

ASIAN DEVELOPMENT BANK

RES:THA XXX

Reevaluation Study Series (Number 24)

**REEVALUATION OF THE
SONGKHLA AND PHUKET PORTS PROJECT
IN
THAILAND**

December 1996

CURRENCY EQUIVALENTS

Currency Unit - Baht (B)

| | At Appraisal | At Project Completion | At Postevaluation | At Reevaluation |
|----------|---------------------|------------------------------|--------------------------|------------------------|
| \$1.00 = | B23.00 | B25.80 | B25.51 | B24.50 |
| B1.00 = | \$0.043 | \$0.038 | \$0.039 | \$0.041 |

ABBREVIATIONS

| | | |
|-------|---|---|
| CTI | - | Chaophaya Terminal International Line Company Limited |
| DH | - | Department of Highways |
| EIRR | - | Economic Internal Rate of Return |
| FIRR | - | Financial Internal Rate of Return |
| HD | - | Harbor Department |
| MIS | - | Management Information System |
| NESDB | - | National Economic and Social Development Board |
| PAT | - | Ports Authority of Thailand |
| PCR | - | Project Completion Report |
| PPAR | - | Project Performance Audit Report |
| REM | - | Reevaluation Mission |
| TA | - | Technical Assistance |

WEIGHTS AND MEASURES

| | | |
|----------------|---|-----------------------------|
| dwt | - | dead weight tons |
| GRT | - | gross registered tonnage |
| km | - | kilometer |
| m | - | meter |
| m ² | - | square meter |
| m ³ | - | cubic meter |
| TEU | - | twenty-foot equivalent unit |

NOTES

- (i) The fiscal year (FY) of the Government ends on 30 September.
(ii) In this Report, "\$" refers to US dollars.

I. BACKGROUND

A. Objectives, Scope and Rationale

1. The Songkhla and Phuket Ports Project, for which a Bank loan (No. 546-THA) of \$71.4 million was approved on 25 November 1981, involved the construction and development of deepwater port facilities at Songkhla and Phuket, and the construction of two road bridges with a connecting road to enable freight traffic to bypass the town of Songkhla. Project development at Songkhla included (i) dredging a 4.0 kilometer (km) approach channel and port basin; (ii) construction of a 510 meter (m) quay suitable for berthing vessels of about 10,000 dead weight tons (dwt); a 300 m breakwater; a 350 m causeway; and transit/storage shed facilities; and (iii) provision of paving, port vessels, and navigation and cargo handling equipment. Project development at Phuket included (i) dredging a 1.5 km approach channel and port basin; (ii) construction of a 360 m quay suitable for berthing vessels of about 15,000 dwt, and transit/storage shed facilities; and (iii) provision of paving, port vessels, and navigation and cargo handling equipment. The total length of the two bridges was 2.8 km and the total length of the bypass road was 13.2 km. The Project scope also included consulting services for construction supervision, detailed engineering for the bridges, and two studies. One study was to cover the organizational and operational planning for both ports, and the other was to make recommendations on the costings and tariff for each port (see Appendix 1.)

2. The Project's rationale was premised on the need to accommodate and handle more efficiently the anticipated growing volume of freight traffic from southern Thailand. About 95 percent of the country's rubber exports were exported from the southern region and most of it by truck and rail transport through the port of Bangkok, which was 700 - 900 km to the north. Outbound freight traffic from the southern region mainly consisted of rubber, palm oil, and general cargo, while inbound freight traffic mainly consisted of fertilizer and general cargo. Some freight was transferred by lighter at coastal towns such as Songkhla and Phuket to feeder ships variously operating between Bangkok, Penang, and Singapore.¹ The Project was consistent with the Government's priorities to encourage the overall economic and social development of the southern region of Thailand. The benefits of the Project were evaluated in the form of reduced transport costs and the stimulus the Project would provide in accelerating economic development.

3. The Project was formulated following independent feasibility studies in 1972 and 1974. These studies were updated in 1976 and master plans, detailed engineering, and tender documents were prepared in 1978 under technical assistance (TA) from the Bank.² Technically, the Project was not

¹ Although there were six alternative port facilities along the east coast between Bangkok and Songkhla, the ports lacked deepwater berthing facilities, and it was necessary to transfer foreign destined cargo by lighter. The only alternative port on the west coast was located at Trang (about 800 km south of Bangkok), which also lacked deepwater berthing facilities.

² TA No. 164-THA, *Port Development Project*, for \$50,000 approved on 29 January 1976; and Loan No. 355-THA, *Songkhla and Phuket Ports Project*, for \$1.5 million approved on 21 September 1978.

expected to face any major physical or environmental risks and was considered economically feasible and able to reasonably withstand adverse consequences of recession, reduced port charges, cost overruns, and delays in completion.

B. Implementation and Completion

4. The Harbor Department (HD) and Department of Highways (DH) were the executing agencies responsible for implementing the Project. The Ministry of Communications was made responsible for overall Project coordination and implementation. During implementation, the Project scope was expanded to include (i) the procurement of a second tugboat at each port; (ii) construction of an 80 square meter (m²) customs house at Songkhla; (iii) the installation of water pumping facilities, and a water supply pipeline from the Songkhla municipal water reservoir; and (iv) a revision to the consultant's terms of reference to include detailed design and installation of the water pumping facilities and water supply pipeline.

5. The Project was completed in June 1988, two years later than was envisaged at appraisal. The overall delay was attributable to the consultants' unfamiliarity with preparation of tender documents and procurement procedures, and to protracted negotiations with contractors. Once tender documents and contracts were signed, physical implementation was relatively free of complications. Before the Project was completed, Government initiatives to privatize the operations of Thailand's deep sea ports were announced, and steps to privatize the Songkhla and Phuket ports were started in March 1987. As a consequence, it was decided to merge the two advisory consultant contracts which had been approved under the Bank's loan, one for port operations and one for a costing/tariff study, as a privatization study. Following the privatization study, bids for the operation of the ports were submitted and the winning bid for a ten-year lease to operate both ports was awarded to Chaophaya Terminal International (CTI) Company Limited from 21 October 1988. Port operations commenced 6 December 1988.

6. Although there was an expansion in Project scope (see para. 4), the total Project cost of \$75.2 million was significantly less than the appraisal estimate of \$119.9 million. All Project components, except for consulting services and for procurement of cargo handling equipment and floating craft, experienced significant cost underruns. The cost underrun was attributed to largely competitive pricing factors relating to a slowdown in the international construction industry and to the improved availability of locally produced materials. The Bank's loan amount of \$47.7 million was used to finance the foreign exchange cost, and \$0.4 million equivalent of the local currency cost. The remainder of the Project cost of \$27.5 million equivalent was financed by the Government. As a result of the cost underrun, \$23.7 million of the Bank's loan was canceled.

C. Major Postevaluation Findings

7. A Project Completion Report (PCR) was completed in June 1990 and a Project Performance Audit Report (PPAR) 18 months later in December 1991. At the time of the PCR Mission in November 1989, the Project ports had been in operation for approximately 11 months and various "settling-in" problems were identified, including an accumulation of silt in the approach channel at

Songkhla and a lack of container ships calling. Although initial tonnages handled at both ports were found to be much below appraisal expectations, the port operator expected cargo throughput to double over the next two years, and for both ports to achieve profitability by FY1991. The impact of implementation delays on the viability of the Project was not considered critical and the designated Project objectives were considered to have been substantively met. Based on the sensitivity calculations at appraisal, the PCR evaluated the economic internal rates of return (EIRRs) to be in excess of the appraisal lower sensitivity limits of 13 percent for Songkhla, 13.2 percent for Phuket and 11.8 percent for the bridges.

8. The PPAR Mission reviewed the Project 18 months after the PCR Mission. Based on the actual cargo movements during 1990 and 5 months throughput for 1991 the amount of cargo handled was expected to exceed the projections prepared for the PCR (see para. 7). Even so, the overall cargo throughput projected for each port was still 30 - 50 percent less than the appraisal estimates. With respect to the bridges and road link, traffic surveys conducted in 1990 by DH indicated that the average daily traffic volumes were 36 percent higher than the appraisal estimate. On the basis of the revised data for the Project components, an overall EIRR reestimate of 7.4 percent was calculated, and the Project was assessed partly successful. The PPAR Mission, in seeking to find reasons for the lower cargo throughput, found that a sizeable portion of the traffic volumes previously handled by lighter and expected to be diverted through the Project ports had been diverted to Bangkok and Penang. At Songkhla the continued sustainability of operations was seen to be strongly dependent on the sufficiency of dredging maintenance.¹ At Phuket, the projected increases in cargo volumes were seen to be insufficient to sustain operations. With respect to the bridges and road component, traffic volumes indicated a substantially growing trend, maintenance was seen to be adequate, and the sustainability of benefits derived were considered assured.

9. The findings of the PCR and PPAR together underscored the importance of (i) streamlining the Government's procedures for the evaluation of contractors and tenders to reduce implementation delays, (ii) providing more attention to the detailed preparation of maintenance dredging requirements, and (iii) more reliable forecasting.

D. Need for Reevaluation

10. The PCR and PPAR evaluations were carried out when the ports had been operational less than 18 months, which suggested that judgment about the performance of Songkhla and Phuket ports, based on low initial freight volumes, was still subject to a wide error margin. Uncertainty surrounding the channel depth that could be maintained at Songkhla also suggested that judgment about the long-term sustainability of benefits could only be regarded as tentative.

11. Reevaluation of the Project enables the Bank to further examine its performance at a more mature stage with seven years of operational data. The reevaluation attempts to arrive at firmer conclusions on the long-term performance and sustainability of the Project, and to assess its impact on economic development in the context of which the Project was justified. Special emphasis in the

¹ It was ascertained that HD had been unable to maintain the channel approach at a depth of 9 meters, even with dredging 90 percent more material than predicted at design. Channel depths of less than 7.5 meters were recorded and this information was considered to have prevented container ships from calling and to have limited the callings of larger conventional vessels.

planning of the study was given to (i) assessing the implications of not fully investigating at appraisal the extent, cost and implementation of dredging requirements, (ii) reestimating the financial and economic internal rates of return (FIRR and EIRR) using seven years operational data to 31 May 1996, (iii) the impact of privatization on port operations, and (v) assessing the socioeconomic developmental impacts.

12. To assist the reevaluation mission (REM), a questionnaire was prepared and sent to the HD, DH and CTI as a basis for discussion during the mission. Consultant assistance was used to provide a technical opinion on the dredging issue and ongoing maintenance requirements at Songkhla, and to assist in evaluating the savings in handling costs and improvements to cargo handling systems. Draft copies of the Report were provided to the Borrower, the Executing Agency, and Bank staff concerned for review and comment. Comments received were taken into consideration in finalizing the Report.

II. REEVALUATION FINDINGS

A. Port System of Thailand

13. The ports and shipping sector in Thailand exists in a maritime transport environment which has undergone considerable change since Project appraisal.

1. At Appraisal

14. At the time of appraisal, freight traffic was concentrated in the northern corridor of Thailand and along the arterial roads radiating from Bangkok to the northeastern and southern regions. The direction, size and composition of traffic flows were seen to reflect Bangkok's central location and dominance as the country's main port and consumption center. The Port of Bangkok then handled about 90 percent of Thailand's international seaborne traffic and 35 percent of its coastal traffic. However, physical constraints, limiting the size of vessels to about 10,000 dwt and limited land area, imposed severe operational limits for international shipping and growing congestion problems. As an interim solution, Sattahip, a former naval port 170 km southeast of Bangkok, was used for bulk export traffic while plans were developed for a second general cargo deepwater port at Laem Chabang, about 120 km southeast of Bangkok. To provide an outlet for export traffic from the southwest peninsula, the Government decided to develop deepwater berths at Songkhla and Phuket, located 940 km and 730 km, respectively, from Bangkok on the west and east side of the southwest peninsular (see Map (i)).

15. Although most of the cargo handled through Thailand's port system was by way of conventional cargo transfer, the trend towards containerization was evident, and the need for improving Thailand's ports to handle containers was prominent in the minds of Government planners. Future developments in shipping services at Bangkok Port were expected to continue to exercise a strong influence on the type and availability of services from Songkhla, in particular for rubber exports. The size of feeder container ships, which were on average 5,000 - 7,000 dwt with onboard crane facilities, was not expected to change. The increasing trend towards "combo" vessels calling at Bangkok which carried

conventional breakbulk cargo as well as containers was expected to prevail, with both types of vessels expected to be used increasingly for carrying rubber in containers for export to Japan and for feeder services to Singapore and Hong Kong. The development of a port facility at Laem Chabang was not expected to alter this pattern. The construction of a deepwater port at Phuket, was expected to stimulate outbound traffic above the then lighterage transfers to oceangoing ships bound for Europe, Japan and the United States of America. The ships receiving transfers by lighter commonly ranged from 9,000 to 15,000 dwt and departed at or near their full draft of 7.5 m to 9 m. Cargo handled by lighter was mainly tin ingots and rubber.

2. Developments Since Appraisal

16. Since appraisal, the maritime transport activities of Thailand's coastal ports have been shaped by the pattern of international cargo flows and improved access of the nation's road and rail systems. Shipowners have reorganized their shipping services by replacing port-to-port services with networks of services organized around transshipment hubs located at Singapore, Hong Kong, and Kobe. From these hubs, subsidiary distribution occurs to Thailand (Laem Chabang and Bangkok), Malaysia (Penang and Port Kelang), Philippines (Manila), Indonesia (Jakarta), People's Republic of China (Shanghai), and ports of Europe, South Pacific and USA. The shipping lines make transshipments between hubs using vessels for which economies of scale prevail and offer a service frequency that the volumes for any one trade from the distribution network from Thailand and other ports cannot compete with. Justification for these developments reflects the delays at non-hub ports caused by inefficient intermodal connections, slow administration procedures, cumbersome customs clearance and draft limitations.

17. The utilization of Songkhla and Phuket ports since appraisal has been affected by (i) the preference of overseas buyers to purchase free-on-board through Bangkok, (ii) the limited frequency of shipping calls, (iii) the opening of the rail line at the border of Thailand (Pedang Basar) and Malaysia offering subsidized rail freight to the Port of Penang¹, (iv) improvements in road conditions, and (v) the low competitive cost of backhaul traffic to the Port of Bangkok.² Counteracting these detractors have been the growing road congestion in Bangkok, countervailing penalties imposed by the Port of Thailand to discourage freight transfers from the southern region and the growing relocation and establishment of new industries in the south.

3. Planning, Coordination, and Operational Responsibility

18. Responsibility for planning and coordination of port development in Thailand is shared by the Ports Authority of Thailand (PAT) and the Harbor Department, under the Ministry of Transport and Communications and the Ministry of Finance. The National Economic and Social Development Board (NESDB) under the Office of The Prime Minister is responsible for reviewing all Government investments in port development and coordinating investments among transport modes.

19. At the time of appraisal, it was envisaged that responsibility for operating the Project ports would be given to PAT on completion of the port facilities at Songkhla and Phuket. However, with the decision to gradually devolve responsibility to the private sector, the Ministry of Transport and

¹ The significantly lower shipping prices from Penang provide further incentive.

² At the time of appraisal, although the alternative for transferring rubber and other cargo shipments from the southern region through the Port of Penang was possible, such an option was impractical due to overall cost considerations, transshipment time, and congestion at the Port of Penang.

Communications determined that in the interim responsibility for the operation of the Songkhla and Phuket ports should remain with HD. Currently, the ports of Bangkok and Laem Chabang are the responsibility of PAT, while the ports of Songkhla and Phuket as well as coastal and river ports are the responsibility of HD. The Port of Laem Chabang is multi-leased to private shipping line interests with responsibilities for different berths. The ports of Songkhla and Phuket are operated under a single lease to a private operator.

20. The services required of the ports operator are defined in the Agreement Between the Treasury Department and CTI for the Management and Operation of Songkhla and Phuket Ports of 21 October 1988. Under the agreement, which applies for a period of ten years, the ports operator is entitled to operate Songkhla and Phuket ports as public ports using the port infrastructure and Government-supplied equipment under the Project, along with equipment provided by the port's operator. The fees which the operator can charge port users cannot exceed maximum tariffs approved by the Minister of Transport and Communications. The port operator is responsible for all aspects relating to the safe and efficient operation of ports, including maintenance for port infrastructure and equipment, and for capital improvements as maybe required for expanded commercial operations. All new constructions over B500,000 require the Minister's approval. The port operator is also responsible for meeting taxes, fees and public utility charges levied on the port property, and for maintaining a management information system (MIS) for the compilation of port traffic statistics and forecasts. The Government is obligated to provide for maintenance dredging, and a pilot service for the ports, to carry out regular depth surveys, and to maintain the breakwater, spending beach and navigational aids. The agreement provides for certain rights of action in the event of default by either of the parties to the agreement.

B. Operating Performance

1. Cargo Throughput

Table 1: Actual and Projected Cargo Throughput ('000 tons)

| Item | SONGKHLA | | | | PHUKET | | | |
|--------------------|--------------|--------------|------------|-------------------|-------------|--------------|------------|-------------------|
| | Actual | | Projected | | Actual | | Projected | |
| | 1990 | 1995 | 1996 | 2000 ^a | 1990 | 1995 | 1996 | 2002 ^a |
| Inbound | | | | | | | | |
| Container | 23.6 | 62.0 | 85 | 104 | 0.0 | 20.2 | 23 | 27 |
| Conventional Cargo | 74.3 | 128.1 | 117 | 142 | 4.2 | 16.3 | 17 | 17 |
| Subtotal | <u>97.9</u> | <u>190.1</u> | <u>202</u> | <u>246</u> | <u>4.2</u> | <u>36.5</u> | <u>40</u> | <u>44</u> |
| Growth Rate (%) | - | 14.2 | 6.3 | 5.0 | - | 54.1 | 9.6 | 1.6 |
| Outbound | | | | | | | | |
| Container | 23.6 | 371.6 | 361 | 569 | 1.0 | 24.8 | 31 | 35 |
| Conventional Cargo | 257.2 | 134.7 | 237 | 322 | 46.2 | 130.6 | 130 | 191 |
| Subtotal | <u>280.8</u> | <u>506.3</u> | <u>598</u> | <u>891</u> | <u>47.2</u> | <u>155.4</u> | <u>161</u> | <u>226</u> |
| Growth Rate (%) | - | 12.5 | 18.1 | 10.5 | - | 26.9 | 3.6 | 5.8 |

| | | | | | | | | | |
|------------------------|--------------|--------------|------------|-----|-------------|-------------|--------------|------------|------------|
| Total | <u>378.7</u> | <u>696.5</u> | <u>800</u> | | <u>1137</u> | <u>51.4</u> | <u>191.9</u> | <u>201</u> | <u>270</u> |
| Growth Rate (%) | - | 13.0 | 14.9 | 9.2 | - | 30.1 | 4.7 | 5.0 | |

^a Year at which maximum utilization capacity of the port is reached without further expansion of the port facilities.

21. Cargo throughput at both Songkhla and Phuket ports has increased considerably since the PPAR was prepared in 1991. At Songkhla, the amount of cargo increased from 0.38 million tons in 1990 to 0.70 million tons in 1995, equivalent to an annual increase of 13 percent (see Table 1). At Phuket, cargo throughput increased over the same period by 30 percent per annum from 51,400 tons. However, whereas the growth in export traffic from Songkhla was expected to derive mostly from increased rubber trade, most of the expansion was generated from increased exports of canned fish and animal foods. At Phuket the expansion of export cargoes was mainly from consignments of rubber and latex, while the increase in imports was mainly of general cargo and frozen fish.

22. Reflecting changes in cargo handling methods, containerized cargo at Songkhla increased between 1990 and 1995 from 11 percent to 62 percent of the total cargo throughput, and the number of container twenty foot equivalent units (TEUs) increased by an annual average of 43 percent from 9,880. The major containerized commodities are rubber, refrigerated and canned seafood, and wood products. At Phuket, the number of TEUs increased less significantly. However, there was a strong expansion in exports of liquid latex by tanker.

23. Based on actual cargo volumes for the first five months from January to May 1996, the estimates of the ports operator, and REM's discussions with shipping operators and port users, cargo throughput for 1996 is projected to increase by 15 percent over 1995 at Songkhla and nearly 5 percent at Phuket. Thereafter, cargo throughput at Songkhla is projected to increase by an average of 9.2 percent per annum to the year 2000 when the maximum utilization capacity of the port's facilities is reached (see para. 45). At Phuket, the cargo throughput is projected to increase after 1996 by 5 percent per annum to the year 2002 when the maximum utilization capacity of the port's facilities is reached. Further details relating to cargo throughput at Songkhla and Phuket ports are shown in Appendix 2.

2. Ship Traffic

24. Details relating to the number and size of vessels calling at Songkhla and Phuket ports are shown in Appendix 3.

25. At present, the major categories of ships calling at Songkhla are container feeder ships, break bulk, general cargo ships and reefers. Supply and survey vessels, which are generally small and serve the offshore oil and gas platforms in the Gulf of Thailand also call. During 1995, the total number of ship calls was 463. Of these 45 percent were vessels with a gross registered tonnage (GRT) between 1,500 and 5,000 tons. Another 40 percent were less than 1,500 GRT, 12 percent were vessels between 5,000 and 10,000 GRT and 2 percent were vessels over 10,000 GRT. In terms of ship length, 60 percent of all vessels calling were between 70 m and 150 m. Only 17 calls (4 percent) were from vessels with a draft greater than 7 m. The largest vessel by tonnage to call at Songkhla in 1995 was 18,951 GRT. This vessel had a length of 164 m and draft of 6.9 m. Although the proportion of container ships calling has increased significantly, there was no perceptible change in the overall size of vessels calling at Songkhla

between 1990 and 1995.¹

26. At Phuket, similar categories of ships call, but in addition to the main categories there are large numbers of ocean-going cruise ships, latex tankers, local ferries and sightseeing boats calling which were not anticipated at appraisal. As a consequence of these additional categories, the overall number of ship calls is higher than projected. During 1995, the total number of ship calls was 719. More than 60 percent of these were vessels between 1,500 and 10,000 GRT and another 11 percent were vessels over 10,000 GRT. The cruise ships, which vary in size from 21 m to over 175 m, carried an average of 344 passengers. In 1995, these vessels were responsible for some 520,000 passenger movements through the port. The largest vessel by tonnage to call at Phuket was 40,012 GRT. This vessel had a length of 177 m and draft of 6 m. While the number of passengers carried and average vessel size of passenger ships at Phuket have increased significantly since 1990, at Songkhla there has been no significant change in the size of cargo vessels.

3. Capacity Utilization

27. The estimated maximum operating capacity at Songkhla is around 1.14 million tons before congestion becomes unacceptable. This compares with a current throughput of around 800,000 tons. At Phuket, the maximum operating capacity is around 270,000 tons compared with a current throughput of around 200,000 tons. After the year 2000 for Songkhla and 2002 for Phuket, additional berthing is warranted to meet cargo throughput requirements and relieve congestion that would otherwise be prohibitive for shipping services. (See paras. 53 and 54 and Appendix 4 for details of capacity estimates.)

4. Port Management and Operations

28. HD operates the ports of Songkhla and Phuket as "landlord ports" deriving revenue in the form of lease rents to offset the associated capital investment cost of the Project and the cost of maintenance dredging. CTI is the owner of the operating assets and holds responsibility for operation of the ports, business development, setting of tariffs, and achieving financial objectives (see para. 20).

29. The management obligations of the ports operator² have been reasonably fulfilled and the organization of CTI is adequately structured with sufficient autonomy to operate the port as a commercial entity. The operations of each port are independent, similarly organized, and each is managed under a port director with responsibility for two divisions: one division is organized with responsibility for operational departments, including engineering and cargo operations; the other division is organized with responsibility for accounting, general administration, and maintaining the port MIS. At Songkhla, CTI has a permanent staff of 115 persons and hires on a casual basis up to 470 laborers for cargo handling. The port's director and management team were previously engaged from a major international port and marine transport circle. At Phuket, CTI has a permanent staff of 26 and hires up to 350 casuals. The port director has long experience and is supported by a capable marketing manager.

30. Both ports are considered by REM to be operated and maintained in a reasonably

¹ Because the depth of the channel varied according to the dredging maintenance of the HD and shipping agents had to contact CTI and the pilots to ascertain the depth before sending vessels, the distribution of vessels, particularly the larger sizes, does not necessarily reflect the servicing that would occur with more reliable dredging maintenance.

² Both ports are operated by the same private company, namely, CTI.

efficient manner. Most of the loading and unloading of containers and breakbulk cargo is carried out using the ship's own lifting equipment. The stevedore performance at each port is considered by REM to be satisfactory for the type of lifting equipment available, though less than for ports equipped with gantry crane systems (see Appendix 5, Table 1).

31. At Songkhla, in addition to the Project equipment supplied, CTI has purchased and leased top loaders for handling full containers and mobile cranes for supplementing ship's gear. The container throughput is getting close to the level where container cranes on the quay apron are becoming economical.¹ In assessing the success of privatizing the operations of the Songkhla and Phuket ports, all of the major port users interviewed by the REM expressed their satisfaction about the services provided.

32. The MIS developed by CTI is well designed and includes information on ships, cargo, berth utilization, waiting time, turnaround times, labor performance and financial revenues and costs. The document is produced within the first two days of each new month and includes year to-date information. The system is considered reliable and in the REM's opinion provides a sound analysis of each port's operations and performance. In reviewing the MIS with the ports operator, CTI pointed to problems relating to the collection of data, particularly on ship operations and to the difficulties of retaining trained people to operate the computer systems. The information collated under the MIS is used extensively by HD.

C. Financial Performance

33. The financial performance of the Project is evaluated in respect of the financial interests of HD (the landlord) and CTI (the ports operator).

1. Landlord

34. The Government's agreement with the ports operator provides for lease payments to be made on the basis of a fixed annual fee paid in advance plus a variable revenue fee paid in arrears.² Actual annual rentals paid to the Government, while static initially and limited to the fixed fee, have increased in line with the growing cargo throughput and revenues at each port. In 1995, lease rentals paid to the Government from Songkhla amounted to B48.98 million or nearly 32 percent of total port revenues. The corresponding lease payments from Phuket amounted to B2.72 million or 7 percent of total port revenues. The Government's capital investment for constructing the Port of Songkhla was B1,174 million and for the Port of Phuket was B933 million.³

35. The maintenance dredging costs to the Government amount to approximately B14 million annually, with most of this amount required for maintenance dredging at Songkhla. Based on the

¹ Investment in a dedicated container berth would require built-in pile supports for the crane rails or at least the front rail, that were not included in the design of the existing quay.

² The flat fee amounts to B16.96 million per year payable in advance on a quarterly basis for the first five years; and B19.90 million per year payable in advance on a quarterly basis for the second five years. The payments are supported by a Bank Guarantee. The variable revenue fee is payable semiannually based on a percentage of the revenue accrued over the previous 12 months.

³ Both in nominal terms. This amount excludes the capital cost of equipment for each port which amounted to respectively B8.9 million and B7.4 million.

cumulative leases rentals paid to HD to end-1995 of approximately B204.5 million and the corresponding all up expenditure on dredging maintenance of approximately B55.6 million, the net return received by the Government on the nominal investment cost in Songkhla is around 1 percent.

2. Ports Operator

36. The consolidated accounts of CTI for the year 1995¹ are sound and the balance sheet is conservatively geared with shareholders funds of nearly 70 percent of total assets and a current asset ratio of 1.8.² Historically, performance in terms of the growth of operating revenues has steadily improved. However, in terms of net income, financial performance has been deteriorating (see Table 2). These trends reflect the burden of increased lease payments and reduced operating margins associated with competitive pricing. The impact of the differences between these two factors is exemplified by the different financial results for 1995 between the two ports which show that even though the operating revenues at Songkhla are 4 times more than at Phuket, the operating profit was one-third less. While this apparent anomaly points to the arbitrary nature of the lease formulae and negotiations for sharing revenues between the Government and the ports operator, the overall impact would appear to be undermining the viability of the ports operator's continued involvement.

Table 2: Summary of Financial Performance
(B million)

| Item | Fiscal Year Ending | | | | | | Trend (%/yr) |
|---|--------------------|-------|--------|--------|--------|--------|-----------------|
| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| Songkhla | | | | | | | |
| Cargo Throughput ('000 tons) | 378.7 | 498.4 | 594.7 | 567.0 | 599.3 | 696.4 | 10.8 |
| Operating Revenue | 57.25 | 82.49 | 113.95 | 123.64 | 132.89 | 155.26 | 19.4 |
| - B /ton | 151 | 165 | 192 | 218 | 222 | 223 | |
| Operating Expenditure | 52.17 | 67.11 | 99.24 | 122.29 | 123.65 | 152.60 | 23.2 |
| - B /ton | 138 | 135 | 167 | 216 | 206 | 219 | |
| - Lease Rent paid to Government | 16.96 | 18.89 | 29.27 | 32.91 | 32.14 | 48.98 | 25.0 |
| Gross Operating Surplus/(Loss) | 5.08 | 15.38 | 14.71 | 1.35 | 9.24 | 2.66 | -34.9 |
| Net Surplus/(Loss) After Tax | 4.57 | 14.01 | 9.434 | (1.64) | 6.30 | 1.14 | -59.0 |
| Phuket | | | | | | | |
| Cargo Throughput ('000 tons) | 51.43 | 75.12 | 70.04 | 120.20 | 176.96 | 191.88 | 28.0 |
| Operating Revenue ^a | 12.78 | 20.02 | 23.47 | 25.82 | 34.73 | 38.08 | 20.1 |
| - B /ton | 248 | 267 | 335 | 214 | 196 | 198 | |
| Operating Expenditure | 7.52 | 11.90 | 12.37 | 26.24 | 26.08 | 34.51 | 32.6 |
| - B /ton | 146 | 158 | 177 | 218 | 147 | 180 | |
| - Lease Rent paid to Government | 0.76 | 0.76 | 1.22 | 1.24 | 2.02 | 2.72 | 32.8 |
| Gross Operating Surplus/(Loss) | 5.26 | 8.12 | 11.10 | (0.42) | 8.65 | 3.57 | -15.0 |
| Net Surplus/(Loss) After Tax | 5.00 | 7.44 | 8.50 | (1.92) | 7.17 | 2.81 | -19.3 |
| Consolidated Accounts Of Port Operator | | | | | | | |
| Current Ratio | 4.30 | 5.39 | 2.91 | 1.68 | 1.92 | 21.78 | |
| Debt/Equity Ratio | 0.01 | 0.02 | 0.04 | 0.08 | 0.16 | 0.15 | |
| After Tax Return on Equity | 29.6% | 39.8% | 25.0% | -6.67% | 20.2% | 6.7% | |

^a Includes revenue from passenger tariffs.

¹ Which reflect primarily the operations of the two ports.

² The accounts are insufficiently disaggregated to evaluate the additional investments in port equipment made by the operator (see para. 31).

D. FIRR/EIRR Reestimates

1. Quantifiable Benefits

37. At appraisal, the financial projections provided for a positive net income for both ports in the first full year (1987) of operation. Thereafter, progressive increases in net incomes were forecast until the maximum utilization capacity of the Project facilities was reached for Songkhla port in 1990 and Phuket port in 1992. The REM's reestimates of the FIRRs and EIRRs are shown in Table 3 together with the estimates made at appraisal in 1986, for the PCR in 1990, and for the PPAR in 1991. The REM's FIRR reestimates for the ports of Songkhla and Phuket, of respectively 0.3 percent and -0.7 percent, are significantly less than the real opportunity return on investment capital of around 6.6 percent and reflect the long delay between investment in the Project and realizing projected revenues through the ports. Because there are no direct revenues derived from traffic using the bridges, the FIRR for the bridges component cannot be estimated. The EIRR reestimates reflect the accelerated increase in freight and traffic volumes over the past five years and the savings to the economy arising from avoided additional vehicle operating costs and freight truck investment costs. A detailed account of the methodology and assumptions underlying the FIRR and EIRR reestimates is provided in Appendix 6.

38. The overall project EIRR of 34.5 percent attests to the economic viability of the Project. Because the EIRR has been reestimated when the design capacity levels for cargo throughput and road traffic at the ports and bridges have been nearly reached, the result can be taken as very close to that calculated with complete actual data.

Table 3: Comparison of FIRR/EIRR Estimates (percent)

| Project Component | AR | PCR | PPAR | Reevaluation |
|-----------------------------|-------------|-----------------|-------------|---------------------|
| FIRR Estimates | | | | |
| Songkhla Port | 8.1 | 7.9 | -6.8 | 0.3 |
| Phuket Port | 7.7 | 7.6 | -7.8 | -0.7 |
| EIRR Estimates | | | | |
| Songkhla Port | 18.1 | >13.0 | 9.5 | 27.4 |
| Phuket Port | 16.3 | >13.2 | -6.4 | 14.7 |
| Songkhla Bridges | 13.8 | >11.8 | 19.5 | 42.9 |
| OVERALL PROJECT EIRR | 17.3 | >12.4 | 7.4 | 34.5 |

^a The FIRR estimates were calculated from the Government's perspective, taking into account only the lease revenues paid by the ports operator.

E. Socioeconomic Impact

39. Completion of both ports expanded the diversity of employment opportunities which, before completion, were mainly related to fishing and small trading services. Development at both port areas has been such that general wage earning is now the major occupation. Apart from stevedoring work, employment opportunities for drivers, utility and hospitality services were also created. At Phuket, the opening of the port resulted in unexpected tourist arrivals which generated work for tour organizers, guides, bus operators, accommodation proprietors, banking and communication services. The overall impact of the diversity in employment has been to lessen the community's dependence on fishing activities and to increase real incomes per capita.

40. Of obvious visible impact is the local development that has followed the construction of the bridges and roads component. Before construction, Ko Yo island was linked to the mainland only by ferry and there was little community development on the island in terms of infrastructure and services. At present, average daily traffic movements between the island and mainland for local users is around 11,000 vehicles per day. There is also a substantial commercial center at Thana Dhee, with modern shopping facilities, a hospital and high school and there has been considerable real estate development together with improved and expanded infrastructure for the community.

41. Although much slower than anticipated at appraisal, increased cargo throughput, particularly at Songkhla is associated with the relocation of new industries, including production for food canning, animal feed and timber building materials.

F. Environmental Impact

42. No physical or environmental risks were expected in implementing the Project. The sites for port development were selected taking into account the results of special studies of the likely environmental impacts. The Songkhla port site at Khao Daeng was expected to have the least adverse impact on the environment and ecology of Songkhla Lake. In the case of Phuket, there were no foreseen adverse environmental or ecological considerations. For the Project bridges constructed between Ko Yo Island and the mainland, the selected sites were subject to detailed examination by the Government which took into account the need to minimize any adverse impacts on fishing areas and prawn breeding grounds in Songkhla Lake. The REM's enquiries and inspection found no unexpected or adverse impacts. Good housekeeping was observed at both ports. The discharge of waste, untreated sewerage and fish spoil into the harbors and channel approaches is prohibited, and effective arrangements exist for the collection of waste from the ports and calling vessels. The results of environmental examinations relating to air and water quality, as authorized by the Government and conducted at the ports harbors in October 1995, are within the standard values for acceptance set by the National Environment Board. The handling of dangerous goods is conducted at separate jetty sites not under the jurisdiction of the harbor ports authority.

43. The REM observed that there has been no requirement to use the firefighting equipment installed at each port, and as a consequence little attention has been paid to equipment checks,

familiarizing staff with equipment and practice drills (see para. 61).¹ Procedures for dealing with occupational injuries are considered adequate at both ports.

G. Sustainability

44. The sustainability of Project benefits is favorable.² Having been well maintained, the infrastructure facilities at both ports are in good condition and with normal maintenance should be usable for many years to come. Although uncertainties still prevail over dredging requirements and the water depth that can be viably maintained at Songkhla, the information and experiences to-date suggest that the situation is manageable (see Appendix 7). These factors together with increased pressures to limit cargo throughput at the Port of Bangkok (to an already attained one million TEUs per annum) will help ensure there is a continued and growing diversion of freight from the southern region through both ports. Together with other already noted developments in the Thailand ports system (see para. 16), the Port of Songkhla is likely to become increasingly important as a feeder port together with roll-on/roll-off services to the Port of Laem Chabang. At Phuket, industry developments and the projections for increased rubber, latex and tin exports remain strong, while the limited alternative berthing facilities available and continued promotional support of the tourist industry will ensure increased tourist patronage at the port.

45. Scope exists to expand the operating capacity of both ports through (i) increasing the number of berths that can handle containers and heavy cargo, and (ii) providing additional and improved handling systems. The existing handling equipment is adequate. However, handling efficiencies could be strengthened markedly with improved crane facilities and extended apron facilities for holding containers and reefers. At Phuket, the need for wharf facilities that are specifically designed for passenger vessels is evident, particularly for passenger terminals.

46. The bridges are designed to carry heavy container loads and have attracted traffic beyond appraisal expectations. In the absence of further expansion to carry more traffic, serious congestion will occur within the next two years that will adversely affect travel times and vehicle operating costs. This potential problem has been recognized by DH and design proposals for expansion are under preparation.

III. KEY ISSUES

47. With the current operator lease for the two ports expiring in two years, the success of privatization under a lease operation is open for review. Assuming the leasing system is continued, issues arise as to the appropriateness of the lease term, the system for renewal, and extension of responsibilities to include maintenance operations. These issues are complicated by the need (i) for transparency in awarding new operating leases, (ii) to maintain competitive incentives, and (iii) to ensure

¹ There was one call for assistance with a fire that broke out on a vessel at an adjoining jetty. Although CTI is not equipped and not permitted to handle petroleum cargoes in bulk, the water tanks for firefighting installed on the Songkhla tugboats were empty and the tugboats were not in a state of readiness to assist.

² Notwithstanding the need for review of the sharing arrangements between the ports operator and Government (see para. 36).

ongoing investments by the Government and the private port operators are sufficient to achieve port operational efficiencies in line with international trends. Not unrelated to the issue of new leases are the expansion requirements at each port, and responsibility for and timeliness of implementation.

A. Privatization

48. **Lease Term.** The sufficiency of the present lease term of ten years draws opposing viewpoints from those who believe the term is sufficient for all investments by the ports operator to be recovered, and from those who feel a longer term is justified to ensure investment is sufficient in systems improvements, lifting equipment and maintenance operations. Overriding this issue is the financial viability of investing in improved systems versus the opportunity savings from deferring investment. Precedents elsewhere point to the need for longer lease terms but with termination covenants for unsatisfactory performance and/or inability to expand and make improvements in line with maintaining accepted port efficiencies. REM's cursory review of the magnitude of capital investment required to meet port expansion requirements at Songkhla and Phuket, including additional storage, reefer electrical connections, pavement improvements, and buildings suggests a much longer lease term is justified (see para. 61).

49. **Lease Award System.** While there are no clear theoretical answers to the type of lease system that should be awarded, there are experiences from the Project and others which warrant consideration. The first point of note is that in awarding the operations of Songkhla and Phuket ports to CTI, the existing lease award system has proven financially viable for CTI, although on a declining trend. Conversely, in consideration of the Government's responsibilities for dredging and investment in development of the two ports, the lease returns while sufficient to more than meet the annual operating expenses for maintenance dredging, have been insufficient to provide a financially viable return on the capital cost of investment. Given the now proven sufficiency of lease payments to meet maintenance dredging costs, this raises the issue of whether the financial sharing arrangements between the Government and the ports operator should not be extended to cover responsibility for maintenance dredging (if not also to ownership and operation of all assets except ownership of the land). Given also that there now exists a history of the operations at each port, a more appropriate lease system might be to consider a lease award based on rental for the land only and bids for the remaining fixed capital assets.

50. The second point of note is whether the lease system should be extended to include several operators with responsibility for specific berths. Examples exist in Laem Chabang and elsewhere, where leases are awarded to more than one port operator, each with responsibility for one or more berths. However insufficient information was available to the REM to evaluate the advantages of single and multiple operators, particularly those involving a major shipping operator.¹ For now, the operational facilities at Phuket would appear too small to further privatize responsibilities. However, considering that the nature of cargo flow patterns has been established for each port, an alternative lease award system might be to revert to the original concept and award the operation of the ports under two separate leases (see para. 61).

¹ Under the Bank's TA Loan No. 2173, the consultants could not identify any advantages using multiple operators because the scope of operations was too small and involve added investment costs without compensating reductions in operating costs.

51. **Responsibility for Maintenance Dredging.** The uncertainty, created as a result of irregular maintenance dredging, deficiencies in depth monitoring equipment, and reports of groundings, appears from discussions to have been a significant constraint on shippers' plans to use Songkhla and Phuket. Contributing to the uncertainty created was the irregularity and insufficiency of budget and unsatisfactory timing of dredging operations. These factors add to the financial justification (see para. 49) for devolving responsibility for dredging to the port's operator. Willingness to take this responsibility, is however constrained by the capital and operating costs involved. The current cost of a suitable dredge with loaders is around \$35 million (64 percent of the total investment cost in Songkhla at 1996 values) and the annual operating costs of maintenance dredging are of the order of \$2.5/m³ or \$3 million annually.¹ On this basis and in consideration of the volume of cargo handled, the annual dredging costs could be alternatively met by a levy of less than \$5 per ton of cargo handled (about 2.5 percent of the average revenue per ton). An alternative option to either the Government or the ports operator taking responsibility for maintenance dredging might be to subcontract responsibility to the private sector on an international bidding basis. While dredging requirements at Phuket are much less than at Songkhla, insufficiency of dredging maintenance and uncertainty attached to the actual dredged depth is also restricting the size of vessels calling (see Appendix 7, para. 8).

B. Continued Role of Government

52. The Government's devolvement of port operations and maintenance to the private sector, leaves ownership of the port and all capital appreciation attached to development improvements with the Government. If privatization of the Government's port assets are extended, the HD's role as a landlord would diminish but its capability and role in the preparation of port master plans and in the regulation of tariffs, ship movements, navigation, environmental and safety aspects will continue to be needed. An early policy decision on the question of extent of privatization would facilitate orderly planning and development by the private sector.

C. Future Expansion at Songkhla and Phuket Ports

53. With the increase in cargo throughput, the need for expanded facilities at each port is evident (see para. 27). However, the situation is more acute at Songkhla because of the time needed to plan, design and implement expansion, before full operating capacity is reached. Under the Bank's TA Loan No. 2173, the consultants have recommended an expansion involving the construction of two more berths at each of Songkhla and Phuket. At Phuket, separation of the cargo and passenger facilities is also recommended. The REM concurs with the need for expansion and with the consultant's recommendations, but with the following reservation: that the improvements should only be made after the engineering sufficiency and financial viability of dredging requirements at both ports have been fully ascertained.

54. In considering the details of facilities needed, a special fish-landing berth and handling facilities are warranted at Songkhla for servicing nearby cannery factories. However, because the berthing time requirements for unloading fish are substantially more than for container and general

¹ Past budget provisions have been much less than this amount (see para. 35).

cargoes, the facilities should not be allowed to interfere with the berthing and waiting time requirements for other cargoes. While plans for making an adjustment in terms of handling costs might seem appropriate, it is relevant to note that the competitiveness of port charges for fish landings is also critical to the utilization of facilities. The financial viability and extent of facilities provided should therefore be balanced against the likely utilization by canneries whose alternative options are to relocate or import through alternative ports using increased on-site factory storage capacities. Because of the flexibility open to canneries, improvements for the landing of fish should be made in consultation with the canneries and with particular attention given to the canneries own development plans.

IV. CONCLUSIONS

A. Overall Assessment

55. Earlier concerns expressed in the PPAR about the ability of the ports, particularly the Port of Phuket, to attract and increase traffic did not eventuate. Cargo throughput at each of Songkhla and Phuket ports accelerated after the PPAR and the volumes are approaching each ports maximum handling capacity before congestion becomes an unacceptable cost to shipping. The average daily traffic volumes using the two bridges constructed under the Project also increased significantly and now exceed by over six times the appraisal estimates and by nearly four times the revised estimates for the PPAR.

56. The reestimated Project EIRR of 35 percent, which reflects increased cargo volumes and vehicle traffic on that which was projected for the PPAR, has been calculated when the design capacities for the ports and bridges have been nearly reached, and attests to the viability of the Project. The Project also assisted economic development of the southern region with the existence of the ports being a prime reason for the relocation of timber related manufactures and canning factories. Construction of the bridges, while facilitating the north-south flow of vehicle traffic, also improved access of the local population on Ko Yo island and the north side of Songkhla to health, education, social and Government services in Songkhla town and Hat Yai.

57. Based on the size and robust nature of the component EIRRs of 27 percent for the Port of Songkhla, 15 percent for the Port of Phuket, and 43 percent for the bridges, and the satisfactory attainment of the socioeconomic objectives, the Project, which was classified as partly successful at the time of the PPAR, is reassessed as generally successful.

B. Lessons Learned

58. The early postevaluation estimates for the Project EIRR were strongly affected by the delay in implementation and the low initial cargo volumes at each port. The findings of this reevaluation study underscore the difficulties of reliably forecasting cargo movements based on too simplistic projections of industry production levels and existing cargo flows. There is a need in forecasting cargo

movements, to also understand the difficulties of capturing traffic already served by existing ports (a feature that has become common to the development of other Bank projects). In this context, there is a need to understand the production and distribution links with processing factories, to understand the optimization responses of shipping lines and alternative transport modes, and to recognize the implications of regulatory controls and industry incentives imposed by the Government. Not unimportantly and related to the difficulties of forecasting is the need to ensure that underlying assumptions inherent in Project design (e.g., relating to maintenance and harbor depth) are met so that the basis of forecasts and projections are valid.

59. More comprehensive geotechnical study tests for appraisal of the Project would have revealed more reliably the magnitude requirements for dredging maintenance, and at the same time revealed the type of dredging equipment best suited to the area. In retrospect, if the cost of a dredge had been included in the Project, some uncertainties relating to the completion and timing of maintenance dredging, available water depth for shipping and the risks of grounding would have been lessened, and earlier utilization of the ports possibly would have occurred.

60. The reevaluation study reinforces the view that the timing for PPARs should be at least three years after project completion, when awareness of the services and benefits available have gained sufficient acceptance.

C. Follow-up Action

61. The Government should (i) formulate as soon as possible a plan for expanding port facilities at Songkhla, subject to verifying the engineering sufficiency and financial viability of dredging requirements; (ii) initiate a study of how the terms of lease at Songkhla and Phuket should be renewed; (iii) consider devolving responsibility for dredging to the ports operator(s); and (iv) initiate procedures for ensuring firefighting systems and drills are in a better state of readiness.