64	62	36	31	31	26	26						20
Other metals						930	703	659	1,165	1,247	1,007	1,075	1,323	1,363						1,755
Fertilizer																				
Other																				
<b>WET CARGO (POL)</b>																				
Exports (incl. bunker)						1,287	1,208	1,451	1,351	1,676	1,676	1,778	1,778	1,778						1,778
Imports						1,287	1,208	1,451	1,287	1,208	1,451									
TOTAL SEA-BORNE						10,318	9,346	9,785	9,128	10,855	11,362	12,075	13,396	13,335						14,213
<b>ACTUAL TRAFFIC</b>																				
<b>DRY CARGO</b>																				
Exports	6,832	5,008	4,616	4,657	4,527	4,715	4,199	4,751	4,009	4,351	4,643	4,813	4,867	4,462	4,198	4,011	3,818	3,356	2,689	2,539
Bulk-Coal (incl. bunker)	2,222	3,067	2,826	1,977	2,135	2,174	1,885	1,705	1,385	1,740	1,924	1,782	1,338	1,137	924	978	978	861	786	811
Foreign	1,363	1,267	1,144	757	1,008	967	824	660	204	162	139	272	266	374	360	434	322	487	471	493
Coastal (Rlys.)	1,559	1,430	1,158	893	954	1,027	884	891	854	1,122	1,392	1,354	1,153	888	537	353	340	543	157	493
Coastal (Ind.)	616	108	565	882	786	1,003	786	1,116	731	632	549	790	911	1,024	911	683	487	380	436	234
Bulk-Ores (foreign)	2,922	1,833	1,613	1,798	1,602	1,528	1,320	1,833	1,939	1,943	2,049	2,176	2,050	2,150	2,406	2,444	1,998	1,598	1,517	1,517
General Cargo	656	219	1	1	1	933	914	1,004	956	967	1,078	1,104	1,207	1,107	912	964	830	687	654	808
Jute	1,030	985	933	951	952	852	808	887	852	868	930	973	1,025	955	750	788	708	610	612	612
Gunnies	n.a.	n.a.	896	896	883	847	808	887	852	868	930	973	1,025	955	750	788	708	610	612	612
Foreign	n.a.	n.a.	37	35	69	106	117	102	119	128	131	182	152	162	176	122	77	42	27	42
Coastal	62	1	104	149	127	40	92	190	215	178	85	267	262	311	292	266	192	121	80	80
Scrap	101	163	181	168	192	145	176	175	159	174	182	163	180	148	151	161	154	124	124	125
Tea	12	1	2	4	29	90	31	16	35	149	175	136	67	70	102	-	1	1	2	1
Sugar	101	163	181	168	192	145	176	175	159	174	182	163	180	148	151	161	154	124	124	125
Iron & Steel	12	1	2	4	29	90	31	16	35	149	175	136	67	70	102	-	1	1	2	1
Pig Iron	526	64	23	23	23	10	21	43	84	81	72	70	129	191	377	566	620	490	248	134
Other	907	359	350	503	291	320	288	419	409	404	334	280	289	237	197	210	196	301	289	236
Imports	2,111	3,112	2,319	2,370	3,192	4,316	3,939	3,583	3,970	3,205	3,571	4,138	4,255	3,859	4,475	3,685	2,822	1,980	1,872	2,894
Bulk-Salt (coastal)	479	615	462	499	426	473	390	360	357	382	408	396	328							



## INCREASES FROM 1960 THROUGH 1970 IN SELECTED CONFERENCE LINE FREIGHT RATES FOR SOME MAJOR INDIAN PORTS

	CALCUTTA			VISAKHAPATNAM			MADRAS			BOMBAY		
	Date	% increase	cumulative %	Date	% increase	cumulative %	Date	% increase	cumulative %	Date	% increase	cumulative %
USA, Atlantic and Gulf of Mexico	1.11.62	10.0		1.11.62	10.0		1.11.62	10.0				
	10.11.63	10.0		10.11.63	10.0		10.11.63	10.0		3.15.64	10.0	
	10.11.65	7.5		10.11.65	7.5		10.11.65	7.5		9.22.65	10.0	
	10.11.67	10.0		10.11.67	10.0		10.11.67	10.0		9.23.67	10.0	
	1. 1.69	10.0		1. 1.69	10.0		1. 1.69	10.0		1. 1.69	10.0	
	11.11.69	5.0	165.3	11.11.69	5.0	165.3	11.11.69	5.0	165.3	12. 1.69	5.0	153.7
Canada (Halifax, St. John & Montreal)	1.11.62	10.0										
	10.20.63	10.0										
	11.15.65	7.5		11.15.65	7.5		11.15.65	7.5		12. 1.65	10.0	
	2. .68	10.0		2. .68	10.0		2. .68	10.0		2. 1.68	10.0	
	4. 1.69	10.0		1. 1.69	10.0		1. 1.69	10.0		4. 1.69	10.0	
	4. 1.70	5.0	165.3	1. 1.70	10.0	143.1	1. 1.70	10.0	143.1	4. 1.70	5.0	139.8
USA & Canada Pacific Ports	1.11.62	10.0					1.11.62	10.0				
	10.11.63	10.0					10.11.63	10.0				
	11.20.65	7.5					10.11.65	7.5		11. 1.65	10.0	
	12.18.68	7.5		-	-	-	12.18.68	7.5		2.18.68	7.5	
	3. 1.69	10.0					3. 1.69	10.0		3. 1.69	10.0	
	1.20.70	5.0	161.5				2. 1.70	5.0	161.5	1.20.70	5.0	136.6
UK & Continent	10.24.63	10.0		10.24.63	10.0		10.24.63	10.0		10.24.63	10.0	
	9.15.66	7.5		9.15.66	7.5		9.15.66	7.5		9.15.66	7.5	
	7.15.70	12.5	133.0	7.15.70	12.5	133.0	7.15.70	12.5	133.0	7.15.70	12.5	133.0
East Africa	1.31.66	2.0								4. 1.64	7.5	
	1.31.68	7.5		-	-	-	-	-	-	8. 1.67	7.5	
	1. 1.69	10.0	120.6							4. 1.70	7.5	124.2
Far East	10. 1.61	10.0		10. 1.61	10.0							
	4. 1.64	7.5		4. 1.64	7.5		3. 1.64	7.5		3. 1.64	7.5	
	9. 1.66	7.5		9. 1.66	7.5		9.15.66	7.5		9.15.66	7.5	
	10. 1.69	7.5	136.6	10. 1.69	7.5	136.6	10. 1.69	7.5	124.2	10. 1.69	7.5	124.2

Sources: Operations Research Group, Baroda: "Overseas Transport and Freight Structure in India's Export Trade" (June 1969) and Merchant Marine Directory 1971.



## PORT OF CALCUTTA: RIVER DREDGING, DRAFTS &amp; SHIP DETENTION

	River Dredging				No. of days 26 ft. draft Available	No. of days with bore tides <sup>a/</sup>	S H I P D E T E N T I O N						Total No. of Vessels Calling	
	No. of Dredgers	Effective Number	Direct Costs (Rs. mlns.)	Spoil Lifted (mln. tons)			General Imports No. of Ships	Ave. detent- ion (days)	Foodgrain Imports No. of Ships	Ave. detent- ion (days)	All Import Vessels Total Days Waiting	General Exports No. of Ships		Ave. detent- ion (days)
1938/39					273									
1943/44					80									
1948/49	3	1.1	2.1	6.2	106									
1949/50	3	1.2	2.3	6.1										
50/51	4	1.6	2.5	7.9										
51/52	3	1.6	3.1	7.1										
52/53	3	1.7	3.6	6.6		108								
53/54	3	1.4	3.5	5.0	103									
1954/55	3	1.8	3.8	6.9										
55/56	3	1.5	4.1	5.7				34				344		1,287
56/57	3	1.6	4.9	6.0				120				325		1,378
57/58	4	1.8	3.8	6.9				165				324		1,590
58/59	4	2.3	6.1	7.9	11	143		218		812		296		1,741
1959/60	4	2.6	6.1	8.9	10			0.4	224	0.5	417		283	1,820
60/61	5	3.1	6.4	9.8	35	157		0.1	279	0.05	84		231	1,788
61/62	6	3.4	8.3	9.5	0	156		0.03	148	0.2	44		316	1,799
62/63	6	3.2	10.6	9.7	15	161		0.4	156	0.3	427		367	1,817
63/64	6	3.7	9.6	12.8	53	160		1.1	216	1.1	1,141	0.1	312	1,806
1964/65	6	3.6	10.5	10.9	36	157		3.0	232	2.8	3,000	0.5	293	1,782
65/66	6	3.9	11.9	12.4	36	143	666	0.3	202	0.06	260	505	215	1,671
66/67	7	4.1	13.1	13.6	57	141	504	2.0	369	9.1	4,920	490	151	1,640
67/68	7	3.9	14.9	17.3	76	130	488	2.1	285	5.1	3,150	485	122	1,464
68/69	6	4.0	12.1	13.8	122	136		1.5	125	5.4	2,050	nil	120	1,381
1969/70	6	4.6	14.2	20.0	81	140	580	0.2	80	0.3	161	500	131	1,220
70/71	6	4.4	15.8	21.0	65	128	427	1.0	121	0.2	205	674	100	1,070
71/72	6	3.6	15.0	19.6	53	133		0.5		1.8		nil	101	1,244
72/73 <sup>c/</sup>								0.6		0.2		nil	nil	

<sup>a/</sup> Calendar years: eg. 108 days with bore tides occurred in 1952 and are therefore shown against FY1952/53.

<sup>b/</sup> For CY1947.

<sup>c/</sup> First six months only.



	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72
<b>CRG Employment (as of 12/31)</b>															
Trafic Manager	29,563	18,670	18,400	18,202	17,412	17,224	16,771	16,951	16,154	14,649	15,356	15,315	15,315	15,315	15,315
Marine Department	4,774	5,121	5,100	5,032	5,088	5,088	5,429	5,382	5,322	5,302	5,322	5,319	5,319	5,319	5,298
Ch. Mech. Engineer	7,997	9,522	9,522	9,522	9,583	11,394	11,536	11,536	11,536	11,497	11,497	11,533	11,533	11,533	11,536
Chief Engineer (Bridle)	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359	2,359
Ch. Engineer (Bridle)	1,772	1,783	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772	1,772
Ch. Med. Officer	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607
Fin. Adviser & CMO	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607
Secretary of Stores	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509	1,509
Land Manager	85	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Ch. Hydraulic Engr.	101	104	104	104	104	104	104	104	104	104	104	104	104	104	104
Labor Adviser & ISO	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Legal Adviser	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Total	40,469	40,944	40,979	40,084	40,093	40,690	41,120	41,827	42,390	42,286	42,423	41,704	42,358	42,577	42,577
of which:															
Administration & Maintenance	4,397	4,436	4,389	4,215	4,631	4,688	4,847	4,935	5,066	5,066	5,066	5,318	5,332	5,298	
Operations	36,072	36,508	36,590	35,879	35,462	36,002	36,979	36,991	37,321	37,320	37,420	36,886	37,026	37,279	
Total	40,469	40,944	40,979	40,084	40,093	40,690	41,120	41,827	42,390	42,286	42,423	41,704	42,358	42,577	
Class I & II	36,072	36,508	36,590	35,879	35,462	36,002	36,979	36,991	37,321	37,320	37,420	36,886	37,026	37,279	
Class III & IV	4,397	4,436	4,389	4,215	4,631	4,688	4,847	4,935	5,066	5,066	5,066	5,318	5,332	5,298	
Total	40,469	40,944	40,979	40,084	40,093	40,690	41,120	41,827	42,390	42,286	42,423	41,704	42,358	42,577	
Average Cl. I & II (Rs.)	12,283	12,775	12,853	12,555	13,546	13,843	14,422	14,843	15,283	15,283	15,283	14,316	14,316	14,316	
Average Cl. III & IV (Rs.)	2,069	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	
Ave. Shore Labor (Rs.)	1,884	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	
<b>CRG Wage Bill (Rs. millions)</b>															
Class I & II	442.6	467.6	467.6	452.6	452.6	467.6	467.6	467.6	467.6	467.6	467.6	467.6	467.6	467.6	
Class III & IV	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	
Total	468.2	493.2	493.2	478.2	478.2	493.2	493.2	493.2	493.2	493.2	493.2	493.2	493.2	493.2	
Average Cl. I & II (Rs.)	12,283	12,775	12,853	12,555	13,546	13,843	14,422	14,843	15,283	15,283	15,283	14,316	14,316	14,316	
Average Cl. III & IV (Rs.)	2,069	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	
Ave. Shore Labor (Rs.)	1,884	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980	
<b>CRG Productivity</b>															
Gross Port Exp./Employee (Rs.)	3,153	3,145	3,186	3,253	3,256	4,310	4,300	4,689	4,564	4,909	5,460	5,704	5,573	5,586	
Gross Port Exp./Tonne	6,766	6,710	6,520	6,764	7,176	7,731	7,627	7,362	6,579	6,599	6,200	6,200	6,128	6,092	
Tons dry cargo/Employee	223	164	205	199	188	201	218	226	199	205	179	157	128	108	
Ave. Discharge & Loading	n.a.														
Federation ship per day	390	465	476	483	n.a.	422	393	388	398	377	377	344	314	416	
Gen. Cargo Imports (CR)	1,046	1,495	1,374	1,531	1,298	1,242	1,528	1,528	1,417	1,489	1,558	1,186	1,186	1,639	
Gen. Cargo Exports (CR)	359	359	421	421	421	421	421	421	421	421	421	421	421	421	
Gen. Cargo Exports (OR)	792	792	792	792	792	792	792	792	792	792	792	792	792	792	
Tons dry cargo/Shore Labor	n.a.														
Ave. Handling (Tons per worker)	71	66	65	65	65	65	65	65	65	65	65	65	65	65	
Federation ship (Tons per worker)	29	28	28	28	28	28	28	28	28	28	28	28	28	28	
Gen. Cargo Imports (CR)	132	132	132	132	132	132	132	132	132	132	132	132	132	132	
Gen. Cargo Exports (CR)	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
Gen. Cargo Exports (OR)	35	35	35	35	35	35	35	35	35	35	35	35	35	35	
1 gang sent home	16x	13x	19x	17x											
Misc-staff/operating assets & /	(8.11)														
<b>MR Productivity</b>															
Ave. Handling (Tons per gang)	39	35	37	37	37	37	37	37	37	37	37	37	37	37	
Per shift (Tons per gang)	24	22	22	22	22	22	22	22	22	22	22	22	22	22	
General Imports	26	28	29	29	29	29	29	29	29	29	29	29	29	29	
General Exports	25	24	24	24	24	24	24	24	24	24	24	24	24	24	
General Exports	25	24	24	24	24	24	24	24	24	24	24	24	24	24	
<b>MR Registered Workers</b>															
General Stevedores	10,972	11,016	11,480	11,166	11,166	11,166	11,166	11,166	11,166	11,166	11,166	11,166	11,166	11,166	
Appr. 1 Employer	4,877	4,877	4,877	4,877	4,877	4,877	4,877	4,877	4,877	4,877	4,877	4,877	4,877	4,877	
Appr. 2 Employer	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	
Appr. 3 Employer	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	
Bagger, Sitchers, Salt	1,921	3,033	4,179	4,162	4,145	4,145	4,145	4,145	4,145	4,145	4,145	4,145	4,145	4,145	
Chipping/Refining	1,729	1,716	1,715	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	
Chipping/Refining	1,729	1,716	1,715	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	1,711	
Clerical/Supervisory	16,632	15,763	17,576	17,039	17,265	17,265	17,265	17,265	17,265	17,265	17,265	17,265	17,265	17,265	
Total	16,632	15,763	17,576	17,039	17,265	17,265	17,265	17,265	17,265	17,265	17,265	17,265	17,265	17,265	
<b>Relative Items:</b>															
M1: Manned ('000)	5,932	5,666	5,810	5,690	4,833	4,954	6,199	6,544	6,160	6,746	5,737	5,533	3,775	4,114	
M2: Vessel Manned	1,462	1,397	1,412	1,385	1,397	1,412	1,385	1,397	1,397	1,397	1,397	1,397	1,397	1,397	
CR: Ave. Shore Labor Roll 1/1	10,080	9,990	9,814	9,401	9,158	8,999	8,338	8,078	7,877	7,877	7,877	7,877	7,877	7,877	

a/ i.e. sum of Chief Medical Officer, Financial Adviser and Chief Accounts Officer, Secretary, Controller of Stores, Land Manager, Labor Adviser and Industrial Relations Officer, and Legal Adviser.

b/ Including Haida construction, i.e. Chief Mechanical Engineer, Chief Engineer and Chief Engineer (Bridle).

c/ i.e. Traffic Manager, Marine Department and Chief Hydraulic Engineer.

d/ Total wages (including allowances) related to average number of shore laborers (excluding superintendence) on the rolls, on calendar year basis.

e/ i.e. Gross Revenues (including allowances) related to average number of shore laborers (excluding superintendence) on the rolls, on calendar year basis.

f/ Malfunction staff (excluding persons employed for Haida work) per Rs. 1 million of gross fixed assets in operation (revalued to 1972 prices).

g/ On calendar year basis, with CR1960 shown against 1990/61, etc.



PORT OF CALCUTTA: REVENUES & EXPENDITURES, FORECAST & ACTUAL  
(In Rs. million)

	1949/50	1954/55	1955/56	1956/57	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72
<b>IBRD First Appraisal Projection (1957)</b>																			
Revenues	48.1	50.3	58.6	66.3															
from goods	11.1	14.2	13.7	16.9															
from vessels	8.2	8.8	9.5	9.6															
from land/buildings	7.5	12.5	12.6	13.1															
from railways	2.0	2.5	5.3	2.8															
miscellaneous	76.9	88.3	99.7	108.7	120.0	125.0	130.0	135.0	140.0	145.0	150.0								
Total																			
Operating Expenses																			
Dredging	3.2	5.3	5.5	6.4															
Labor <sup>a/</sup>	10.3	11.0	11.3	12.3															
Other	45.8	62.7	63.5	64.8															
Total	59.3	79.0	80.3	83.5	86.0	88.0	90.0	93.0	96.0	100.0	104.0								
Gross Surplus	17.6	9.3	19.4	25.2	34.0	37.0	40.0	42.0	44.0	45.0	46.0								
"Depreciation" <sup>b/</sup>	3.2	2.6	2.8	2.7	3.0	5.0	7.5	9.5	11.5	13.0	14.0								
Interest	10.0	10.6	10.3	9.7	10.0	11.6	13.0	14.7	16.4	18.1	21.1								
Net Income	4.4	(3.9)	6.3	12.7	21.0	20.4	19.5	17.8	16.1	13.9	10.9								
Debt Service	13.2	13.2	13.2	12.5	13.0	14.5	15.8	17.4	19.0	21.4	31.1								
Debt Service Coverage	1.3	0.7	1.5	2.0	2.6	2.5	2.5	2.4	2.3	2.1	1.5								
<b>IBRD Second Appraisal Projection (1961)</b>																			
Revenues																			
from goods					79.8	79.9	77.8	85.4	96.5	100.0	104.5	114.7	115.5	117.0					
from vessels					19.4	18.8	18.7	20.0	22.6	22.8	23.5	25.9	26.1	26.5					
from land/buildings					10.2	12.0	11.5	11.8	12.3	16.0	18.0	18.5	18.5	19.5					
from railways					15.2	15.6	17.9	15.1	15.5	15.5	16.0	16.8	17.0	17.0					
miscellaneous					3.0	3.3	3.8	3.8	3.8	4.0	4.0	4.5	4.5	4.5					
Total					127.6	129.6	129.7	136.1	150.7	158.3	166.0	180.4	181.6	184.5					
Operating Expenses																			
Dredging					5.8	8.1	8.5	8.8	10.4	11.8	12.0	12.5	12.5	12.5					
Labor <sup>a/</sup>					15.9	17.1	15.9	15.9	19.2	20.1	20.7	21.5	21.5	21.6					
Other					76.9	85.1	86.5	87.7	89.1	90.7	92.8	95.8	95.8	96.3					
Total					98.6	110.3	110.9	112.4	118.7	122.6	125.5	129.8	129.8	130.4					
Gross Surplus					29.0	19.3	18.8	23.7	32.0	35.7	40.5	50.6	51.8	54.1					
"Depreciation" <sup>b/</sup>					2.5	2.2	2.2	2.1	2.3	2.9	9.6	9.8	10.8	14.3					
Interest					10.9	12.3	14.0	15.6	21.3	25.4	29.5	32.6	32.6	33.3	15.1				
Net Income					15.6	4.8	2.6	6.0	8.4	7.4	1.4	8.2	7.8	6.5					
Debt Service					13.4	14.5	16.2	17.7	23.6	28.3	39.1	42.4	44.0	47.6					
Debt Service Coverage					2.2	1.3	1.2	1.3	1.4	1.3	1.0	1.2	1.2	1.1					
<b>ACTUAL</b>																			
Revenues																			
from goods	48.1	50.3	58.6	66.3	79.8	79.9	77.8	88.9	92.6	105.6	111.3	113.6	114.8	116.2	139.4	130.7	130.2	134.3	194.1
from vessels	11.1	14.2	13.7	16.9	19.4	18.8	18.7	19.9	19.8	20.9	23.8	26.3	25.2	36.9	48.8	56.4	38.7	33.7	39.1
from land/buildings	8.2	8.8	9.5	9.6	10.2	12.0	11.5	11.9	12.8	14.2	14.6	15.2	16.0	20.7	20.9	25.0	26.1	25.9	25.9
from railways	7.5	12.5	12.6	13.1	15.2	15.6	17.9	16.4	20.1	25.0	23.5	24.4	27.6	27.6	25.9	26.6	26.5	28.8	28.8
miscellaneous	2.0	2.5	5.3	2.8	3.0	3.3	3.8	4.1	5.3	4.0	4.0	9.1	10.6	13.1	14.3	8.1	11.9	16.0	9.8
Total	76.9	88.3	99.7	108.7	127.6	129.6	129.7	141.2	150.6	169.7	177.2	189.5	191.0	211.6	250.8	242.0	232.4	236.6	297.7
Operating Expenses																			
Dredging	3.2	5.3	5.5	6.4	5.8	8.1	8.5	8.8	10.9	15.6	14.6	17.0	19.3	18.9	23.2	22.6	22.2	24.5	23.8
Labor <sup>a/</sup>	10.3	11.0	11.3	12.3	15.9	17.1	15.9	15.4	16.6	19.7	21.3	21.7	22.7	24.7	25.5	26.4	29.9	31.2	34.2
Other	45.8	62.7	63.5	64.8	76.9	85.1	86.5	93.9	93.0	101.7	101.2	115.6	127.1	144.1	153.8	168.2	210.7	204.7	235.1
Total	59.3	79.0	80.3	83.5	98.6	110.3	110.9	118.1	120.5	137.0	137.1	154.3	169.1	187.7	202.5	217.2	262.8	260.4	293.1
Gross Surplus	17.6	9.3	19.4	25.2	29.0	19.3	18.8	23.1	30.1	32.7	40.1	35.2	21.9	23.9	48.3	24.8	(30.4)	(23.8)	4.6
"Depreciation" <sup>b/</sup>	3.2	2.6	2.8	2.7	2.5	2.2	2.2	3.0	3.0	6.6	11.0	10.3	13.5	20.4	22.4	24.5	25.8	26.3	26.4
Interest <sup>c/</sup>	10.0	10.6	10.3	9.7	10.9	12.3	14.0	15.8	19.5	21.7	23.8	23.5	25.6	34.1	35.2	38.0	39.7	39.7	43.0
Net Income	4.4	(3.9)	6.3	12.7	15.6	4.8	2.6	4.3	7.6	4.4	5.3	1.4	(17.2)	(30.6)	(9.3)	(37.7)	(95.9)	(89.8)	(58.3)
Debt Service	13.2	13.2	13.2	12.5	13.4	14.5	16.2	18.0	21.7	27.5	33.3	32.2	37.5	52.8	55.9	60.8	64.4	64.7	69.8
Debt Service Coverage	1.3	0.7	1.5	2.0	2.2	1.3	1.2	1.3	1.4	1.2	1.2	1.1	0.6	0.4	0.9	0.4	(0.5)	(0.4)	0.1

<sup>a/</sup> Cargo handling labor only.

<sup>b/</sup> Debt amortization requirements (including Sinking Fund appropriations) only through 1959/60; this plus Renewals & Replacement Fund appropriations for 1960/61 through 1968/69; depreciation calculated on the basis of historical costs of net assets, using established asset lives, for last three years.

<sup>c/</sup> Excludes interest chargeable to Haldia Dock Project and capitalized.



## CALCUTTA PORT COMMISSIONERS: INVESTMENT PROGRAMS AND THEIR FINANCING, PROJECTED &amp; ACTUAL

	Period 1957/58-1962/63 (6 years)				Period 1961/62-1965/66 (5 years)				Period 1966/67-1971/72 (6 years)	
	Forecast		Actual		Forecast		Actual		Actual	
	Total (Rs. mln)	% of Total	Total (Rs. mln)	% of Total	Total (Rs. mln)	% of Total	Total (Rs. mln)	% of Total	Total (Rs. mln)	% of Total
<b>Fixed Investment</b>										
Project 198-IN	280.0	100.0	194.1	79.0	157.5	47.9	153.0	54.0	74.5	9.6
Project 294-IN	-	-	6.4	-	147.4	44.9	67.3	23.8	155.1	20.1
Haldia (incl. Est. Dredger)	-	-	1.8	- )	-	-	29.0	10.3	383.0	49.6
Capitalized Debt Chges. Haldia	-	-	-	- )	-	-	9.0	3.2	79.0	10.2
Bhagirathi/Hooghly Works	-	-	-	- )	23.7	7.2	-	-	26.4	3.4
Purchase of 13 diesel locos	-	-	-	- )	-	-	-	-	23.4	3.0
Other non-project	-	-	43.3	17.6 )	-	-	24.5	8.7	31.6	4.1
TOTAL	280.0	100.0	245.6	100.0	328.6	100.0	282.8	100.0	773.0	100.0
<b>Financing</b>										
Net Income + S.F. accretions	108.7	-	56.8	-	33.2	-	17.8	-	-291.8	-
"Depreciation"	49.5	-	19.5	-	35.4	-	44.4	-	145.8	-
less Amortization	-14.3	-	-17.1	-	-35.4	-	-38.1	-	-138.7	-
Net Internal	143.9	51.4	59.2	24.1	33.2	10.1	24.1	8.5	-284.7	-36.8
Govt. Operating Subsidy	-	-	-	-	-	-	-	-	176.1	22.8
IBRD Loan 198-IN	138.0	49.3	93.2	37.9	90.0	27.4	90.4	32.0	66.9	8.7
IBRD Loan 294-IN	-	-	-	-	100.0	30.4	47.3	16.7	94.1	12.2
Government Loans	13.0	4.6	97.0	39.5	105.5	32.1	66.0	23.3	532.5	68.8
Debentures	-	-	-	-	-	-	25.0	8.8	85.0	11.0
Total Borrowing	151.0	53.9	190.2	77.4	295.5	89.9	228.7	80.8	778.5	100.7
Government Grants	-	-	-	-	-	-	-	-	27.8	3.6
TOTAL	294.9	105.3	249.4	101.5	328.7	100.0	252.8	89.3	697.7	90.3
Change in Working Capital	+14.9	-	+3.8	-	+0.1	-	-30.0	-	-75.3	-



CALCUTTA PORT COMMISSIONERS: INVESTMENT & ITS FINANCING, PROJECTED & ACTUAL  
(in Rs. millions)

APPENDIX TABLE 10

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/1964	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	Total for Periods Covered
<b>IBRD First Appraisal Projection (1957)</b>																
<u>Investment</u>																
Project 198-IN	22.2	34.8	82.3	66.7	55.8	18.2										280.0
<u>Financing</u>																
Net Income	21.0	20.4	19.5	17.8	16.1	13.9										108.7
"Depreciation"	3.0	5.0	7.5	9.5	11.5	13.0										49.5
less Amortization	-3.0	-2.9	-2.8	-2.7	-2.6	-3.3										-17.3
Net Internal	21.0	22.5	24.2	24.6	25.0	23.6										140.9
IBRD Loan 198-IN	6.1	9.1	42.3	39.2	33.3	8.0										138.0
Government Loan	13.0	-	-	-	-	-										13.0
Total	40.1	31.6	66.5	63.8	58.3	31.6										291.9
Change in Working Capital	+17.9	-3.2	-15.8	-2.9	+2.5	+13.4										+11.9
<b>IBRD Second Appraisal Projection (1961)</b>																
<u>Investment</u>																
Project 198-IN					117.5	40.0	-	-	-							157.5
Project 294-IN					4.1	41.3	70.4	31.6	-							147.4
Non-project investment					8.2	-	-	-	15.5							23.7
Total					129.8	81.3	70.4	31.6	15.5							328.6
<u>Financing</u>																
Net Income					8.4	7.4	1.4	8.2	7.8							33.2
"Depreciation"					2.3	2.9	9.6	9.8	10.8							35.4
less Amortization					-2.3	-2.9	-9.6	-9.8	-10.8							-35.4
Net Internal					8.4	7.4	1.4	8.2	7.8							33.2
IBRD Loan 198-IN					70.0	20.0	-	-	-							90.0
IBRD Loan 294-IN					1.6	27.3	54.4	16.7	-							100.0
Government Loans					30.0	20.0	20.0	20.0	15.5							105.5
Total					110.0	74.7	75.8	44.9	23.3							328.7
Change in Working Capital					-19.8	-6.6	-5.4	+13.3	+7.8							+0.1
<b>ACTUAL</b>																
<u>Investment</u>																
Project 198-IN	15.4	20.6	21.6	56.0	45.6	34.9	29.1	30.8	12.6	69.7	2.8	2.0	-	-	-	341.1
Project 294-IN	-	-	-	-	0.2	6.2	18.4	14.6	27.9	93.9	33.6	14.7	2.0	10.9	-	222.4
Haldia (incl. Est. Dredger)	-	-	-	-	-	1.8	6.4	10.4	10.4	19.6	37.6	74.2	86.1	81.2	84.3	412.0
Capitalized Debt Charges, Haldia	-	-	-	-	-	-	-	5.3	3.7	6.4	8.6	7.9	13.0	19.4	23.7	88.0
Bhagirathi/Hooghly Works	-	-	-	-	-	-	-	-	0.4	0.2	2.4	6.3	8.5	8.6	8.6	26.4
Purchase of 13 diesel locos	-	-	-	-	-	-	-	-	-	16.7	5.2	1.0	0.2	0.3	0.3	23.4
Other non-project	8.0	4.2	5.7	11.6	7.2	6.6	3.6	3.1	4.0	4.0	5.9	6.5	5.8	4.4	5.0	85.6
Total	23.4	24.8	27.3	67.6	53.0	49.5	57.5	64.2	58.6	194.0	105.4	112.9	114.2	124.6	121.9	1198.9
<u>Financing</u>																
Net Income	15.6	4.8	2.6	4.3	7.6	4.4	5.3	1.4	-17.2	-30.6	-9.3	-37.7	-95.9	-89.8	-58.3	-292.8
R & R Fund appropriations	-	-	-	0.8	0.8	0.8	1.5	1.6	1.6	1.7	1.7	1.7	-	-	-	12.2
Depreciation appropriations	2.5	2.2	2.2	2.2	2.2	5.8	9.5	8.7	11.9	18.7	20.7	22.8	25.8	26.3	26.4	187.9
less Amortization	-2.5	-2.2	-2.2	-2.2	-2.2	-5.8	-9.5	-8.7	-11.9	-18.7	-20.7	-22.8	-24.7	-25.0	-26.8	-185.9
Sinking Fund Accretions (net)	2.4	3.0	2.5	3.0	3.7	2.9	3.2	3.0	3.5	4.7	4.1	3.6	5.2	5.6	6.6	57.0
Net Internal	18.0	7.8	5.1	8.1	12.1	8.1	10.0	6.0	-12.1	-24.2	-3.5	-32.4	-89.6	-82.9	-52.1	-221.6
Government Operating Subsidy	-	-	-	-	-	-	-	-	-	-	-	-	50.0	29.0	97.1	176.1
IBRD Loan 198-IN	-	9.4	9.7	29.1	20.5	24.5	16.3	22.0	7.1	66.9	-	-	-	-	-	205.5
IBRD Loan 294-IN	-	-	-	-	0.2	4.3	14.7	9.7	18.4	69.4	19.1	5.6	-	-	-	141.4
Government Loans	15.0	20.0	10.0	30.0	15.0	7.0	10.0	11.5	22.5	34.5	88.0	90.0	100.0	100.0	120.0	673.5
Debentures, net changes	-	-	-	-	-	-	15.0	10.0	-	10.0	20.0	15.0	10.0	15.0	15.0	110.0
Total Borrowing	15.0	29.4	19.7	59.1	35.7	35.8	56.0	53.2	48.0	180.8	127.1	110.6	110.0	115.0	135.0	1130.4
Government Capital Grants	-	-	-	-	-	-	-	-	-	-	-	-	10.0	10.0	7.8	27.8
Total	33.0	37.2	24.8	67.2	47.8	43.9	66.0	59.2	35.9	156.6	123.6	78.2	80.4	71.1	187.8	1112.7
Change in Working Capital	+9.6	+12.4	-2.5	-0.4	-5.2	-5.6	+8.5	-5.0	-22.7	-37.4	+18.2	-34.7	-33.8	-53.5	+65.9	-86.2



COMMISSIONERS FOR THE PORT OF CALCUTTA: BALANCE SHEETS 1970-72 (AS AT MARCH 31)  
(Rs. millions)

A S S E T S					L I A B I L I T I E S				
	1968 (Proforma)	1970	1971	1972		1968 (Proforma)	1970	1971	1972
<u>Current Assets</u>					<u>Current Liabilities</u>				
Cash in hand and in banks	34.4	57.2	21.8	32.5	Accounts payable	n.a.	46.2	23.0	24.7
Accounts receivable	65.7	69.6	90.2	81.1	Advances and deposits	n.a.	21.8	22.7	27.0
Government Subsidy due	-	12.5	21.5	98.6	Accrued wages and bills payable	n.a.	34.5	40.1	45.1
Payments in advance and other balances	-	4.1	4.9	7.8	Unclaimed debt service	0.9	0.9	0.9	1.0
Stores and materials	<u>25.5</u>	<u>22.2</u>	<u>21.0</u>	<u>21.6</u>	Short-term Govt. loan	-	-	35.0	31.1
	125.6	165.6	159.4	241.6	Other miscellaneous items	<u>n.a.</u>	<u>73.5</u>	<u>87.7</u>	<u>101.4</u>
						113.2	176.9	209.4	230.3
<u>Investments</u>					<u>Long-term Debt</u>				
Revenue Reserve Fund (Cost)	n.a.	1.0	0.7	0.7	Debentures	287.2	312.2	327.2	342.2
Fire Insurance Fund (Cost)	9.9	0.7	5.9	1.3	Government loans	318.2	499.1	593.5	707.0
Vessels Replacement Fund (Cost)	16.5	8.8	2.1	9.3	IBRD loans	<u>296.2</u>	<u>268.2</u>	<u>251.0</u>	<u>232.8</u>
Interest Equalization Fund (Cost)	1.3	0.7	0.6	0.6		901.6	1079.5	1171.7	1282.0
Indian Seamen's Home Building Fund (Cost)	1.6	1.6	1.6	1.6	<u>Other Liabilities</u>				
General Sinking Fund (market)	95.3	108.9	117.4	127.2	Pension Fund Provision	-	9.0	17.3	26.8
General Sinking Fund - interest accrued	<u>n.a.</u>	<u>1.1</u>	<u>1.2</u>	<u>1.5</u>	Indian Seamen's Home Building Fund	1.6	1.6	1.6	1.6
	129.7	122.8	129.5	142.2	Interest Equalization Fund	<u>1.0</u>	<u>0.7</u>	<u>0.6</u>	<u>0.5</u>
<u>Fixed Assets</u>					<u>Total Liabilities</u>				
Gross Fixed assets to operation	1025.4	1081.5	1116.6	1126.6		1045.6	1298.3	1432.0	1573.5
Less accumulated depreciation	<u>320.5</u>	<u>348.7</u>	<u>371.5</u>	<u>394.4</u>	<u>Surplus and Reserves</u>				
Net Fixed Assets in Operation	704.9	732.8	745.1	732.2	Capital Reserve	57.0	93.9	118.7	125.9
Work in Progress	<u>134.3</u>	<u>280.8</u>	<u>366.4</u>	<u>473.9</u>	Capital Assets Replacement Reserve	-	-	-	1.4
	839.2	1013.6	1111.5	1206.1	Revenue Reserve Fund	3.2	5.0	5.8	6.6
Deferred Charges (financial)	11.3	11.7	11.7	11.9	Accumulated Deficits	-	<u>-83.5</u>	<u>-141.4</u>	<u>-105.6</u>
	60.2	15.4	- 19.9	28.3		60.2	15.4	- 19.9	28.3
<b>TOTAL ASSETS</b>	<b>1105.8</b>	<b>1313.7</b>	<b>1412.1</b>	<b>1601.8</b>	<b>TOTAL LIABILITIES</b>	<b>1105.8</b>	<b>1313.7</b>	<b>1412.1</b>	<b>1601.8</b>
<u>MEMO ITEM: Fixed Assets with all items other than land at replacement values:-</u>									
Gross Fixed assets in operation		1784.6	1775.3	1773.9	Current ratio	1.11	0.94	0.76	1.05
Less accumulated depreciation needed		<u>680.3</u>	<u>674.3</u>	<u>701.3</u>	Long-term debt to equity ratio (without asset revaluation) a/	93/7	99/1	-	98/2
Net fixed assets in operation		<u>1104.3</u>	<u>1101.0</u>	<u>1072.6</u>	Long-term debt to equity ratio (with asset revaluation) a/		70/30	74/26	74/26

a/ Taking long-term debt net of Sinking Fund balance.



APPENDIX TABLE 12

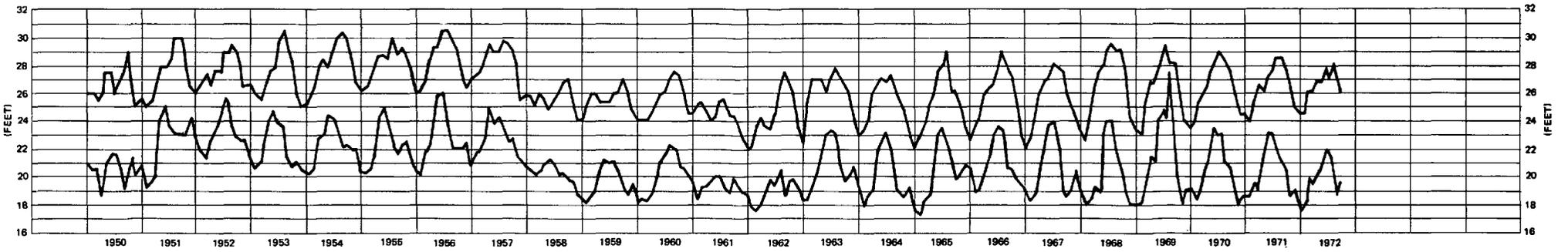
CALCUTTA PORT COMMISSIONERS: TARIFF INCREASES 1957/58 - 71/72

<u>Fiscal Year</u>	<u>Date of Increase</u>	<u>Additional Revenue Expected</u>		<u>Approx. Breakdown of Increased Revenues</u>			
		<u>as % of prev. year's op. rev.</u>	<u>in Rs million</u>	<u>Imports</u>	<u>Exports</u>	<u>Vessels &amp; other</u>	<u>Port Railways</u>
1957/58	-						
1958/59	n.a.	1.3%	1.50	-	-	-	1.50
1959/60	1/15/60	11.9%	13.55	10.31	2.24	1.10	-
1960/61	-						
1961/62	-						
1962/63	-						
1963/64	4/1/63	5.2%	7.89	1.13	1.28	1.80	3.68
1964/65	-						
1965/66	8/1/65	7.8%	12.90	2.55	3.48	3.90	2.97
1966/67	6/1/66	9.2%	15.00	7.90	1.88	5.02	0.20
	6/28/66	4.9%	8.00	3.50	2.50	2.00	-
	2/23/67	0.4%	0.70	-	-	-	0.70
1967/68	4/1/67	19.3%	34.80	29.50	0.30	3.80	1.20
1968/69	4/4/68	4.6%	10.00	8.50	-	1.50	-
1969/70	-						
1970/71	6/25/70	4.1%	8.00	-	8.00	-	-
1971/72	-						
Cumulative Total			112.34	63.39	19.68	19.02	10.25



COMMISSIONERS FOR THE PORT OF CALCUTTA

HOOGLY DRAFTS

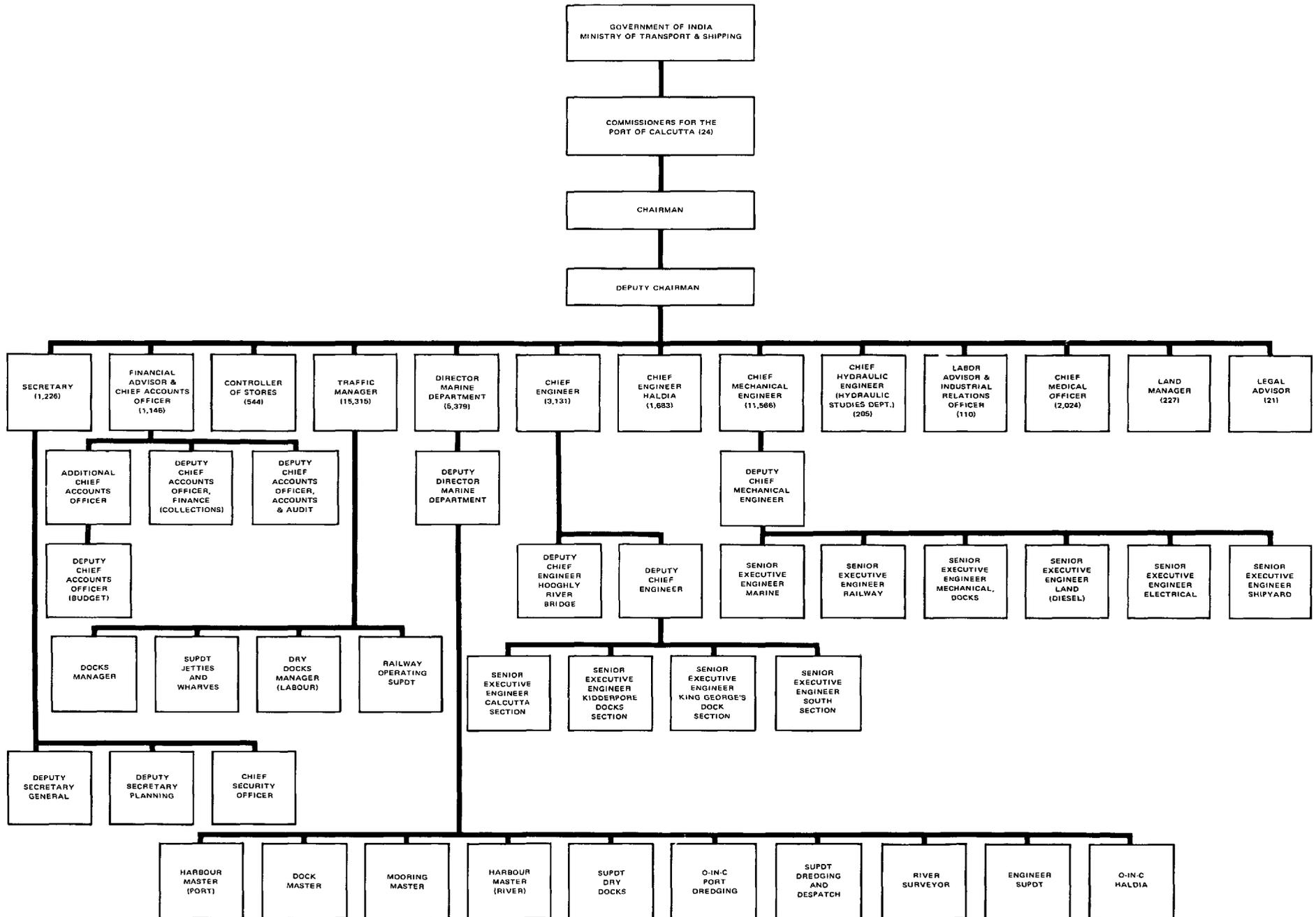


TOP GRAPH LINE INDICATES MAXIMUM DRAFTS EACH MONTH AVAILABLE FOR FEW DAYS ONLY.  
LOWER GRAPH LINE INDICATES MINIMUM DRAFTS EACH MONTH.



COMMISSIONERS FOR THE PORT OF CALCUTTA

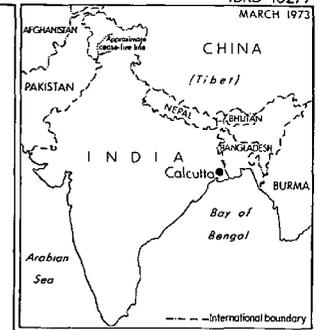
ORGANIZATION CHART



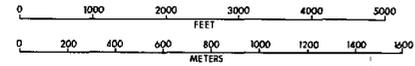
NOTE: Numbers in brackets following the titles of the heads of the 13 main departments show number of staff employed as of 12/31/71



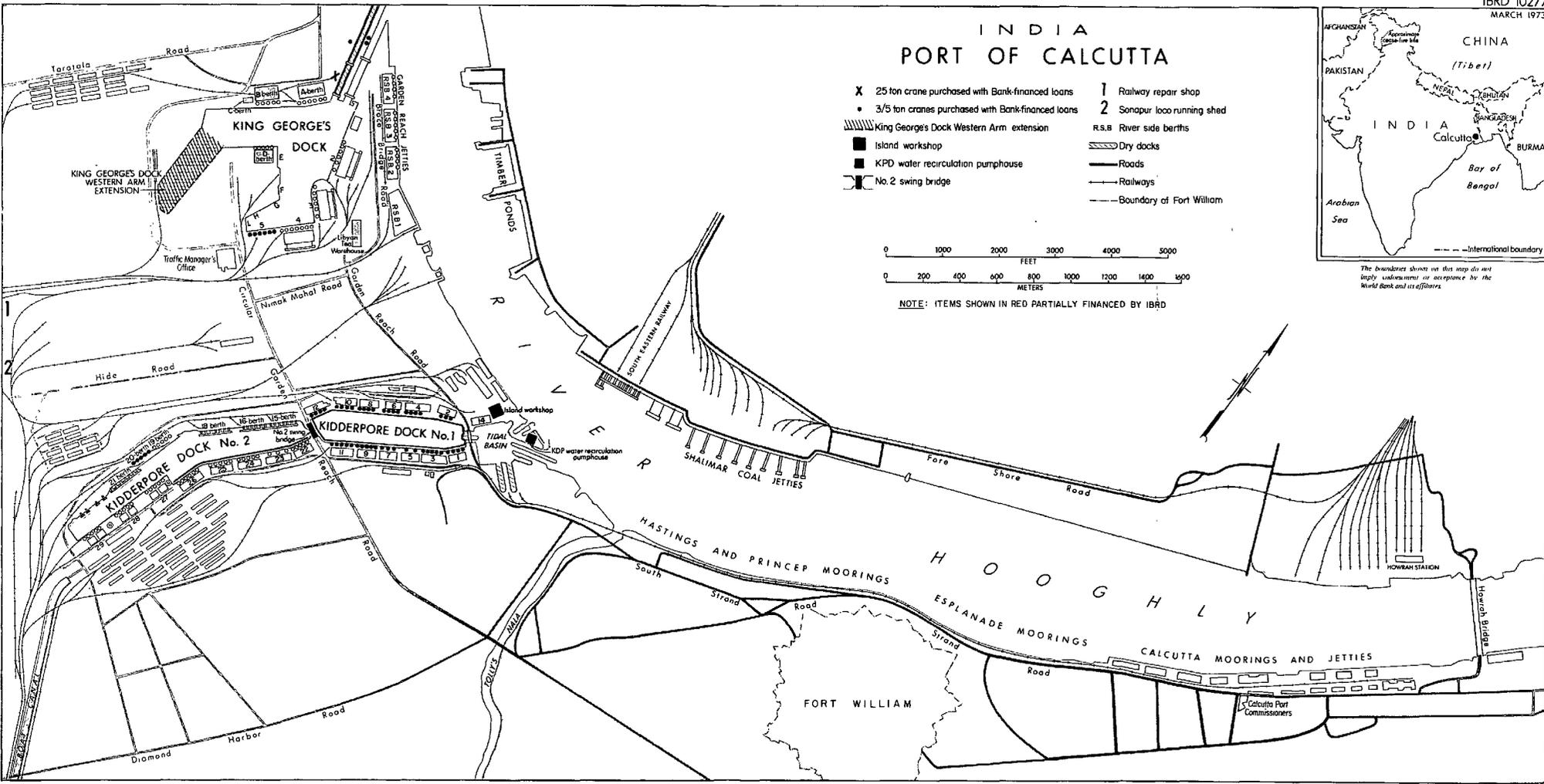
# INDIA PORT OF CALCUTTA



- X 25 ton crane purchased with Bank-financed loans
- 3/5 ton cranes purchased with Bank-financed loans
- ▨ King Georges Dock Western Arm extension
- Island workshop
- KPD water recirculation pumphouse
- ⊓ No. 2 swing bridge
- 1 Railway repair shop
- 2 Sonapur loco running shed
- R.S.B River side berths
- ▨ Dry docks
- Roads
- Railways
- Boundary of Fort William



NOTE: ITEMS SHOWN IN RED PARTIALLY FINANCED BY IBRD



The boundaries shown on this map do not imply endorsement or acceptance by the World Bank and its affiliates.



# INDIA HALDIA PORT LOCATION



- NAVIGATION CHANNEL
- ▤ CORRECTIVE WORKS (SPURS, GROINS ETC)
- ▨ PROTECTIVE WORKS
- EXISTING PIPELINE (TO BE USED FOR CRUDE OIL)
- PROPOSED PETROLEUM PRODUCTS PIPELINE
- TANK FARM TERMINAL
- RAILS
- RAILROADS
- REFINERY

