

# **FINAL REPORT**

## **STUDY ON THE EFFECTIVE PORT MANAGEMENT AND OPERATION SYSTEM IN THE KINGDOM OF THAILAND**

**MARCH 1988**

**JAPAN INTERNATIONAL COOPERATION AGENCY**





17732.



## PREFACE

In response to the request of the Government of the Kingdom of Thailand, the Japanese Government has decided to conduct a study on the Effective Port Management and Operation System and entrusted the study to the Japan International Cooperation Agency (JICA). The JICA sent to Thailand a study team headed by Mr. Tamotsu Okabe, President of the Overseas Coastal Area Development Institute of Japan from August 1986 to January 1988.

The team had discussions on the Project with the officials concerned of the Government of Thailand and conducted a field survey. After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relationship between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Kingdom of Thailand for the close cooperation they extended to the team.

March, 1988



Kensuke Yanagiya

President

Japan International Cooperation Agency



LETTER OF TRANSMITTAL

March, 1988

Mr. Kensuke Yanagiya  
President  
Japan International Cooperation Agency

Dear Mr. Yanagiya:

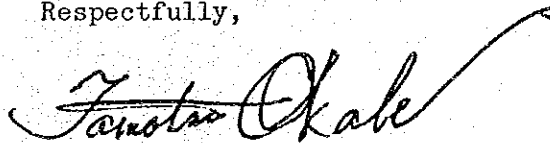
It is my great pleasure to submit herewith a report for the Study on the Effective Port Management and Operation System in the Kingdom of Thailand.

The Japanese study team, headed by myself, conducted a survey on the system in Thailand from August 1986 to January 1988 at the request of the Japan International Cooperation Agency. The findings of this survey were analyzed to propose an appropriate system necessary for effectively managing and operating ports in the Kingdom of Thailand in the future, and the results of the analysis were then compiled into this report. I hope that the study results will be fully utilized by the Government of the Kingdom of Thailand.

On behalf of the Japanese study team and myself, I would like to express my deepest appreciation to the Government of the Kingdom of Thailand and to the various organizations concerned with the Study for their unlimited cooperation and assistance, and for the warm hospitality which they extended to the team during our stay in Thailand.

I am also greatly indebted to the Japan International Cooperation Agency, the Ministry of Transport, the Ministry of Foreign Affairs, the Japanese Embassy and the JICA Office in Thailand for giving us valuable suggestions and assistance during the field survey and the preparation of this report.

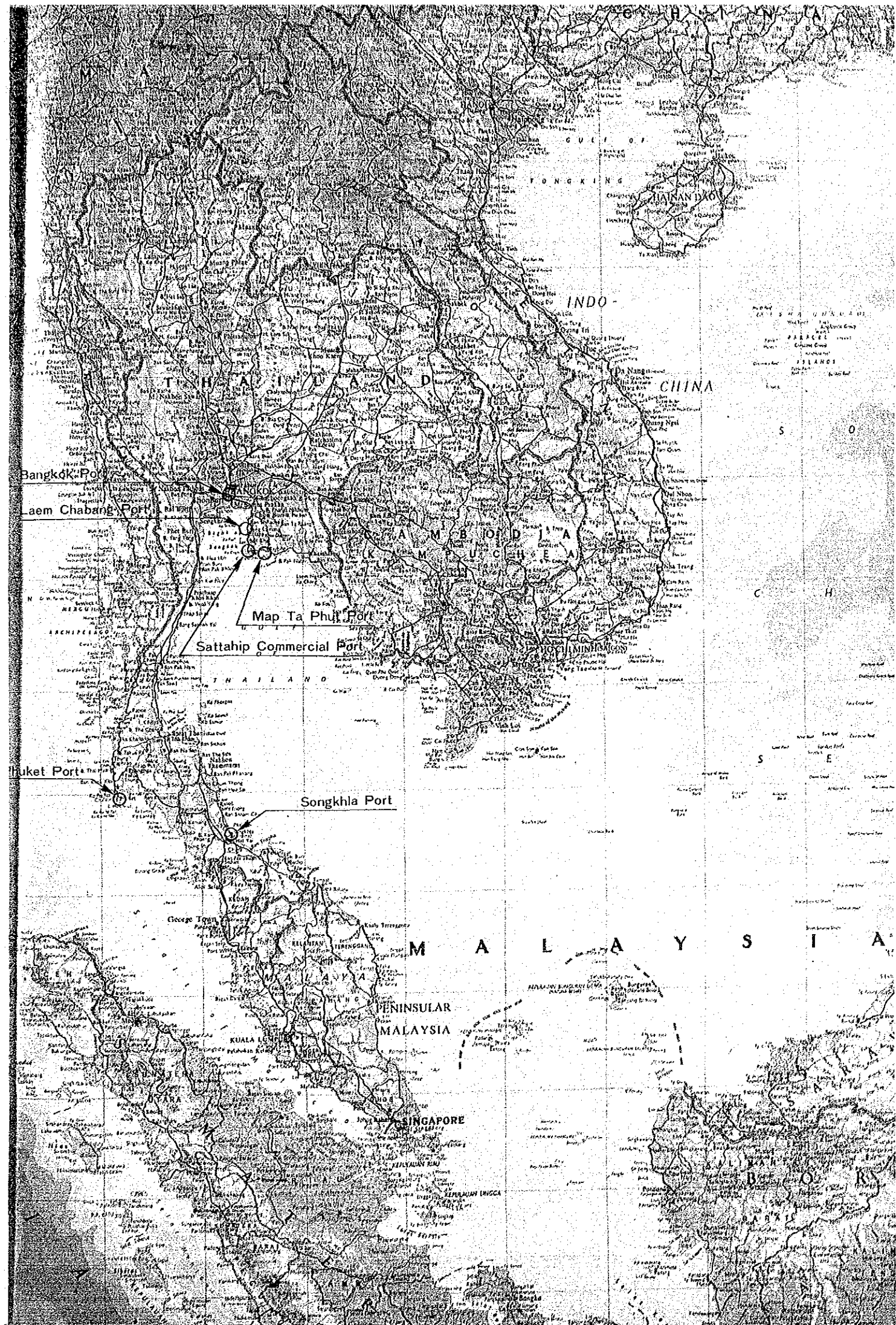
Respectfully,



Tamotsu Okabe  
Head  
Japanese Team for the Effective  
Port Management and Operation System Study  
(President, the Overseas Coastal Area  
Development Institute of Japan)









## NOTES

### 1. Abbreviation

ADB	The Asian Development Bank
ASEAN	The Association of Southeast Asian Nations
B	Baht
BOI	The Board of Investment
CFS	Container Freight Station
CKD	Completely Knocked Down
CY	Container Yard
DWT	Dead Weight Tonnage
ESB	The Eastern Seaboard
ETO	The Express Transport Organization of Thailand
FCL	Full Container Load
GRT	Gross Register Tonnage
HD	The Harbour Department of the Ministry of Communications
IBRD	The International Bank for Reconstruction and Development
IEAT	The Industrial Estate Authority of Thailand
IMO	The International Maritime Organization
JICA	The Japan International Cooperation Agency
LAQ	Lease-a-quay
LCL	Less than Container Load
LUP	License-to-use-the-port
MEA	Metropolitan Electricity Authority
MOC	The Ministry of Communications
MOF	The Ministry of Finance
MOI	The Ministry of Interior
MP Act	The Maritime Promotion Act
MPC	The Maritime Promotion Commission
MWWA	Metropolitan Water Works Authority
NEC	The National Executive Council
NEC 281	The Announcement of the National Executive Council No. 281 or the Alien Business Law
NFC	National Fertilizer Corporation Ltd.
NPC	National Petrochemical Corporation Ltd.

NESDB	The National Economic and Social Development Board
NRT	Net Register Tonnage
OCS	The Office of Commodity Standard
OECF	The Overseas Economic Cooperation Fund
OESB	The Office of the Eastern Seaboard Committee
OMPC	The Office of the Maritime Promotion Commission
OPS	The Office of the Permanent Secretary of the Ministry of Communications
PAT	The Port Authority of Thailand
PAT Act	The Port Authority of Thailand Act
PDC	The Personnel Development Centre of the Port Authority of Thailand
RTG	The Royal Thai Government
RTN	The Royal Thai Navy
\$	U.S. Dollar(s)
SRT	The State Railway of Thailand
TEU	Twenty-foot Equivalent Unit
TOT	Telephone Organization of Thailand
TPU	The Transport Planning Unit
UNCTAD	The United Nations Conference on Trade and Development
¥	Yen

## 2. Sources of Tables and Figures

The sources of tables and figures are mentioned below them. But those whose sources are not mentioned in particular are made based on the analysis by the Study Team.

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# **SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**



## SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

### Port Development Policy

1. It is essential for the economic activity of Thailand to provide efficient port services (III.A Para4). On the other hand, the development of ports as a leading infrastructure for the promotion of industrial location and a nucleus of regional economic development should be also stressed (III.A Para7).
2. It is necessary to provide deeper water facilities for both bulk carriers and container ships in order to reduce transport costs through more efficient operations (III.B Para21). It is also necessary to locate international trade ports in remote regions to establish regional independence and reduce the burden on the Bangkok Metropolitan Area (III.B Para26).
3. It is necessary to develop deep sea ports to import energy and other resources, and to establish efficient port transport measures such as coastal and inland shipping (III.B Para31).
4. The development of Laem Chabang Port should be strongly advocated in order to relieve the congestion at the port of Bangkok as well as to promote the development of the Eastern Seaboard (ESB) region (III.B Para82). To enhance the competitiveness with Bangkok Port and attract sufficient cargo, container handling at Laem Chabang Port and inland transportation between the port and the Bangkok area must be highly efficient (III.D Para64).
5. For the international ports of Songkhla and Phuket, it is necessary to develop both of these ports as part of a unified regional economic development plan, which should be carefully coordinated with other national development projects (III.D Para95).
6. Concerning local ports, it is necessary to develop ports especially in the towns of the southern region and along the ESB as well as in the towns

along the inland waterways (III.C Para47).

7. Following is a tentative proposal for the location of ports of refuge along the coast of Thailand based on the navigation chart (III.C Para50):

Ports:	Sattahip Commercial Port
	Songkhla Port
	Phuket Port
Anchorage:	Around Ko Phangngan and Ko Samui
	Phuket Ocean Vessel Anchorage

It would be advisable to collect the opinions of numerous experts including commanders of the Royal Thai Navy (RTN), chief pilots, and experienced masters in identifying ports of refuge (III.C Para51).

#### **Functions of the Port Management Body**

8. The duties of the port management body are to oversee the overall activities which are carried out by various other bodies at the port including terminal operators, to ensure safe and efficient operations, and to promote the orderly growth of the port (V.A Para5). However, the actual scope of business of port management bodies vary from port to port (V.A Para7).

9. Port management bodies generally have the following functions (V.A Para 6):

- i) Maintenance and utilization of their own facilities
- ii) Control of traffic within the port
- iii) Provision of services for vessels such as pilot, tug, search and rescue, etc.
- iv) Coordination among individual terminal operations
- v) Supervision and control of terminal operations and other commercial activities
- vi) Port sales activities
- vii) Restriction of the disorderly use of the port area
- viii) Formulating and implementing port development plans

Other than these, the port management body sometimes takes on the



following works (V.E Para99):

ix) Terminal operation

x) Arranging facilities for governmental organizations, service suppliers and users such as office buildings, welfare facilities, medical care, etc.

#### **Port Area**

10. For the effectiveness of port activities, a certain minimum water area should be placed under the exclusive jurisdiction of the port management body with some exceptions in case of emergency , and land areas necessary for port activities should be used exclusively by the port management body. Additionally, the port management body should retain some sort of administrative control around those exclusive use areas, since some activities there may affect the effectiveness and safety of the port (V.E Para112).

11. Within the areas where future expansion is planned, harmful conduct like construction not following the port development plan should be strictly prohibited to assure smooth expansion (V.E Para113). Within the port area, permanent and temporary encroachment on water areas, should be controlled not only from the viewpoint of navigation safety but also considering harmony with port activities. Basically all reclamation and construction must be a part of the port development plan (V.E Para114). From the same viewpoint, when private facilities are operated or planned in some areas adjacent to the port, it is recommended that these areas be included in the port area, for example, the Ko Sichang and Si Racha areas in the Laem Chabang port area (V.E Para115).

12. Outside of port areas, all port facilities along waterways should be regulated by unified plans provisionally called "Channel Development Plans" (V.E Para115).

#### **Possibility of Privatization of Terminal Operations**

13. It is essential for prospective private companies to have a strong

financial and technical background to act as a terminal operator. It is suggested that the required amount of capital would be at least Baht 50 million. However, at present there is no suitable Thai company which has both enough capital and sufficient technical experience (V.B Para36).

14. It is recommended that at least one of the major Thai partners of any joint venture with a foreign company should have some connection with port operation or cargo handling so that the company could benefit from technical transfer (V.B Para43).

#### (1) Laem Chabang Container Terminals

15. The income/expense break-even point of a potential terminal operator is approximately 74,000 TEU/year. This figure will probably be realized within about five years (V.B Para47). However, before reaching the break-even point, the operator's financial situation would be severe. In order to overcome these risks to the terminal operator, the period of the lease agreement should be 10 to 15 years (V.B Para48).

16. Aiming to minimize the total transportation cost, each shipping company will choose the most suitable type from the following four types of lessees :

- i) A public or private independent operator
- ii) A consortium of shipping companies
- iii) A shipping company or its affiliated company with sub-users
- iv) A shipping company or its affiliated company with exclusive use

It is recommended to lease terminals to shipping companies if they so desire because of the reduction of the total transportation cost (V.B Para50).

17. It is recommended to lease each container terminal to a separate operator in order to assure fair competition (V.B Para49).

#### (2) Laem Chabang Break Bulk and Coastal Shipping Terminals

18. As it would be difficult for the operator to pay the terminal rent, the break bulk terminal and coastal shipping terminals should be operated by a single operator to reduce the operating cost. If it is not possible to find a private operator, the License-to-use-the-port (LUP) system should be applied whereby the port management body takes charge of operating these facilities using some private cargo handling companies (V.B Para52,53).

(3) Laem Chabang Tapioca and Sugar/Molasses Terminal

19. Independent terminal operators, traders or a consortium are potential lessees. To lighten the burden of additional investment for conveyors, warehouses, etc., a longer-term lease is advisable, say 25 to 30 years, almost equal to the lifetime of these additional facilities (V.B Para57).

(4) Map Ta Phut Agri/Mineral Terminal

20. The maximum revenue will be almost equal to the total cost of the terminal rent, the public-use facility cost and the operating cost. However, further analysis should be made based on the detailed program of implementation, including the kinds of industries that will locate in the industrial area (V.B Para61).

(5) Map Ta Phut Factory Berths

21. The factories are the only potential lessees, and it is recommended to offer almost the same period of lease as that of the land for the factories, around 30 years (V.B Para62).

(6) Songkhla Port and Phuket Port

22. It will be difficult to recover the construction cost by means of the terminal rent (V.B Para63). All the berths at each port should be leased to a single operator respectively, which will contribute to minimize the operation cost (V.B Para64). The Government is required to assist in the field of finance, technical aspects and coordination with other government agencies (V.B Para67).

## **Privatization of Port Activities**

23. Pilotage should continue to be provided by the Harbour Department HD at least for the moment. Privatization of tugboat and rope boat service would be difficult at the initial stage when demand is insufficient. Privatization of water and electricity supply services would not be advantageous for both port management bodies and private firms. Telephone service in the port area is not suitable for privatization because the major part of this service has to depend on the Telephone Organization of Thailand. Cleaning and garbage collection in the port area should be executed by either the port management body or a private company. Search and rescue and marine pollution elimination services are difficult to be privatized (V.B Para68).

## **Port Management Body for the New International Ports**

### **(1) Laem Chabang Port**

24. The Port of Laem Chabang should be managed by an autonomous body separated from the local and central administrative organs as well as from the existing port management body, namely, the Port Authority of Thailand (PAT) (V.D Para95).

25. If a new state enterprise is established for the management of Laem Chabang Port, certain changes should be made in the organizational structure as compared with PAT (VI.C Para55).

26. The members of the Board of Commissioners should include individuals with expertise in the fields of ports, transportation, navigation, commerce, economics and finance. Additionally, the board should include outstanding representatives of the local community to contribute their opinions concerning local matters. Experts on industries and representatives of the branch offices of relevant government agencies should also serve on the Board (VI.C Para56).

However, if it is not possible to add outstanding local individuals to the Board due to the legal restrictions on the number of Board members, the

best way to provide local interests with representation is by the formulation of a group of local interests (VI.C Para57).

27. By means of the privatization of terminal operations, the new management bodies should be significantly smaller than PAT, and the total number of employees is estimated at about 70 (VI.C Para60).

The majority of the staff of the new port management bodies should be new recruits, and the advice and coaching of foreign experts will be indispensable. However, after several years during which time the foreign experts will support the staff in general port affairs, the Thai staff must gain the ability to manage the ports on their own, as a result of the keen efforts to transfer managerial know-how from the experts to the Thai staff (VI.C Para61).

28. If PAT is assigned to manage Laem Chabang Port because of the present political and administrative circumstances, a new branch office should be established to be specifically responsible for the management of the new port. In this case, it is strongly recommended for the efficient operation of Laem Chabang Port that the branch responsible for management of the port be strictly separated from existing port management in terms of accounts, operations of facilities, and even welfare and promotion of personnel and workers (VI.C Para62).

29. The actual decision-making for all ports must be vested in the Director Generals or Sub-Boards separately responsible for each port, and the present Board of Commissioners would issue rules and regulations common to both ports under PAT jurisdiction and take care of general affairs (VI.C Para63).

30. For Laem Chabang Port, the total deficit of the entire port during one project cycle of 30 years would be around Baht 720 million. This unrecoverable amount should be subsidized by the Government, and is almost equivalent to the total land acquisition, reclamation and dredging costs (V.C Para75).

It is advisable that the subsidy be given in the form of bearing the initial investment in land acquisition, reclamation and dredging, which are estimated to almost equal the total loss over the 30 years (V.C Para76).

## (2) Map Ta Phut Port

31. The Industrial Estate Authority of Thailand (IEAT) would be an appropriate port management body for Map Ta Phut Port. A new department of IEAT, whose main office will be located at the site and which will be in charge of the management of the Port will have to be established. In order to achieve cost-effective port management, the financial accounts of the port sector in IEAT should be kept separately from that of the industrial estate (V.D Para97).

An advisory group of local interests should also be formulated in order for the Director General of the Office to gain adequate support for its decisions (VI.C Para67).

32. For Map Ta Phut Port, financial assistance by the Government is recommended for promoting the location of factories because construction and maintenance of the breakwater and navigation channel will be very costly at this port (V.C Para78).

## (3) Songkhla and Phuket Ports

33. For the first stage of the development of these ports, direct management by the Government is realistic and effective (V.D Para98), and a committee comprising Government officials from relevant fields should be formulated for managing the ports (VI.C Para69). To retain the independence of each port, individual sub-committees should be established, and separate accounts should be kept to ensure autonomy of finance. Local interests should be invited on an equal status to sub-committee members to ensure a general consensus on port policy and operations (VI.C Para70).

34. The port management bodies of Songkhla Port and of Phuket Port could recover only a small part of their necessary costs (V.C Para81). The Government should execute at its own expense the maintenance and repairs of breakwaters, navigation channels, and navigation aids effectively utilizing the HD's capability (V.C Para82). Other losses should be borne by the Government (V.C Para83).

35. The Government should try to generate demand for port use through

executing related projects like those for industrial development. However, Songkhla and Phuket Ports should have separate management and accounts in the Government in order to motivate individual ports to improve their financial situation (V.D Para98).

#### (4) Accounting System

36. Each port management body should make use of external audits by independent organizations such as the office of Auditor General of Thailand in order to check improper and incorrect accounting (VI.D Para80).

#### Terminal Operation System

##### 37. (1) Laem Chabang Container Terminal

One container terminal should be operated by a single operator who has enough skilled personnel and equipment to supply good service to customers.

In order to secure smooth container flow, all the sections in the container terminal should be closely connected with each other, performing the necessary activities such as container ship operation, container yard operation, gate operation, CFS operation, cargo documentation and maintenance and repairs, respectively (VI.E Para83).

##### (2) Laem Chabang Break Bulk Terminal

As for loading/discharging to and from wharves, it is recommended for the terminal operator to control direct shipping and direct delivery on the wharf so that efficient shoreside operations can be maintained (VI.E Para84~86).

##### (3) Laem Chabang Agri-Bulk Terminal

The loading operation should be consistently performed without any distinction between stevedoring and longshoring (VI.E Para87,88).

##### (4) Map Ta Phut NFC and NPC Terminal

As exclusive industrial berths function as part of productive plants, the entire cargo handling process should be performed by a

single operator, in accordance with the operations of the plant itself (VI.E Para89).

(5) Bangkok and Sattahip Commercial Ports

i) Container Cargo Handling

PAT should establish a new integrated operational section, which will be responsible for the control of daily operations, and transfer the necessary workers in order to meet the increasing demand for container operations (VI.E Para96). Rearrangement of the PAT Port Area should be examined for both facilities and traffic control (VI.E Para97).

In order to enjoy the merits of containerization to the utmost, measures to promote door to door transportation service should be considered immediately (VI.E Para99).

ii) Conventional Berths

In accordance with international trade rules, PAT should take responsibility for discharged goods up to and inside the shed (VI.E Para100).

PAT should consider converting the present handling area for imported iron and steel goods into a container stacking area.

The total number of wharf cranes should be reduced to an appropriate level by retiring older cranes (VI.E Para102).

iii) Other Improvements

PAT should review the present durable years of old cargo handling equipment in the light of the actual breakdown ratio in order to meet users' demands (VI.E Para103).

PAT should re-examine the storage capacity of the overtime warehouse and expand its space if necessary (VI.E Para104).

(6) Training System

i) Training at Bangkok Port

It is obvious that a significant part of the cargo handling within the PAT Port Area is actually conducted by private companies, and PAT should oversee the qualifications of these companies and their employees. Therefore, PAT should function as a parent body and execute training of all port workers within the PAT Port Area (VI.E Para106).



ii) Training at Laem Chabang Port

As the container volume is expected to rapidly increase in the port's initial stage, the terminal operator will have to secure trained personnel on an urgent basis. The following measures should be taken (VI.E Para107):

- o To invite foreign experts who have extensive experience and who can teach local workers to operate and maintain equipment
- o To select several suitable candidates and send them overseas to take training courses
- o To employ some experienced foreign persons who can instruct the staff through working together on a daily basis

iii) Training at Songkhla and Phuket Ports

Although it is important to make an effort to train port workers in a systematic way, it is advisable to take measures on an "on-the-job training" basis due to the small cargo volume in the initial stage (VI.E Para108).

(7) Lease Agreement

The main conditions of the terminal lease agreement between the port management body and the lessee as terminal operator should be examined and formulated along the lines of Appendix IV (VI.E Para82).

**Ship Handling and Other Services**

38. In order to control the traffic of small ships which have almost no communication apparatus on board and often violate navigation rules, the following measures should be considered (IV.C Para62):

- i) Monitoring and training
- ii) Restriction of the maximum length of barge trains
- iii) Restriction of passing and overtaking
- iv) Provision of waiting anchorages
- v) Construction of visual traffic control signals and leading lights

39. Shore-based radar stations which have long been employed as a

supplementary safety measure in developed countries should be put to use to ensure safe navigation in Bangkok Port (IV.C Para64).

40. At Bangkok Port, the channel depth is well maintained but the existing bar channel is not wide enough for the current traffic conditions, so expansion and improvement (from a curved line to a straight line as much as possible) of the channel should be initiated (IV.C Para68).

41. For the safe utilization of the channel, maintaining a pair buoy system and expansion of the channel should be considered (IV.C Para71).

42. It is definitely advisable to organize a cooperation system for the prevention of marine pollution and marine incidents as early as possible (IV.E Para125).

It is recommended for the Government to more positively conduct search and rescue and the prevention of marine pollution directly because these items are not limited to port areas (IV.E Para126).

#### **Government's Roles**

43. Items of port administrative matters which may possibly be conducted by the Government are (V.F Para123):

- o Provision of fundamental organs
- o Decision of fundamental policy
- o Coordination among Government Agencies
- o Support of implementation of development
- o Supervision of port management bodies
- o Supervision of management and operation performance
- o Preparation of basic information

#### **Governmental Organization**

44. The development of the port sector should take place under a uniform port policy (VI.A Para3).

45. Based on the National Economic and Social Development Plan, the

Ministry of Communication (MOC) should oversee the entire field of port development and administration, and should set fundamental port policy while seeking the advice of other ministries and agencies which will continue to exercise authority in fields closely related to operations and planning such as finance, state property and customs (VI.A Para6).

#### **Core Organization and National Port Commission**

46. To oversee the nation's ports, it is strongly recommended to establish a "core organization" within MOC which would be responsible for port planning, administration and development (VI.A Para7). The core organization would be responsible for drafting and initiating almost all those items listed in the paragraph 43 with the close cooperation of the National Port Commission - See the next paragraph - (VI.A Para8).

47. For achieving high quality port administration, coordination among relevant governmental agencies and the advice of experts from academia and the private sector is indispensable (VI.A Para10). Therefore, it is recommended that such experts and representatives of agencies in the following fields get together in one forum, a National Port Commission (VI.A Para11):

- |                                     |  |
|-------------------------------------|--|
| o Budget                            | o Local Administration                     |
| o Customs                           | o Environmental Protection                 |
| o National and Regional Development | o Marine Transport                         |
|                                     | o Civil Engineering                        |
| o Industrial Development            | o Business (industry, trade and transport) |
| o Promotion of Exports              |  |

48. The National Port Commission should consider various matters which are of vital importance including (VI.A Para15):

- i) The National Port Development Plan,
- ii) Individual Port Development Plans,
- iii) The structure of new Port Management Bodies, and
- iv) The definition of individual port areas.

The Minister would be free to ask the advice of the Port Commission on any matter relating to the development, management, supervision, coordination and planning of ports and harbors, as necessary (VI.A Para16).

#### **Project Team**

49. It is very difficult for an existing MOC agency namely, the Office of the Permanent Secretary (OPS), HD, the Office of the Maritime Promotion Commission (OMPC) or PAT to act as the core organization for port and harbor development. Therefore, a new core organization should be established (VI.A Para18~28).

50. However, the establishment of a new government organization in a short period of time would be very difficult, and the Government is presently required to deal with specific port matters on an urgent basis. Thus it is appropriate to organize a "project team" as soon as possible on a temporary basis and then to set about the establishment of the core organization on a step by step basis (VI.A Para28). The Project Team should be an inter-agency group, but for convenience the Team should establish its office within OPS (VI.A Para31). It is recommended that the Team would consist of 10 officials tentatively: 4 from OPS, and 2 each from PAT, OMPC, and HD (VI.A Para32).

51. The duties of the Project Team should include all urgent matters concerning ports and harbors (VI.A Para33).

52. The Project Team should coordinate with various Ministries and obtain expert advice by using the Maritime Promotion Commission (MPC) to make a short-term system workable, considering the scope of MPC's authority and its close relations with MOC. However, considering the lack of expertise within MPC on certain matters such as port budget, engineering and management, the Team should rely on other outside experts as well (VI.A Para36).

#### **Port Planning System**

53. Careful port planning not only of new ports but also of expansion or

rehabilitation of existing ports is essential (VI.B Para38). These plans should consist of a national port development plan, which shows the fundamental policy of ports and the priority of port developments, and individual port development plans, which follow the national plan. There should be two kinds of plans, namely long-term plans and short-term plans (VI.B Para43,44,47).

54. The National Port Development Plan should be drafted by the core organization. The draft of the Plan should be submitted to the National Port Commission for deliberation, and then the Commission should make recommendations and submit them to the Minister of Communications. The Minister should then present the Plan to the Cabinet for approval (VI.B Para51).

The individual Port Development Plans should be drafted by port management bodies according to the framework shown in the National Port Development Plan (VI.B Para52).

#### **Legal Aspects**

55. The following items should be prescribed in a legal instrument, preferably in the form of an Act (VI.F Para10):

- i) Matters relating to national and individual port planning;
- ii) Concerning the National Port Commission, major items of the organization, rules of procedures for meetings, terms of reference and definition of the secretariat;
- iii) Matters relating to port management bodies other than PAT, including provisions concerning port areas;
- iv) Relationships between central and local governments and port management bodies; and
- v) The machinery and the procedure of settling disputes between port users and port management bodies and other suppliers of facilities or services.

56. Clear definitions of the jurisdiction of the governmental organizations should be worked out as early as possible (VI.F Para13).

57. As the Thai legislative process is somewhat lengthy, it is recommended that at the initial stage matters should be dealt with in the form of ministerial orders, and at a later stage regulations should be formalized under a parliamentary Act (VI.F Para114).

58. However, it is also recommended that a review of existing laws governing ports and preparation of a new composite parliamentary Act, a preliminary draft of which is attached as Appendix V, should be initiated as soon as possible (VI.F Para115~117).

# MAIN REPORT





## I . Introduction

In response to a request made by the Government of the Kingdom of Thailand, the Government of Japan has decided to conduct a Study on the Effective Port Management and Operation System in the Kingdom of Thailand.

The Study objectives are as follows: i) to analyze the present situation of ports in Thailand; ii) to formulate the fundamental concepts of the port development policy; iii) to establish the fundamental framework for port administration; iv) to prepare the principles for the management and operation of the international ports; v) to recommend management and operation systems for Laem Chabang Port, Map Ta Phut Port, Songkhla Port and Phuket Port; and vi) to make comments on the present management and operation systems of the existing international ports.

In order to achieve the objectives mentioned above, the Japan International Cooperation Agency consigned the Study to the Overseas Coastal Area Development Institute of Japan.

The Ministry of Communications and the Port Authority of Thailand were assigned as counterpart agencies to the Japanese Study Team and also as coordinating bodies in relation with the other organizations concerned.

Actual study work commenced in August 1986 with the arrival of the Study Team in Thailand. Since then, the Study was carried out both in Thailand and in Japan including 8.5 months of field surveys in Thailand.

In the course of the Study, the Inception Report, Progress Report I, Progress Report II, Interim Report and Draft Final Report have been submitted to the Royal Thai Government. In addition, several formal presentations and various discussions with counterpart personnel and the members of the Steering Committee were held. Comments and suggestions were given by the members of the Steering Committee.

The Steering Committee and counterpart members and the Study Team personnel are as follows:

# Steering Committee Members

M.L. Joengjan Kambhu

Mr. Sribhumi Sukhanetr

Capt. Kajit Buajitti (RTN)

Mr. Chamlong Saligupta

Mr. Amphon Tiyabhorn

Sen. Lt. Chit Ongsuwan (RTN)

Mr. Seree Suebsanguan

Vice Admiral Prinyar Uttamoat (RTN)

Sen. Lt. Pongsak Vongsamoot (RTN)

Dr. Savit Bhotibihok

Mr. Sansern Wongcha-um

Mr. Chotechai Attavipatch

Mr. Kovit Kuvanonda

Mr. Kamrob Varachat

Ms. Krishnee Varanusupakul

Mr. Puchanee Suksamiti

MOC (Chairman)

(- Sep., 1987)

MOC (Chairman)

(Oct., 1987 -)

MOC (Deputy Chairman)

(- Sep., 1987)

MOC (Deputy Chairman)

(Oct., 1987 -)

HD

(- Oct., 1987)

HD

(Nov., 1987 -)

OMPC

PAT

(- Sep., 1986)

PAT

(Oct., 1986 -)

OESB

NESDB

IEAT

MOC

(- Sep., 1987)

MOC

(Oct., 1987 -)

MOC (Secretary)

MOC (Secretary-Assistant)

# Counterpart Members

Mr. Puchanee Suksamiti

MOC

Mr. Ong-art Singsuwit

MOC

Mr. Pathai Metharom

OESB

Ms. Chuntana Shitgasornpongse

NESDB

Mr. Chaiyos Chaimankong

OMPC

Mr. Sarin Skulratana

OMPC

Ms. Sunisa Mookdarsanit

HD

Ms. Rapeepan Kongdis

PAT

Mr. Sakunroeng Patamasang	PAT
Mr. Saksit Suksumeth	IEAT

Japanese Study Team

Mr. Tamotsu Okabe	(Team Leader)
Mr. Shoji Ishizuki	Legal Affairs (Sub Leader)
	(- Mar., 1987)
Mr. Hideaki Sagara	Legal Affairs
	(Apr., 1987 -)
Mr. Hidehiko Kuroda	Port Planning
Mr. Takashi Yanase	Regional Development
Mr. Hiroshi Fuseya	Port Administration
Mr. Shinichi Saga	Port Financing
Mr. Fumihiko Masuda	Management & Operation
Capt. Koichi Kuwazaki	Navigation Control
Mr. Seiichiro Ohnishi	Shipping
	(- Mar., 1987)
Mr. Yukito Kida	Shipping
	(Apr., 1987 -)
Mr. Jun Shimizu	Maritime Transport
Mr. Hideaki Mine	Terminal Operation
Mr. Yutaka Kumano	Business Analysis
Mr. Masaru Suzuki	Coordination (JICA)

## II. Review of the Present Situation

### A. Natural Conditions

1. Thailand is located in the tropics between latitude  $5^{\circ}37'N$  -  $20^{\circ}27'N$  and longitude  $97^{\circ}22'E$  -  $105^{\circ}37'E$ . The total area is about  $513,115 \text{ km}^2$ . The northern part is mountainous with dense forest. The land of the northern area is dry and mostly plateau land and a great central plain covers the central part of the country. The boundary to the north is with Burma and Laos, to the east are Laos and Cambodia and southern Burma lies to the west, while south of the country are the Gulf of Thailand, Malaysia and the Andaman Sea. The seacoast of Thailand is about 2,614 km long. The climate of Thailand is dominated by the northeast and southwest monsoons.

2. The coastal areas of Thailand are roughly divided into three regions based on topography. They are the west coast of the Malay Peninsula, the east coast of the Malay Peninsula, and the vicinity of Bangkok and the Eastern Seaboard (ESB).

3. The west coast of the Peninsula is characterized by beach under eroding conditions due to wave force during the southwest monsoon season, and many rocky headlands and offshore reefs are found along the coast. The east coast of the Peninsula is beach under aggrading conditions caused by littoral drift due to wave action during the northeast monsoon. The Gulf of Thailand is very shallow, and its average depth 30 km offshore is less than 20 m. Even in the center of the Gulf, the water depth reaches only 80 m and the seashore is thus mostly flat sandy beach and there are many transitional sand bars and sand spits near the mouths of the rivers. The coast on the inner Gulf is characterized by smooth beach with deltas formed by river-borne sediment discharged from large rivers such as the Bang Pakong, the Chao Phraya, the Mae Klong and the Tha Chin. The coast of ESB is partially sandy beach subject to the affects of the southwest monsoon.

4. Both the west coast and the east coast of the Peninsula have an

equatorial climate with high rainfall during the SW monsoon season for the former and during the NE monsoon for the latter. The vicinity of Bangkok and ESB is divided into two climate regions: a tropical monsoon climate area with moderate rainfall and an equatorial climate area with high rainfall during the SW monsoon season.

5. Generally 3 to 7 tropical cyclones pass over Thailand each year. In the autumn, most of these cyclones are generated near the Philippines or in the South China Sea and then move westward to Thailand. On the other hand, tropical cyclones generated in the Indian Ocean or the Andaman Sea move northward in the spring. Occasionally they bring heavy rainfall and strong winds to the area.

6. On the west coast of the Peninsula, about 80% of the waves are smaller than 2.0 m in height with a period shorter than 6 - 7 seconds, and only 1 - 2 % of the waves are 3.0 m or higher. On the east coast of the Peninsula, most of the waves come from the east and about 85 % of the waves are smaller than 2.0 m with a period shorter than 8 seconds. However, in sheltered areas protected by sand spits such as Pak Phanang and Pattani, wave height is only about 0.5 m even during the NE monsoon season. On the coast in the inner Gulf and along ESB, the wave height is favorable for maritime activities with 90 % or more of the waves less than 2.0 m in height.

7. Along the west coast of the Peninsula, the littoral drift is insignificant, while along the east coast the littoral drift is the primary factor for the channel shoaling of the outer channels except for Ban Don Bay, Pak Phanang and Pattani. The bottom sediments along the coast of the inner Gulf are composed of mud and hence the littoral drift along ESB is also a significant cause of channel shoaling.

## B. Socioeconomic Conditions

### General Conditions

8. The population of Thailand increased to 44,825 thousand in 1980 from 26,358 thousand in 1960 with an average annual 2.7% growth rate during that period, and it reached 52,969 thousand in 1986 with an average annual growth rate of 2.3% during 1984 - 1986. Especially, the central region including Bangkok Metropolis showed an average annual growth rate of 3.9% during the past three years with 20% of the national population concentrated in the central region and with 15.7% in the Bangkok Metropolitan Area. As a result the central region has a population density of 383.2 persons/km<sup>2</sup> and the Bangkok Metropolitan Area has a population density of 1,070.2 persons/km<sup>2</sup>, which is almost ten times the national average of 103.2 persons/km<sup>2</sup>.

9. As for the national population distribution, the northeastern region accounts for 35.2% of the national total, with a high growth rate. However, the population density has been gradually increasing in the southern region recently, and the transport axis between the Bangkok Metropolitan Area and the southern region has become important.

10. Urbanization has proceeded along with the progress of the industrialization of the Thai economy. However, only 13 cities have a population of more than 50,000 persons, all of which are located on the major transport network. The cities having more than 100 thousand inhabitants are Chiang Mai in the north region, Khon Kaen, Ubon Ratchathani and Nakhon Ratchasima in the northeastern region, Hat Yai in the southern region and Bangkok.

11. The structure of the Thai economy remained virtually unchanged up to the late 1950s. In the early 1960s, the industrial and service sectors began to supplement agriculture as significant income and employment generators. Today, Thailand is still predominantly an agrarian country with about 69% of its working population engaged in and 23% of the national income derived from agriculture. Over the years, however, the industrial

and service sectors have been increasing their share of the total GDP and of the total employment.

12. Significant structural changes in the Thai economy have taken place since the early 1960s. The agricultural sector's share of the national income declined steadily from about 40% in 1960 to 23.2% in 1984. At the same time, the manufacturing sector expanded very rapidly, increasing its share of the national income from 13% in 1960 to 21.2% in 1984. Such a structural change does not, however, imply that agricultural output failed to rise during the period. On the contrary, it increased by about 5% per year. Moreover, a high degree of diversification took place, enabling Thailand to increase its export items from only three major commodities -- rice, teak and rubber -- in the early 1950s to more than 10 agricultural products by 1979. The agricultural sector's share of export tonnage in 1984 is 76.2% and its share of export value is 43.4%.

13. The industrialization process initiated during the 1960s was geared toward import substitution. It was succeeded in the 1970s by a drive to produce export-oriented items. By the mid 1970s, Thailand was exporting manufactured goods ranging from cement to watch parts, and including canned fruits, garments, chemical products, transport equipment and television sets. In 1984, manufactured exports accounted for about 30% of total export earnings.

14. International trade is vital to the Thai economy. Thailand's entry into foreign markets has enabled its economy to expand rapidly. Today, export and import transactions together account for about half of the national income. Although there were annual deficits in the balance of trade, the balance of payments recorded a continuous surplus throughout the 1960s and the early 1970s. Sharp increases in oil prices since 1973, though, affected the balance of payment position severely. Nevertheless, the situation improved in 1980 and the balance of payments is now roughly even.

15. The public sector supports the growth process by providing basic infrastructures and by creating a positive environment for private sector development. The ratio of capital formation by the public sector to that

Table 2.1 Regional Share of Population

(Unit: 1,000 Persons)

Region \ Year	1960	1970	1980	1981	1982	1983	1984	1985	1986
Total	26,259	34,398	46,961	47,875	48,847	49,515	50,583	51,796	52,969
Central	5,009	6,491	9,026	10,022	10,261	9,919	10,143	10,503	10,757
(Bangkok)	19.1%	18.9	20.1	20.9	21.0	20.0	20.1	20.3	20.3
	3,293	4,528	6,645	7,465	7,686	7,341	7,558	8,740	8,032
	12.5	13.2	14.8	15.6	15.7	14.8	14.9	15.1	15.7
Eastern	1,576	2,045	2,697	2,944	3,037	3,123	3,185	3,301	3,418
	6.0	5.9	6.0	6.1	6.2	6.3	6.3	6.4	6.5
Western	1,687	2,076	2,701	2,866	2,951	2,984	3,036	3,099	3,146
	6.4	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
N-Eastern	8,992	12,025	15,699	16,393	16,720	17,219	17,638	18,061	18,552
	34.2	35.0	35.0	34.2	34.2	34.8	34.9	34.9	35.2
Northern	5,723	7,489	9,074	9,714	9,834	10,106	10,281	10,391	10,490
	21.8	21.8	20.2	20.3	20.1	20.4	20.3	20.1	19.9
Southern	3,272	4,272	5,628	5,935	6,046	6,166	6,300	6,441	6,608
	12.5	12.4	12.6	12.4	12.4	12.5	12.2	12.4	12.5

Source: Ministry of Interior

Table 2.2 Regional Distribution of Population Density

(Unit: Persons/km<sup>2</sup>)

Region \ Year	1960	1970	1980	1981	1982	1983	1984	1985	1986
Whole Thailand	51.4	67.0	87.4	93.3	95.2	96.5	98.6	100.9	103.2
Central region	203.9	264.3	367.5	408.0	417.8	403.8	361.4	374.3	383.2
(Bangkok metropolis)	413.3	568.7	835.0	937.6	965.3	922.0	974.3	1,010.6	1,070.2
Eastern region	43.2	56.7	73.9	80.6	83.2	85.5	87.3	90.4	94.0
Western region	39.2	48.2	62.7	66.6	68.5	69.3	71.0	72.0	73.1
N-Eastern region	53.3	71.2	93.0	97.1	99.0	102.0	104.5	107.0	109.9
Northern region	33.7	46.3	53.5	57.3	58.0	59.6	60.6	61.3	61.8
Southern region	51.4	67.0	87.4	93.3	95.2	96.5	98.0	91.1	93.4

Source: Ministry of Interior

Table 2.3 Annual Population Increase Rate

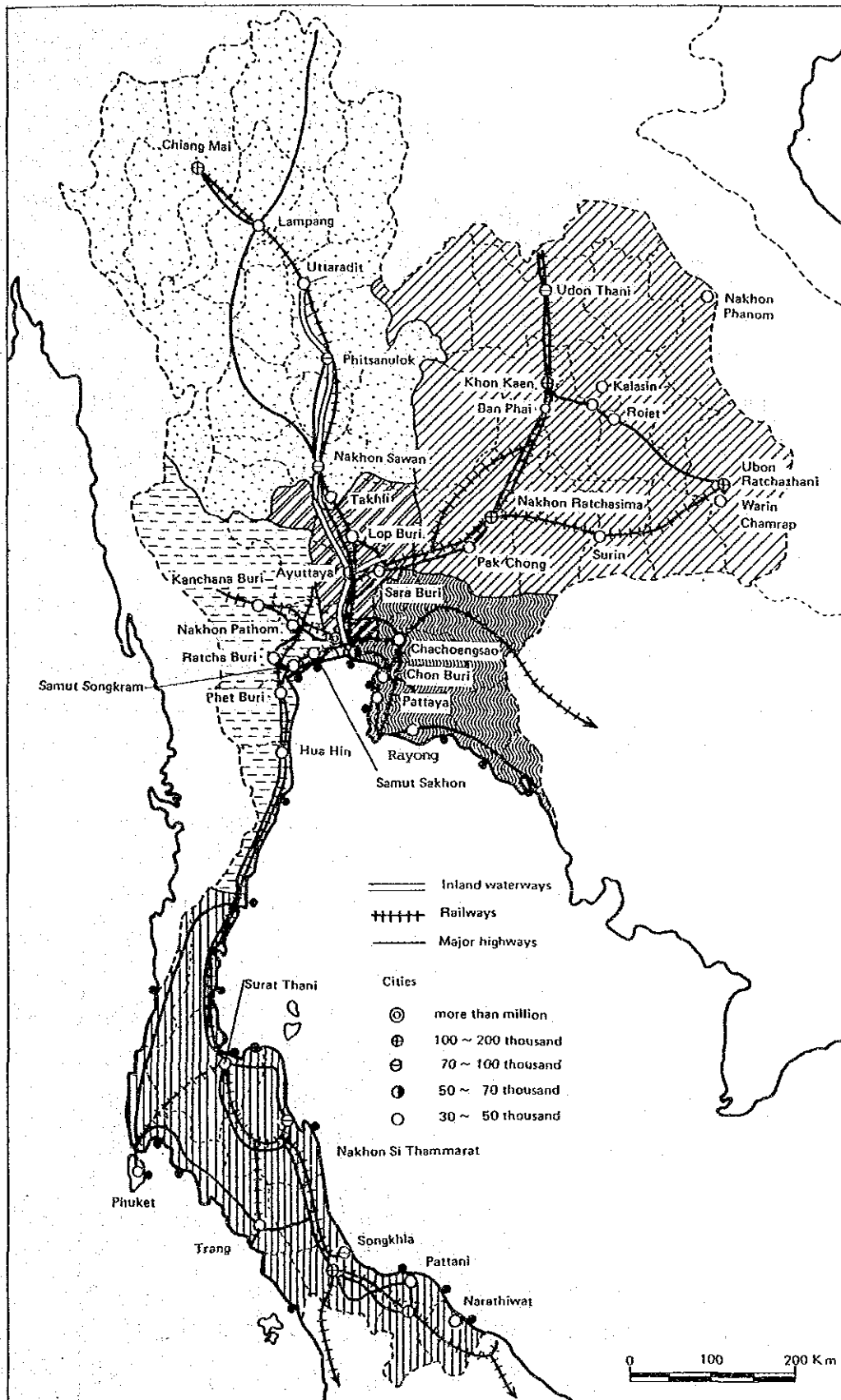
(Unit: %)

Region \ Year	1960-1970	1970-1980	1981	1982	1983	1984	1985	1986
Whole Thailand	2.7	2.7	6.8	2.0	1.4	2.2	2.4	2.3
Central region	2.7	3.4	11.0	2.1	-4.5	2.3	3.5	5.9
(Bangkok metropolis)	3.7	4.3	13.5	2.9	-8.5	3.0	3.7	3.6
Eastern region	2.7	3.0	10.1	3.5	1.3	2.0	3.6	3.6
Western region	1.9	2.6	6.7	3.0	1.3	1.7	2.1	1.6
N-Eastern region	2.9	2.7	4.4	2.0	3.0	2.4	2.4	2.7
Northern region	2.7	1.9	7.1	1.2	2.8	1.7	1.1	1.0
Southern region	2.7	2.8	5.4	1.9	2.0	2.2	2.2	2.6

Source : Ministry of Interior



Fig. 2.1 Transportation Network in Thailand



Source: Based on National Statistics

Table 2.4 GRP by Sector and Region in 1984 and Shares

(Unit: Million Baht ... upper figures)  
% ... lower figures)

Sector \ Region	Central	Eastern	N-Eastern	Western	Northern	Southern	Bangkok
Agriculture	5,409 6.3%	10,074 11.7%	21,844 25.4%	9,584 11.2%	19,553 22.8%	13,968 16.3%	5,470 6.0%
Mining & Quarrying	563 10.4%	620 11.4%	349 6.4%	1,084 20.0%	1,288 23.8%	1,290 24.0%	214 4.0%
Manufacturing	2,236 2.9%	4,826 6.3%	3,983 5.2%	3,020 3.9%	2,400 3.1%	1,466 1.9%	59,151 76.7%
Construction	535 3.0%	814 4.6%	2,580 14.6%	715 4.0%	2,332 13.2%	1,797 10.2%	8,907 50.4%
Electricity & Water supply	559 6.9%	625 7.7%	792 9.8%	449 5.6%	745 9.2%	689 8.5%	4,227 52.3%
Transport & Communication	942 3.8%	1,061 4.3%	2,783 11.3%	1,273 5.2%	2,989 12.1%	2,157 8.8%	13,401 54.5%
Wholesale & Retail trade	2,614 4.6%	3,762 6.6%	11,739 20.4%	3,852 6.7%	8,424 14.7%	6,297 11.0%	20,741 36.1%
Bangkok, Insurance, etc.	718 2.7%	1,119 4.1%	1,967 7.3%	1,088 4.0%	2,204 8.2%	1,576 5.8%	18,322 67.9%
Ownership of Dwellings	298 5.5%	343 6.4%	1,157 21.5%	323 6.0%	824 15.3%	525 9.8%	1,900 35.4%
Public Administration	925 6.6%	735 5.2%	3,192 22.6%	814 5.8%	2,199 15.6%	1,627 11.5%	4,615 32.7%
Services	1,195 2.9%	2,883 6.9%	4,891 11.8%	1,224 2.9%	4,343 10.5%	3,128 7.5%	23,873 57.5%
GRP	15,992 4.4%	26,860 7.4%	55,278 15.2%	23,426 6.4%	47,302 13.0%	34,528 9.5%	160,821 44.2%
Per Capita GRP	6,273	8,625	3,119	7,879	4,716	5,324	20,497
Regional Discrepancy	0.87	1.20	0.43	1.10	0.66	0.74	2.85

Note: GRP is shown in constant 1970 prices.  
Source: Statistical Yearbook, NESDB

Table 2.5 Sectorial GDP and Share

(Unit: Million Baht ... upper figures)  
% ... lower figures)

Sector \ Year	1979	1980	1981	1982	1983	1984
Agriculture	71,408 25.8	72,784 24.9	77,701 25.0	78,502 24.2	81,449 23.7	85,902 23.6
Mining & Quarrying	4,531 1.6	4,780 1.6	4,623 1.5	4,431 1.4	4,414 1.3	5,115 1.5
Manufacturing	57,841 20.9	60,597 20.7	64,490 20.7	67,317 20.8	72,252 21.1	77,081 21.2
Construction	14,547 5.3	16,576 5.7	15,500 5.0	15,097 4.7	15,927 4.6	17,680 4.9
Electricity & Water Supply	5,178 1.9	5,560 1.9	6,330 2.0	6,755 2.1	7,348 2.1	8,088 2.2
Transport & Communication	17,663 6.4	18,811 6.4	20,209 6.5	21,715 6.7	23,290 6.8	24,605 6.8
Wholesale & Retail Trade	45,497 16.4	48,227 16.5	51,103 16.4	52,789 16.3	55,076 16.1	57,430 15.8
Banking, Insurance, etc.	15,582 5.6	17,419 5.9	19,197 6.2	21,396 6.6	24,238 7.1	26,994 7.4
Ownership of Dwellings	4,289 1.5	4,502 1.5	4,723 1.5	4,936 1.5	5,178 1.6	5,369 1.5
Public Administration	11,594 4.2	12,423 4.2	13,192 4.2	13,833 4.3	14,498 4.2	14,106 3.9
Services	28,777 10.4	31,173 10.6	34,202 11.0	37,261 11.5	39,276 11.4	41,536 11.4
Total	276,907	292,852	311,270	324,032	342,946	364,206

Source: NESDB