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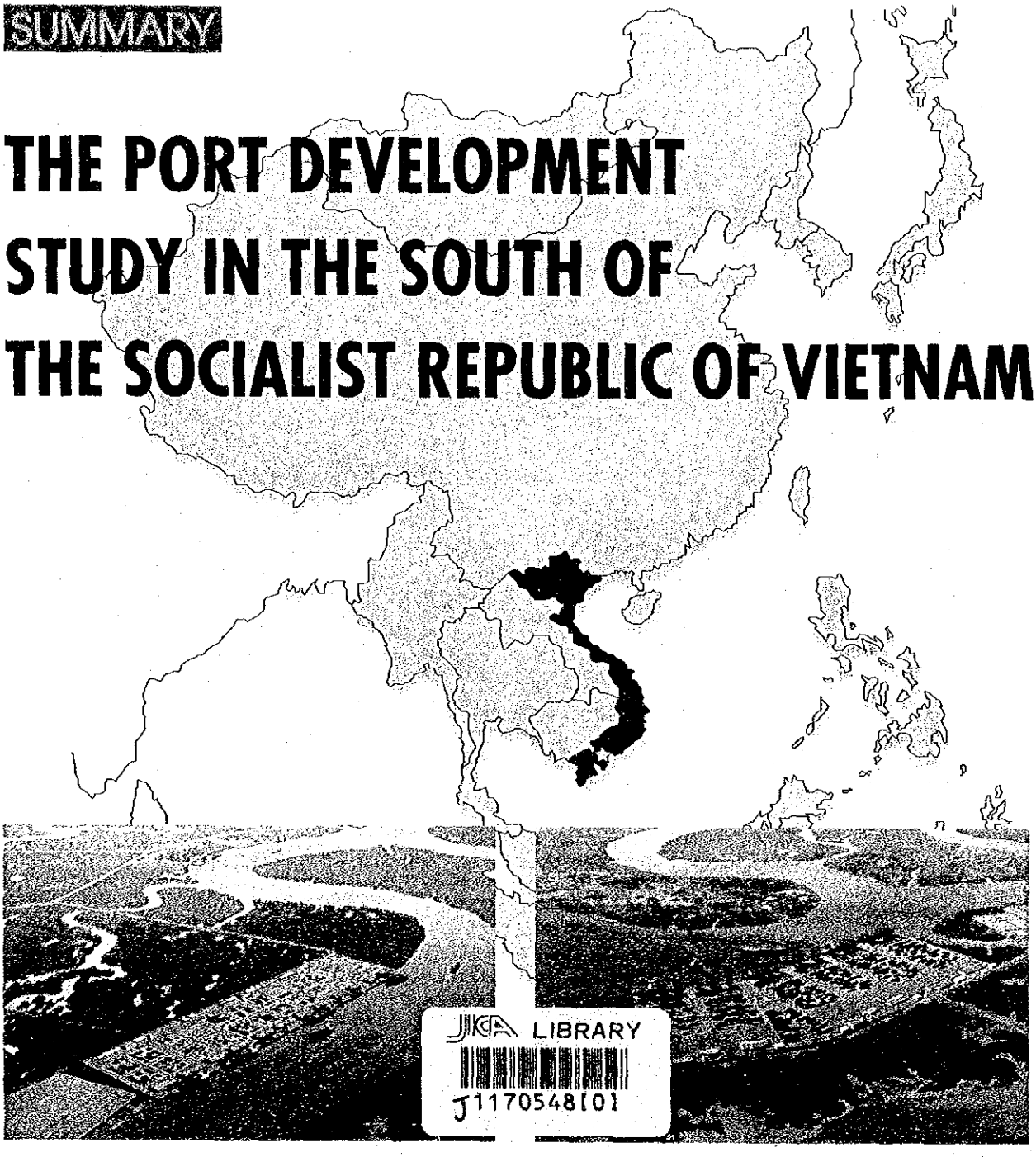
Japan International Cooperation Agency (JICA)
Ministtry of Transport (MOT), the Socialist Republic of Vietnam
Vietnam National Maritime Bureau (VINAMARINE)

FINAL REPORT

SUMMARY

THE PORT DEVELOPMENT STUDY IN THE SOUTH OF THE SOCIALIST REPUBLIC OF VIETNAM



December 2002

The Overseas Coastal Area Development Institute of Japan (OCDI)
JAPAN Port Consultants, Ltd. (JPC)

Note: The following exchange rate is used in this report.

US$ 1.00=Vietnam Dong 15,000VND=Japanese Yen 120

August 2002

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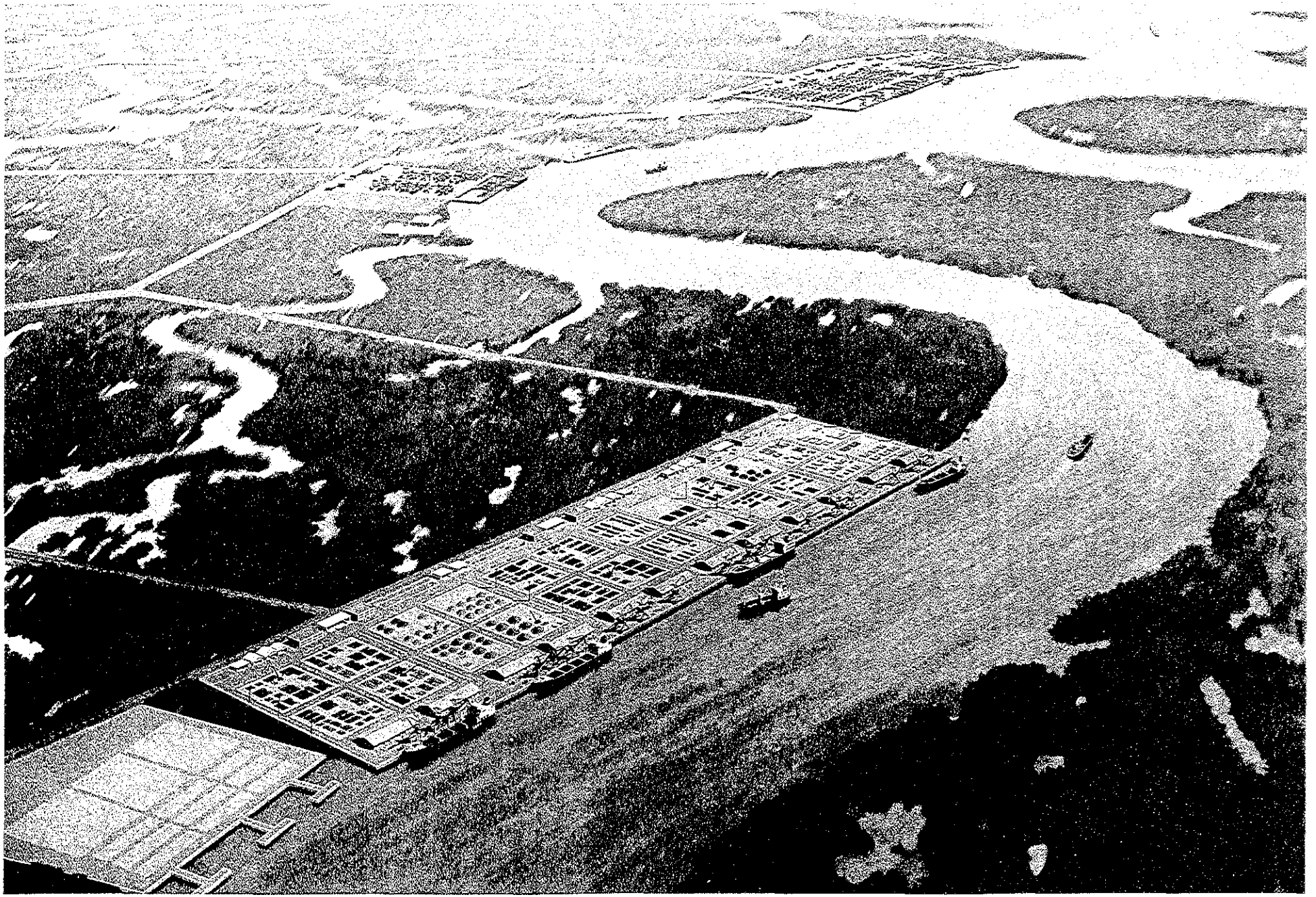
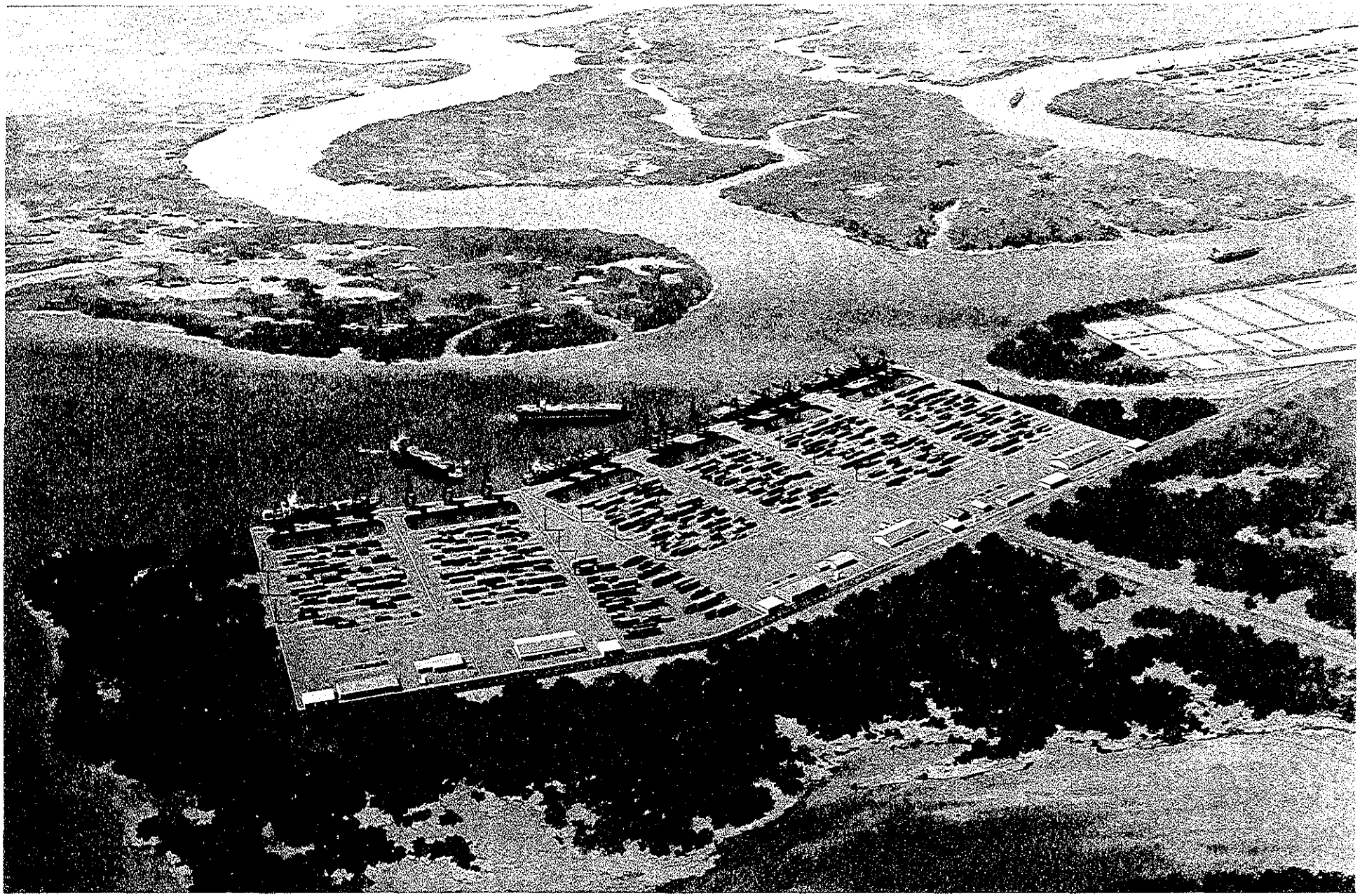


CAI MEP - THI VAI INTERNATIONAL PORT



CAI MEP INTERNATIONAL CONTAINER TERMINAL

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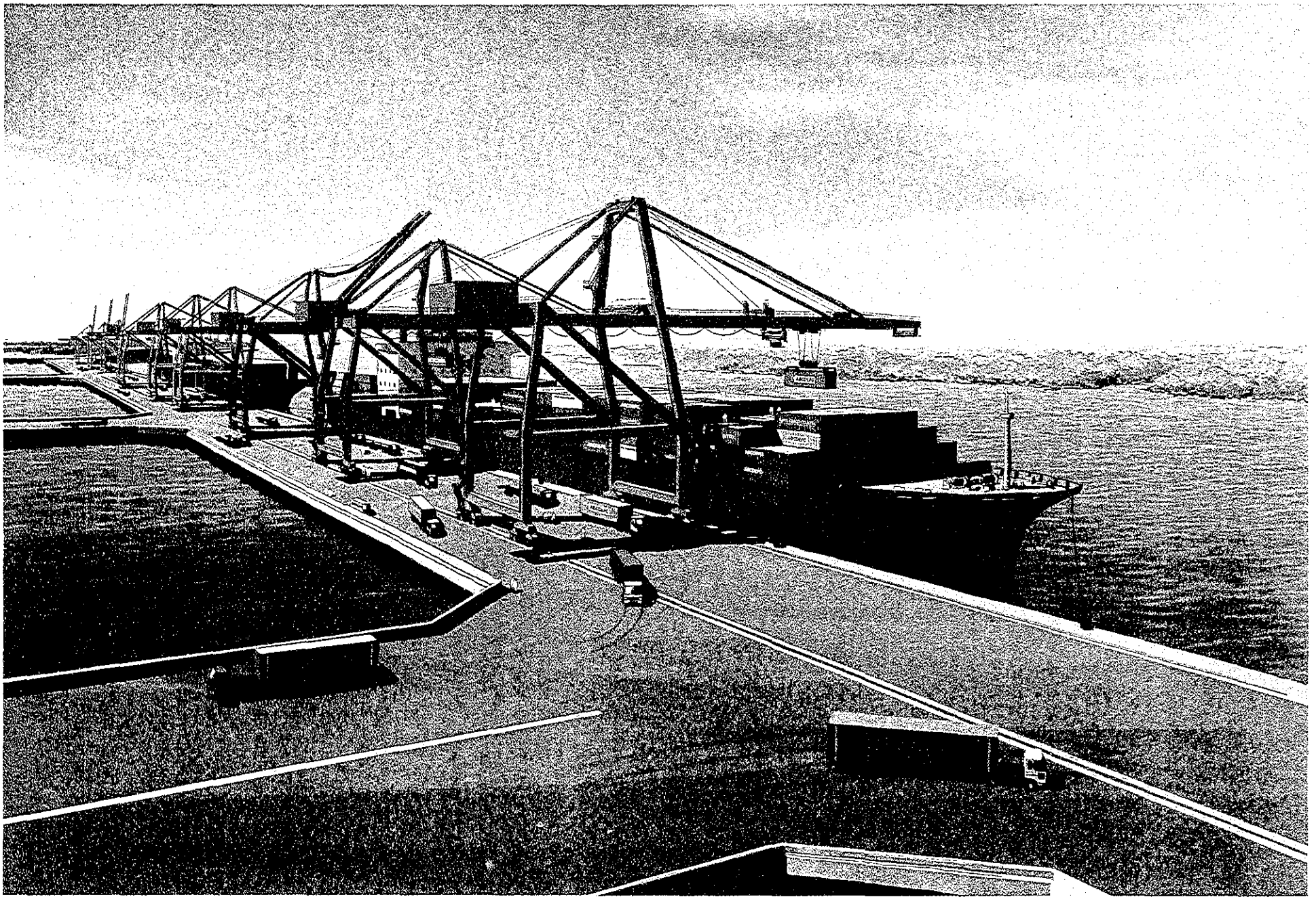


CAI MEP INTERNATIONAL CONTAINER TERMINAL

PREFACE

In response to the request from the Government of the Socialist Republic of Vietnam (hereinafter referred to as "GOV"), the Government of Japan decided to conduct the Port Development Study in the South of the Socialist Republic of Vietnam (hereinafter referred to as "the Study") and entrusted the study to the Japan International Cooperation Agency (JICA).

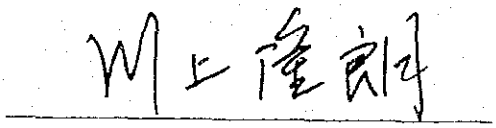
JICA selected and dispatched a study team headed by Mr. Yukio NISHIDA (hereinafter referred to as "the Study Team") of the Overseas Coastal Area Development Institute of Japan (OCDI) and comprised of OCDI and Japan Port Consultants (JPC) to Vietnam four times between March 2001 and October 2002.

The Study Team held discussions with the officials concerned of GOV and conducted field surveys at the study area. Upon returning to Japan, the Study Team conducted further studies and prepared this final report.

We hope that this report will contribute to the promotion of this project and to the enhancement of friendly relations between our two countries.

Finally, we wish to express our sincere appreciation to the officials concerned of GOV for their close cooperation extended to the Study Team.

December 2002



Takao KAWAKAMI
President
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

December 2002

Mr. Takao KAWAKAMI
President
Japan International Cooperation Agency

Dear Mr. KAWAKAMI,

It is my great pleasure to submit herewith the Final Report of "The Port Development Study in the South of the Socialist Republic of Vietnam".

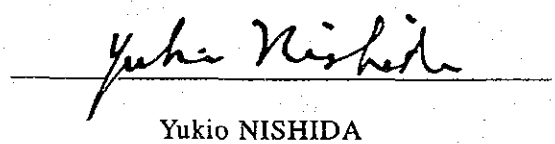
The Study Team comprised of the Overseas Coastal Area Development Institute of Japan (OCDI) and Japan Port Consultants (JPC) conducted surveys in the Socialist Republic of Vietnam over the period between March 2001 and October 2002 according to the contract with the Japan International Cooperation Agency (JICA).

The Study Team compiled this report, which proposes the future development scenario including Master Plan and Short-term Plan for the ports in the south of Vietnam up to 2020 and 2010 respectively, through close consultations with officials of the Ministry of Transport of the Vietnamese Government and other authorities concerned.

On behalf of the Study Team, we would like to express our sincere appreciation to the Ministry of Transport and other authorities concerned for their cooperation, assistance, and heartfelt hospitality extended to the Study Team.

We are also very grateful to the Japan International Cooperation Agency, the Ministry of Foreign Affairs, the Ministry of Land, Infrastructure and Transport, and the Embassy of Japan in the Socialist Republic of Vietnam for valuable suggestions and assistance during the course of the Study.

Yours faithfully,



Yukio NISHIDA
Team Leader
The Port Development Study in the South
of the Socialist Republic of Vietnam

List of Abbreviations

ADB	Asian Development Bank
AFTA	ASEAN Free Trade Agreement
APA	ASEAN Ports Association
ASEAN	Association of South-East Asian Nations
BCR	Benefit / Cost Ratio
BDSM	Ben Dinh - Sao Mai
BOD_5	Biological Oxygen Demand after 5 days
BOT	Build-Operate-Transfer
BR-VT	Ba Ria-Vung Tau
BT	Build-Transfer
BTO	Build-Transfer-Operate
CAAV	Civil Aviation Administration of Vietnam
CDL	Chart Datum Level
CFEA	Central Focal Economic Area
CFS	Container Freight Station
CM	Cai Mep
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
DSI	Development Strategy Institute
DWT	Dead Weight Tonnage
EDI	Electric Data Interchange
EIA	Environment Impact Assessment
EIRR	Economic Internal Rate of Return
EPZ	Export Processing Zones
FIRR	Financial Internal Rate of Return
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GPS	Global Positioning System
GRT	Gross Registered Tonnage
GSO	General Statistical Office
HCMC	Ho Chi Minh City
HDI	Human Development Index
HEPZA	HCMC Export Processing and Industrial Zones Authority
HHWL	Highest High Water Level
HWL	High Water Level
IAPH	International Association of Port and Harbours
ICD	Inland Clearance Depot
IEE	Initial Environmental Examination
IMO	International Maritime Organization
IZ	Industrial Zones
JBIC	Japan Bank for International Cooperation
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JY	Japanese Yen
LCC	Lower Cai Mep International Container Terminal
LCM	Lower Cai Mep
LLWL	Lowest Low Water Level
LWL	Low Water Level
LOA	Length Overall
MADRECO	Maritime Dredging Company

MIS	*Management Information System*
MOC	Ministry of Construction
MOSTE	Ministry of Science, Technology and Environment
MOT	Ministry of Transport
MPI	Ministry of Planning and Investment
MPMU	Vinamarine Project Management Unit
MSL	Mean Sea Level
NFEA	Northern Focal Economic Area
NH	National Highway
NM	Nautical Mile
NR	National Road
OD	Origin and Destination
ODA	Official Development Assistance
PMB	Port Management Body
PSA	Port of Singapore Authority
PSP	Private Sector Participation
PTP	Port of Tanjung Pelapas
PTSC	Petro Vietnam Technical Service Company
PVECC	Petro Vietnam Engineering Consulting Company
RO/RO	Roll-on Roll-off
RTG	Rubber Tired Gantry Crane
SCF	Standard Conversion Factor
SER	Shadow Exchange Rate
SFEA	*Southern Focal Economic Area*
SOE	State-owned Enterprise
SS	Suspended Solid
TCN	Ministeral Standards in Vietnam
TCVN	Standard of Vietnam
TEDI	Transport Engineering Design Incorporation
TEDI-S	Transport Engineering Design Incorporated South
TEU	Twenty Footer Equivalent Unit
TV	Thi Vai
TVG	Thi Vai International General Cargo Terminal
UCC	Upper Cai Mep Container Terminal
US$	United States Dollar
UNCTAD	United Nations Conference on Trade and Developmnet
VCCI	Vietnam Chamber of Commerce and Industry
VICT	Vietnam International Container Terminals
VIETSOVPETRO	Vietnam-Soviet Petroleum Company
VINALINES	Vietnam National Shipping Lines
VINAMARINE	Vietnam National Maritime Bureau
VINAWACO	Vietnam National Waterway Corporation
VITRANSS	Vietnam Transport Strategy Study
VIWA	Vietnam Inland Waterway Administration
VMRCC	Vietnam Maritime Regional Coordination Center
VMS	Vietnam Maritime Safety Agency
VND	*Vietnam Dong*
VOC	Vehicle Operation Cost
VPBD	Vertical Plastic Board Drain
VSIZ	Vietnam-Singapore IZ
VTS	Vessel Traffic Service

Final Report
CONTENTS

Executive Summary

The Port Development Study in the South of the Socialist Republic of Vietnam
(March 2001 to November 2002)

1. Introduction

1.1 Background of the Study

Most of the ports such as Saigon, Nha Be ports were constructed long ago and in curved river sections, therefore, water depth of shipping channel and its turning radius are unable to cater to large vessels. More critically, the port back-up areas inshore are limited, handling equipment is superannuated and of low capacity, and as a result these ports cannot meet the growing cargo throughput demands, especially in terms of container traffic. Therefore, it is necessary to formulate a port development master plan in this area from a long-term perspective.

In addition to the port development scenario mentioned above, what is equally important is to formulate an appropriate port operational strategy, which is fully controlled by the government body. On this basis, the most functional and economical operation of the new port complex in the Thi Vai - Vung Tau area should be established.

1.2 Objectives of the Study

The objectives of the Study are:

1) to identify the development potential of the port complexes in the SFEA and to define the future role of the Thi Vai - Vung Tau port complex development.

2) to prepare a port development/administration strategy in SFEA comprising demand forecast, a port development concept, a port administration/management system, an institutional framework, possible introduction of equitization schemes, etc (target year 2020).

3) to prepare a master plan for comprehensive development/administration of the port complexes in SFEA including Thi Vai - Vung Tau development, taking into account proper functional allotment among the ports in the Saigon Port area and the Thi Vai - Vung Tau area (target area 2020)

4) to prepare a short-term development/administration plan for the ports in SFEA and to carry out a feasibility study for the priority projects (target year 2010).

5) to carry out relevant technology transfer.

2. Socio-economic Conditions and Traffic Demand Forecast

2.1 Socio-economic Conditions

The SFEA (Southern Economic Focal Area) can be recognized as the port hinterland of the Study, covering four local governments such as Ho Chi Minh City and the provinces of Binh Duong, Dong Nai and Ba Ria-Vung Tau. SFEA had a population of 8.5 million in 2000 which accounted for 11% of the national total. It showed robust economic activities rather in the same year in terms of GDP (31% of the national total), trade (57%) and FDI (85%).

Saigon Port and other SFEA ports handled 28 million tons in 2000 excluding crude oil shipment from offshore oilfields. Throughput almost doubled during the period from 1996 – 2000. The traffic is increasing, particularly container traffic with neighboring Asian countries. On the other hand, port access transport becomes longer and makes road traffic congestions much worse in HCM City.

2.2 Traffic Demand Forecast

The Study prepared three economic growth alternatives (high, middle and low) based on different investment scenarios and then employed the middle one as the most likely case. As a result, SFEA port traffic is projected at 50.1 million tons in 2010 and 95.4 million tons in 2020. Containerized cargo will show a sharp increase of 5.4 times until 2020.

As a next step, traffic demand of a Thi Vai – Vung Tau new ports was analyzed based on major shipping routes, possible ship size and shippers' location. The result shows that the new deep seaport will have considerable cargo demand particularly of containers (1.1 million TEU in 2010 and 3.3 million TEU in 2020). It will also benefit the shippers located at the provinces of Dong Nai and Baria – Vung Tau when handling their non-containerized cargoes.

3. Natural Conditions and numerical Analysis on Wave

3.1 Natural Conditions

Available data on natural conditions in the study area are first collected, including meteorological, hydrographical, oceanographycal and natural environmental conditions. On the other hand, site surveys are carried out on topography, bathymetry, sediments, tide and currents, river discharge, and foundation soils at Thi Vai, Cai Mep, Ben Dinh-Sao Mai and Ganh Rai Bay areas. The natural conditions at these areas are made clear and applied to numerical simulations for assessment of sedimentation at the channels and other analyses. The most important condition in view of construction of port facilities is very soft sub-soils with 15-30m deep on the surface at all the sites.

Historical change in coastlines and riverbanks are analyzed by means of comparing the available past aero-photographs. There is no significant change except at Can Dio coast, which is also verified by simulation calculations based on One-line Theory.

3.2 Numerical Analysis on Wave Height

Waves are hindcasted for past 30 typhoons and daily winds for 5 years, introducing a Spectral Model and the Global Wave Model, respectively. The offshore design wave height is estimated to be 8.0m for a 50-year return period. Based on these analyses, it is proved that calmness of BD-SM port should be improved by constructing a breakwater.

3.3 Effect of Current on Ships' Navigation and Berthing Operations

In the Thi Vai River Approach Channel, current speed is sometimes high, but its direction is parallel to the channel alignment. Such current does not hinder navigation of ships in the channel. It is necessary to pay attention to the effect of current at around Buoy No.5, where the maximum current reaches to1.3 m/sec four times a day at spring tide and crosses almost perpendicularly to the Dinh River Channel. It should be taken account carefully for the safety of turning operation of the ships to/from BD-SM Port.

The effect of current on berthing/un-berthing operations at the proposed ports is minimal, considering the combined encounter possibility of both high-speed current and berthing/ un-berthing operations.

4. Port Development Plan

4.1 Basic Concept of Long Term Port Development

Port development in the south of Vietnam in the 21st century is carried out based on the following fundamental views.

1) To support the people's life and activity
2) To cooperate industrial spaces such as IZ and to vitalize areas
3) To increase the charm of HCMC as an international city taking advantage of the various functions of port and waterfront,
4) To preserve good natural environment and to create attractive life.
5) To centralize port investment for important port facilities.
6) To minimize the investment risk by step-wise development
7) To harmonize with the development of other Infrastructures

4.2 Basic Direction of Port Development

In the year 2020, total cargo volume is forecast to reach 78 million tons, of which 4.7 million TEUs will be containerized. This figure is 3.5 times during the forecast period while containerized cargo will show 5.4 times in the same period.

According to calculations, the Long Tau River channel has sufficient capacity to accept twice the current number of vessels using the channel. In addition, ports along the Sai Gon River have the capacity to handle twice the current cargo volume. However, due to the severe traffic congestion in the center of the city, it is not recommendable that ports along Sai Gon River handle twice the

current volume. Moreover, vessels are expected to become larger. Therefore, new ports should be developed outside the center of the city.

4.3 Master Plan and Short Development Plan in SFEA

Based on the results of cargo demand forecast and the maximum vessel sizes, number of berths in 2020 and 2010 is calculated as below:

Table 4.3(1) Number of Container Berths

Container Berths	Vessel Size	2010	2020	Total
Tan Cang Cat Lai	20,000 DWT	2	0	2
Cat Lai Container	20,000 DWT	2	0	2
Hiep Phuoc Container	20,000 DWT	1	2	3
Upper Cai Mep	50,000 DWT	0	2	2
Lower Cai Mep	50,000 DWT	4	0	4
Lower Cai Mep	80,000 DWT	0	2	2
Total		9	6	15

Table 4.3 (2) Number of General Cargo Berths

General Cargo Berths	Vessel Size	2010	2020	Total
Cat Lai	20,000 DWT	1	0	1
Hiep Phuoc Container	20,000 DWT	1	1	2
Hiep Phuoc General	20,000 DWT	0	10	10
Thi Vai General	50,000 DWT	2	4	6
Dong Xuyen IP	20,000 DWT	1	0	1
Total		5	15	20

Table 4.3(3) Number of Passenger Berths

Passenger Berths	Vessel Size	2010	2020	Total
Sai Gon	50,000 GRT	0	1	1

4.4 Channel Development

The basic channel parameters are shown in the table 4.4 and the channel development plan in the Thi Vai-Vung Tau area is attached in the final page of this summary.

Table 4.4 Basic Channel Parameters				
DWT	Depth (m)		Width (m)	
	Full	Tidal	Two-Way	One-Way
80,000	-16		420	200
50,000	-14	-12	310	150
20,000	-11	-9	260	120
5,000	-7.5	-5.5	160	70

4.5 Re-Development of HCMC Riverfront Complex

In recent years, the urban traffic congestion becomes severe in the center of HCMC and the friction between urban and harbor activities become obvious. On this account, neither the expansion of existing ports nor newly constructed terminal in the Saigon River side in a city center is recommended. Port facilities have to, therefore, be markedly relocated to suburban areas. To put it concretely, port should move to the Cat Lai area and the Hiep Phuoc area step-by-step, while some parts of the cargo handling function can be maintained in harmonization with the urban activities.

Ports located in the upstream of Sai Gon River and neighboring area from Tan Thuan bridge, where severe traffic congestion usually occurs, should be redeveloped as a passenger ship terminal and a waterfront park to increase the charm and fame of HCMC as a worldwide city while some parts of the cargo handling function can be maintained in harmonization with the urban activities.

5. Port Administration, Management and Operation

5.1 Port Administration

The continuous process of change in international sea transport from a segmented modal approach to a much more integrated transport concept is imposing an increasing pressure on Vietnamese ports to adapt their role and function to the more demanding environment. This entails the reform of a national port development policy, as well as the further improvement in the legislative, regulatory, and managerial environment where Vietnamese commercial ports are being operated.

(1) Classification of Ports

In order to identify the importance of ports, to clarify the investment priority, and to distribute effectively limited budgets, Vietnamese ports should be divided functionally into the following three categories. 1) Major ports which contribute significantly to the national economic development and international trade. 2) Other ports, and 3) Specialized ports which specialize in serving the needs of particular users or particular commodities.

(2) Unification of Port Administration

Without a unified administration system in Vietnam, it is very difficult to make the best use of

limited coastal areas, and the duplication of related infrastructure such as a road may result. The port administration such as a policy-making and supervising port development should be performed by one administrative apparatus which consists of MOT and VINAMARINE.

(3) Institutionalization of Formulating and Authorizing a Port Master Plan

It is necessary to institutionalize the formulation and authorization of a port master plan of each major port in Vietnam. The port management body (PMB) should formulate a draft master plan and then submit it to the central government for authorization.

(4) Establishment of Appropriate Port Management System

To accelerate the national economic growth through the promotion of maritime international transportation, port management system by public entity is essential. However, the present Vietnamese port management bodies are a mixture of semi-public and private entities. In order to raise the administrative capacity of a port management body (PMB) to its highest level, it is necessary to keep the following four essential principles. 1) Autonomy, 2) Financial independence, 3) Principle competition, 4) Unitary management. Accordingly, the new form of a port management body should be a port management organization which is managed by the Board of Commissioners and director general, assisted by deputy director generals and directors of the departments which are responsible for day by day management and operation. Needless to say, the organization of the Board of Commissioners is very important and the New PMB should be supervised by the central government and relevant government agencies.

(5) Establishment of Appropriate Port Tariff Base

In order to increase shipcalls of direct shipping lines and to secure the growth of the national economy, it is necessary to keep the port tariff competitive in the international shipping market. It is also very important for the central government to make a further effort to establish a "time conscious tariff structure". This tariff structure will encourage port users to handle increasing port cargo at port.

5.2 Port Management and Operation

(1) Realization of Efficient Port Management and Operation

1) Introduction of Electric Data Interchange (EDI) System
It is essential for Vietnam to consider the introduction of a more advanced information system for port/terminal management and operation. The relevant government agencies and port management bodies should make an effort to introduce a "one-stop service system" and a full-scaled EDI system at major ports. Particularly, MOT and VINAMARINE are expected to take the strong leadership towards these tasks.

2) Improvement of Port Statistics System
Accurate and reliable port statistics including cargo handling volume, number of ship calls, port operation performances and other relevant data/information are essential as a base of port planning,

administration, management and operation. Although port related data and statistics in Vietnam are well collected and compiled, it is still recommended to make further efforts for upgrading and clarifying the trends of cargo handling volume by lot, and the origin/destination of each kind of commodity/cargo type, as well as the number of calling ships, and the present situation of dominant port facilities. Port statistics should be also edited, having close relation with statistics system of land transportation, which is closely related to port activities, and also be compatible with international standards.

(2) Promotion of Private Sector Participation (PSP)

In order to gain the maximum benefit from the social capital, efficient port management and operation are required. In this sense, the promotion of private sector participation (PSP) is a main stream of port management business throughout the world. There are several types of PSP, including Build, Operate and Transfer (BOT), Lease, Joint Venture, and so on. However, the selection of PSP type should be carefully carried out through a thorough examination of national policy, nation's financial situation, and the volition of the private sector. In particular in Vietnam, it can be fundamentally recommended that the port infrastructure should be owned and controlled under the responsibility of a public sector. In this sense, when PSP is introduced to Vietnamese ports, a Lease type or a BOT type is recommended in the long run as the suitable type of PSP, depending on the available government financial resources.

6. Priority Project in Thi Vai Area for 2010

6.1 Priority Project in Thi Vai Area

The development of a deep container terminal (CDL –14m) is vital to the independent growth of the Vietnamese economy. From this viewpoint, the construction of 2 berths in the lower Cai Mep site should be given priority. In tandem with this, another general terminal with berth depth of -14m in Thi Vai area where industrialization is rapidly advancing is also planned.

The use of ODA funds to finance the construction and development of all infrastructures required up to year 2010 is, on the one hand, not in conformity with the target of ODA, which is to support and stimulate the self-development of recipient countries, and on the other hand, it raises issues involving budget limitations. Consequently, it is desirable to allocate the limited funds for priority projects, which will act as a catalyst for further investment into the projects by either the target country or the private sector.

Table 6.1 Priority Project in 2010

(1) Terminals

Site	DWT	Cargo Type	Berths	Cargo Vol.(x1,000)
Lower Cai Mep	50,000DWT	Container	2B (LCC3-4) -14m	600 TEUs
Thi Vai	50,000DWT	General	2B (TVG1-2) -14m	1,100 tons

(2) Navigation Channel -Section 1

Up to Cai Mep (24 hours, two-way traffic)	Depth (m)
Present	-9
Phase 1	-12
Phase 2	-14

(3) Navigation Channel – Section 2

Cai Mep - Thi Vai (tidal, 2-way traffic)	Depth (m)
Present	-10
Phase 1	-12

Remark: Bend sections (One-way traffic)

6.2 Sedimentation and Dredging of the Channels

Sedimentation/Erosion in the planned channels is analyzed to estimate necessary dredging volume by means of a seabed variation simulation program, named PHRI-JPC Model, based on the survey results and calibrations with the past and present records of currents and sedimentation.

Capital dredging volume is estimated for the planned channel to amount 9.9 million m^3, and maintenance dredging volume is assessed to be about 2 million m^3 once three to four years, including the necessary allowance for sedimentation and tolerance for over-dredging. Dredging method is discussed in consideration of locations, volume and material. The most appropriate equipment and operation method are drag suction hopper dredgers and ordinary operation method. Additional introduction of a blade dredger is proposed for leveling undulations on the bottom of the dredged channel.

The dumping site of the dredged materials is discussed and proposed to be at the trough of more than 20 deep, which is formed about 5km off the Vung Tau Cape. The impacts of damping soils are assessed in terms of the quality of dumping soils, diffusion of SS of dumped soils, and accumulation on the seabed. No serious impacts are anticipated, even taking account of fisheries.

6.3 Facility Design

(1) Lower Cai Mep International Container Terminal

A coupled steel pipe pile type structure is adopted for the quay and its face line is allocated at 140m off the riverbank, and trestles of 90m long are provided between the quay and terminal yard at riverside.

The terminal yard shall be reclaimed by sand up to CDL+5.0m and the soft subsoil layer of about 30m thick shall be improved by Plastic Board Drains with Pre-load. The yard will be paved mainly by concrete blocks, and buildings in the terminal will be supported by concrete piles.
From the new terminal to the existing road, an access road of about 3km long with asphalt paved 4 lanes shall be constructed, and one bridge of about 100m long shall be constructed in the route.

(2) Thi Vai International General Cargo Terminal

The face line of quay is allocated at riverbank just in front of terminal yard. The quay structure is made of coupled steel pipe pile foundation, and the revetment behind quay is made of steel sheet pile wall.

The terminal yard is also reclaimed by sand up to CDL+5.0m and the soft subsoil layer of about 15m thick shall be improved. The yard will be paved by asphalt and concrete piles will support buildings in the terminal.

An access road of about 2km long between the new terminal to the existing road shall be constructed.

6.4 *Construction Plan and Cost Estimate*

Through the study and investigation, it is found that capabilities and experiences of local contractors are sufficient, if necessary large equipments and work vessels could be prepared under joint operation with foreign contractors. As for construction material supply, steel pipe piles or sheet piles and large-size rubber fenders should be imported from foreign countries. A large volume of soils needs to be dredged for navigation channels. Therefore, large-capacity suction hopper dredgers are suitable for the dredging works, some of which should be procured from abroad.

The construction schedule for the Project is proposed based on discussions on several alternative schedules, including plans of construction periods of five and four years. The proposed plan of construction schedules takes five years to complete after the commencement of construction works, which is supposed to start from the beginning of 2005. The major reason to choose this schedule is that consolidation of foundation soils takes time; in this case, about two years and the additional cost of about 800 million yen is required for shortening the consolidation period to about 1.5 years as four-year construction period plan. The schedule is still so tight to complete the works until the target year, or the end of 2009, that various procedures such as financial arrangement and tendering, and critical works such as soil improvement and sand filling/removing works in the wharves should be carried out smoothly and quickly.

Cost estimates for the Project up to the year 2010 are summarized as follows:

Lower Cai Mep: Container Wharf (LCC3 & LCC4) including Access Channel and Road
50,000 DWT × 2 Berths ——— 159 Million USD (19.1 Billion Yen)

Thi Vai: General Cargo Wharf (TVG1 & TVG2) including Access Channel and Road
50,000 DWT × 2 Berths ——— *81 Million USD (9.7 Billion Yen)*

6.5 Economic Analysis

The results of the economic analysis for the port group planned in Cai Mep and Thi Vai areas in EIRR, BCR and NPV are 22.5%, 2.71 and US$ 1,100 million and these are more than the same obtained for the port group planned in Ben Dinh-Sao Mai and Thi Vai areas (19.6%, 2.23 and US$ 888 million). Judging from these economic viability indicators, the development of planned port group in either area is feasible and competitive from the national economic viewpoint. And this result constitutes a part of the factors to give a priority to the development of planned port group in Cai Mep and Thi Vai areas.

The EIRR, BCR and NPV of the Lower Cai Mep International Container Terminal (LCC) and Thi Vai International General Cargo Terminal (TVG) combined as a priority package yield 16.1%, 1.48 and US$ 155 million, respectively. If the project is planned independently for each port, the figures become 17.1%, 1.48 and US$ 123 million for LCC and 12.4%, 1.25 and US$19.9 million, respectively. This result implies that the development of LCC is more effective to the national economy than the development of TVG.

As a conclusion, it is clear that whatever the form of combination, the project is considered competitive and feasible from the national economic viewpoint.

6.6 Financial Analysis

The financial internal rate of return (FIRR) for the 5 year construction project is 5.7 % for a new port management body, and 23.8 % for a terminal operator. FIRR for the new port management body exceeds the weighted average interest rate (3.78 %) of assumed fund raising plans, and FIRR for the terminal operator exceeds the assumed private bank's interest rate (15.0 %). It is also evidenced that the financial internal rate of return (FIRR) for the 4 year construction project is 5.8 % for a new port management body, and 22.5 % for a terminal operator. FIRR for the new port management body and the terminal operator exceeds the target interest rate, respectively. At the same time, the result of the sensitivity analysis shows that FIRR for both projects (5-year and 4-year construction project) is exceeding, or is almost the same as the target interest rate. Hence, the project is considered to be financially feasible.

Table 6.6 Result of FIRR Calculation

		Port Management Body	Terminal Operator
F I R R	5 Year Construction Project	5.7 %	23.8 %
	4 Year Construction Project	5.8 %	22.5 %

6.7 Environmental Considerations

Industrial development along the Thi Vai River has started since 1975 with a few numbers of enterprises. Then, the survey areas have been industrialized rapidly since early 1990, having the opportunity of the official designation of some Industrial Zones (IZs).

On the other hand, a large extent of mangrove swamp and mud-land eco-system has still remained in and around the existing IZs.

Taking account of the above peculiarity, the Study Team has conducted a series of Environmental Study such as site surveys and evaluation of existing environmental conditions, initial environmental examination and preliminary environmental impact assessment.

As a result of the study, it is revealed that even though some negative environmental impacts have been predicted such as decrease in mangrove forests in IZs, the Project can be implemented as far as appropriate environmental mitigation measures and monitoring are taken specifically for prevention of bank erosion of the mangrove forests.

7. Investment Plan in Thi Vai Area

Eight container berths in Cai Mep and six general cargo berths in Thi Vai are planned for the master plan 2020 in Thi Vai area. To develop those facilities including the channel, it is necessary to invest USD 620 million in Cai Mep and USD 240 million in Thi Vai.

Figure 7 Investment Plan

Area	Vessel	Terminal		-2010			-2020
Cai Mep	50,000DWT	LCC3	LCC4	160			
	50,000DWT	LCC5	LCC6		130		
	50,000DWT	UCC2	UCC1			130	
	80,000DWT	LCC2	LCC1				200
Thi Vai	50,000DWT	TVG1	TVG2	80			
	50,000DWT	TVG3	TVG4		40	40	
	50,000DWT	TVG5	TVG6				80
Total				240	170	170	280

Mill. USD

8. Port Administration and Management Program up to the Year 2010

8.1 Required Port Administration and Management System

(1) Organization of New Port Management Body (PMB)

In order to administrate and manage planned international container and general cargo terminals, a new port management body must be established before the new port is operational. The organization form of the new port management body should be an organization, which is managed by the Board of Commissioners and director general, assisted by deputy director generals and directors of the departments, which are responsible for day by day management and operation. The organization of the Board of Commissioners is a key factor to set up the efficient, financially independent and regional development-oriented PMB at the projected site. MOT and VINAMARINE should take a strong initiative to establish the new PMB in Vietnam. The New PMB should also continue to be supervised by the central government.

(2) Organization of Board of Commissioners

The Board of Commissioners is the supreme decision-making body of PMB. Top management is always carried out by the Board of Commissioners. Taking the organization of major Asian port management bodies into account, the Board of Commissioners at the New PMB should consist of men of the central government/governmental agencies career, men of municipal government career, and maritime business leaders. MOT and VINAMARINE should play an important role to set up the Board of Commissioners.

(3) Organizational Scale of New Port Management Body (PMB)

Based on the correlation analysis between the number of staffs and seaborne cargo throughput at typical container ports in the world, the necessary number of staffs of a New PMB can be proposed to be approximately 300.

(4) Organization of Construction Management Team

To initiate port construction works at the project site, a construction management organization must be identified and set up at first. The number of construction management team members begins with some tens of staffs, and will increase as many as some hundreds, as the construction works proceed. It is also recommendable that the construction management team will be developed and transferred to an administrative, engineering and technology division within the future PMB, when the planned port is newly operational.

8.2 Scheme of Private Sector Participation (PSP)

(1) Introduction of Private Sector Participation (PSP)

In order to gain the maximum benefit from the social capital, the efficient port management and operation are required. A private sector aims at high productivity based on its long cargo handling experience, and also has flexibility in quickly responding to the changing international cargo market. Although there are several types of PSP, including Build, Operate and Transfer (BOT), Lease, Joint Venture, and so on, the selection of PSP type should be carefully carried out. From the short-term point of view in Vietnam, it can be recommended that the port infrastructure should be developed, owned and controlled under the responsibility of a public sector. In this sense, a Lease type is recommended as the most suitable type of PSP for the planned container and general cargo terminals.

(2) Container Terminal Utilization at New Port

There are three types of terminal utilization: "Public Use", "Commercial Use", and "Private Use". Since a New Port in SFEA is used not only by one dominant shipping company, but also by plural shipping companies, high efficiency and flexible berth allocation of a terminal must be secured, and thus public use of a terminal should be maintained. It is recommended that the "Commercial Use" system should be adopted at a new container terminal in SFEA. In short, a public sector

provides port infrastructure and quayside container cranes, while a private sector provides superstructure. Terminal management and operation under a "Commercial Use" system are carried out by the same private sector.

9. Follow up Actions for the Successful Implementation of the Proposed Port Development

Items listed below should be followed up continuously.

(1) Periodical Review of Port Plans
(2) Authorization of the Project Schemes in Vietnam
(3) Procurement Policy of Financial Resources
(4) Engineering Requirements for Further Improvement of the Proposed Port Development Schemes

10. Policies for Overall Port Sector Promotion of the Country

Apart from the Study, further development studies will be necessary concerning items listed below.

(1) Promotion of Supporting Activities for Port Sector Development
(2) Strengthening of Port Engineering Administration
(3) Port-related Human Capability Building
(4) Enhancement of Port Sales Activities

Implementation Organization, Duration and Flowchart of the Study

1. JICA Study Team

The Study Team was made up of the experts listed below.

Expert	Assignment
Mr. Yukio NISHIDA	Team Leader / Port Policy
Mr. Takashi SHIMADA	Port Planning (1) / Investment Planning
Mr. Hideki YOKOMOTO	Port Planning (2)
Mr. Kiyoshi SATO	Port Management (1) / Financial Analysis
Mr. Koichiro HAYASHI	Port Management (1) / Financial Analysis
Mr. Takashi SAKURAI	Port Management (2)
Mr. Yoshikatsu NAKAMURA	Regional Planning
Mr. Ken KUMAZAWA	Demand Forecast (1)
Mr. Tetsuji MASUJIMA	Demand Forecast (2)
Mr. Isamu KOIKE	Economic Analysis
Mr. Saburo FUJIZUKA	Natural Conditions
Mr. Kohei NAGAI	Dredging / Sedimentation
Mr. Nobuaki NAGAO	Engineering Design
Mr. Takahisa SOGABE	Implementation Planning / Cost Estimate
Mr. Koichiro HARADA	Environmental Considerations
Mr. Masahiro TAGAWA	Hydraulic Simulations
Mr. Toshihiko KAMEMURA	Coordination
Mr. Masayuki FUJIKI	Coordination
Mr. Shane REED	Coordination
Mr. Hideki YOKOMOTO	Coordination
Mr. Ryu MIZUKOSHI	Interpreter

2. Counterpart and Coordination Committee

MOT served as a counterpart agency of the Study Team. MOT established a steering committee composed by officials of the following agencies (See Figure 1).

Ministry of Transport
VINAMARINE, MOT

The committee was chaired by Mr. Nguyen Viet Tien, Vice Minister of MOT.

MOT also established a working team to coordinate the day-to-day progress of the Study. Mr. Vuong Dinh Lam, Vice Chairman of VINAMARINE, chaired the working team meeting.

3. Ministry of Foreign Affairs and JICA

Following officials of the Japanese Government and JICA supported the Study Team.

Ministry of Foreign Affairs
Japanese Embassy in Vietnam, Mr. Satoshi UOTANI Second Secretary

JICA
First Development Study Division, Social Development Study Department
Mr. Takeshi NARUSE, Director
Mr. Yodo KAKUZEN, Deputy Director
Mr. Hirotsugu MORI

Vietnamese Office
Mr. Morimasa KANAMARU, Resident Representative
Mr. Yuichi SUGANO, Assis. Resident Representative
Mr. Hiroshi SHIRAKAWA, Assis. Resident Representative

JICA Expert dispatched to MOT Mr. Mitsutaka OTSU

4. Field Survey

First Stage	March to July 2001
Second Stage	October to December 2001
Third Stage	March to July 2002
Forth Stage	October 2002

5. Flow Chart

This Study was carried out according to the flowchart shown in Figure 2.

6. Study Area

The Study covers the following three major port complexes in SFEA (See Figure 3).

1) Ports in HCMC (ports along the Saigon River and Dong Nai River, ports along the Nha Be River, ports along the Soai Rap River)
2) Ports along the Thi Vai River
3) Ports in the Vung Tau area

Figure 1 Study Organization

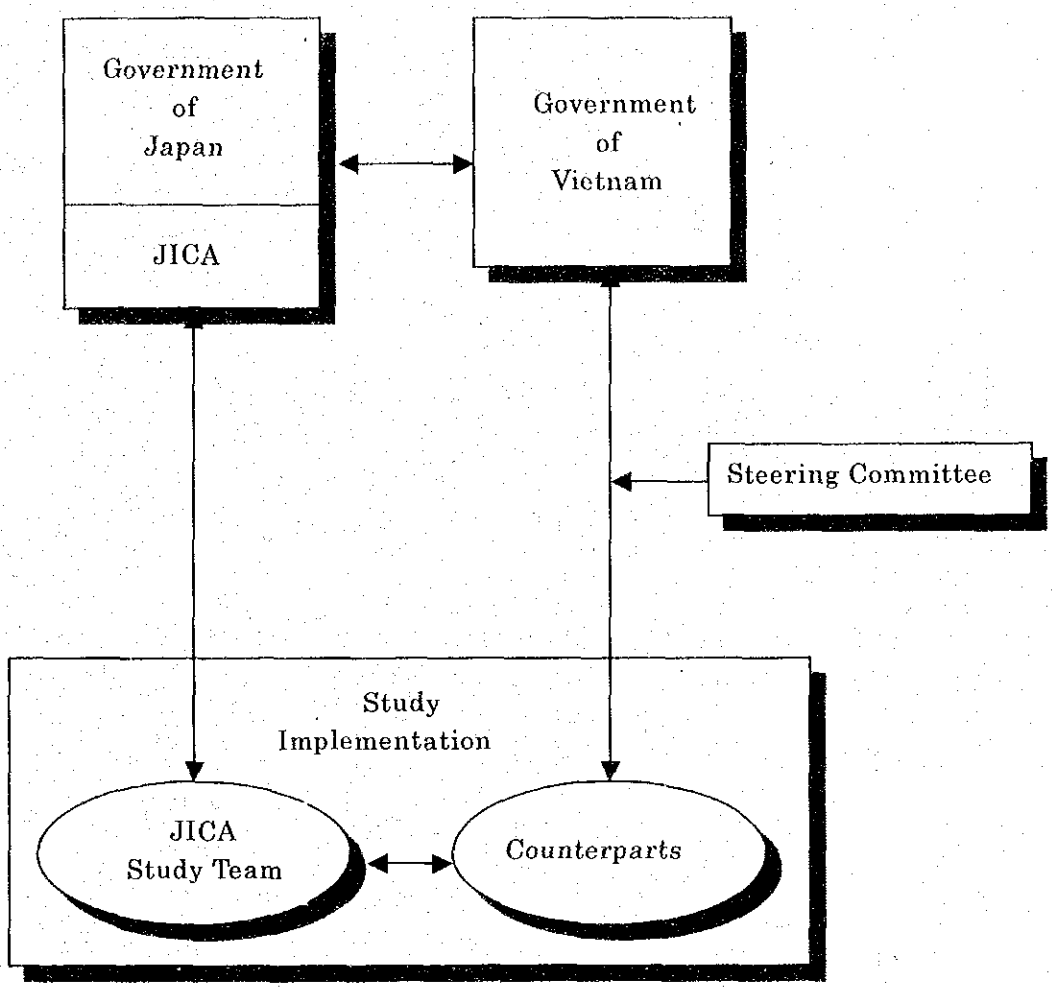


Figure 2 Study Flowchart

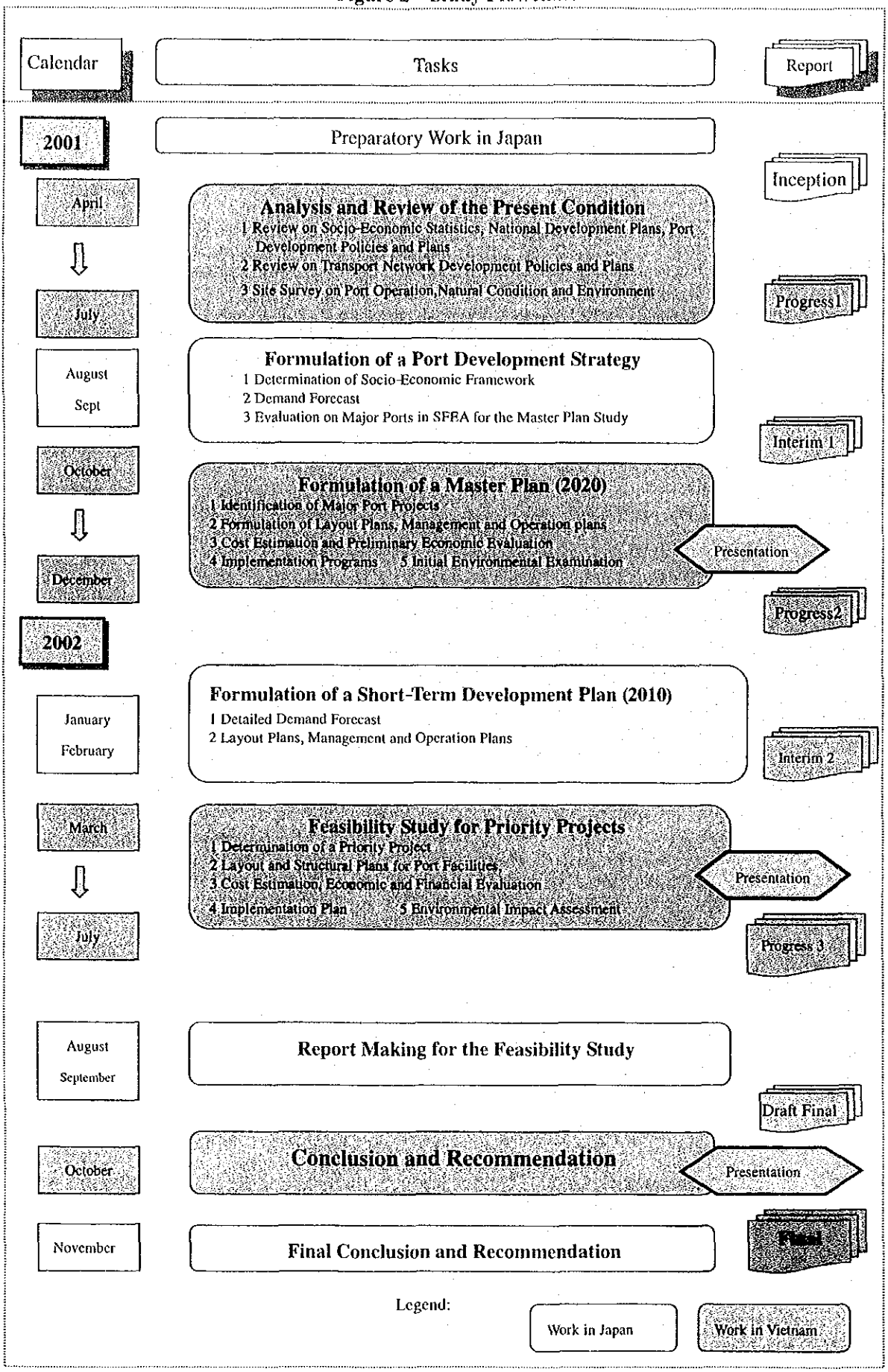
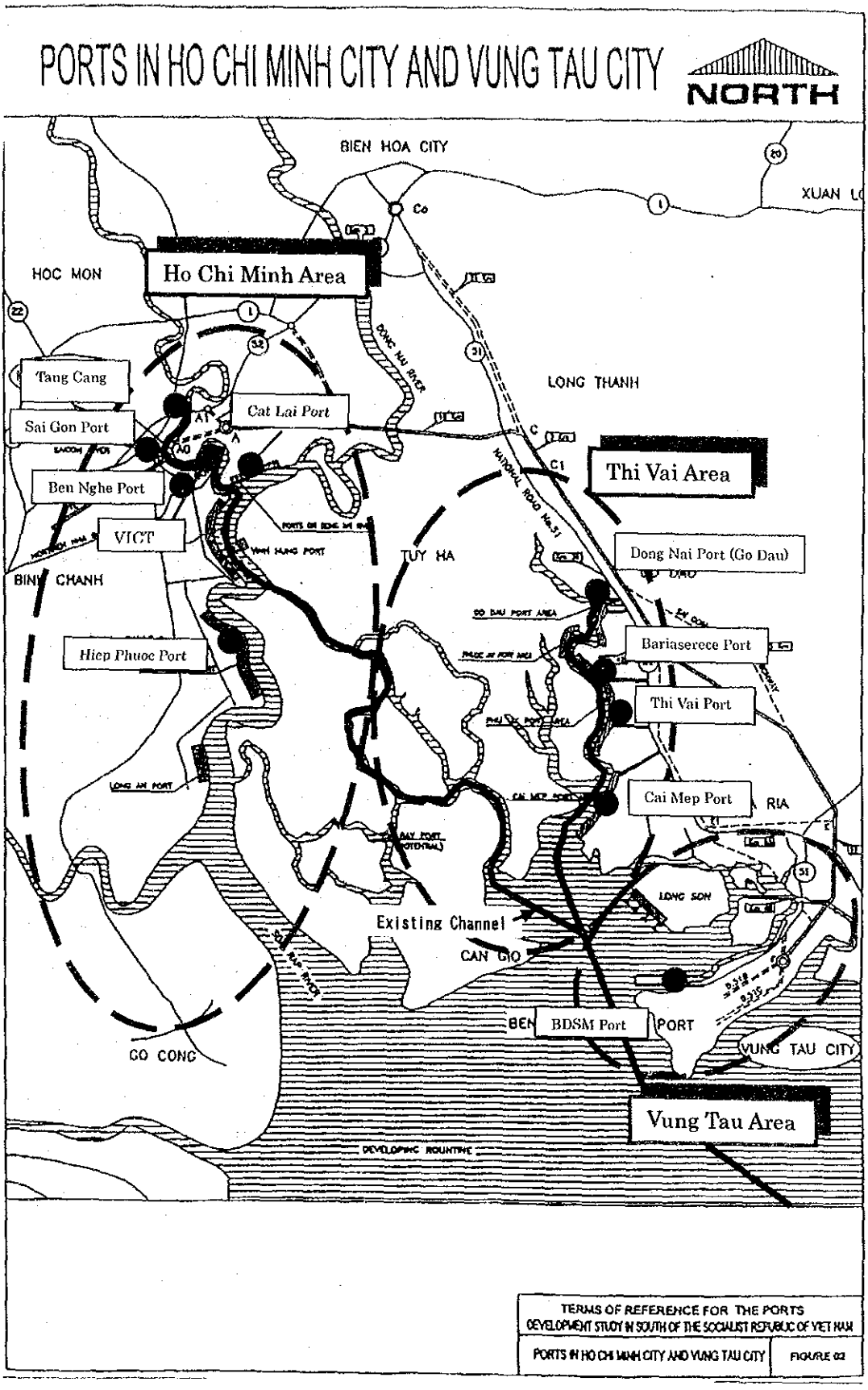


Figure 3 Study Area



Location of Ports in the South of Vietnam