



ASEAN Maritime Transport Working Group

The Study on Project Priorities to Upgrade Performance and Capacity of ASEAN Network Ports

Final Report PART I

March 2011



Japan International Cooperation Agency

**The Overseas Coastal Area Development Institute of Japan (OCDI)
Mitsubishi Research Institute, Inc. (MRI)
Ides, Inc. (Ides)**

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Source : Study on Guidelines for Assessing Port Development Priorities including
Acceptable Performance levels in ASEAN

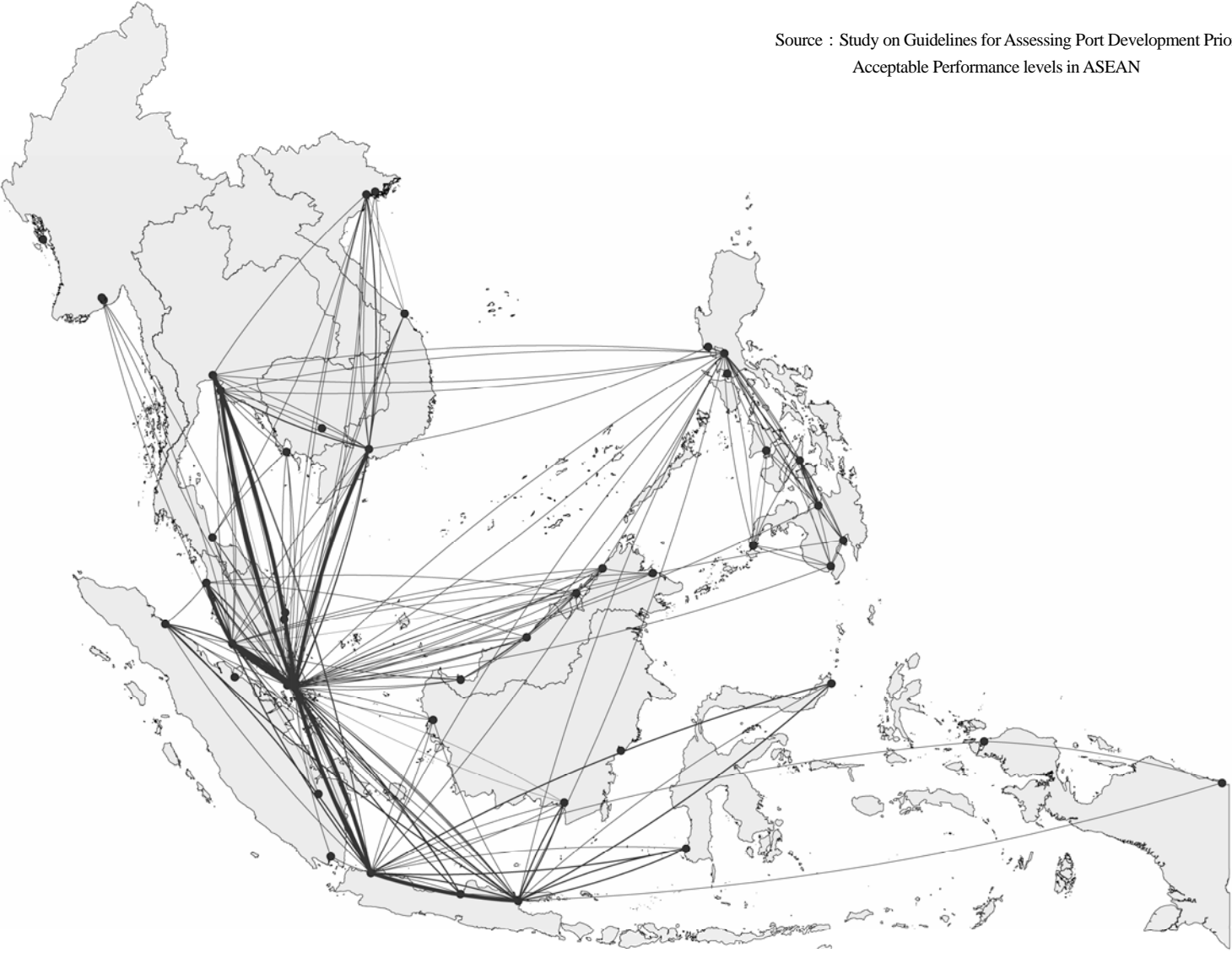


Figure : Shipping Services between Network Ports (More than Two Services per Month)

Abbreviations

AEC	ASEAN Economic Community
ASEAN	Association of South East Asian Nations
ATM	ASEAN Transport Ministers Meeting
CPO	Crude Palm Oil
DF/R	Draft Final Report
DGST	Directorate General of Sea Transportation
DOTC	Department of Transportation and Communication
EDI	Electronic Data Interchange
ERIA	Economic Research Institute for ASEAN and East Asia
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
F/R	Final Report
FTA	Free Trade Agreement
GMS	Greater Mekong Sub-region
IC/R	Inception Report
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
JTCA	Japan Transport Cooperation Association
KMI	Korea Maritime Institute
MLTM	Ministry of Land, Transport and Maritime Affairs
MRI	Mitsubishi Research Institute, Inc.
MTWG	Maritime Transport Working Group
OCDI	The Overseas Coastal Area Development Institute of Japan
PG/R	Progress Report
QMS	Quality Management System
Ro/Ro	Roll-on/Roll-off
STOM	Senior Transport Officials Meeting
TEU	Twenty-foot Equivalent Units
VINAMARINE	Vietnam Maritime Administration



Executive Summary

Chapter 1. Outline of the Study

Leaders of the ASEAN member states approved “the ASEAN Economic Community Blueprint” at ASEAN Summit in November 2007 to achieve a single market by 2015, which is a master plan showing the policy directions of each sector, related to economic integration of the ASEAN member countries. In line with this blueprint, ASEAN Transport Ministers Meeting adopted “Roadmap towards an Integrated and Competitive Maritime Transport in ASEAN” in November 2007. In this roadmap, twenty measures to improve ASEAN maritime transport are listed in five categories, namely, developing a single ASEAN voice, infrastructure, market integration, harmonization, and human resources and capacity development.

Following this roadmap, MTWG decided to invite external donor institutions to assist with the implementation of the following four measures among twenty measures at the meeting held in Viet Nam in September 2008:

- No. 5: Develop a database of maritime trade movements to and from within ASEAN
- No. 6: Develop guidelines for assessing priorities, including acceptable performance levels
- No. 7: Identify required improvement areas in ASEAN network port performance and capacity, based among others, on regular forecasts of maritime trade and requirements
- No. 8: Develop project priorities, based on the guidelines for assessing port development, to raise performance and capacity levels towards bridging such gaps in ASEAN network ports

Responding to request from the ASEAN member countries measures No. 6 and No. 8 are assisted by JICA and measures No. 5 and No. 7 are assisted by Korea (the studies on measures No. 5, No. 6 and No. 7 have already been completed).

This study aims at identifying the measures to be taken with high priorities and the direction of the development of ASEAN network ports by assessing issues of these ports, by making use of the Guidelines for Assessing Port Development Priorities developed by Measure No. 6, and related studies conducted by ASEAN. Specific objectives of this study are as follows:

- 1) To identify priority projects to raise performance and capacity levels and to improve the efficiency of maritime trade in a network composed of 47 ASEAN network ports based on the Guidelines for Assessing Port Development Priorities and the result of demand forecasting.
- 2) To illustrate outlines of projects which needs resource mobilization from domestic and/or international partners among priority projects. Outlines of projects include the location, project components, rough cost estimate, implementation schedule and problems to be solved.

Chapter 2. Long List of the Projects

2.1 Process of preparing the Long List of the Projects

Draft of the long list of projects was prepared based on present issues which ASEAN network ports face, future prospect of each port based on the forecasted cargo volume and changes of circumstance surrounding ports in future such as a policy newly formulated by the government or the port management body, and other information including those which were collected during the site



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survey conducted in the study on Measure 6.

The draft long list of projects was sent to each country in advance and a proposal of the projects to be included in the long list was made in the presentation from each delegation at ASEAN-JAPAN MARITIME TRANSPORT WORKSHOP ON MEASURE NO 8 which was held in Hanoi on September 23 and 24 in 2010.

Furthermore, exchange of opinions on the projects to be listed in the long list was made and the draft long list was revised at the workshop. Each country undertook internal consultation with relevant parties on the revised long list of projects and provided their comments/inputs on it.

2.2 Long List of the Projects

Total of 121 projects are shown in the long list below.

Long List of the Projects

Country	Port	Name of Project	
Brunei	Muara	Container Terminal Construction Project (Phase 1) on Pulau Muara Besar	
Cambodia	Phnom Penh	Construction of new Phnom Penh Container Terminal	
		Construction of new Container Terminal in Kilometer No 6 Port Phnom Penh city and Tonle Bitt Port Kampong Cham Province	
		Redevelopment of Phnom Penh Port	
	Sihanoukville	Continuous Construction of Sihanoukville Port Special Economic Zone Development Project	
		Multi-Purpose Terminal Development	
		Enhancement of Container Handling Productivity	
		M/P study for the development of a new container terminal	
		Transfer the old jetty to Passenger terminal	
		SEZ Development Project (Phase II)	
		Improvement of Port and Maritime Safety	
Indonesia	Belawan	Expansion of Container Terminal	
		Relocation of Passenger Terminal	
		Improvement of container terminal operation	
		A Large Scale Port Expansion Plan at an idle site	
		Expansion of CPO Terminal	
	Dumai	Development of Container Terminal	
		Palm Oil terminal construction project IN Tanjung Buton	
		Extension of passenger terminal	
	Tanjung Priok	Channel and Basin Improvement	
		Development of New Access Road	
		Inner Road Improvement	
		Yard & Pier Improvement	
		Development of Koja Liquid Bulk Terminal & CPO Terminal	
		Car Terminal Expansion	
		Railway Extension	
		East Ancol Development	
		Kalibaru Development	
		New Development in Subang	
	Palembang	Improvement of Approach Channel	
		Api-api new coal port Development	
		Quayside Container Crane	
	Panjang	Expansion of Conventional Terminal	
		Conversion of ISAB Terminal	
		Upgrading of the port management and operation system	
	Pontianak	Yard reorganization	
		Approach channel improvement	
		Temajo port development a the seacoast	
		Redevelopment of the existing port area and facilities	
	Tanjung Perak		New Multipurpose Terminal Development Project



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		Western Channel Deepening and Widening Project
		Channel development plan
		Multi-purpose terminal improvement plan
		Effect of Mudflood new development in Probolinggo
	Tanjung Emas	Container Terminal Expansion Project
		New Development in Kendal
	Banjarmasin	Container Terminal Redevelopment Project (Phase 2)
		Maharabang Coal Terminal Construction Project
		New Development of Coal Terminal in Kuala Kapuas
	Makassar	Makassar Container Terminal Expansion Project(will be completed in 2013)
		Makassar New Port Project (Phase I)
	Balikpapan	New Container Terminal Construction Project(will be completed in 2011)
		New Development in Penajam Pasir for mining activities
	Bitung	Container Terminal Expansion Project (Phase 2)
		Container Terminal Expansion Project (Phase3)
	Sorong	Terminal expansion
		New Port Development in Arar
	Jayapura	Quay extension
		New Port Development in Depapre
Malaysia	Port Klang	North Port Expansion
		West Ports Expansion(Development of CT6-600meter)
	Penang	North Butterworth Container Terminal Expansion Project(will be completed in 2011)
		North Channel Deepening Project
	Kuching	Tebedu Inland Port Development Plan
		Approach Channel Improvement
	Bintulu	Container Terminal Expansion Project(will be completed in 2011)
	Kota Kinabalu	Installation of RTGs and Gantry Crane at Sapangar Bay Container Port
	Tanjung Pelepas	Development of Container Terminal Phase II (#13 and #14)
		Development of new container terminals Phase III and IV
	Kuantan	Kuantan Port Expansion
	Kemaman	Development of New Terminal
Myanmar	Yangon	Development of AWPT Wharf IV
		Yangon Port Approach Channel Deepning Project
	Thilawa	Thilawa Port Development Project (plot 10,11,12,13,14)
		Thilawa Port Development Project(22plots)
		Thilawa Port Access Road Improvement
		Thilawa Port Approach Channel Deepening Project
	Kyaukpyu	Kyaukpyu Deep Seaport Project, Crude Oil Terminal/Jetty
		Urgent Rehabilitation of General Cargo Jetties
Philippines	Manila	Manila North Harbor Redevelopment Project
		MICT No.6 Container Terminal Expansion project
	Cebu	Development of New Cebu Port
		Re-Development of Cebu Baseport
		Upgrading/Improvement of CIP Berths & Dredging of Cebu Channel
		Construction of Fast Ferry Terminal
	Iloilo	Cargo Handling Productivity Enhancement Project
		Expansion of Loboc Wharf Project
		Deepening of the channel
	Cagayan de Oro	Expansion of Terminal
		Expansion of the Berth Length and Container Yard (Phividec)
		Modernization of Equipment(Phividec)
	Davao	Davao Container Terminal Construction Project
	General Santos	Cargo Handling Productivity Enhancement Project
		Passenger Terminal Development Project(ABD)
		Makar port expansion project (RCwharf)
	Zamboanga	New Passenger Terminal Project
		Installation of Equipment
	Plural Ports	Quayside Gantry Crane Installation Project



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Singapore	Singapore	Development of Pasir Panjang Terminal Phase III and IV	
Thailand	Bangkok	Asset Development Project	
	Laem Chabang	Rail Transfer Terminal (RST)	
		Coastal Terminal	
		LCP Phase 3 Development	
	Songkhla	Development of the Second Songkhla Port	
Development of the Songkhla Port			
Vietnam	Ho Chi Minh	Development of Access Roads(will be completed in 2015)	
		Improvement of Approach Channel in Cai Mep area and Vung Tau area	
		Rehabilitation of improvement of Approach channel (Soai Rap)	
		Conversion of the existing port area to the complex of passenger port, maritime and commercial center	
		Relocation project (Saigon - HiepPhuoc Port)	
	Hai Phong	Development of the Hai Phong International Gateway Port (former Lach Huyen Gateway port)	
		Deepening and Widening of Hai Phong Approach Channel	
	Da Nang	Tho Quang Terminal Project	
		Tien Sa Terminal Expansion Project	
		The Lien Chieu Port Construction Project	
	Cai Lan	Container Terminal Development Berths No.2-4	
	Vietnam	Plural Ports	Operational Improvement Project
	Cambodia	Plural Ports	Operational Improvement Project
Indonesia	Plural Ports	Operational Improvement Project	
Philippines	Plural Ports	Operational Improvement Project	
Myanmar	Prural Port	Operational Improvement Project	

Chapter 3. Short List of the Projects

3.1 Basic Idea for compiling the Short List of the Projects

Projects which listed in the short list are the projects considered to be highly beneficial among the long list of projects. A highly beneficial project means a project which contributes to the realization of integrated and competitive maritime transport in ASEAN and contributes to the strengthening of the ASEAN regional network.

Items and important factors to access port development priorities were proposed in the study on Measure 6 as a checklist for initial evaluation of port development priorities. These indices of assessment are considered to contain the following meanings.

- 1) Responding to Maritime Transport Demand: a port/terminal, through implementation of a project shall ensure sufficient capacity, necessary scale of facilities and necessary performance levels in regard to maritime transport demand.
- 2) Effects on Regional Development: a port/terminal, through implementation of a project, shall support government policies and industrial development.
- 3) Reduction in Transport Cost: a port/terminal, through implementation of a project, shall contribute to the reduction of transport cost.
- 4) Coping with Regional Transport Corridors: a port/terminal shall be incorporated in ASEAN logistics networks.
- 5) Basic Requirement: a port/terminal, through implementation of a project, shall satisfy basic requirements from the national/social point of view.

3.2 Short List of the Projects

The short list of projects is compiled of seventeen (17) projects in eight (8) countries which includes one capacity development project for port EDI system in five (5) countries.



Short List of the Projects

Country	Name of Port	Name of Project
Cambodia	Phnom Penh	① <i>Construction of New Phnom Penh Container Terminal</i>
Cambodia	Sihanoukville	② Enhancement of Container Handling Productivity
Cambodia	Sihanoukville	③ Transfer the old jetty to Passenger terminal
Indonesia	Belawan	④ <i>Expansion of Container Terminal</i>
Indonesia	Tanjung Priok	⑤ Container Terminal Development Project (former East Ancol Development. The project site will likely be changed.)
Indonesia	Tanjung Perak	⑥ New Multi Purpose Terminal Development Project
Malaysia	Penang	⑦ Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and Kuala Perai Terminal
Malaysia	Tanjung Pelepas	⑧ Development of Container Terminal Phase II (#13 and #14)
Malaysia	Kuantan	⑨ Kuantan Port Expansion
Myanmar	Thilawa/Yangon	⑩ Thilawa/Yangon Port Approach Channel Dredging
Philippines	Cebu	⑪ Development of New Cebu Port
Philippines	Davao	⑫ Davao Container Terminal Construction Project
Singapore	Singapore	⑬ <i>Development of Pasir Panjang Terminal Phase III & IV</i>
Thailand	Laem Chabang	⑭ <i>Coastal Terminal Development Project</i>
Vietnam	Ho Chi Minh	⑮ Improvement of Approach Channel in Cai Mep Area and Vung Tua Area
Vietnam	Hai Phong	⑯ <i>Development of Hai Phong International Gateway Port</i>
Cambodia, Indonesia, Myanmar, Philippines, Vietnam	Project by a country (plural ports in a country)	⑰ Operational Improvement Project by introducing/upgrading Port EDI system

Note 1: Projects in italics are on-going projects. Projects in the DD stage are included.

Note 2: Name of a project of Penang port was changed from North Channel Deepening Project to the above.

Chapter 4. Priority Projects

4.1 Evaluation of the Priority Projects

All the projects listed in the short list are aimed at realizing integrated and competitive maritime transport in the ASEAN region. In this study, urgency, importance and efficiency of each project shall be emphasized when evaluating the projects. Criteria used to evaluate priority projects, such as urgency, importance and efficiency, are deemed to be different by types and roles of ports in the ASEAN maritime network. Therefore, evaluation of the project priorities should be conducted by classifying types of ports and roles in the network. Furthermore, policies for port development of each country have been considered in evaluating priority projects.

4.2 Analysis of Projects by Port Types

ASEAN 47 network ports are classified into five types in the study on Measure 6 from the viewpoint of the scale of cargo throughput, whether it is transshipment port or origin-destination, area



of partner ports on liner services, and the dimensions of port facilities.

Projects included in the short list of projects are analyzed from the viewpoint of the characteristics of types of ports.

Ports in type-1 are world class hub ports and many ASEAN network ports connect to everywhere in the world through transshipment at type-1 ports. Projects of type-1 ports contribute not only to their own development but also to strengthening the entire ASEAN maritime network.

Ports in type-2 are gateway ports of countries and are located near the center of industrial area and/or logistics hub. Projects of type-2 ports stimulate economic growth and develop together with the economic development of each country, as well as improve the connectivity within the ASEAN countries and between the ASEAN region and other regions.

Ports in type-3 are base ports in the region of each country where mainly inter-regional container vessels call at. Projects of type-3 ports contribute to the growth of the national economy and the strengthening the inter-regional maritime network.

Ports in type-4 are small scale ports in regions where mainly intra-regional vessels call at and account for 22 of the 47 network ports. Projects of type-4 ports contribute to strengthening the ASEAN maritime network.

Ports in type-5 are small scale ports servicing coastal shipping and/or short distance maritime routes. Projects of type-5 ports are required to meet demands for development in a timely manner.

4.3 Roles of Projects for Strengthening the Network

A port functions as a node and an approach channel functions as a link in a maritime network. To strengthen the ASEAN maritime network, it is necessary to improve functions of ports and channels and to realize a maritime network with sufficient capacity.

Therefore, from the viewpoint of realizing a network with sufficient capacity, projects in the short list to increase container handling capacity, improve the approach channel and accommodate large passenger ships are important and given high priority.

A capacity development project for introducing/upgrading a port EDI system to improve operational efficiency will contribute to realizing seamless physical distribution in a port. Therefore, this project is given high priority.

In order for ASEAN as a whole to develop its economic activities further, ASEAN maritime network composed of 47 ASEAN network ports needs to connect with the inland corridors to a greater extent and expand to remote areas such as the eastern part of ASEAN which can cover the whole area of ASEAN.

Furthermore, for establishment of ASEAN Economic Community, it is necessary for many ports in ASEAN countries, especially ASEAN network ports, to enhance their function in order to form effective and efficient maritime networks. To that end, the priority projects are of great importance.

4.4 Priority Projects

Characteristics, roles and functions of the ports with priority projects are varied, and the projects themselves have different features. As a result of analyzing the projects in terms of their contents, types of ports and roles for strengthening the network, every project in the short list is expected to contribute to strengthening the ASEAN maritime network in addition to the economic development of each country. Therefore, all the projects included in the short list are identified as priority projects.

① Construction of New Phnom Penh Container Terminal: Phnom Penh port (Cambodia) – Type-5



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This project is to develop a container terminal downstream from the present Phnom Penh port.

- ② Enhancement of Container Handling Productivity: Sihanoukville (Cambodia) – Type-4

This project is to install equipment for handling containers to improve operational efficiency.

- ③ Transfer the old jetty to Passenger Terminal: Sihanoukville (Cambodia) – Type-4

This project is to convert the old jetty to a passenger terminal and establish a new passenger terminal with international standard.

- ④ Expansion of Container Terminal: Belawan port (Indonesia) – Type-4

This project is to expand container terminals to increase container handling capacity.

- ⑤ Container Terminal Development Project: Tanjung Priok port (Indonesia) – Type-2

This project is to develop new container terminals to increase container handling capacity.

- ⑥ New Multi Purpose Terminal Development Project: Tanjung Perak port (Indonesia) – Type-3

This project is to develop large scale multi purpose terminals to cope with the increasing container demand.

- ⑦ Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and Kuala Perai Terminal: Penang port (Malaysia) – Type-3

This project is to deepen the North Channel to cope with larger vessels.

- ⑧ Development of Container Terminal Phase II (#13 and #14): Tanjung Pelepas port (Malaysia) – Type-1

This project is to expand container handling capacity to cope with increasing cargo demand.

- ⑨ Kuantan Port Development: Kuantan port (Malaysia) – Type-4

This project is to develop container terminals to cope with increasing container cargo.

- ⑩ Thilawa/Yangon Port Approach Channel Improvement: Thilawa port/Yangon port (Myanmar) – Type-4

This project is to dredge the outer-bar and inner-bar in the Yangon River and deepen the approach channel of Thilawa port and Yangon port.

- ⑪ Development of New Cebu Port: Cebu port (Philippines) – Type-4

This project is to develop container terminals in a new site to handle containers efficiently.

- ⑫ DAVAO Container Terminal Improvement Project: Davao port (Philippines) – Type-4
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This project is to expand the present wharf as a container terminal to cope with increasing containers.

- ⑬ Development of Pasir Panjang Terminal Phase III and IV: Singapore port (Singapore) – Type-1

This project is to expand container handling capacity to cope with increasing cargo demand.

- ⑭ Coastal Terminal Development Project: Laem Chabang (Thailand) – Type-2

This project is to develop a terminal for coastal shipping for the promotion of modal shifting.

- ⑮ Improvement of the Approach Channel and Vessel Control and Development of Cai Mep Thi Vai Terminal : Ho Chi Minh port (Vietnam) – Type-2

This project is to deepen an approach channel to ease the passage of larger vessels.

- ⑯ Development of Hai Phong International Gateway port: Hai Phong (Vietnam) – Type-3

This project is to develop a new deep sea port offshore of the existing port to cope with increasing container cargo and accommodate larger vessels.

- ⑰ Operational Improvement Project by Introducing/Upgrading Port EDI System: Cambodia, Indonesia, Myanmar, Philippines, Vietnam

This project is to improve operational efficiency by introducing/upgrading a port EDI system to each country.

When a port EDI system is introduced, it is essential that the receiving system such as the current state of related legislation, implementing and operational structure of institution and so on be set up

4.5 For Implementation of the Priority Projects

Priority projects are of vital importance for the ASEAN member countries which are aiming at the ASEAN Economic Community (AEC) and all member countries need to make efforts to implement these projects. Some of the projects are already in the implementing stage, some will be implemented using a country's own funds while some projects will need to mobilize resources from inside and/or outside of the country. Efforts must be made for the latter projects to proceed to the implementing stage to improve the maritime transport network in the ASEAN region by facilitating resource mobilization.

Upon requesting necessary domestic investment or assistance from foreign agencies, the feasibility and/or details of the project will be required. Therefore, it is necessary to examine the contents of priority projects which need resource mobilization.

In this report, project details are illustrated for twelve (12) projects below which need resource mobilization in terms of background and requirement of the project, future prospect, purpose of the project, outline of the project and rough project cost, economic evaluation, term and schedule of the project based on data and information which were obtained during the study.

It is noted that there may be instances in the future where there is a need to plan, develop, construct and/or maintain ports and port facilities that would require foreign funding and may not have been foreseen by this Report. When that situation occurs, the evaluation of such project should be made in considering altered status of variables such as economic outlook both in ASEAN and abroad,



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future demand, intention of the private sector/industry, the policy of the government and so on at that time.

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- ② Transfer the Old Jetty to Passenger Terminal: Sihanoukville (Cambodia)
- ③ Expansion of Container Terminal: Belawan (Indonesia)
- ④ Container Terminal Development Project: Tanjung Priok (Indonesia)
- ⑤ New Multi-Purpose Terminal Development Project; Tanjung Perak (Indonesia)
- ⑥ Kuantan Port Expansion: Kuantan (Malaysia)
- ⑦ Thilawa/Yangon Port Approach Channel Dredging: Thilawa port/Yangon port (Myanmar)
- ⑧ Development of New Cebu Port: Cebu port (Philippines)
- ⑨ Davao Container Terminal Improvement Project: Davao (Philippines)
- ⑩ Improvement of the Approach Channel and Vessel Control and Development of Cai Mep Thi Vai Terminal: Ho Chi Minh port (Vietnam)
- ⑪ Development of Hai Phong International Gateway Port: Hai Phong port (Vietnam)
- ⑫ Operational Improvement Project by Introducing/Upgrading Port EDI System: Vietnam, Indonesia



Summary

Chapter 1. Outline of the Study

1.1 Outline of the Study

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- 2) To illustrate outlines of projects which need resource mobilization from domestic and/or international partners among projects. Outlines of projects include the location, project components, rough cost estimate, implementation schedule and problems to be solved.

1.2 Process of the Study

The process of the study was as follows.

After commencement of the study, the JICA study team prepared the Inception Report (IC/R) and visited Vietnam, the lead coordinator of Measure 8, in early July to explain the IC/R and confirm the outline of the workshop on Measure 8 to be held in September.

At the same time, the JICA study team visited Korea in July to collect information of the study



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on Measure 7, specifically the demand forecast and required improvement areas of the 47 ASEAN network ports which were conducted by Malaysia and Korea. Utilizing the results of the study on Measure 6, study, a long list of projects, a short list of projects and a framework of initial evaluation for selecting projects were also examined.

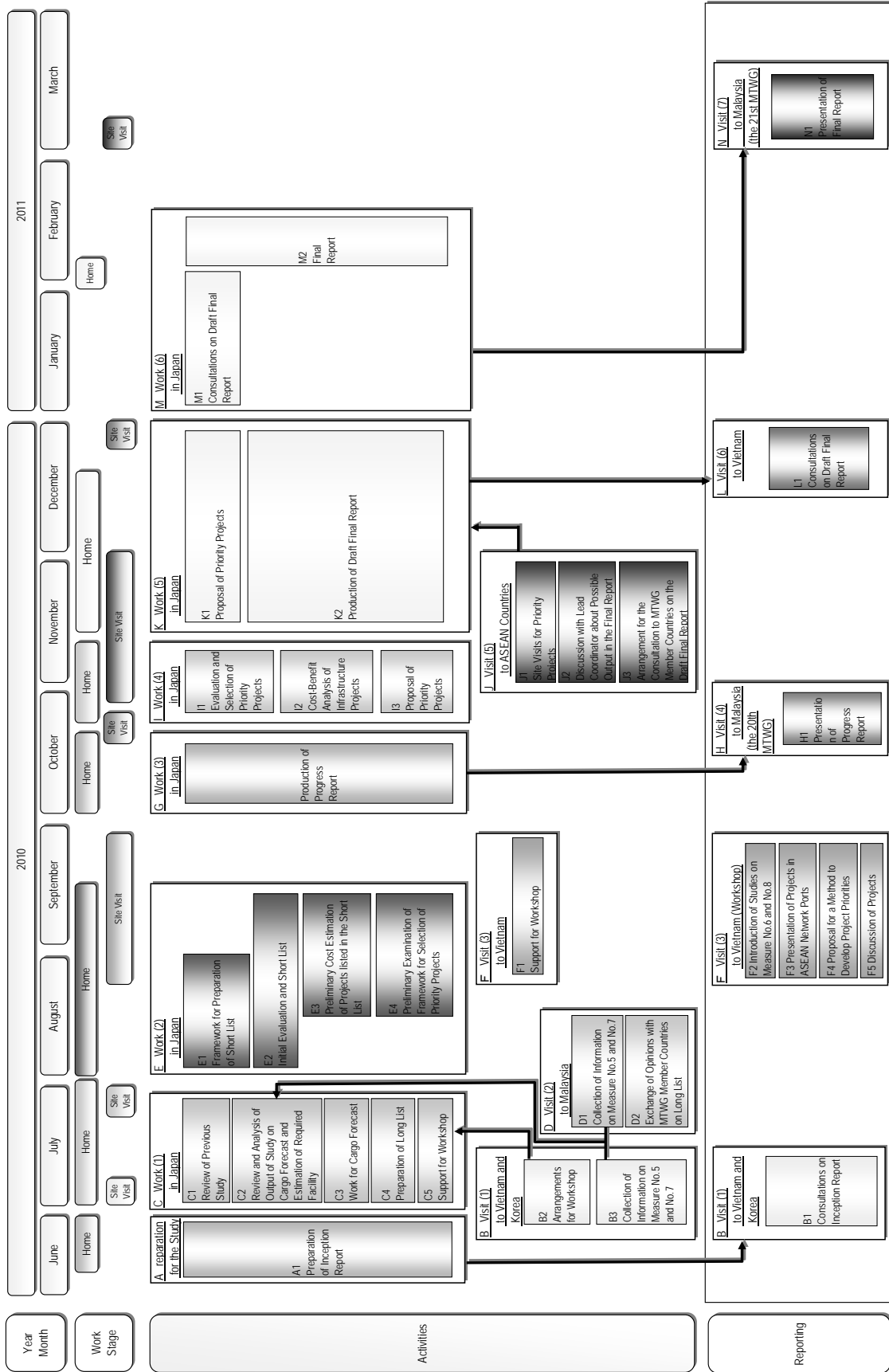
Through the workshop on Measure 8 in Hanoi and the 20th MTWG meeting, the ASEAN member countries, facilitated by the JICA study team, reached an agreement on the long list of projects, the short list of projects and a method to develop project priorities, and to exchange views on project priorities.

The JICA study team conducted site surveys from the second half of October to December to collect further information on priority projects. At the same time, the JICA study team discussed the basic direction of the final report with the Vietnam side.

The draft final report was sent to all member countries from Vietnam, the lead coordinator. The final report was prepared reflecting comments on the draft final report from the member countries. Finally, the final report on the study was reported and adopted at the 21st MTWG meeting held in March 1st to 3rd, 2011.

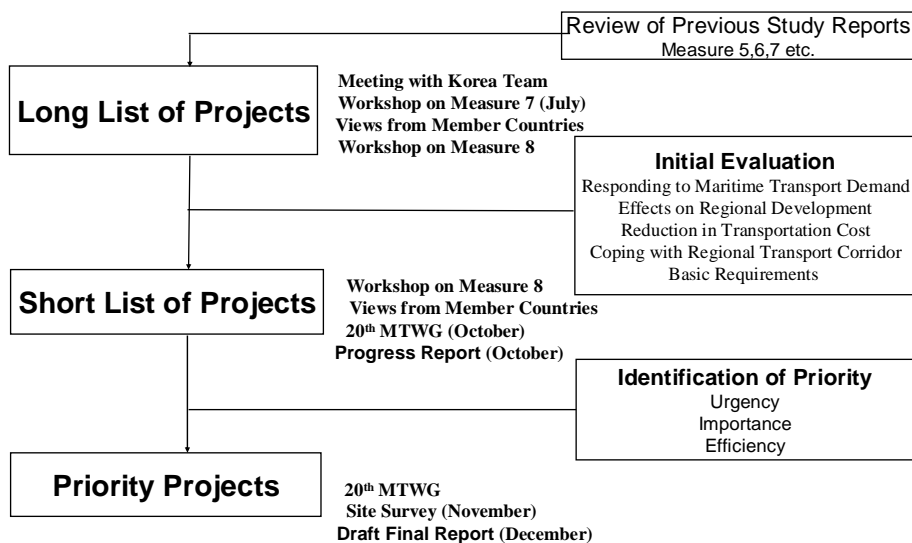


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1.3 Process of the Study



Chapter 2. Long List of the Study

2.1 Process of preparing the Long List of the Projects

Draft long list of projects was prepared based on present issues which ASEAN network ports face, future prospect of each port based on the forecasted cargo volume and changes of circumstance surrounding ports in future such as a policy newly formulated by the government or the port management body, and other information including those which were collected during the site survey conducted in the study on Measure 6.

The draft was sent to each country in advance and a proposal of the projects to be included in the long list was made in the presentation from each delegation at ASEAN-JAPAN MARITIME TRANSPORT WORKSHOP ON MEASURE NO 8 which was held in Hanoi on September 23 and 24 in 2010.

At the workshop, exchange of opinions on the projects to be listed in the long list was made and the draft long list was revised. Each country undertook internal consultation with relevant parties on the revised long list of projects and provided their comments/inputs on it.

2.2 Long List of the Projects

Total of 121 projects are shown in the long list below.

The projects on channels count 15, those on container terminals count 45, those on non-container terminals count 39, those on transport from/to ports count 8, and those on management/procedure count 1. Operational Improvement Projects which are prepared for five countries and projects which could not be classified owing to lack of information are not included in the long list.



**The Study on Project Priorities to Upgrade Performance and Capacity of
ASEAN Network Ports**

Long List of the Projects

Country	Port	Name of Project
Brunei	Muara	Container Terminal Construction Project (Phase 1) on Pulau Muara Besar
Cambodia	Phnom Penh	Construction of new Phnom Penh Container Terminal
		Construction of new Container Terminal in Kilometer No 6 Port Phnom Penh city and Tonle Bitt Port Kampong Cham Province
		Redevelopment of Phnom Penh Port
	Sihanoukville	Continuous Construction of Sihanoukville Port Special Economic Zone Development Project
		Multi-Purpose Terminal Development
		Enhancement of Container Handling Productivity
		M/P study for the development of a new container terminal
		Transfer the old jetty to Passenger terminal
		SEZ Development Project (Phase II)
		Improvement of Port and Maritime Safety
Indonesia	Belawan	Expansion of Container Terminal
		Relocation of Passenger Terminal
		Improvement of container terminal operation
		A Large Scale Port Expansion Plan at an idle site
		Expansion of CPO Terminal
	Dumai	Development of Container Terminal
		Palm Oil terminal construction project IN Tanjung Buton
		Extension of passenger terminal
	Tanjung Priok	Channel and Basin Improvement
		Development of New Access Road
		Inner Road Improvement
		Yard & Pier Improvement
		Development of Koja Liquid Bulk Terminal & CPO Terminal
		Car Terminal Expansion
		Railway Extension
		East Ancol Development
		Kalibaru Development
		New Development in Subang
	Palembang	Improvement of Approach Channel
		Api-api new coal port Development
		Quayside Container Crane
	Panjang	Expansion of Conventional Terminal
		Conversion of ISAB Terminal
		Upgrading of the port management and operation system
	Pontianak	Yard reorganization
		Approach channel improvement
		Temajo port development a the seacoast
		Redevelopment of the existing port area and facilities
	Tanjung Perak	New Multipurpose Terminal Development Project
		Western Channel Deepening and Widening Project
		Channel development plan
		Multi-purpose terminal improvement plan
	Tanjung Emas	Effect of Mudflood new development in Probolinggo
		Container Terminal Expansion Project
	Banjarmasin	New Development in Kendal
		Container Terminal Redevelopment Project (Phase 2)
		Maharabang Coal Terminal Construction Project
	Makassar	New Development of Coal Terminal in Kuala Kapuas
		Makassar Container Terminal Expansion Project(will be completed in 2013)
	Balikpapan	Makassar New Port Project (Phase I)
		New Container Terminal Construction Project(will be completed in 2011)
	Bitung	New Development in Penajam Pasir for mining activities
		Container Terminal Expansion Project (Phase 2)
		Container Terminal Expansion Project (Phase3)



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	Sorong	Terminal expansion
		New Port Development in Arar
	Jayapura	Quay extension
		New Port Development in Depapre
Malaysia	Port Klang	North Port Expansion
		West Ports Expansion(Development of CT6-600meter)
	Penang	North Butterworth Container Terminal Expansion Project(will be completed in 2011)
		North Channel Deepening Project
	Kuching	Tebedu Inland Port Development Plan
		Approach Channel Improvement
	Bintulu	Container Terminal Expansion Project(will be completed in 2011)
	Kota Kinabalu	Installation of RTGs and Gantry Crane at Sapangar Bay Container Port
	Tanjung Pelepas	Development of Container Terminal Phase II (#13 and #14)
		Development of new container terminals Phase III and IV
Kuantan	Kuantan Port Expansion	
Kemaman	Development of New Terminal	
Myanmar	Yangon	Development of AWPT Wharf IV
		Yangon Port Approach Channel Deepning Project
	Thilawa	Thilawa Port Development Project (plot 10,11,12,13,14)
		Thilawa Port Development Project(22plots)
		Thilawa Port Access Road Improvement
	Kyaukpyu	Kyaukpyu Deep Seaport Project, Crude Oil Terminal/Jetty
Urgent Rehabilitation of General Cargo Jetties		
Philippines	Manila	Manila North Harbor Redevelopment Project
		MICT No.6 Container Terminal Expansion project
	Cebu	Development of New Cebu Port
		Re-Development of Cebu Baseport
		Upgrading/Improvement of CIP Berths & Dredging of Cebu Channel
		Construction of Fast Ferry Terminal
	Iloilo	Cargo Handling Productivity Enhancement Project
		Expansion of Loboc Wharf Project
		Deepening of the channel
	Cagayan de Oro	Expansion of Terminal
		Expansion of the Berth Length and Container Yard (Phividec)
		Modernization of Equipment(Phividec)
	Davao	Davao Container Terminal Construction Project
	General Santos	Cargo Handling Productivity Enhancement Project
		Passenger Terminal Development Project(ABD)
Makar port expansion project (RCwharf)		
Zamboanga	New Passenger Terminal Project	
	Installation of Equipment	
Plural Ports	Quayside Gantry Crane Installation Project	
Singapore	Singapore	Development of Pasir Panjang Terminal Phase III and IV
Thailand	Bangkok	Asset Development Project
	Laem Chabang	Rail Transfer Terminal (RST)
		Coastal Terminal
		LCP Phase 3 Development
	Songkhla	Development of the Second Songkhla Port
Development of the Songkhla Port		
Vietnam	Ho Chi Minh	Development of Access Roads(will be completed in 2015)
		Improvement of Approach Channel in Cai Mep area and Vung Tau area
		Rehabilitation of improvement of Approach channel (Soai Rap)
		Conversion of the existing port area to the complex of passenger port, maritime and commercial center
		Relocation project (Saigon - HiepPhuoc Port)
	Hai Phong	Development of the Hai Phong International Gateway Port (former Lach Huyen Gateway port)



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		Deepening and Widening of Hai Phong Approach Channel
	Da Nang	Tho Quang Terminal Project
		Tien Sa Terminal Expansion Project
		The Lien Chieu Port Construction Project
	Cai Lan	Container Terminal Development Berths No.2-4
Vietnam	Plural Ports	Operational Improvement Project
Cambodia	Plural Ports	Operational Improvement Project
Indonesia	Plural Ports	Operational Improvement Project
Philippines	Plural Ports	Operational Improvement Project
Myanmar	Prural Port	Operational Improvement Project

Chapter 3. Short List of the Projects

3.1 Basic Idea for compiling the Short List of the Projects

The ASEAN network ports are expected to carry out important roles to realize smooth physical distribution and activate intra-trade in the ASEAN region. Therefore, it is essential for each of the ASEAN network ports to be able to handle cargo at the acceptable performance levels and to develop necessary port infrastructure to meet the cargo demand and prevent congestion.

Projects which listed in the short list are the projects considered to be highly beneficial among the long list of projects. A highly beneficial project means a project which contributes to the realization of integrated and competitive maritime transport in ASEAN and contributes to the strengthening of the ASEAN regional network.

Items and important factors to access port development priorities were proposed in the study on Measure 6 as a checklist for initial evaluation of port development priorities. These indices of assessment are considered to contain the following meanings.

- 1) Responding to Maritime Transport Demand: a port/terminal, through implementation of a project shall ensure sufficient capacity, necessary scale of facilities and necessary performance levels in regard to maritime transport demand.
- 2) Effects on Regional Development: a port/terminal, through implementation of a project, shall support government policies and industrial development.
- 3) Reduction in Transport Cost: a port/terminal, through implementation of a project, shall contribute to the reduction of transport cost.
- 4) Coping with Regional Transport Corridors: a port/terminal shall be incorporated in ASEAN logistics networks.
- 5) Basic Requirement: a port/terminal, through implementation of a project, shall satisfy basic requirements from the national/social point of view.

Based on the abovementioned idea, initial evaluation shall be conducted to narrow the projects down from the long list of projects to the short list of projects. Five items and eleven important factors are defined upon conducting initial evaluation are as follows.

Items and Important Factors for Initial Evaluation

Items	Important Factors
(i) Responding to Maritime Transport Demand	a) Measures coping with the shortage of port capacity
	b) Measures responding to larger vessels being deployed
	c) Measures for improving productivities
(ii) Effects on Regional	a) Development of Economic Special



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Development	Zones/Industrial Zones around the port
	b) Interest of investment in port development
	c) Scale of the hinterland and beneficiaries
(iii) Reduction in Transportation Cost	a) Reduction in maritime transportation cost
	b) Reduction in land transportation cost
(iv) Coping with Regional Transport Corridors	a) Roles in line with regional corridor projects
	b) Roles in ASEAN maritime network
(v) Basic Requirements	Consideration on securing navigational safety, rehabilitation of port facilities and port environment protection

Initial evaluation results of the projects selected in the short list is as follows.



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Country	Port	Project Name	Purpose/Background	Port			Development			Transportation Network			Others	Overall evaluation score	
				Shortage of Capacity	For Larger Vessels	Productivities	SEZ/Industrial Zones	Interest of Investment	Scale of the Hinterland	Marine Transportation Cost	Land Transportation Cost	Regional Corridor			Maritime Network
Cambodia	Phnom Penh	Construction of new Phnom Penh Container Terminal	To develop a new modern and easily accessible container port and reduce traffic congestion around the present port area	H	H	M	H	H	M	H	H	L	M	17	
	Sihanoukville	Enhancement of Container Handling Productivity Transfer the Old Jetty to Passenger Terminal		H	L	H	H	H	M	H	H	M	M	L	13
Indonesia	Belawan	Expansion of Container Terminal	To increase the capacity of container handling for international and domestic	H	L	H	H	M	M	H	H	H	L	13	
	Tanjung Priok	Container Terminal Development Project (former East Ancol Development. The project site will likely be changed.)		H	M	H	H	H	M	H	M	H	H	M	16
Malaysia	Tanjung Perak	New Multipurpose Terminal Development Project	Development of a new terminal for multipurpose use at Lamong Bay	H	M	M	H	H	M	H	H	M	L	14	
	Penang	Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and Kuala Perai Terminal		M	H	L	H	H	M	L	H	M	M	M	13
	Tanjung Pelepas	Development of Container Terminal Phase II (#13 and #14)		H	M	M	H	H	M	L	L	H	H	L	13
Myanmar	Kuantan	Kuantan Port Expansion	To increase the container handling capacity	L	M	M	H	H	M	H	H	L	L	12	
	Thilawa/Yangon	Thilawa/Yangon Port Approach Channel Improvement Project		M	H	L	H	M	L	L	H	M	M	H	14
Philippines	Cebu	Development of New Cebu Port	To increase the capacity of cargo handling	H	H	H	H	H	H	H	H	M	M	18	
	Davao	Davao Container Terminal Construction Project		H	M	H	H	M	M	H	M	L	M	L	12
Singapore	Singapore	Development of Pasir Panjang Terminal Phase III and IV	To expand the container port capacity.	H	M	M	H	H	M	L	L	L	L	13	
Thailand	Laem Chabang	Coastal Terminal	To develop the coastal terminal for serving containers transported from/to LCP by coastal ship from southern part of Thailand or barge from inland waterway.	H	L	L	H	H	M	M	M	H	H	15	
Vietnam	Ho Chi Minh	Improvement of Approach Channel and Vessel Control and Development of Cai Mep area		H	M	L	H	H	M	H	M	L	H	M	14
Plural Countries (Cambodia, Indonesia, Myanmar, Philippines, Vietnam)	Hai Phong	Development of Hai Phong International Gateway Port	Development of a deep sea outer port of Hai Phong	M	H/M	L	H	H	M	L	H	H	M	17	
	Project by a country (Plural Ports in a country)	Operational Improvement Project by Introducing/Upgrading Port EDI System		-	-	-	-	-	-	-	-	-	-	-	-



3.2 Short List of the Projects

The short list of projects is compiled of seventeen (17) projects in eight (8) countries which includes one capacity development project for port EDI system in five (5) countries.

Short List of the Projects

Country	Name of Port	Name of Project
Cambodia	Phnom Penh	① <i>Construction of New Phnom Penh Container Terminal</i>
Cambodia	Sihanoukville	② Enhancement of Container Handling Productivity
Cambodia	Sihanoukville	③ Transfer the old jetty to Passenger terminal
Indonesia	Belawan	④ <i>Expansion of Container Terminal</i>
Indonesia	Tanjung Priok	⑤ Container Terminal Development Project (former East Ancol Development. The project site will likely be changed.)
Indonesia	Tanjung Perak	⑥ New Multi Purpose Terminal Development Project
Malaysia	Penang	⑦ Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and Kuala Perai Terminal
Malaysia	Tanjung Pelepas	⑧ Development of Container Terminal Phase II (#13 and #14)
Malaysia	Kuantan	⑨ Kuantan Port Expansion
Myanmar	Thilawa/Yangon	⑩ Thilawa/Yangon Port Approach Channel Dredging
Philippines	Cebu	⑪ Development of New Cebu Port
Philippines	Davao	⑫ Davao Container Terminal Construction Project
Singapore	Singapore	⑬ <i>Development of Pasir Panjang Terminal Phase III & IV</i>
Thailand	Laem Chabang	⑭ <i>Coastal Terminal Development Project</i>
Vietnam	Ho Chi Minh	⑮ Improvement of Approach Channel in Cai Mep Area and Vung Tua Area
Vietnam	Hai Phong	⑯ <i>Development of Hai Phong International Gateway Port</i>
Cambodia, Indonesia, Myanmar, Philippines, Vietnam	Project by a country (plural ports in a country)	⑰ Operational Improvement Project by introducing/upgrading Port EDI system

Note 1: Projects in italics are on-going projects. Projects in the DD stage are included.

Note 2: Name of a project of Penang port was changed from North Channel Deepening Project to the above.

Chapter 4. Priority Projects

4.1 Viewpoint for Evaluating Priority Projects

All the projects listed in the short list aim at realizing integrated and competitive maritime transport in the ASEAN region. In this study, urgency, importance and efficiency of each project shall be emphasized when evaluating the projects. Furthermore, classification of types of ports and roles in the network, and policies for port development of each country will be considered in evaluating priority projects.



Analysis of the contents of the short list of projects

- Urgency: responding to demand, larger vessels and others
- Importance: effects on regional development, roles in the maritime network others
- Efficiency: operational efficiency, effects of the project and others

Analysis of projects by port types

- Characteristics of ports
- Significance of improving functions

Roles of projects for strengthening the network

Hearings of the policies from member countries

- Workshop in Hanoi
- 20th MTWG
- Site Surveys

4.2 Analysis of Projects by Port Types

ASEAN 47 network ports are classified into five types in the study on Measure 6 from the viewpoint of the scale of cargo throughput, whether it is transshipment port or origin-destination, area of partner ports on liner services, and the dimensions of port facilities.

Port Types and Their Characteristics

Type-1	World class transshipment port serving as a hub of trunk line services
Type-2	World class port serving as a main gateway to their country
Type-3	Large scale port serving mainly for inter regional container shipping
Type-4	Small scale port serving mainly for intra regional container shipping
Type-5	Small scale port (terminals) mainly for coastal and/or sub-regional services

Projects included in the short list of projects are analyzed from the viewpoint of the characteristics of types of port.

Ports in type-1 are world class hub ports and many ASEAN network ports connect to everywhere in the world through transshipment at type-1 ports. Projects of type-1 ports contribute not only to their own development but also to strengthening the entire ASEAN maritime network.

Ports in type-2 are gateway ports of countries and are located near the center of industrial area and/or logistics hub. Projects of type-2 ports stimulate economic growth and develop together with the economic development of each country, as well as improve the connectivity within the ASEAN countries as well as between the ASEAN region and other regions.

Ports in type-3 are base ports in the region of each country where mainly inter-regional container vessels call at. Projects of type-3 ports contribute to the growth of the national economy and the strengthening the inter-regional maritime network.

Ports in type-4 are small scale ports in regions where mainly intra-regional vessels call at and account for 22 of the 47 network ports. Projects of type-4 ports contribute to strengthening the ASEAN maritime network.

Ports in type-5 are small scale ports servicing coastal shipping and/or short distance maritime routes. Projects of type-5 ports are required to meet demands for development in a timely manner.

4.3 Roles of Projects for Strengthening the Network

A port functions as a node and an approach channel functions as a link in a maritime network. To strengthen the ASEAN maritime network, it is necessary to improve functions of ports and channels and to realize a maritime network with sufficient capacity.



Therefore, from the viewpoint of realizing a network with sufficient capacity, projects in the short list to increase container handling capacity, improve the approach channel and accommodate large passenger ships are important and given high priority.

A capacity development project for introducing/upgrading a port EDI system to improve operational efficiency will contribute to realizing seamless physical distribution in a port. Therefore, this project is given high priority.

In order for ASEAN as a whole to develop its economic activities further, ASEAN maritime network composed of 47 ASEAN network ports needs to connect with the inland corridors to a greater extent and expand to remote areas such as the eastern part of ASEAN which can cover the whole area of ASEAN.

Furthermore, for establishment of ASEAN Economic Community, it is necessary for many ports in ASEAN countries, especially ASEAN network ports, to enhance their function in order to form effective and efficient maritime networks. To that end, the priority projects are of great importance.

4.4 Priority Projects

Characteristics, roles and functions of the ports with priority projects are varied, and the projects themselves have different features. As a result of analyzing the projects in terms of their contents, types of ports and roles for strengthening the network, every project in the short list is expected to contribute to strengthening the ASEAN maritime network in addition to the economic development of each country. Therefore, all the projects included in the short list are identified as priority projects.

① Construction of New Phnom Penh Container Terminal: Phnom Penh port (Cambodia) – Type-5

This project is to develop a container terminal downstream from the present Phnom Penh port.

② Enhancement of Container Handling Productivity: Sihanoukville (Cambodia) – Type-4

This project is to install equipment for handling containers to improve operational efficiency.

③ Transfer the old jetty to Passenger Terminal: Sihanoukville (Cambodia) – Type-4

This project is to convert the old jetty to a passenger terminal and establish a new passenger terminal with international standard.

④ Expansion of Container Terminal: Belawan port (Indonesia) – Type-4

This project is to expand container terminals to increase container handling capacity.

⑤ Container Terminal Development Project: Tanjung Priok port (Indonesia) – Type-2

This project is to develop new container terminals to increase container handling capacity.

⑥ New Multi Purpose Terminal Development Project: Tanjung Perak port (Indonesia) – Type-3

This project is to develop large scale multi purpose terminals to cope with the increasing container demand.

⑦ Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and



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Kuala Perai Terminal: Penang port (Malaysia) – Type-3

This project is to deepen the North Channel to cope with larger vessels.

⑧ Development of Container Terminal Phase II (#13 and #14): Tanjung Pelepas port (Malaysia) – Type-1

This project is to expand container handling capacity to cope with increasing cargo demand.

⑨ Kuantan Port Development: Kuantan port (Malaysia) – Type-4

This project is to develop container terminals to cope with increasing container cargo.

⑩ Thialwa/Yangon Port Approach Channel Improvement: Thilawa port/Yangon port (Myanmar) – Type-4

This project is to dredge the outer-bar and inner-bar in the Yangon River and deepen the approach channel of Thilawa port and Yangon port.

⑪ Development of New Cebu Port: Cebu port (Philippines) – Type-4

This project is to develop container terminals in a new site to handle containers efficiently.

⑫ DAVAO Container Terminal Improvement Project: Davao port (Philippines) – Type-4

This project is to expand the present wharf as a container terminal to cope with increasing containers.

⑬ Development of Pasir Panjang Terminal Phase III and IV: Singapore port (Singapore) – Type-1

This project is to expand container handling capacity to cope with increasing cargo demand.

⑭ Coastal Terminal Development Project: Laem Chabang (Thailand) – Type-2

This project is to develop a terminal for coastal shipping for the promotion of modal shifting.

⑮ Improvement of the Approach Channel and Vessel Control and Development of Cai Mep Thi Vai Terminal : Ho Chi Minh port (Vietnam) – Type-2

This project is to deepen an approach channel to ease the passage of larger vessels.

⑯ Development of Hai Phong International Gateway port: Hai Phong (Vietnam) – Type-3

This project is to develop a new deep sea port offshore of the existing port to cope with increasing container cargo and accommodate larger vessels.

⑰ Operational Improvement Project by Introducing/Upgrading Port EDI System: Cambodia, Indonesia, Myanmar, Philippines, Vietnam

This project is to improve operational efficiency by introducing/upgrading a port EDI system to each country.



When a port EDI system is introduced, it is essential that the receiving system such as the current state of related legislation, implementing and operational structure of institution and so on be set up

4.5 For Implementation of the Priority Projects

Priority projects are of vital importance for the ASEAN member countries which are aiming at the ASEAN Economic Community (AEC) and all member countries need to make efforts to implement these projects. Some of the projects are already in the implementing stage, some will be implemented using a country's own funds while some projects will need to mobilize resources from inside and/or outside of the country. Efforts must be made for the latter projects to proceed to the implementing stage to improve the maritime transport network in the ASEAN region by facilitating resource mobilization.

Upon requesting necessary domestic investment or assistance from foreign agencies, the feasibility and/or details of the project will be required. Therefore, it is necessary to examine the contents of priority projects which need resource mobilization.

In this report, project details are illustrated for twelve (12) projects below which needs resource mobilization in terms of background and requirement of the project, future prospect, purpose of the project, outline of the project and rough project cost, economic evaluation, term and schedule of the project based on data and information which were obtained during the study.

It is noted that there may be instances in the future where there is a need to plan, develop, construct and/or maintain ports and port facilities that would require foreign funding and may not have been foreseen by this Report. When that situation occurs, the evaluation of such project should be made in considering altered status of variables such as economic outlook both in ASEAN and abroad, future demand, intention of the private sector/industry, the policy of the government and so on at that time.

- ① Enhancement of Container Handling Productivity: Sihanoukville (Cambodia)
- ② Transfer the Old Jetty to Passenger Terminal: Sihanoukville (Cambodia)
- ③ Expansion of Container Terminal: Belawan (Indonesia)
- ④ Container Terminal Development Project: Tanjung Priok (Indonesia)
- ⑤ New Multi-Purpose Terminal Development Project; Tanjung Perak (Indonesia)
- ⑥ Kuantan Port Expansion: Kuantan (Malaysia)
- ⑦ Thilawa/Yangon Port Approach Channel Dredging: Thilawa port/Yangon port (Myanmar)
- ⑧ Development of New Cebu Port: Cebu port (Philippines)
- ⑨ Davao Container Terminal Improvement Project: Davao (Philippines)
- ⑩ Improvement of the Approach Channel and Vessel Control and Development of Cai Mep Thi Vai Terminal: Ho Chi Minh port (Vietnam)
- ⑪ Development of Hai Phong International Gateway Port: Hai Phong port (Vietnam)
- ⑫ Operational Improvement Project by Introducing/Upgrading Port EDI System: Vietnam, Indonesia

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Chapter 1. Outline of the Study

1.1 Background

Leaders of the ASEAN member states approved “the ASEAN Economic Community Blueprint” at ASEAN Summit in November 2007 to achieve a single market by 2015, which is a master plan showing the policy directions of each sector related to economic integration of the ASEAN member countries. In line with this blueprint, ASEAN Transport Ministers Meeting adopted “Roadmap towards an Integrated and Competitive Maritime Transport in ASEAN” in November 2007 (see Reference Material 1-1). In this roadmap, twenty measures to improve ASEAN maritime transport are listed in five categories, namely, developing a single ASEAN voice, infrastructure, market integration, harmonization, and human resources and capacity development.

Following this roadmap, MTWG decided to invite external donor institutions to assist with the implementation of the following four measures among twenty measures at the meeting held in Viet Nam in September 2008:

- No. 5: Develop a database of maritime trade movements to and from within ASEAN
- No. 6: Develop guidelines for assessing priorities, including acceptable performance levels
- No. 7: Identify required improvement areas in ASEAN network port performance and capacity, based among others, on regular forecasts of maritime trade and requirements
- No. 8: Develop project priorities, based on the guidelines for assessing port development, to raise performance and capacity levels towards bridging such gaps in ASEAN network ports

Responding to request from the ASEAN member countries, measures No. 6 and No. 8 are assisted by JICA and measures No. 5 and No. 7 are assisted by Korea (the studies on measures No. 5, No. 6 and No. 7 have already been completed).

Maritime transport network is basic infrastructure to achieve a single market in ASEAN Economic Community (AEC) where efficient and competitive shipping service is of critical importance. However, the economic development of ASEAN countries is at different stages; the maritime transport infrastructure remains at poor levels in some countries while some countries’ infrastructure has reached the highest level in the world. Efficient shipping service requires the same level of port infrastructure at every terminal on a service route. In particular, it is very important for network ports to satisfy the minimum requirement for the water depth of the navigation channel, the installation of quay side cranes, and the development of dedicated bulk cargo terminals. Taking into account these characteristics of shipping services, efforts shall be made to solve bottlenecks on a shipping route and ensure efficient shipping services deploying the most suitable size and type of ships. ASEAN MTWG has therefore launched a study for assessing port development priorities from the viewpoint of efficient regional maritime network.

ASEAN has a plan to identify priority projects based on the result of the study on Measure No 8. In the roadmap, it is scheduled that funds necessary for project implementation will be arranged in 2012 and all ASEAN network ports will provide sufficient performances and capacity levels in 2015.

1.2 Objectives of the Study

ASEAN Transport Ministers have approved and the ASEAN member countries represented by Maritime Transport Working Group are following “The Roadmap towards Integrated and Competitive Maritime Transport”. This study aims at assisting “the study on measures which should be taken with high priorities in ASEAN network ports”, that is being coordinated by Vietnam.



The Study on Project Priorities to Upgrade Performance and Capacity of ASEAN Network Ports

In 2009, JICA assisted the study on “Preparation of guidelines for assessing port development priorities” which was one of the 20 actions identified in the “Roadmap” towards an Integrated and Competitive Maritime Transport in ASEAN and coordinated by Brunei Darussalam. The study included surveys of present situations of ASEAN network ports and the preparation of guidelines for assessing priorities of port development. The result of the study was summarized in the report entitled “the Study on Guidelines for Assessing Port Development Priorities including Acceptable Performance levels in ASEAN”.

This study aims at identifying the measures to be taken with high priorities and the direction of the development of ASEAN network ports by assessing issues of these ports, by making use of the Guidelines for Assessing Port Development Priorities developed by Measure No. 6, and related studies conducted by ASEAN. Specific objectives of this study are as follows:

- 1) To identify priority projects to raise performance and capacity levels and to improve the efficiency of maritime trade in a network composed of 47 ASEAN network ports based on the Guidelines for Assessing Port Development Priorities and the result of demand forecasting.
- 2) To illustrate outlines of projects which need resource mobilization from domestic and/or international partners among priority projects. Outlines of projects include the location, project components, rough cost estimate, implementation schedule and problems to be solved.

1.3 Study Area

This study covers the 47 ASEAN network ports shown in Table 1.3-1.

Site visits to several network ports in Indonesia, Myanmar, the Philippines and Vietnam were made by the JICA study team based on the discussions with the related organizations of each country, the lead coordinator of Measure No.8 and the ASEAN Secretariat.

The study team also visited the Republic of Korea to collect information on the relevant study results of the “Roadmap towards an integrated and competitive maritime transport in ASEAN.”

Table 1.3-1 ASEAN Network Ports

Country	Network Ports
Brunei Darussalam	Muara
Cambodia	Phnom Penh, Sihanoukville
Indonesia	Belawan, Dumai, Tanjung Priok (Jakarta), Palembang, Panjang, Pontianak, Tanjung Perak (Surabaya), Tanjung Emas (Semarang), Makassar, Balikpapan, Banjarmasin, Bitung, Jayapura, Sorong
Malaysia	Port Klang, Penang, Johore (Pasir Gudang), Tanjung Pelepas, Kuantan, Kemaman, Bintulu, Kuching, Sandakan, Kota Kinabalu
Myanmar	Yangon, Thilawa, Kyaukphyu
Philippines	Manila, Batangas, Subic Bay, Cebu, Iloilo, Cagayan de Oro, Davao, General Santos, Zamboanga
Singapore	Singapore
Thailand	Bangkok, Laem Chabang, Songkhla
Vietnam	Ho Chi Minh, Hai Phong, Da Nang, Cai Lan



1.4 Outline of the Study

1.4.1 Process of the Study

The process of the study is as follows.

This study on Measure 8 was implemented based on the cooperation framework between ASEAN and JICA, and the outcome of the study will be utilized for implementation of the ‘Roadmap’. Therefore, the JICA study team periodically reported to and held discussions with Vietnam, the lead coordinator of Measure 8. The JICA study team also exchanged views and information with the ASEAN Secretariat, Malaysia - lead coordinator of Measure 5 and 7 - and representatives from the Republic of Korea - assisting agency of Measure 5 and 7.

The JICA study team visited Vietnam in early July and discussed the IC/R with Vietnam, and the Vietnam side basically accepted the Inception Report. Both parties also shared the concept of the study including the necessity of making use of Workshop on Measure 8 and MTWG effectively for building consensus among the ASEAN member countries.

At the same time, the JICA study team visited Korea in July to collect information of the study on Measure 7, specifically the demand forecast and required improvement areas of the 47 ASEAN network ports which were conducted by Malaysia and Korea. Utilizing the results of the study on Measure 8, a long list of projects, a short list of projects and a framework of initial evaluation for selecting projects were also examined.

The workshop on Measure 8 was held in September 23rd – 24th in Hanoi, Vietnam, organized by the Vietnamese Government and with the support of the JICA. Some members of the JICA study team entered Hanoi ahead of time and assisted the organizer with preparations.

The JICA study team prepared a draft long list of projects based on the on-site surveys conducted in 2009, views and information collected from member countries which was requested to each country at the workshop on Measure 7 in July, and information obtained from the study on Measure 7. At the workshop on Measure 8, each delegation gave a presentation on projects of each country’s network ports and the JICA study team presented the draft long list of projects, method of initial evaluation for a short list of projects and a preliminary short list of projects. After the presentations, member countries discussed on revised long list of projects and preliminary candidate for short list of projects. Furthermore, the JICA study team proposed a conceptual method to develop project priorities.

Through the workshop on Measure 8 in Hanoi, the ASEAN member countries, facilitated by the JICA study team, reached an agreement on the long list of projects, method of initial evaluation for a short list of projects and a conceptual method to develop project priorities. The JICA study team confirmed that cooperation was required in preparation for the discussion at the MTWG meeting.

Discussion at the workshop on Measure 8 was summarized as “Summary record of the ASEAN-JAPAN maritime transport workshop on Measure No.8”. The program for the workshop, list of delegates and summary record are attached as Reference Material-2.

The 20th MTWG meeting was held in Kuching, Malaysia on October 26 to 28. At the 20th MTWG meeting, the JICA study team reported the progress of the study, presented the long list of projects and the short list of projects, and proposed a conceptual method to develop project priorities, and reached a basic agreement on the study with member countries.

The JICA study team conducted site surveys from the second half of October to December to collect further information on priority projects. At the same time, the JICA study team discussed the basic direction of the final report with the Vietnam side.

The draft final report was sent to all member countries from Vietnam, the lead coordinator. The final report was prepared reflecting comments on the draft final report from the member countries. Finally, the final report on the study was reported and adopted at the 21st MTWG meeting held in



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ASEAN Network Ports**

March 1st to 3rd, 2011.



The Study on Project Priorities to Upgrade Performance and Capacity of ASEAN Network Ports

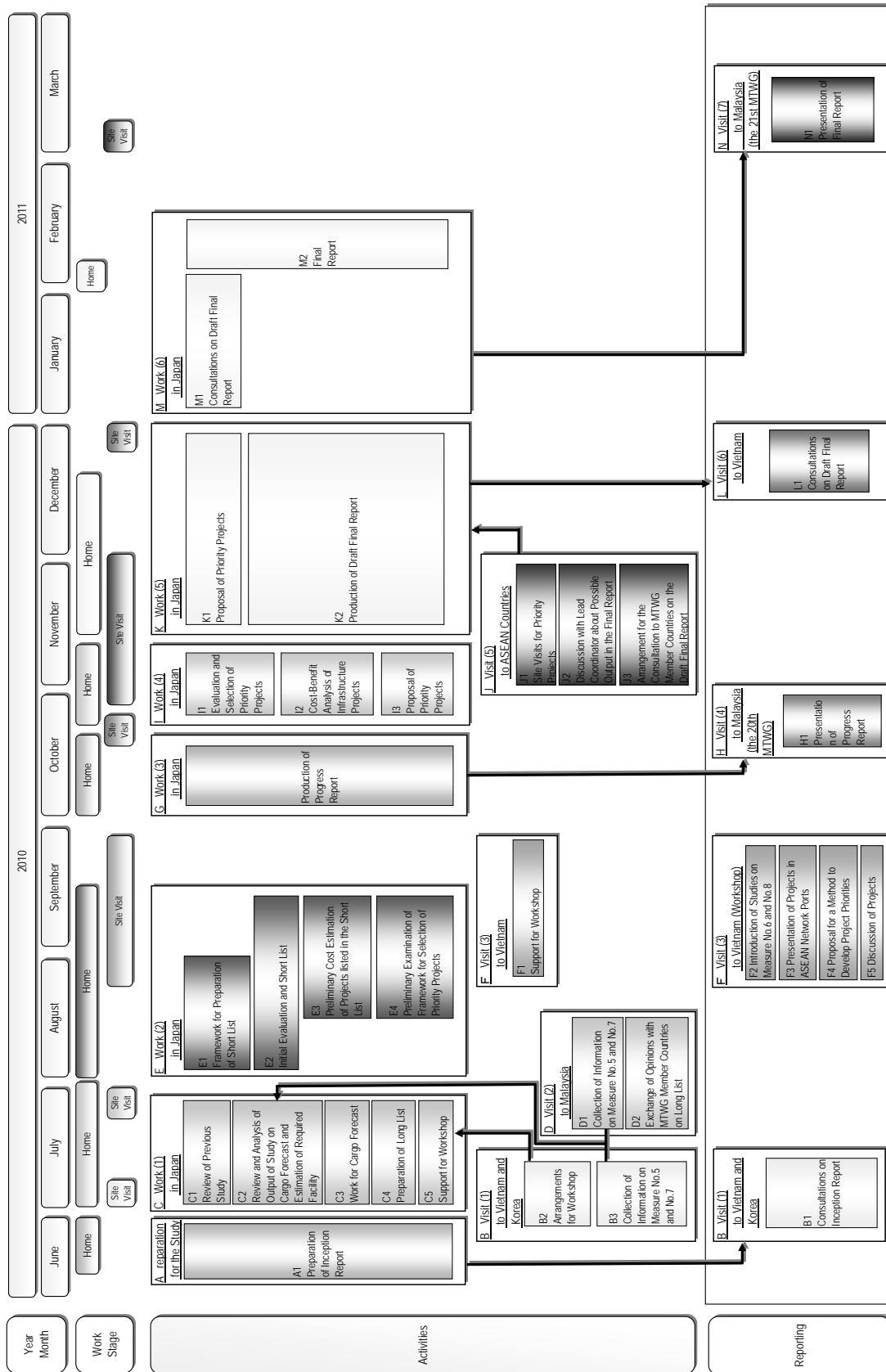


Figure 1.4-1 Work Schedule



The Study on Project Priorities to Upgrade Performance and Capacity of ASEAN Network Ports

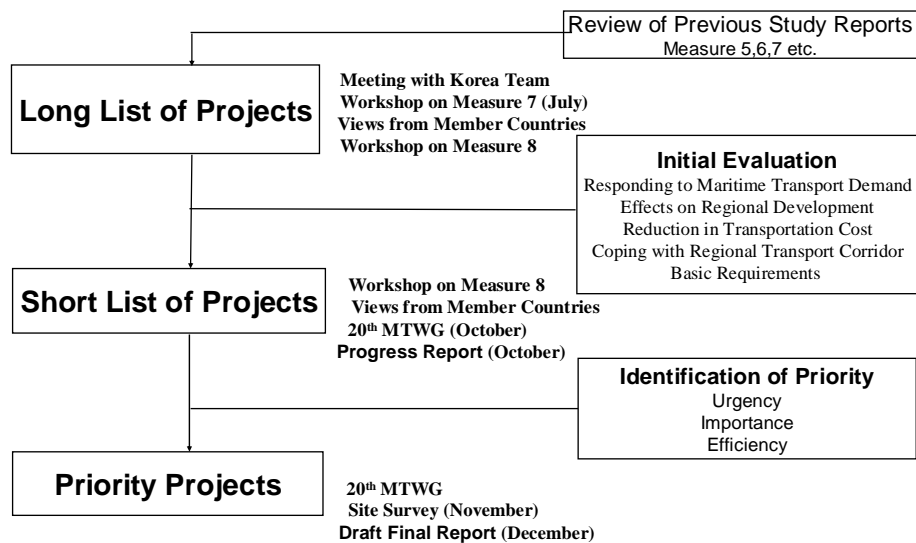


Figure 1.4-2 Collaboration with ASEAN

1.4.2 Utilization of the Results of Measure 5 and 7

The JICA study team visited the Korea Maritime Institute (KMI) in the Republic of Korea which has been working on the study on Measure 5 and 7. Concerning the study on Measure 7, methodologies and results of the demand forecast and estimation of port capacity and required improvement areas were discussed and information necessary to conduct the study on Measure 8 was collected. The progress of the study on Measure 5 which develops a database of maritime trade movements was also identified at the time of the meeting with KMI.

The JICA study team participated in the workshop on Measure 7 which was held in Kuala Lumpur on July 27th -28th and exchanged views with member countries regarding the study on Measure 8. Specifically, the JICA study team explained the Inception Report and a preliminary long list of projects, and requested all the member countries to cooperate with the study on Measure 8.

1.4.3 Site Survey related to Priority Projects

Some priority projects needed site surveys and coordination with related organizations. The study team visited these ports and carried out the following surveys and tasks.

- 1) Explanation and discussion of a draft of the project
- 2) Examination of current conditions including access channels and access roads
- 3) Collection of information on construction costs and cost-benefit analysis
- 4) Hearings with relevant parties and confirmation of common understandings

The Study team conducted site surveys in four countries, namely; Indonesia, Myanmar, the Philippines and Vietnam in October to December, 2010.



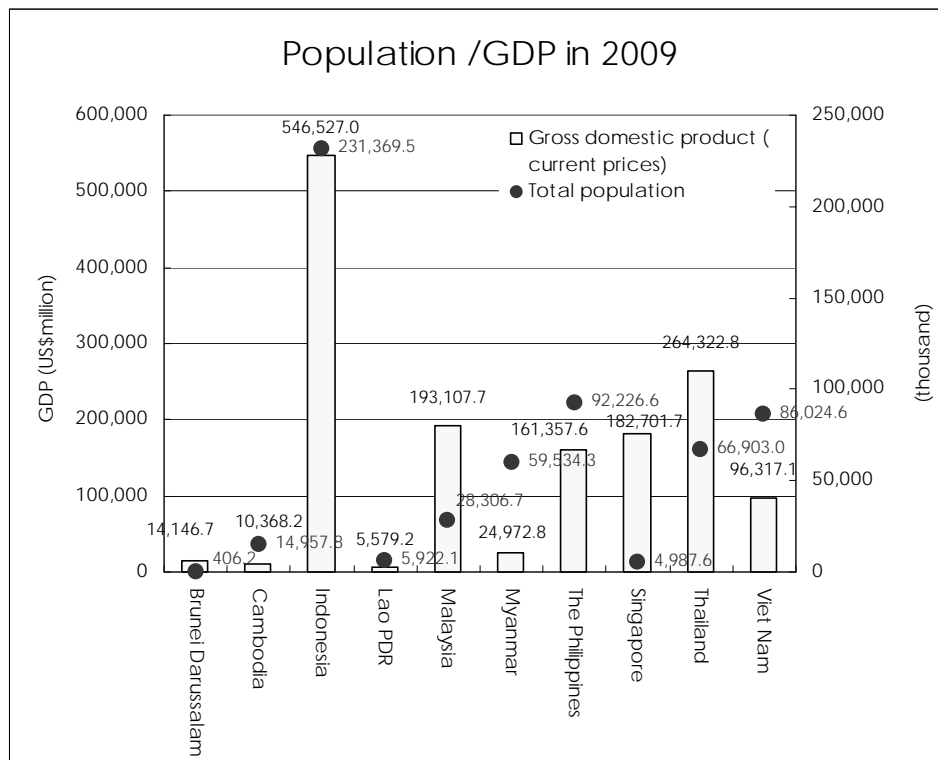
Chapter 2. Conditions of the Study

2.1 The Benchmark Study and Guidelines for Acceptable Port Development Priorities

2.1.1 Outline of ASEAN Network Ports

(1) Overview of ASEAN

ASEAN was formed under an agreement among the five countries of Thailand, Indonesia, Malaysia, Singapore and the Philippines in 1967 and later Brunei, Vietnam, Lao PDR, Myanmar and Cambodia also joined. ASEAN is presently composed of ten countries and undertakes activities in various fields as a cooperative organization. The total area of the member countries is 4.48 million km², while the population and the GDP amount to 574.63 million and 1463.2 billion US\$ in 2008. Collectively, ASEAN comprises 3.3% of the world's area, 8.6 % of the world's population and 2.4 % of the world's GDP. GDP per capita in 2008 is US\$ 2,546.



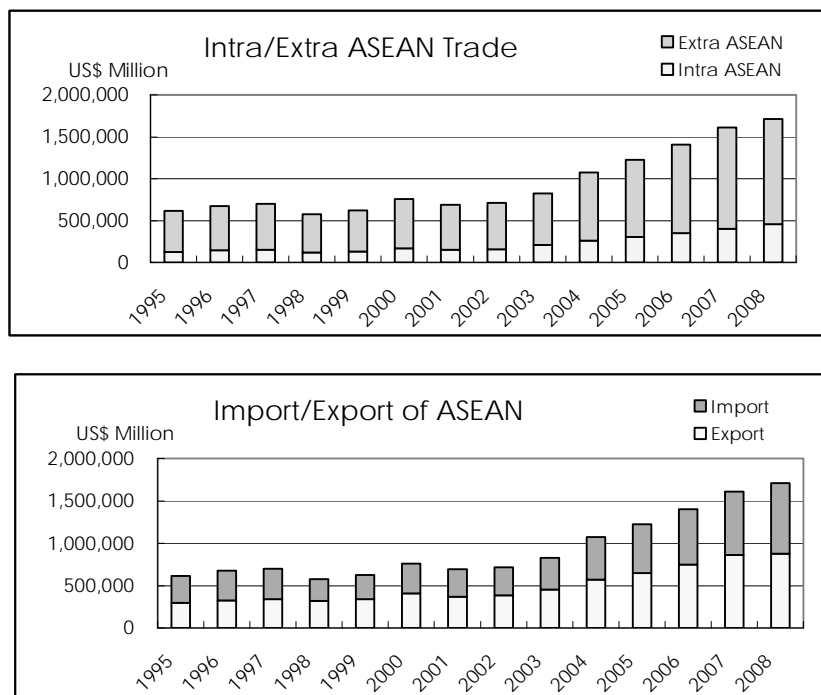
Source: ASEAN Secretariat

Figure 2.1-1 Population and GDP of ASEAN Countries (2009)

Total value of trade increase year by year and those in 2008 reached US\$2,010.3 billion (6.1% of the world's total). Value of export and import of ASEAN countries in 2008 is US\$1,016.6 billion and 993.6 US billion respectively. Around 25% of these values are intra-ASEAN trade and 75% is extra ASEAN.



The Study on Project Priorities to Upgrade Performance and Capacity of ASEAN Network Ports



Source: ASEAN Secretariat

Figure 2.1-2 Trade of ASEAN Countries

(2) ASEAN Network Ports

Location of Ports

One of the factors behind the remarkable economic growth of ASEAN is the expansion of intra/extra ASEAN trade; in this regard, the 47 ASEAN network ports have played essential roles as important infrastructures. The importance of ports will increase in accordance with further development of ASEAN countries. The 47 ports listed as the ASEAN network ports are selected to be part of the Trans-ASEAN Transportation Network from the viewpoint of its geographical location, role of the port, demand for the port and other factors.



**The Study on Project Priorities to Upgrade Performance and Capacity of
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Table 2.1-1 Location and Management of ASEAN Network Ports

Port		Location	(Km from the mouth of the river)	PMB
Brunei	Muara	Kalimantan Island	Brunei Bay	MOC
Cambodia	Phnom Penh	Indochina	Mekong River (332)	PPAP
	Sihanoukville	Indochina	Kompong Som Bay	PAS
Indonesia	Belawan	Sumatra Island	Belawan River (13.5)	PELINDO I
	Dumai	Sumatra Island	Malacca Strait	PELINDO I
	Tanjung Priok	Jawa Island	Jawa Sea	PELINDO II
	Palembang	Sumatra Island	Musi River (111)	PELINDO II
	Panjang	Sumatra Island	Lumpung Bay	PELINDO II
	Pontianak	Kalimantan Island	Kapis Kecil River (11)	PELINDO II
	Tanjung Perak	Java Island	Madura Strait	PELINDO III
	Tanjung Emas	Java Island	Java Sea	PELINDO III
	Banjarmasin	Kalimantan Island	Balito River (15)	PELINDO III
	Makassar	Sulawesi Island	Makassar Strait	PELINDO IV
	Balikpapan	Kalimantan Island	Balikpapan Bay	PELINDO IV
	Bitung	Sulawesi Island	Lembah Strait	PELINDO IV
	Sorong	New Guinea Island	Dampiem Strait	PELINDO IV
	Jayapura	New Guinea Island	Pacific Ocean	PELINDO IV
Malaysia	Port Klang	Malay Peninsula	Malacca Strait	PKA
	Penang	Malay Peninsula	Malacca Strait	PPC
	Kuching	Kalimantan Island	Sarawaku River (31)	KPA
	Bintulu	Kalimantan Island	South China Sea	BPA
	Kota Kinabalu	Kalimantan Island	South China Sea	SPA
	Sandakan	Kalimantan Island	Sulu Sea	SPA
	Johore	Malay Peninsula	Johore Strait	JPA
	Tanjung Pelepas	Malay Peninsula	Pulai River (the mouth)	JPA
	Kuantan	Malay Peninsula	South China Sea	KPA
	Kemaman	Malay Peninsula	South China Sea	KPA
Myanmar	Yangon	Indochina	Yangon River (32)	MPA
	Thilawa	Indochina	Yangon River (16)	MPA
	Kyaukphyu	Indochina	Bangal Bay	MPA
Philippines	Manila	Luzon Island	Manila Bay	PPA
	Batangas	Luzon Island	Batangas Bay	PPA
	Subic Bay	Luzon Island	SubicBay	SBMA
	Cebu	Cebu Island	Bohol Strait	CPA
	Iloilo	Panay Island	Iloilo Strait	PPA
	Cagayan de Oro	Mindanao Island	Macajalar bay	PPA
	Davao	Mindanao Island	Pakiptan Strait	PPA
	General Santos	Mindanao Island	Sarangani Bay	PPA
	Zamboanga	Mindanao Island	Basilan Strait	PPA
Singapore	Singapore	Malay Peninsula	Singapore Strait	MPA
Thailand	Bangkok	Indochina	Chao Phraya River (26)	PAT
	Laem Chabang	Indochina	Gulf of Thailand	PAT
	Songkhla	Malay Peninsula	Gulf of Thailand	MD
Vietnam	Ho Chi Minh	Indochina	Sai Gon River (85)	T/O
	Hai Phong	Indochina	Cam River	T/O
	Da Nang	Indochina	Da Nang Bay	T/O
	Cai Lan	Indochina	Ha Long Bay	T/O

Source : JICA Team



Port Activity

Total cargo throughput of ASEAN network ports in 2008 is estimated at around 1.38 billion tons. Port of Singapore handled the largest volume with more than 500 million tons. Next biggest port in terms of volume is Port Klang handling 150 million tons in total. In addition, ports of Ho Chi Minh, Tanjung Pelepas, Laem Chabang and Balikpapan handled more than 50 million tons of cargo.

In terms of container throughput, the total amount in 2008 is estimated at around 70 million TEUs. Port of Singapore ranks first handling nearly 30 million TEUs. Following Singapore, Port Klang handled 8 million TEUs, Port of Tanjung Pelepas handled 5.6 million TEUs and Port of Laem Chabang handled 5.2 million TEUs. In addition, ports of Tanjung Priok, Ho Chi Minh and Manila handled more than 3 million TEUs in 2008.

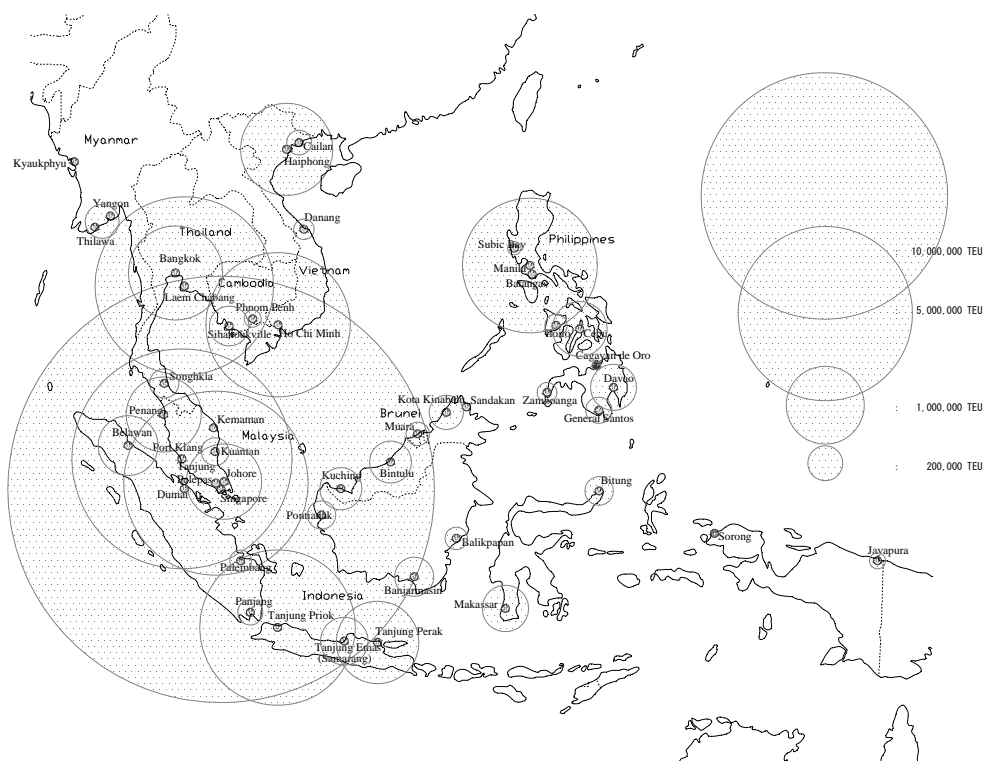


The Study on Project Priorities to Upgrade Performance and Capacity of ASEAN Network Ports

<Total Cargo Volume>



<Container>



Source: The study on the Guidelines for Assessing Port development Priorities including Acceptable Performance Levels in ASEAN (Feb.2010)

Figure 2.1-3 Cargo Throughput of Network Ports (in 2008)



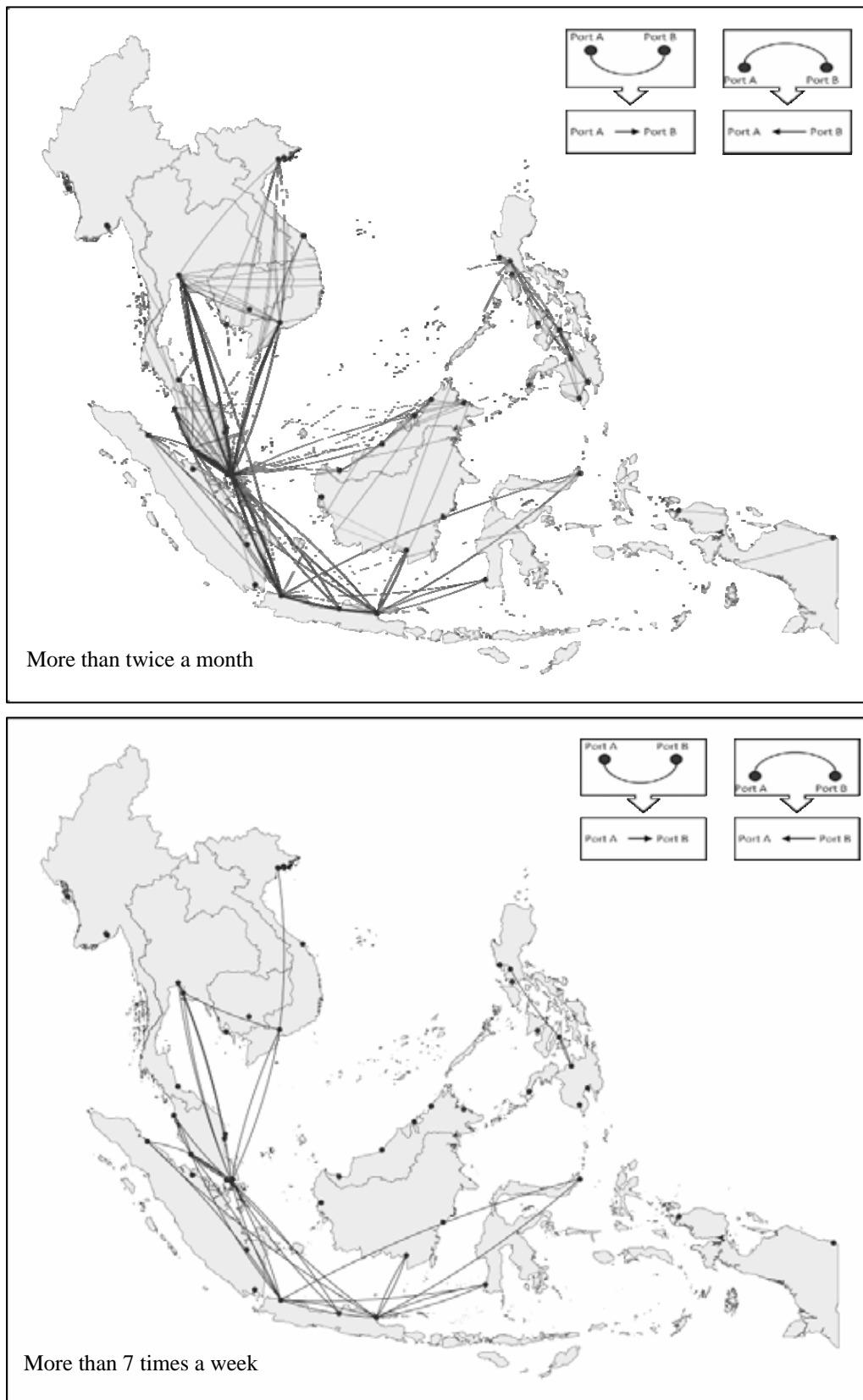
**The Study on Project Priorities to Upgrade Performance and Capacity of
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Maritime Network among Network Ports

The present situation of ASEAN liner network is observed in the following figures. The following figures show the container liner routes between the 47 ports which are the target of this study. This figure is based on the database of container liners as of August 2008. (Source: The Containership Database: MDS Transmodal Containership Databank)



The Study on Project Priorities to Upgrade Performance and Capacity of ASEAN Network Ports



Source: The study on the Guidelines for Assessing Port development Priorities including Acceptable Performance Levels in ASEAN (Feb.2010)

Figure 2.1-4 Container Liner Routes among ASEAN Network Ports (August, 2008)



Connection with the World by Regular Container Routes

Connection between 47 ports and other regions in the world by container shipping routes is shown in Table 2.1-2. This table is prepared based on MDS database. Ports of Tanjung Priok, Port Klang, Tanjung Pelepas, Singapore, Laem Chabang and Hai Phong connect with almost all regions in the world. On the other hand, fifteen (15) Network Ports such as Palembang, Sandakan, Yangon, Iloilo and others have connection with only intra ASEAN. Twenty seven (27) ports connect with ports in East Asia and fourteen (14) ports connect with ports in South Asia/ Middle East/ Africa.

Table 2.1-2 ASEAN Network Ports' Connection with the World

	Intra ASEAN	Extra ASEAN				
		East Asia	Oceania	South Asia/ Middle East/ Africa	Europe	North/ middle/ south America
Muara	○	○				
Phnom Penh						
Sihanoukville	○	○		○		
Belawan	○	○		○		○
Dumai						
Tanjung Priok	○	○	○	○	○	○
Palembang	○					
Panjang	○					
Pontianak	○					
Tanjung Perak	○	○	○	○	○	
Tanjung Emas	○	○				
Banjarmasin	○			○		
Makassar	○					
Balikpapan	○					
Bitung	○					
Sorong	○					
Jayapura	○					
Port Klang	○	○	○	○	○	○
Penang	○	○				
Kuching	○	○				
Bintulu	○	○				
Kota Kinabalu	○	○				
Sandakan	○					
Johore	○					
Tanjung Pelepas	○	○	○	○	○	○
Kuantan	○	○				
Kemaman						
Yangon	○					
Thilawa						
Kyaukphyu						
Manila	○	○	○	○		
Batangas						
Subic Bay	○	○				
Cebu	○	○	○			
Iloilo	○					
Cagayan de Oro	○	○				
Davao	○	○	○			



**The Study on Project Priorities to Upgrade Performance and Capacity of
ASEAN Network Ports**

General Santos	○	○	○			
Zamboanga	○					
Singapore	○	○	○	○	○	○
Bangkok	○	○		○	○	○
Laem Chabang	○	○	○	○	○	○
Songkhla	○	○				
Ho Chi Minh	○	○	○	○	○	
Hai Phong	○	○	○	○	○	○
Da Nang	○	○				
Cai Lan	○	○				
47	41	27	12	14	9	8

Source: The Containership Database: MDS Transmodal Containership Databank, May 2010

Channel

Situation of approach channels of ASEAN network ports differs according to their geographical location. Some ports are located along a river while other ports face the sea. In case of river ports, it is necessary for calling vessels to navigate a river to a certain distance under restriction of depth, air clearance and other obstacles. In most approach channels of river ports, maintenance dredging is required periodically. There are two types of channels in terms of sea ports. In some ports, channels have been dredged in order to maintain the required dimensions and in other ports, channels are naturally deep. In case of the former channels, maintenance dredging may be required. When a port intends to accommodate larger vessels, deepening and widening of the channel is generally required.

Main channels of each port are listed in the following table. Twelve ports are located along rivers: the distance from the sea to Phnom Penh Port and Palembang Port is 332 km and 111 km respectively and calling vessels to these ports have to navigate over a long distance. Most of these river ports are required to do maintenance dredging periodically.

There are 16 ports whose channel depth is less than 10m while channels of 21 ports are deeper than 12m.

Table 2.1-3 Channel of Network Ports

Port	Location (km from river mouth)	Length (m)	Depth (m)	width (m)	Maintenance Dredging
Muara	Brunei Bay	4,800	13.0	180	unnecessary
Phnom Penh	Mekong River (332)	322,000	4.2	-	necessary
Sihanoukville	Kompong Som Bay	1,000	9.5	125	-
Belawan	Belawan River (13.5)	22,224	8.7	-	necessary
Dumai	Malacca Strait	101,860	16.0	255	unnecessary
Tanjung Priok	Jawa Sea	-	14.0	125	necessary
Palembang	Musi River (111)	111,120	3.7	150	necessary
Panjang	Lumpung Bay	2,000	13.0	200	unnecessary
Pontianak	Kapis Kecil River (11)	11,112	4.0	60	necessary
Tanjung Perak	Madura Strait	44,448	9.5	100	necessary
Tanjung Emas	Java Sea	4,000	10.0	200	necessary
Banjarmasin	Balito River (15)	15,000	8.0	138	unnecessary
Makassar	Makassar Strait	3,704	16.0	150	-
Balikpapan	Balikpapan Bay	22,224	13.0	150	-
Bitung	Lembah Strait	14,484	16.0	800	necessary
Sorong	Dampiem Strait	5,556	20.0	500	unnecessary
Jayapura	Pacific Ocean	2,963	27.0	500	unnecessary
Port Klang	Malacca Strait	8,000	15.0	365	necessary
Penang	Malacca Strait	18,520	11.0	182	necessary



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Kuching	Sarawaku River (31)	-	4.9	-	unnecessary
Bintulu	South China Sea	5,600	16.0	240	necessary
Kota Kinabalu	South China Sea	-	-	-	-
Sandakan	Sulu Sea	-	7.3	-	unnecessary
Johore	Johore Strait	-	12.5	-	-
Tanjung Pelepas	Pulai River (at the mouth)	12,600	16.0	420	-
Kuantan	South China Sea	4,800	13.0	220	necessary
Kemaman	South China Sea	11,000	18.0	300	-
Yangon	Yangon River (32)	62,000	9.0	600	necessary
Thilawa	Yangon River (16)	-	-	-	necessary
Kyaukphyu	Bangal Bay	-	24.0	-	-
Manila	Manila Bay	4,850	12.0	1,852	-
Batangas	Batangas Bay	-	-	350	-
Subic Bay	SubicBay	1,000	47.0	800	unnecessary
Cebu	Bohol Strait	-	9.1	-	unnecessary
Iloilo	Iloilo Strait	1,852	8.7	1,400	necessary
Cagayan de Oro	Macajalar bay	-	-	-	unnecessary
Davao	Pakiptan Strait	2,700	31.1	370	unnecessary
General Santos	Sarangani Bay	33,000	-	16,000	unnecessary
Zamboanga	Basilan Strait	7,000	62.0	1,800	-
Singapore	Singapore Strait		16.0		-
Bangkok	Chao Phraya River (26)	18,000	8.5	150	necessary
Laem Chabang	Gulf of Thailand	4,500	16.0	400	-
Songkhla	Gulf of Thailand	4,000	9.0	120	-
Ho Chi Minh	Sai Gon River (85)	85,000	8.5	-	Necessary
Hai Phong	Cam River	36,000	7.5	100	necessary
Da Nang	Da Nang Bay	6,300	10.0	110	-
Cai Lan	Ha Long Bay	34,500	10.0	130	-

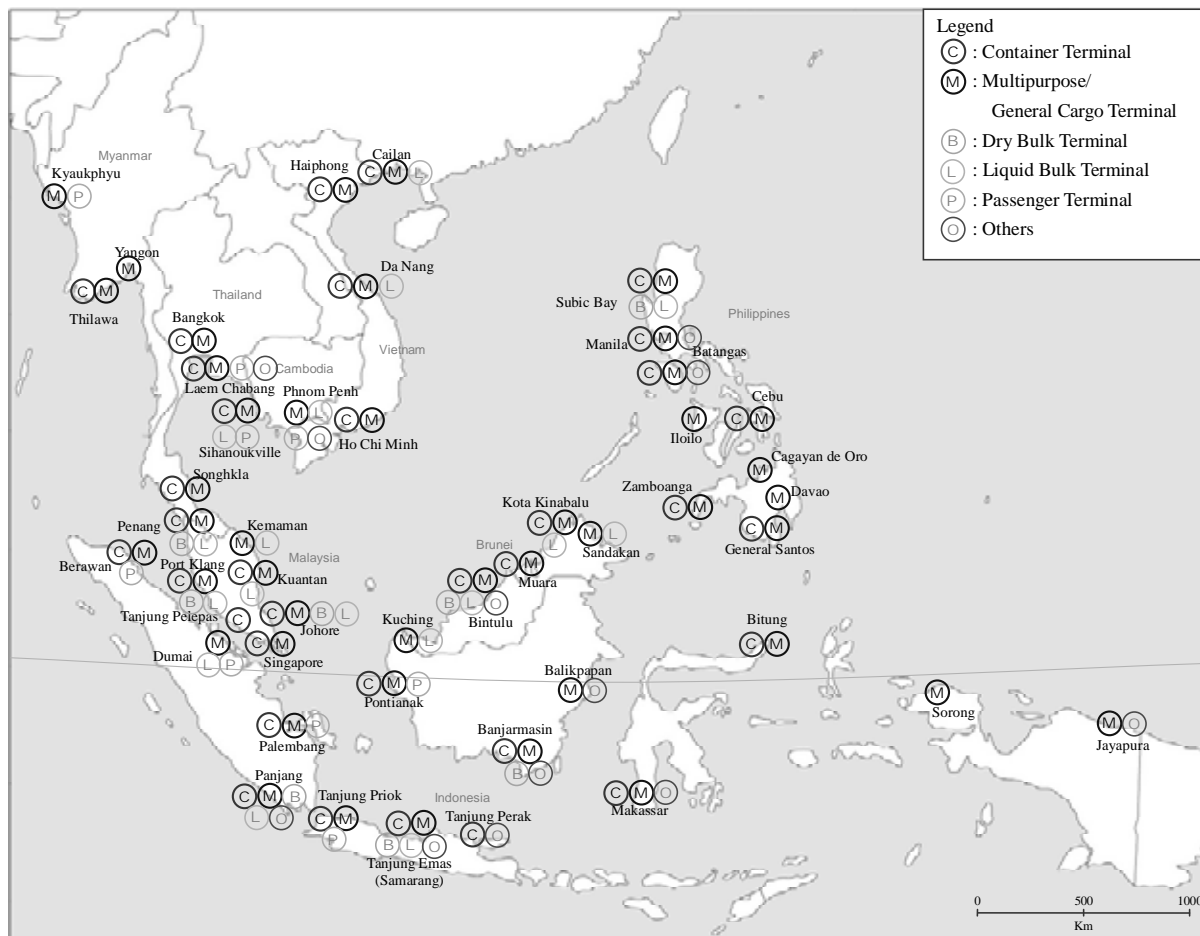
From the answers to the questionnaire in the study on Guidelines for Assessing port development Priorities including Acceptable Performance Levels in ASEAN and the study on the Guidelines for Assessing Port development Priorities including Acceptable Performance Levels in ASEAN (Feb. 2010)

Terminals

Types of terminal located in each port are summarized in Figure 2.1-5. This figure is drafted based on the answers to the questionnaire in the study on Guidelines for Assessing port development Priorities including Acceptable Performance Levels in ASEAN. The answers focused mainly on public terminals though there may be terminals other than those in the answers under private management. Almost all network ports handle containers. Dedicated or zoned container terminals are located in 32 ports but in 11 ports container cargo is handled in multipurpose terminals.



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From the answers to the questionnaire in the study on Guidelines for Assessing port development Priorities including Acceptable Performance Levels in ASEAN

Figure 2.1-5 Terminals of ASEAN Network Ports

Port Procedure

ASEAN member countries agreed on the establishment of the ASEAN Single Window in February 2005. This agreement aims at formulating uniform trade documentation and procedures and enables member countries to exchange information on the same platform. All authorities related to foreign trade are expected to finish their examination based on the unified format by the time of customs clearance. The timeline for the introduction of the single window was agreed to be 2008 by Brunei Darussalam, Indonesia, Malaysia, the Philippines, Thailand and Singapore while Cambodia, Laos, Myanmar and Vietnam will adopt it by 2012. It is also agreed that the single window shall be operated based on international standard documentation and IT system.

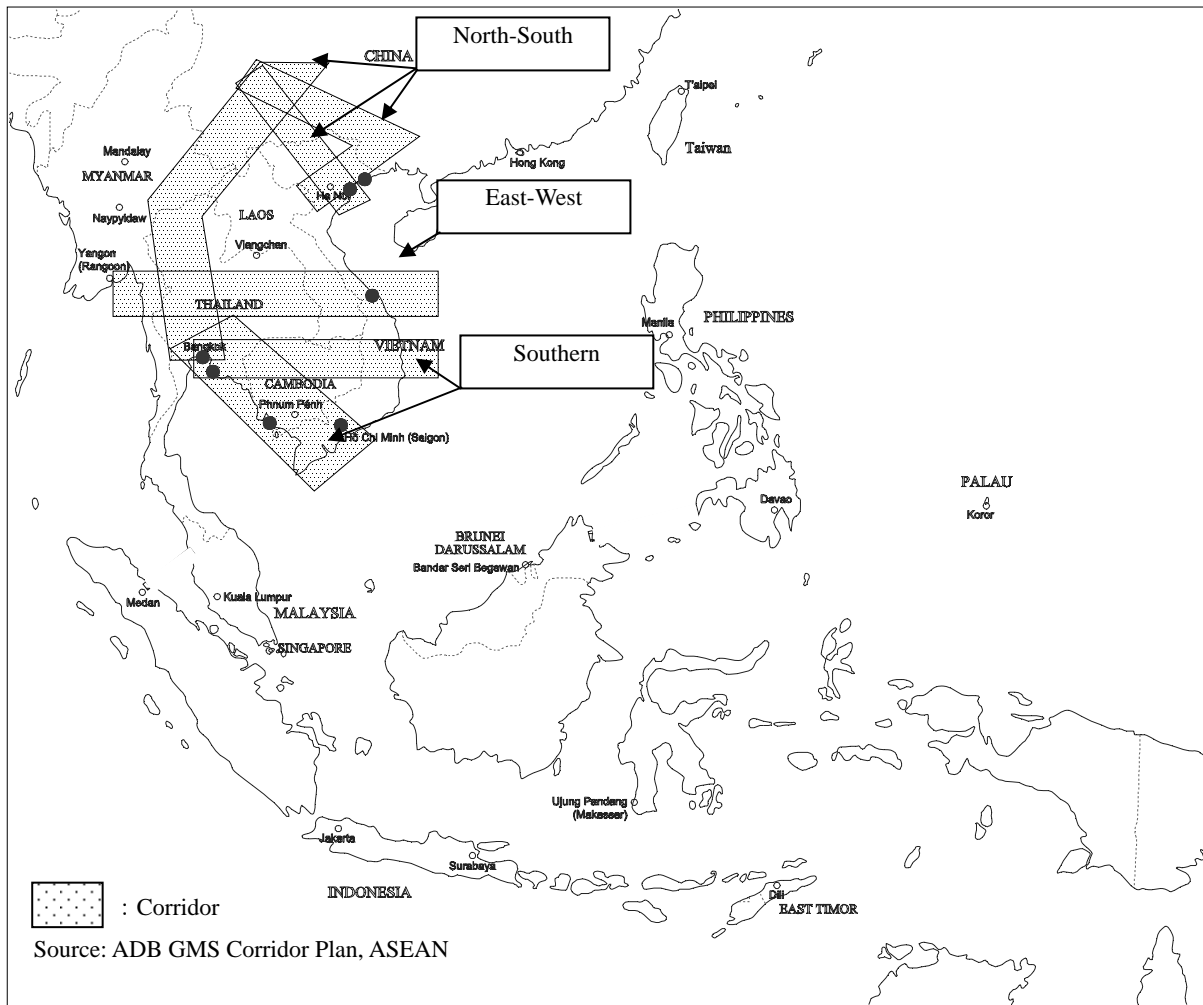
Aiming at harmonious international maritime transport, the Convention on Facilitation of International Maritime Traffic (FAL) was concluded in 1965. Among ASEAN countries, Indonesia, Singapore, Thailand and Vietnam have already ratified the FAL convention.

Access from/to ports in hinterlands

There are three regional corridor plans in the Greater Mekong sub region, namely, East-West Corridor, North-South Corridor, and Southern Corridor. Seamless connection with transportation networks of roads, railways and inland waterways including these corridors in the hinterlands is required.



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Source: The study on the Guidelines for Assessing Port development Priorities including Acceptable Performance Levels in ASEAN (Feb.2010)

Figure 2.1-6 Greater Mekong sub region Corridor Plan

2.1.2 Utilization of Guidelines for Acceptable Port Development Priorities

This study will be conducted by making the maximum use of the guidelines for acceptable port development priorities (hereinafter referred to as “the guidelines”) which were results of the benchmark study.

In prescreening projects from the long list of projects to the short list of projects, a method for initial evaluation which was proposed in the benchmark study will be basically used. The original checklist for initial assessment was partially revised considering ease of obtaining data and simplicity of evaluation.

In the study on Measure 7 which was carried out by the Korean study team, a performance estimate model proposed in the benchmark study was used to estimate the demand forecast and capacity of some container terminals. In this study, possible handling capacity will be estimated by using the proposed model in case of a container terminal to be developed.

Furthermore, a standard of the acceptable capacity for a conventional terminal, dry bulk/liquid bulk terminal and RO-RO terminal were also proposed, and thus these are used in this study if needed.

A characteristic feature of ports in ASEAN region is that many ports are located along the



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coastal area with a gently shelving bottom or in the vicinity of a river mouth, and thus securing the water depth is a common issue. Basic ideas for the water depth and width of a channel necessary to secure safe navigation for approaching vessels are indicated in the guidelines. In the study, implementing efficiency of channel deepening projects is evaluated based on the guidelines.

Consideration of the roles in line with ASEAN regional corridor plans for the purpose of strengthening regional linking within ASEAN region is a key factor in examining port development priorities. Three regional corridor plans are proposed in the Great Mekong sub region and great efforts are being made to realize the plan. Maritime routes connecting gateway ports of island nations to other gateway ports also have an important role in forming the ASEAN economic community. Therefore, consideration on maritime routes of island nations shall be paid attention when evaluating port development priorities.

Smoothness, simplification and standardization of port related procedures are pressing issues, and thus the introduction of an IT system and single window for port documentation is important for enhancing the performance of port operation. Taking into account the importance of introducing electronic port documentation and single window which was indicated in the benchmark study, introduction of a port EDI system shall be given a high priority as an urgent issue to be responded to accordance with the acceptance level of each country in this study.

The ASEAN 47 network ports include both world class transshipment ports and ports which contribute to the local economy. Therefore, the benchmark study proposed that types of ports be classified into five types and performance level of development and operation should be set up by types of port. Full consideration in this study shall be paid to the types of ports when evaluating project priorities.

2.2 Cargo Demands and Capacities of Network Ports

2.2.1 Demand Forecast

(1) Outline of Forecast Method in Measure 7

In Measure 7 of ASEAN Maritime Roadmap Study, cargo demands of network ports were forecasted to identify areas in need of improvement. An outline of the forecast is given below.

- ① The targets are container cargo and break bulk cargo.

Most liquid cargo such as crude oil and palm oil and dry bulk cargo such as coal belong to particular cargo owners. These owners sometimes have their own port facilities and handle their cargo by themselves. Only cargoes handled in public berths are treated in the forecast. Therefore, container cargo and dry bulk cargo are the targets. In particular, container cargo is rapidly increasing in ASEAN and new container facilities are required in many ports.

- ② The demand in a country is divided into ports.

At first the entire demand in each country is forecasted. Then the demand is divided into the ports of each country. The reason is that it is difficult to get data in common formats for all network ports.

Gaps between the demands and capacities are analyzed for ports rather than berths. One reason is that data for berth analysis are not available. Another reason is that berth allocations are flexible in some ports and thus a port based forecast is better than a berth based forecast.



- ③ Target years are 2010, 2015, and 2020.

Forecast periods for the development of port facilities are sometimes as long as 20 years. But in this study the period is 10 years due to the fact that the economic situation in and around ASEAN is changing rapidly and that reliable data for the forecast are available in the last 10 years.

- ④ Break bulk cargo volumes are estimated from container cargo volumes.

Data of break bulk cargo are insufficient compared to those of container cargo. Therefore, container cargo volume is forecasted at first, and then bulk cargo volume is forecasted based on the container cargo volume.

(2) Method of cargo volume forecast in Measure 7

Cargo handled in ASEAN ports are 1) cargo departing from /arriving to ASEAN countries and 2) T/S (transshipment) cargo. It is assumed that T/S cargo is handled in Singapore Port, Tanjung Pelpas Port, and Klang Port due to past volumes, data availability, and the reliability of a forecasting method.

Step 1 Total cargo volume in ASEAN

In Step 1, the sum of 1) cargo volumes that are departing from /arriving to ASEAN countries and are not transshipped in ASEAN ports (Non-T/S) and 2) cargo volumes that are departing from /arriving to ASEAN countries and are transshipped in ASEAN ports (Intra-T/S) is calculated.

A regression equation is used for the forecast. The independent variables are population and GDP of ASEAN. The source of population and GDP is World Economic Outlook 2010 (IMF). The source of cargo volumes is statistics and data from member countries.

According to the forecast, the sum of Non-T/S and Intra-T/S is 90,663 thousand TEU in 2020.

Step 2 Extra-T/S cargo volume

In Step 2, cargoes that are transshipped in an ASEAN port and whose origin/destination is not ASEAN is forecasted (Extra-T/S). The independent variable is world GDP excluding ASEAN GDP.

The Extra-T/S are mostly handled in Singapore Port, Tanjung Pelpas Port, and Klang Port. The cargo volume for the forecast is the sum of Extra-T/S in these three ports.

Extra-T/S volume is forecast to reach 40,840 thousand TEU in 2020.

Step 3 Non-T/S cargo in each country

In Step 3, Non-T/S in ASEAN countries (nine countries) are forecasted using regression equations. The independent variables are population, GDP, and trade amount of each country.

Non-T/S volume is forecast to reach 74,339 thousand TEU in 2020.

Step 4 Cargo volume of each country

At first, the difference of cargo volume in Step 1 and the sum of cargo volume in Step 2 is calculated. This volume is Intra-T/S. Then, Extra-T/S in Step 2 is added to Intra-T/S. The total T/S is 57,164 thousand TEU in 2020. This volume is distributed to Singapore Port, Tanjung Pelpas Port, and Klang Port.

Finally sum of T/S volume and Non-T/S volume in each country is calculated.



Step 5 Allocation to ports

Container volume in each country calculated in Step 4 is allocated to each port based on trend, governmental policy, and professional opinions. For example, governmental policy calls for the future volume in Bangkok Port to stay at 2006 levels to avoid traffic congestion in the city. Therefore, future volume in Bangkok Port is set to 2006 levels and the increment is allocated to Laem Chabang Port.

Step 6 Cargo volume per container and ratio of containerization

Break bulk cargo volume is calculated based on cargo volume (MT) in 1TEU and containerization ratio. These parameters are forecasted in each country because it is difficult to forecast these parameters in each port.

Step 7 Break bulk cargoes in each port

Container cargo in each port calculated in Step 5 and parameters calculated in Step 6 are used to estimate break bulk cargoes in each port.

Container cargo volume (TEU) in each port and container cargo volume (MT) per TEU are used to calculate containerized cargo volume (MT). This volume is divided by the containerization ratio to obtain the total cargo volume (Container + Break bulk). And then the container cargo volume (MT) is subtracted, thereby yielding the break bulk cargo volume.

(3) Demand forecast in Measure 8

Demand forecast in Measure 7 is mentioned above. It is necessary to take note that there is a problem in that the data and information are insufficient to make an accurate forecast.

(Container cargo)

It is desirable that the container cargo volume in a port is forecasted directly. But due to the lack of information, the cargo volume is forecasted for a country, and then allocated to each port. The allocation is based on trends and professional opinions.

(Break bulk cargo)

Generally, total volume of container and non-container break bulk is forecasted first, and then divided them into container and break bulk. But in Measure 7, the container volume is calculated first, and then break bulk volume is estimated. The parameters for the estimation are rough, and thus the forecast will not yield precise results.

Forecast in Measure 7 is conducted in the circumstances where data is insufficient and inconsistent in ASEAN. It is strongly desired that a well-arranged database be developed. But in Measure 8, project specifications are at an early stage. For this purpose, even a rough forecast is useful. Therefore the forecast in Measure 7 is used in Measure 8.

2.2.2 Result of Demand Forecast in Measure7

(1) Container Cargo

Table 2-1 is the result of the forecast of container cargo in Measure7. Table 2-1 is the result of the forecast of container cargo.



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Table 2.2-1 Demand Forecast of Container Cargo

(Unit:000TEU)

Country	Port	Demand in 2008	Forecast		
			2010	2015	2020
Brunei	Muara	100	120	135	157
Cambodia	Phnom Penh	48	58	125	244
	Sihanoukville	259	256	344	456
Indonesia	Balikpapan	87	88	144	201
	Banjarmasin	252	255	419	585
	Belawan	590	609	1,044	1,526
	Bitung	79	80	131	184
	Dumai	-	5	8	12
	Jayapura	43	43	71	99
	Makassar	349	385	784	1,359
	Palembang	78	83	150	231
	Panjang	104	104	171	239
	Pontianak	131	120	152	165
	Sorong	-	4	7	10
	TanjungEmas	375	374	613	857
	TanjungPerak	2,213	2,242	3,678	5,141
	TanjungPriok	3,935	3,864	5,861	7,575
Malaysia	Bintulu	290	299	433	613
	Johor	935	856	920	967
	Kemaman	0	0	0	0
	Klang	7,974	8,123	11,422	15,686
	KotaKinabalu	194	336	474	668
	Kuantan	127	133	199	292
	Kuching	291	315	383	466
	Penang	918	866	996	1,122
	Sandakan	40	45	82	147
	TanjungPelapas	5,600	6,143	9,680	14,900
Myanmar	Kyaukphyu	-	0	0	0
	Thilawa	38	51	97	157
	Yangon	226	217	254	277
Philippines	Batangas	0.5	1	3	5
	CagayanDeOro	150	156	216	277
	Cebu	496	503	622	734
	Davao	349	355	444	524
	GeneralSantos	114	118	162	203
	Iloilo	82	84	108	136
	Manila	3,039	3,025	3,570	4,008
	SubicBay	29	35	65	117
Zamboanga	65	66	81	92	
Singapore	Singapore	29,918	29,697	37,512	45,299
Thailand	Bangkok	1,461	1,390	1,454	1,481
	LaemChabang	5,240	5,282	7,505	10,382
	Songkhla	140	140	171	203
Vietnam	CaiLan	102	89	109	116
	DaNang	62	76	143	213
	Hai Phong	1,399	1,422	2,552	4,002
	HoChiMinh	3,434	3346	5,141	7,001

Source: Final Report of Measure No.7



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(2) Break Bulk Cargo

Forecast of Break bulk cargo is based on rough assumptions, and reliability is low compared to that of container cargo. Table 2-2 is the result of the forecast of break bulk cargo.

Table 2.2-2 Demand Forecast of Break Bulk Cargo

(Unit:000MT)

Country	Port	Demand in 2008	Forecast		
			2010	2015	2020
Brunei	Muara	494	568	688	848
Cambodia	Phnom Penh	NA	38	56	83
	Sihanoukville	287	281	417	614
Indonesia	Balikpapan	111	103	119	125
	Banjarmasin	1,114	1,073	1,377	1,599
	Belawan	14,973	14,214	17,595	19,706
	Bitung	529	597	1,140	1,970
	Dumai	617	596	772	905
	Jayapura	258	238	276	289
	Makassar	1,358	1,465	2,492	3,838
	Palembang	NA	0	0	0
	Panjang	1,816	1,898	2,991	4,265
	Pontianak	1,450	1,348	1,581	1,678
	Sorong	850	793	938	1,005
	TanjungEmas	1,660	1,479	1,561	1,492
	TanjungPerak	4,173	3,993	5,043	5,764
	TanjungPriok	9,155	8,939	11,868	14,258
Malaysia	Bintulu	2,095	3,274	4,796	7,025
	Johore	2,406	2,297	3,044	3,805
	Kemaman	372	372	556	783
	Klang	9,072	8,796	12,107	15,724
	KotaKinabalu	1,331	1,336	1,419	1,485
	Kuantan	1,712	1,389	1,224	1,017
	Kuching	563	1,005	733	535
	Penang	1,555	1,262	1,114	928
	Sandakan	454	507	995	1,839
	TanjungPelapas	NA	0	0	0
Myanmar	Kyaukphyu	NA	23	31	37
	Thilawa	426	538	695	841
	Yangon	1,266	1,296	1,569	1,489
Philippines	Batangas	339	343	401	447
	CagayanDeOro	1,019	943	1,103	1,228
	Cebu	21,391	21,172	24,761	27,578
	Davao	73	114	134	149
	GeneralSantos	192	200	234	261
	Iloilo	852	857	1,002	1,117
	Manila	3,144	3,029	3,542	3,945
	SubicBay	1,222	1,200	1,403	1,563
Zamboanga	650	714	835	930	
Singapore	Singapore	27,935	28,341	37,725	47,870
Thailand	Bangkok	2,179	2,129	2,712	3,387
	LaemChabang	2,731	2,668	3,400	4,246
	Songkhla	296	289	368	460
Vietnam	CaiLan	102	301	5341	833
	DaNang	1,997	1,894	2,822	3,702



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	Hai Phong	10,518	10,207	16,122	22,424
	HoChiMinh	1,221	1,170	1,787	2,405

Source: Final Report of Measure No.7

2.2.3 Optimal Handling Capacity

(1) Container Cargo

Handling capacity is calculated by UNCTAD's model that is commonly used to calculate container handling capacity. This model basically uses crane capacity and parameters that reflect terminal conditions (throughput, number of berths, depth of a berth, others)

This calculation is theoretical and produces an ideal estimation based on the existing handling facilities. Real situation (such that a crane is not used due to yard congestion) is not considered.

$$\text{Handling Capacity} = C \times A \times W \times E \times U$$

where, C: Number of quay cranes (incl. mobile crane on a quay)
 A: Annual working hours
 (= Annual working days \times average working hours in a day)
 W: Crane working ratio
 (= Berth occupancy rate \times berth movement coefficient
 \times crane operation coefficient)
 E: Crane operation efficiency
 (= Crane's designed capacity \times crane operation loss
 \times interference coefficient)
 U: Unit conversion factor (BOX \rightarrow TEU)
 (UNCTAD, Port development, 1985)

(2) Break Bulk Cargo

Handling capacity of break bulk cargo is also calculated by UNCTAD's commonly used model. This model basically uses handling capacities of each berth. This model also uses parameters that reflect terminal conditions. This calculation is also theoretical and produces an ideal estimation based on the existing handling facilities. Real situation is not considered.

$$\text{Handling Capacity} = B \times S \times \sum P_i \times H \times D \times O \times R$$

where, B: Number of Berths
 S : Handling Ability per hour per ship (ton/ship/hr)
 P_i : Occupancy Rate of Cargo i (= 1 ; because data is insufficient)
 H : Operating Hours in a Day
 D : Annual Operating Days
 O : Berth Occupancy Ratio
 R : Co-efficient for Operation
 (UNCTAD, Port development, 1985)

2.2.4 Results of Estimation of Optimal Handling Capacity

Table 2-3 is the handling capacity of each network port in 2008 estimated in Measure 7.



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Table 2.2-3 Handling Capacity Estimation in 2008

Country	Port	Current Capacity	
		Container (000TEU)	Break bulk (000MT)
Brunei	Muara	111	709
Cambodia	Phnom Penh	73	98
	Sihanoukville	195	290
Indonesia	Balikpapan	100	197
	Banjarmasin	305	1,004
	Belawan	984	23,361
	Bitung	81	2,032
	Dumai	-	730
	Jayapura	24	197
	Makassar	543	2,409
	Palembang	94	-
	Panjang	139	2,007
	Pontianak	153	1,430
	Sorong	30	700
	TanjungEmas	381	1,642
	TanjungPerak	1,804	4,980
	TanjungPriok	5,805	10,977
Malaysia	Bintulu	344	3,613
	Johor	1,060	3,613
	Kemaman	-	492
	Klang	8,895	11,402
	KotaKinabalu	270	2,275
	Kuantan	335	1,594
	Kuching	360	1,317
	Penang	1,004	2,409
	Sandakan	47	1,198
	TanjungPelapas	7,218	-
Myanmar	Kyaukphyu	-	197
	Thilawa	122	967
	Yangon	301	1,752
Philippines	Batangas	104	730
	CagayanDeOro	154	2,195
	Cebu	270	26,408
	Davao	333	358
	GeneralSantos	205	668
	Iloilo	112	894
	Manila	2,789	5,006
	SubicBay	207	3,065
Singapore	Zamboanga	48	1,517
	Singapore	33,465	37,581
Thailand	Bangkok	1,786	3,512
	LaemChabang	6,890	4,052
	Songkhla	145	303
Vietnam	CaiLan	152	492
	DaNang	104	2,628
	Hai Phong	2,221	11,020
	HoChiMinh	3,355	4,941

Source: Final Report of Measure No.7



2.3 Routes in Network Ports

2.3.1 Transport Capacity in Each Link

(1) Transport Capacity of Vessels

An analysis of vessel sizes which call at network ports is conducted. The target vessels are container vessels on container routes. Bulk vessels are also important in ASEAN ports, but data on bulk vessels are insufficient for analysis.

The analysis of container routes is based on MDS Transmodal – Containership Bank (2007). Sizes of container vessels (TEU) on each route are summed up for one year. The MDS Transmodal does not include data on size for some vessels. In these cases, vessel sizes are derived from Containerization International Yearbook.

Table 2.3-1 shows the transport capacity of container vessels departing from each port. Singapore Port and Klan Port, which are world class hub ports, are called at by large vessels on trunk lines. These ports handle many T/S cargos. Major ports of each country follow those ports.

Table 2.3-1 Annual Container Transport Capacity

	Port of Departure	TEU/Year
1	Singapore	19,749,900
2	Port Klang	10,930,777
3	Laem Chabang	5,795,518
4	Tanjung Pelepas	5,739,800
5	Tanjung Priok (Jakarta)	3,717,982
6	Bangkok	2,566,786
7	Ho Chi Minh	1,887,536
8	Tanjung Perak (Surabaya)	1,885,747
9	Manila	1,509,426
10	Penang	1,463,464
11	Semarang	765,908
12	Belawan	756,770
13	Hai Phong	405,779
14	Da Nang	369,304
15	Makassar	304,918
16	Kota Kinabalu	252,324
17	Kuching	236,052
18	Songkhla	233,064
19	Davao	230,262
20	Kuantan	229,140
21	Sihanoukville	224,744
22	Bitung	201,594
23	Cagayan de Oro	189,644
24	Muara	185,788
25	Cebu	179,912
26	Subic Bay	154,856
27	Yangon	138,180
28	Panjang	136,500
29	General Santos	123,552
30	Bintulu	122,092
31	Banjarmasin	113,525
32	Cai Lan	109,096
33	Iloilo	61,100
34	Jayapura	52,416
35	Sorong	52,416
36	Pontianak	48,828



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37	Zamboanga	43,280
38	Sandakan	35,724
39	Palembang	34,944
40	Johore Bahru	10,816
41	Phnom Penh	0
42	Dumai	0
43	Balikpapan	0
44	Kemaman	0
45	Thilawa	0
46	Kyaukphyu	0
47	Batangas	0

Source: MDS Transmodal – Containership Bank (2007)

(2) Transport Capacity of Links

Table 2-3-2 lists the transport capacity of each link. Port Types are described below.

Type 1

World class hub ports used for the transshipment of long distance trunk liner services are required to handle several thousand TEUs in 24 hours. Dwelling time of a container in transshipment port is shorter than origin-destination ports and a transshipment container is counted two times in container throughput. Consequently the berth performance is usually higher than the other type terminals. Therefore, world class hub ports with the high ratio of transshipment are classified as Type 1.

Type 2

World class ports serving as a main gateway to their country are classified as Type 2. Ports in this class are mainly origin-destination ports and their transshipment cargo ratio is not so high. Type 2 ports may be required to accommodate Over Panamax container ships with a capacity of 6,000-8,000 TEUs.

Type 3

Large scale ports used for inter regional container shipping services are classified as Type 3, where liner services in the Asia region or between the Middle East are dominant. Ports in this class may be required to accommodate container ships up to 2,500-4,000TEU and achieve a fairly high berth productivity.

Type 4

Small scale ports used for intra regional container shipping services are categorized as Type 4. Ports in this class are sometimes located in rivers and have restrictions on the draft and/or length of calling ships. Type 4 ports may be required to accommodate container ships up to 2,000-2,500 TEUs.

Type 5

Small scale ports/terminals for coastal shipping and/or sub-regional services are categorized as Type 5. Ports in this class do not have a dedicated container berth and use general cargo berth or multi-purpose berths for container handling. Productivity of container handling, therefore, remains at a low level. Type 5 ports may have difficulties in port facilities and operation, so it is necessary to study the needs for improvement carefully.

A Type 1 Port is a hub port where large vessels in trunk lines call. The demand of the port is not only demand to/from the region but also T/S cargo. Links between Type 1 Ports have special characteristics, and therefore, these links are excluded in Table 2.3-2.

Table 2.3-2 shows that links between Type 1 and Type 2 have large transport capacity, which means



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these links have strong connections. Type 2 Ports handle a large volume of regional demand. Some trunk lines call at Type 2 Ports and feeder lines to/from Type1 Ports connect to Type2 Port.

This table includes some Type 3 Ports. Bangkok Port was once a Type 2 Port but is now Type 3 due to the ascension of Laem Chabang Port. Type 3 Ports are regional ports that are located in regional economic centers. Type 3 Ports have feeder routes to/from Type 1 or Type 2 Ports. Tanjung Perak (Surabaya) and Tanjung Emas (Semaran) connect to Tanjung Priok (Jakarta) and Singapore

Some Type 4 Ports such as Belawan and Kuntan are also connecting to Type 1 Ports and Type 2 Ports.

Table 2.3-2 Container Transport Capacity of Each Link

	Departure		Arrival		Capacity TEU/Yr
	Type	Name	Type	Name	
1	2	LAEM CHABANG	1	SINGAPORE	2,654,952
2	1	SINGAPORE	2	LAEM CHABANG	2,555,424
3	3	BANGKOK	2	LAEM CHABANG	2,115,986
4	1	SINGAPORE	2	JAKARTA (TANJUNG PRIOK)	1,542,918
5	2	LAEM CHABANG	3	BANGKOK	1,504,764
6	2	JAKARTA (TANJUNG PRIOK)	1	SINGAPORE	1,287,002
7	2	HO CHI MINH CITY	1	SINGAPORE	876,204
8	1	SINGAPORE	2	HO CHI MINH CITY	833,768
9	3	PENANG	1	PORT KLANG	749,008
10	2	LAEM CHABANG	2	HO CHI MINH CITY	705,744
11	1	PORT KLANG	3	PENANG	690,612
12	2	JAKARTA (TANJUNG PRIOK)	3	SURABAYA (TANJUNG PERAK)	599,178
13	3	PENANG	1	SINGAPORE	573,300
14	1	SINGAPORE	3	BANGKOK	560,082
15	1	PORT KLANG	2	JAKARTA (TANJUNG PRIOK)	557,388
16	1	SINGAPORE	3	SURABAYA (TANJUNG PERAK)	541,892
17	1	SINGAPORE	3	PENANG	518,596
18	3	SURABAYA (TANJUNG PERAK)	2	JAKARTA (TANJUNG PRIOK)	485,334
19	2	JAKARTA (TANJUNG PRIOK)	1	PORT KLANG	466,596
20	2	LAEM CHABANG	1	TANJUNG PELEPAS	452,400
21	1	SINGAPORE	2	MANILA	444,756
22	2	JAKARTA (TANJUNG PRIOK)	4	BELAWAN	430,136
23	1	SINGAPORE	4	KUANTAN	355,888
24	2	HO CHI MINH CITY	3	BANGKOK	350,428
25	3	SEMARANG	1	SINGAPORE	342,420
26	3	BANGKOK	1	SINGAPORE	337,728
27	3	SURABAYA (TANJUNG PERAK)	1	SINGAPORE	335,660
28	1	TANJUNG PELEPAS	2	LAEM CHABANG	327,704
29	4	BELAWAN	3	SURABAYA (TANJUNG PERAK)	322,588
30	2	MANILA	2	LAEM CHABANG	306,436
31	3	SURABAYA (TANJUNG PERAK)	3	SEMARANG	304,108
32	2	MANILA	1	SINGAPORE	288,992
33	2	LAEM CHABANG	1	PORT KLANG	280,802
34	1	SINGAPORE	3	SEMARANG	276,848
35	2	JAKARTA (TANJUNG PRIOK)	1	TANJUNG PELEPAS	268,320
36	3	SEMARANG	3	SURABAYA (TANJUNG PERAK)	267,488
37	1	PORT KLANG	4	BELAWAN	256,602
38	4	DA NANG	2	HO CHI MINH CITY	252,304
39	2	MANILA	2	JAKARTA (TANJUNG PRIOK)	237,536
40	1	PORT KLANG	2	LAEM CHABANG	230,620

MDS Transmodal – Containership Bank (2007)



2.3.2 Trend of Vessel Size

Figure 2.3-1 - Figure 2.3-5 shows the size and frequency of calling vessels

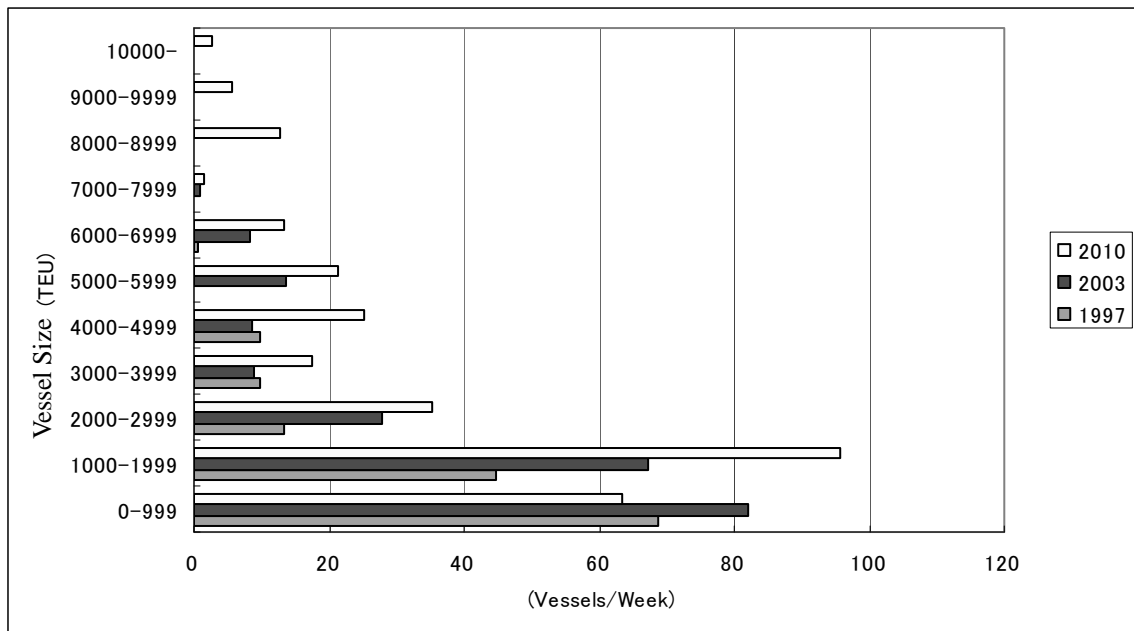
Type 1 Ports were once called by trunk lines with less than 4000TEU vessels and feeder lines with less than 1000 TEU vessels. Now, sizes of both vessels have increased. Trunk lines are more than 8000TEU and feeder lines are 1000-2000TEU/

Main sizes of Type 2 Ports used to be less than 1000TEU and 1000-2000TEU. Now calls of 1000~2000TEU are increasing. 2000~3000TEU class ships are also increasing and trunk lines with more than 5000 TEU call.

Type 3 Ports also have trends similar to Type 2 Ports. Sizes are become larger and calls are increasing.

Main size of Type 4 Ports and Type 5 Ports are less than 2000TEU, but here also vessels sizes are increasing.

Based on these trends, even Type 5 Ports need container facilities that can accommodate 2000TEU class vessels.

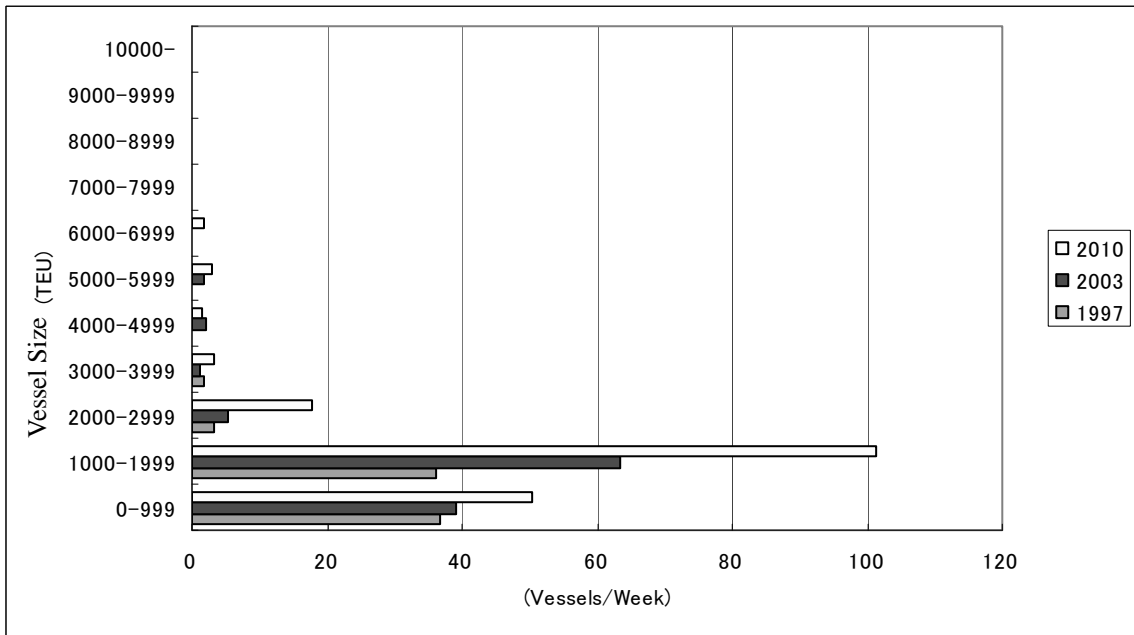


Source : Prepared from the Containership Database: MDS Transmodal Containership Databank, May 2010

Figure 2.3-1 Calling Frequency of Container Vessels (Type 1 Ports)

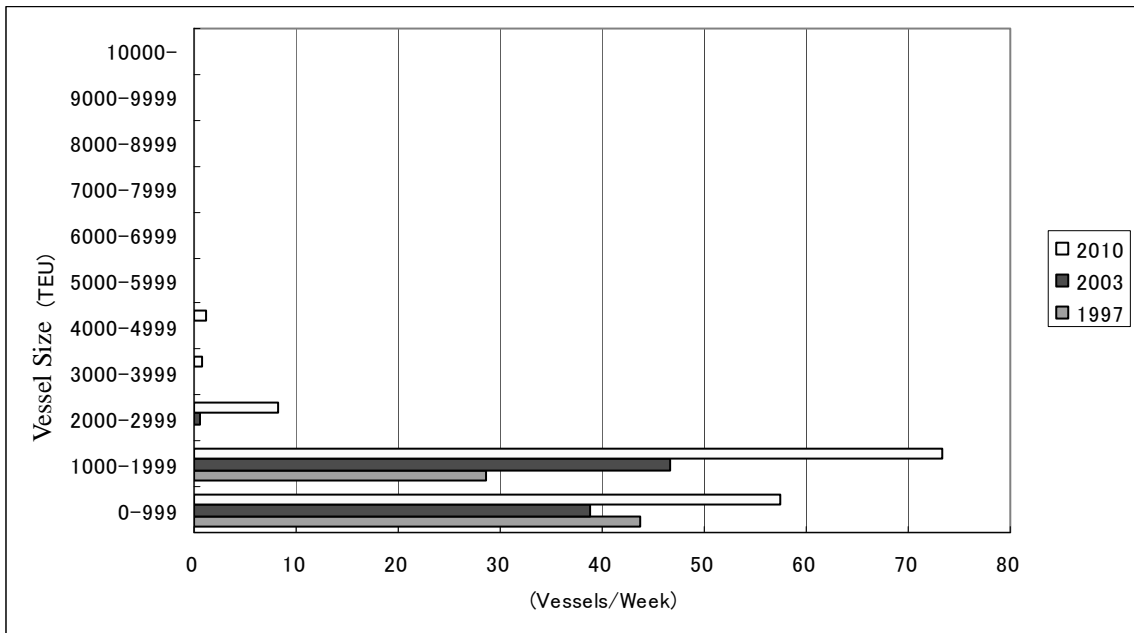


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Source : Prepared from the Containership Database: MDS Transmodal Containership Databank, May 2010

Figure 2.3-2 Calling Frequency of Container Vessels (Type 2 Ports)

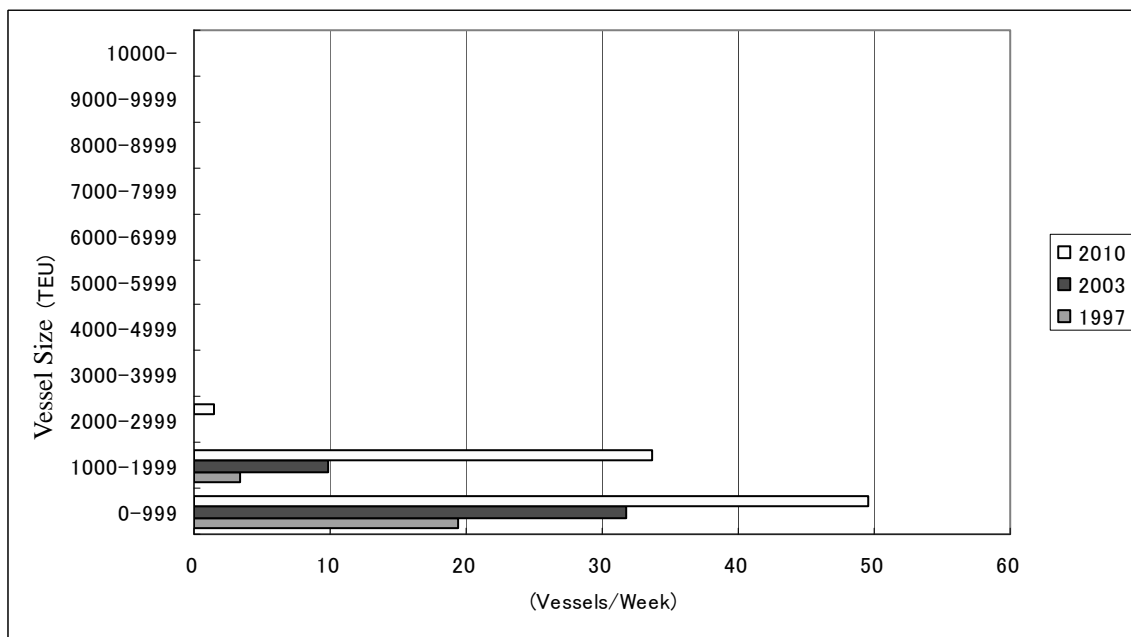


Source : Prepared from the Containership Database: MDS Transmodal Containership Databank, May 2010

Figure 2.3-3 Calling Frequency of Container Vessels (Type 3 Ports)

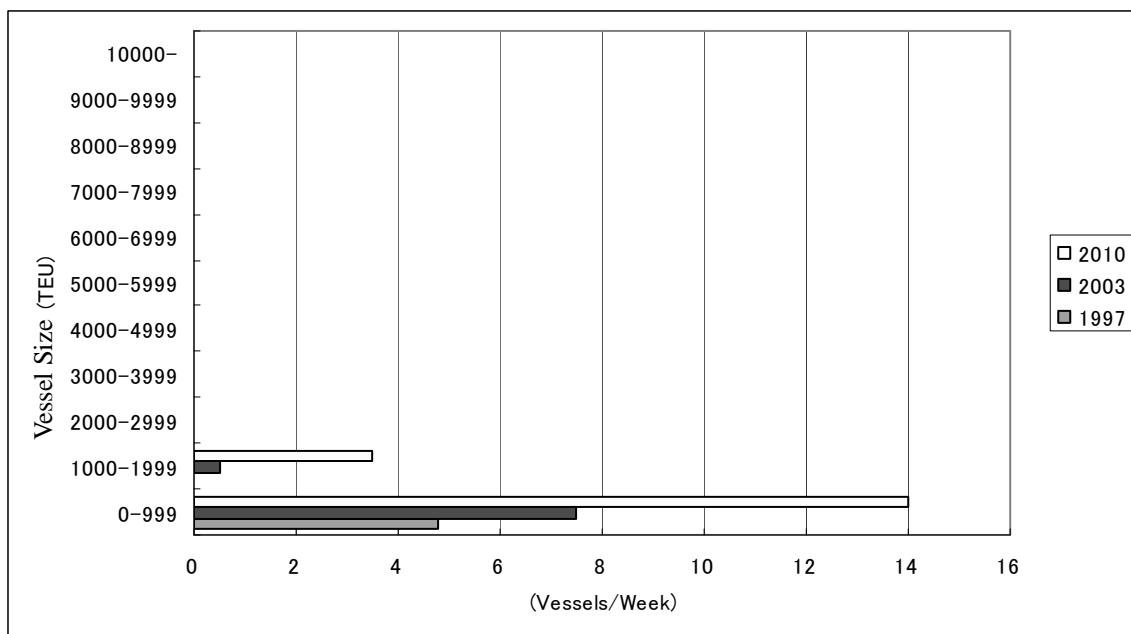


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Source : Prepared from the Containership Database: MDS Transmodal Containership Databank, May 2010

Figure 2.3-4 Calling Frequency of Container Vessels (Type 4 Ports)



Source : Prepared from the Containership Database: MDS Transmodal Containership Databank, May 2010

Figure 2.3-5 Calling Frequency of Container Vessels (Type 5 Ports)



2.4 Issues of ASEAN network ports

2.4.1 Examination of Issues

It is necessary to grasp the overall issues currently faced by ASEAN network ports when we examine the priority of projects. In the report of the study on Measure 7, future cargo volume in 2015 and 2020 of each ASEAN network port is forecasted and the relation between the cargo volume and capacities of port facilities are analyzed. Based on the result of this analysis and information on development plans of ASEAN network ports, the improvement areas of each port are also recommended in the report.

The issues which ASEAN network ports face or will face in the near future are examined based on the improvement areas which are shown in the report of the study on Measure 7 as well as other information including that which the JICA study team collected in the study on Measure 6 at each port. Conditions of terminals, channels and navigation, access to ports and port management and procedure influence the capacity of a port. Issues of ASEAN network ports are classified into four categories: channels and navigation, container terminals, non-container terminals, transport from/to ports and port management/procedure. The concept of the examination process is shown in Figure 2.4-1.

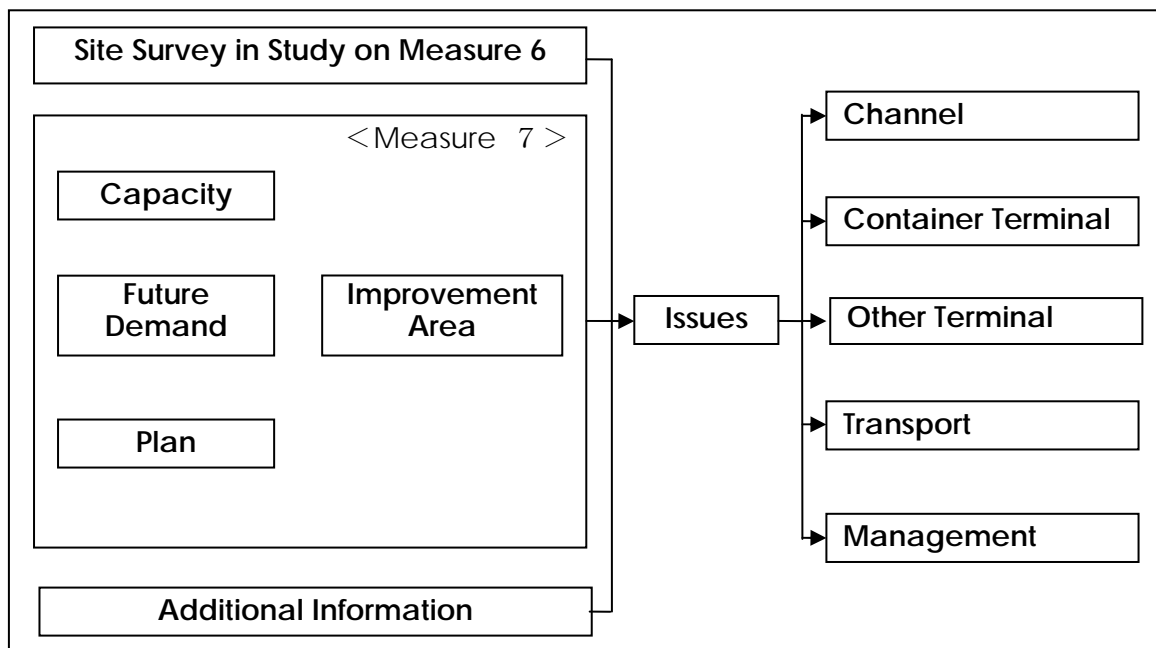


Figure 2.4-1 Concept of Examination Process

2.4.2 Issues of ASEAN Network Ports

All ASEAN network ports have various issues which are expected to be solved by physical (hard factors) or non-physical (soft factors) measures. The number of the ports which have problems in each category is shown by types of ports in Table 2.4-1.



Table 2.4-1 Number of Ports with Issues

Port by type	Channel/Navigation		Container Terminal		Other Terminal		Transport		Management	
	Hard factor	Soft factor	Hard factor	Soft factor	Hard factor	Soft factor	In the Vicinity	In the Hinterland	Management	Procedure
Type 1(3)	2		1		1		-		1	
	1	1	1	1	1	-	-	-	1	-
Type 2(4)	3		4		1		3		3	
	2	2	3	4	1	-	2	3	2	1
Type 3(8)	5		7		6		4		5	
	1	5	6	6	4	4	1	4	3	2
Type 4(22)	11		21		14		12		12	
	6	9	17	17	14	5	7	6	12	1
Type 5(10)	5		5		6		9		6	
	4	2	5	5	6	-	2	7	6	-
Total (47)	26		38		28		28		27	
	14	19	32	33	26	9	12	20	24	4

Thirty one twenty six (26) ports face issues related to channels/navigation. Fourteen (14) of these ports have physical problems and nineteen (19) ports have problems related to navigation. Thirty eight (38) ports face issues related to container terminals. Thirty two (32) of these ports have problems related to facilities and thirty three (32) have operational problems. There are twenty eight (28) ports which face problems of terminals other than container terminals. Twenty six (26) of these ports have problems related to facilities and nine (9) have operational problems. Twenty eight (28) ports face issues related to transport from/to ports. Twelve (12) of these ports have problems in the vicinity and twenty (20) have problems of access transport from/to the hinterlands. Port which have problems related to soft factors count twenty seven (27) and twenty four (24) of these have problems related to port management while four (4) have problems related to procedures.

Ports which are categorized in Type 1 have not so many problems. All ports of Type 2 face problems related to container terminals. Almost all ports of type 3 have problems of every category. Almost all ports of type 4 face problems related to container terminals. Almost all ports of type 5 have problems related to traffic.

Regarding issues related to channels and navigation, problems of hard factors such as location, insufficient depth/width of a channel, restriction of air clearance, sedimentation, need for a deeper channel to accommodate larger vessels etc. are observed. In order to overcome these problems, such measures as new or alternate channel development, deepening and/or widening of a channel, removal of obstacles and periodical maintenance dredging etc. should be taken.

Problems of soft factors include lack of navigational aids, insufficient navigational aid, insufficient tug service, and insufficient pilotage service etc. In order to overcome these problems, such measures as installation of buoys and light buoys, maintenance of buoys and light buoys, deployment of tug boats and enhancement of pilotage etc. should be taken.

In terms of hard factors, problems related to container terminals include mixture of container and general cargo handling, lack of dedicated use of berth, inadequate yard areas, insufficient storage areas and facilities, insufficient depth of berth, shortage of berth length, lack of quay crane, weak



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foundation for crane installation, shortage of cargo handling equipment, aging facilities/equipment, inadequate capacity to meet rapid increase of container throughput, and shortage of parking for container trucks outside of ports etc. In order to overcome these problems such measures as new container terminal development, conversion of an existing terminal to a container terminal, expansion of container berth, deepening of container berth, reinforcement of facilities, maintenance of facilities and equipment, renewal of aging facilities and equipment, expansion of container yard, improvement of storage areas, improvement of terminal gates etc. should be taken.

In terms of soft factors the following problems are identified: low productivity, idling time when passing through a gate, disorderly cargo handling in a yard, lack of yard planning, and lack of communication between ship side and terminal side etc. In order to overcome these problems, such measures as improvement of terminal operation planning, introduction of IT technology into terminal operation, enhancement of cargo handling works, automatization of gate operation, and installation of sufficient equipment etc. should be taken.

Regarding non-container terminals, problems related to hard factors include low efficiency and lack of safety owing to mixed use of terminal, inadequate terminal area, mixed traffic routes in a port, insufficient length and depth of a berth, insufficient equipment, aging facilities, lack of facilities corresponding to new demand (container, bulk, RORO, passenger, barge), difficulty of port expansion, and low cargo handling efficiency etc. In order to overcome these problems, such measures as redevelopment of existing terminal, relocation to another place, functional separation, development of a dedicated use terminal, extension of a terminal, deepening of a berth, improvement of a storage facility, installation and improvement, and maintenance or renewal of equipment and facilities etc. should be taken.

In terms of soft factors, problems include low efficiency at multi-purpose terminals, idling time in passing a gate, and additional movement of cargo in a yard, complicated traffic lines, unstable power supply, and low efficiency etc. In order to overcome these problems, such measures as installation of sufficient facilities and equipment, and improvement of terminal operation etc. should be taken.

Regarding transport to/from ports, problems in the vicinity of ports include congestion of roads, road restrictions on trucks, narrow port access road etc. In order to overcome these problems, such measures as development of access roads, and improvement of parking areas of trucks etc. should be taken.

Problems related to access to/from hinterlands include lack of trunk roads, roads/railways designed with inadequate standards, shortage of transport capacity, inconvenient transshipment to railway transport etc. In order to overcome these problems, such measures as construction/improvement of trunk roads, review of the standards to be applied, improvement of modern railway terminal and modal shift policy etc. should be taken.

Regarding port management/procedures, problems include lack of management and operation plan, insufficient communication among port related business, unmotivated operation system and policy of discouraging vitality of the private sector etc. In order to overcome these problems such measures as planning port management and operation, establishment of comprehensive port management system, port promotion policy, introduction of PPP system etc. should be taken. In terms of port procedures, problems include complicated procedures, time-consuming port procedure etc. In order to overcome these problems such measures as introduction of IT system and stable operation system should be taken.



Chapter 3. Long list of projects

3.1 Process of establishing the long list of projects

Priority projects shall be selected among the projects included in the long list by a process of an initial evaluation and identification of priority. Accordingly, preparation of the long list of projects is the most fundamental step of the study. The long list has to include all necessary projects which have a possibility to be identified as a priority project.

Every ASEAN network port faces various kinds of problems as described in 2.2.1 and must take measures in order to overcome these problems. Some ports are implementing a container terminal expansion project and some ports intend to develop a new container terminal. Some ports have a future development plan while some ports have commenced a part of the plan and seek additional funds for completing the plan. Some ports are conducting a survey on their future development needs.

Draft long list of projects was prepared based on present issues which ASEAN network ports face, future prospect of each port based on the forecasted cargo volume and changes of circumstance surrounding ports in future such as a policy newly formulated by the government or the port management body, and other information including those which were collected during the site survey conducted in the study on Measure 6. The draft was sent to each country in advance and a proposal of the projects to be included in the long list was made in the presentation from each delegation at ASEAN-JAPANMARITIME TRANSPORT WORKSHOP ON MEASURE NO 8 which was held in Hanoi on September 23 and 24 in 2010. At the workshop, exchange of opinions on the projects to be listed in the long list was made and the draft long list was revised. Each country undertook internal consultation with relevant parties on the revised long list of projects and provided their comments/inputs on it. The long list of the projects in ASEAN network ports has been finalized through the process above described (See Figure 3.1-1).

There are several projects for which information is insufficient, however, the long list is considered to include all necessary projects.

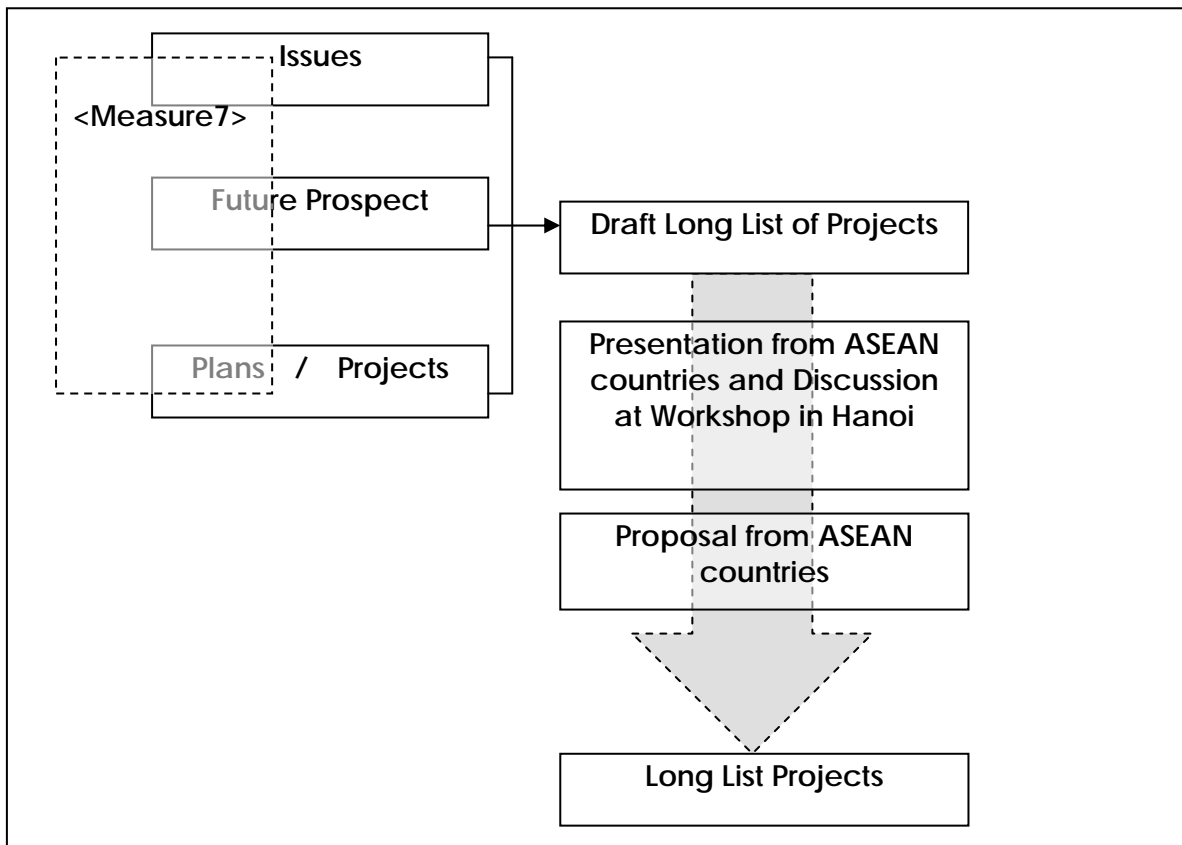


Figure 3.1-1 Concept of Process of Establishing the Long List

3.2 Long list of Projects

The long list of projects prepared through the process mentioned above is shown in Table 3.2-1. The title and purpose/background of 121 projects are shown in the list. Operational Improvement Projects are prepared for five countries not for ports and one project in the Philippines is prepared for a group of ports. It should be noted that there are several projects named as a different title or which are parts of the other projects because the information were collected from various sources.



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Table 3.2-1 Long List of Projects of ASEAN Network Port

Country	Port	Project Title	Purpose/Background	note
Brunei	Muara	Container Terminal Construction Project (Phase 1) on Pulau Muara Besar	Construction of a new container terminal (Capacity: 800,000 TEUs/year) as part of the development of Pulau Muara Besar	.
Cambodia	Phnom Penh	Construction of new Phnom Penh Container Terminal	To develop a new modern and easily accessible container port and reduce traffic congestion around the present port area	.
		Construction of new Container Terminal in Kilometer No 6 Port Phnom Penh city and Tonle Bitt Port Kampong Cham	To increase of new terminal will be connected to the development of the following activities: Special Economic Zone, Agricultural Processing Zone and Industrial Lines.	
		Redevelopment of Phnom Penh Port	To rehabilitate and reform the present multi-purpose terminal for the redevelopment of the waterfront	
	Sihanoukville	Continuous Construction of Sihanoukville Port Special Economic Zone Development Project	Goal of SEZ is supporting Phnom Penh – Sihanoukville growth corridor. Reducing the poverty of Cambodian people. Creating the private sectors. Creating around 25,000 – 30,000 jobs in Sihanoukville. Supporting the Port Autonomous of Sihanoukville as a back up service.	*
		Multi-Purpose Terminal Development	To improve the bulk cargo facilities and increase the capacity in bulk/general cargo handling and provide a wharf for oil supply base	.
		Enhancement of Container Handling Productivity	To improve the productivity of container operation through the installation of additional cargo handling equipment and quay cranes, and united IT system	
		M/P study for the development of a new container terminal	M/P study for the development of a new container terminal	
		Transfer the old jetty to Passenger terminal	–	
		SEZ Development Project (Phase II)	–	
		Improvement of Port and Maritime Safety	–	
Indonesia	Belawan	Expansion of Container Terminal	To increase the capacity of container handling for international and domestic container	*
		Relocation of Passenger Terminal	To improve the connectivity between passenger ship and railway by relocating the passenger terminal in the vicinity of the railway station	
		Improvement of container terminal operation	To improve the productivity of container handling in the container yard	
		A Large Scale Port Expansion Plan at an idle site	–	
		Expansion of CPO Terminal	–	
	Dumai	Development of Container Terminal	To establish the capacity of container handling	
		Palm Oil terminal construction project IN Tanjung Buton	–	
		Extension of passenger terminal	–	
	Tanjung Priok	Channel and Basin Improvement	To improve the safety and efficiency in manoeuvring vessels in the port	*
		Development of New Access Road	To improve the connectivity to the expressways by directly linking the port to the roads of Jakarta Outer Ring Road / Jakarta Intra Urban Tollway / Jakarta Harbour Road.	.
		Inner Road Improvement	To improve the road condition in the port	*
		Yard & Pier Improvement	To improve the efficiency in cargo handling at the yard and mooring at the pier, and coping with the growing container volume	
		Development of Koja Liquid Bulk Terminal & CPO Terminal	To increase the capacity of handling liquid bulk & CPO	
		Car Terminal Expansion	To increase the capacity of handling cars	
		Railway Extension	To link the railway directly to container terminals	
		Container Terminal Development Project(former East Ancol Development. The project side will likely be changed.)	To improve the effectiveness and safety of the port function through the re-development of the port and to increase container handling capacity.	
		Kalibaru Development	To improve the effectiveness and safety of the port function through the re-development of the eastern area of the port	
New Development in Subang	–			



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Country	Port	Project Title	Purpose/Background	note
Indonesia	Palembang	Improvement of Approach Channel	To reduce the restriction of the shallow and narrow channel	*
		Api-api new coal port Development	To develop coal loading facilities for small- and medium-size mining companies	*
		Quayside Container Crane	To improve the productivity of loading/unloading at quayside	
	Panjang	Expansion of Conventional Terminal	To increase the capacity of handling conventional cargo	*
		Conversion of ISAB Terminal	To increase the container handling capacity by converting an existing multipurpose terminal (ISAB Terminal) into a container terminal after the lease contract of the terminal will be terminated in 2017	
		Upgrading of the port management and operation system	—	
	Pontianak	Yard reorganization	To streamline the yard operation by reorganizing / expanding the container yard and introducing RTGs	
		Approach channel improvement	To reduce the restriction of the shallow channel	*
		Temajo port development at the seacoast	—	
		Redevelopment of the existing port area and facilities	—	
	Tanjung Perak	New Multipurpose Terminal Development Project	Development of a new terminal for multipurpose use at Lamong Bay	
		Western Channel Deepening and Widening Project	Deepening and widening of the Western Channel (depth: from 9.5 meters to 12 meters, width: from 100 meters to 200 meters) to accommodate larger vessels	
		Channel development plan	—	
		Multi-purpose terminal improvement plan	—	
		Effect of Mudflood new development in Probolinggo	—	
	Tanjung Emas	Container Terminal Expansion Project	Expansion of the container terminal to increase the container handling capacity at Tanjung Emas Port	
		New Development in Kendal	—	
	Banjarmasin	Container Terminal Redevelopment Project (Phase 2)	Redeveloping a container terminal as Phase 2	
		Maharabang Coal Terminal Construction Project	Construction of a new coal terminal at Maharabang, 50 km upstream from Banjarmasin in response to the new traffic regulation by the municipal administration prohibiting the transportation of coal through the city area	
		New Development of Coal Terminal in Kuala Kapuas	—	
	Makassar	Makassar Container Terminal Expansion Project (will be completed in 2013)	Expansion of the container terminal to cope with the increasing container throughput at Makassar Port	*
		Makassar New Port Project (Phase I)	Construction of a new container terminal as part of the urban complex development project	
	Balikpapan	New Container Terminal Construction Project (will be completed in 2011)	Construction of a new container terminal at Kariangau, about 10 kilometers north of Semayang terminal, to cope with the congestion at Semayang Terminal now used as a multipurpose terminal	*
New Development in Penajam Pasir for mining activities		—		
Bitung	Container Terminal Expansion Project (Phase 2)	Construction of a container terminal as Phase 2	*	
	Container Terminal Expansion Project (Phase 3)	Construction of container terminals as Phase 3		
Sorong	Terminal expansion	To increase the capacity of container handling		
	New Port Development in Arar	—		



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Country	Port	Project Title	Purpose/Background	note
Indonesia	Jayapura	Quay extension	To resolve the shortage of mooring facilities	
		New Port Development in Depapre	–	
Malaysia	Port Klang	North Port Expansion	To increase the cargo handling capacity	
		West Ports Expansion (Development of CT6-600meter)	To increase the container handling capacity	
	Penang	North Butterworth Container Terminal Expansion Project (will be completed in 2011)	Expansion of the North Butterworth Container Terminal (NBCT) to increase container handling capacity and centralise all container operations at the NBCT	*
		North Channel Deepening Project	Deepening of the North Channel (depth: from 11 meters to 15 meters) to accommodate larger vessels	
	Kuching	Tebedu Inland Port Development Plan	To facilitate movement of goods (transshipment) from Sarawak to Kalimantan Barat (Indonesia) and vice versa through Kuching Port Authority.	*
		Approach Channel Improvement	To reduce the restriction due to shallow channel	
	Bintulu	Container Terminal Expansion Project (will be completed in 2011)	Expansion of the container terminal to cope with the increasing container cargoes	*
	Kota Kinabalu	Installation of RTGs and Gantry Crane at Sapangar Bay Container Port	To improve the productivity in operation at yard and quayside at Sapangar Bay Container Port	
	Tanjung Pelepas	Development of Container Terminal Phase II (#13 and #14)	To expand the capacity of container handling	
		Development of new container terminals Phase III and IV	To expand the capacity of container handling	
Kuantan	Kuantan Port Expansion	To increase the container handling capacity		
Kemaman	Development of New Terminal	To increase the cargo handling capacity		
Myanmar	Yangon	Development of AWPT Wharf IV	To increase the capacity of container handling	
		Yangon Port Approach Channel Deepening Project	–	
	Thilawa	Thilawa Port Development Project (plot 10,11,12,13,14)	–	
		Thilawa Port Development Project (22plots)	–	
		Thilawa Port Access Road Improvement	To improve the access road from Yangon to Thilawa Port	
		Thilawa Port Approach Channel Deepening Project	To accommodate 30,000 DWT class vessels at the Port of Thilawa	
	Kyaukphyu	Kyaukphyu Deep Seaport Project, Crude Oil Terminal/Jetty	To develop deep seaport for container ships, bulk carriers and crude oil tankers	
		Urgent Rehabilitation of General Cargo Jetties	To rehabilitate jetties used for loading and unloading general cargo and fishery products	
Philippines	Manila	Manila North Harbor Redevelopment Project	Manila North Harbor, having 11 piers/wharves of 5 to 6 meters deep, is the country's leading domestic port and handles more than 16 million tons of cargoes per year. This project aims to redevelop and expand the port so as to handle large vessels and supply sufficient	*
		MICT No.6 Container Terminal Expansion project	–	
	Cebu	Development of New Cebu Port	To increase the capacity of cargo handling	
		Re-Development of Cebu Baseport	1) To exploit real estate potential of the Baseport for commercial and tourism-oriented purposes; 2) The port activity creates traffic congestion on the roadways leading to the Baseport with cargo trucks/vans clogging the roads; 3) No further space available for	
		Upgrading/Improvement of CIP Berths & Dredging of Cebu Channel	Upgrading/Improvement of CIP Berths & Dredging of Cebu Channel	
Construction of Fast Ferry Terminal	To provide one terminal for all outgoing/incoming passengers of fast ferries in line with the berth rationalization of the Cebu Domestic Baseport; There are presently four (4) fast ferry passenger terminals located at different sites within the Cebu Domestic Baseport			



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Country	Port	Project Title	Purpose/Background	note
Philippines	Iloilo	Cargo Handling Productivity Enhancement Project	Installing cargo handling equipment to increase the productivity at the Port of Iloilo.	
		Expansion of Loboc Wharf Project	—	
		Deepening of the channel	—	
	Cagayan de Oro	Expansion of Terminal	To increase the capacity of cargo handling	
		Expansion of the Berth Length and Container Yard (Phividec)	—	
		Modernization of Equipment(Phividec)	—	
	Davao	Davao Container Terminal Construction Project	Construction of a container terminal to cope with the increasing container cargoes of 349,000 TEUs in 2008. (PPA 2000-2009 Port Traffic Statistics as 395, 828 TEUs in 2009).	
	General Santos	Cargo Handling Productivity Enhancement Project	Installing cargo handling equipment on Berth No. 9 to increase productivity and alleviate the congestion (present berth occupancy rate: 88%)	
		Passenger Terminal Development Project(ABD)	—	
		Makar port expansion project (RCwharf)	—	
	Zamboanga	New Passenger Terminal Project	The passenger terminal is very congested because more than 2 million domestic passengers and more than 20 thousand international passengers use it in a year. This project is aim to separate international passengers from domestic passengers from the view point of security	
		Installation of Equipment	—	
Plural Ports	Quayside Gantry Crane Installation Project	To improve the productivity of container operation through the installation of quayside gantry cranes.		
Singapore	Singapore	Development of Pasir Panjang Terminal Phase III and IV	To expand the container port capacity.	*
Thailand	Bangkok	Asset Development Project	To develop in to Logistics and Port-related activities.	
	Laem Chabang	Rail Transfer Terminal (RST)	To increase the efficiency of rail transfer in LCP, and subsequently make the operation faster and safer.	*
		Coastal Terminal	To develop the coastal terminal for serving containers transported from/to LCP by coastal ship from southern part of Thailand or barge from inland waterway.	*
		LCP Phase 3 Development	To serve the increasing throughput in the future	*
	Songkhla	Development of the Second Songkhla Port	To cope with future demand for the Songkhla Port	
		Development of the Songkhla Port	To enhance the potential connectivity between Thailand, Northern Sumatra and Malaysia via IMT-GT corridors.	
Vietnam	Ho Chi Minh	Development of Access Roads(will be completed in 2015)	To improve the connectivity between the port and the hinterland	*
		Improvement of Approach Channel in Cai Mep area and Vung Tau area	To accommodate larger vessels which will call the deep-water terminals at Cai Mep area	
		Rehabilitation of improvement of Approach channel (Soai Rap)	—	
		Conversion of the existing port area to the complex of passenger port, maritime and commercial center	—	
		Relocation project (Saigon - HiepPhuoc Port)	—	
	Hai Phong	Development of the Hai Phong International Gateway Port (former Lach Huyen Gateway port)	Development of a deep sea outer port of Hai Phong	*
		Deepening and Widening of Hai Phong Approach Channel	To improve the approach channel with two way lanes and reduce waiting time for navigation	



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Country	Port	Project Title	Purpose/Background	note
Vietnam	Da Nang	Tho Quang Terminal Project	Development of terminal for general cargo at Tho Quang at Da Nang Port as a substitute for Han River Terminals	*
		Tien Sa Terminal Expansion Project	Expansion of the terminal for container/general cargo at Da Nang Port	
		The Lien Chieu Port Construction Project	This is a project made for receiving ships and goods arrived in Da Nang port when both of Tien Sa port and Son Tea port will exceed their capacities. So, the investigation for construction has recently been made and appealing investors to use priority capital.	
	Cai Lan	Container Terminal Development Berths No.2-4	To develop a new container terminal	*
Cambodia	Plural Ports	Operational Improvement Project	Introduction / Upgrading of Port EDI System for smooth operation.	
Indonesia	Plural Ports	Operational Improvement Project	Introduction / Upgrading of Port EDI System for smooth operation.	
Myanmar	Plural Ports	Operational Improvement Project	Introduction / Upgrading of Port EDI System for smooth operation.	
Philippines	Plural Ports	Operational Improvement Project	Introduction / Upgrading of Port EDI System for smooth operation.	
Vietnam	Plural Ports	Operational Improvement Project	Introduction / Upgrading of Port EDI System for smooth operation.	

*: Projects under construction

The listed projects are categorized into projects related to channels/ navigation, container terminals, non-container terminals, transport from/to ports and port management/procedure by types of ports. The numbers of projects of each category are shown in Table 3.2-2.

The projects on channels count 15, those on container terminals count 45, those on non-container terminals count 39, those on transport from/to ports count 8, and those on management /procedure count 1. Operational Improvement Projects which are prepared for five countries and projects which could not be classified owing to lack of information are not included in the long list.

At the type 1 ports there are five (5) projects on container terminals. At the type 2 ports, there are eighteen (18) projects including those on channels, container terminals, non-container terminals and transport. At the type 3 ports, there are thirteen (13) projects including those on channels, container terminals and non-container terminals. At the type 4 ports, there are fifty two (52) projects including those on channels, container terminals, non-container terminals, transport and management. At the type 5 ports, there are twenty (20) projects including those on container terminals, non-container terminals and transport.

Table 3.2-2 Number of Projects (by the type of ports)

Type of Port	Total	Channel/ Navigation	Container Terminal	Other Terminal	Transport	Management
Type 1(3)	5	-	5	-	-	-
Type 2(4)	18	3	6	3	6	-
Type 3(8)	13	5	4	4	-	-
Type 4(22)	52	7	23	20	1	1
Type 5(10)	20	-	7	12	1	-
Total (47)	108	15	45	39	8	1

Note: Five projects of Operational Improvement Projects prepared for five countries and eight projects which could not be classified owing to lack of information are not included.



Chapter 4. Short List of Projects

4.1 Framework for Compiling the Short List of Projects

4.1.1 Basic Idea for Compiling the Short List of Projects

The ASEAN network ports are expected to carry out important roles to realize smooth physical distribution and activate intra-trade in the ASEAN region. Therefore, it is essential for each of the ASEAN network ports to be able to handle cargo at the acceptable performance levels and to develop necessary port infrastructure to meet the cargo demand and prevent congestion.

Projects which listed in the short list are the projects considered to be highly beneficial among the long list of projects. A highly beneficial project means a project which contributes to the realization of integrated and competitive maritime transport in ASEAN and contributes to the strengthening of the ASEAN regional network.

From the abovementioned point of view, a framework for compiling the short list of projects will be examined in this section. The study on “Guideline for Assessing Port Development Priorities including Acceptable Performance Levels in ASEAN” (hereinafter referred to as “the benchmark study”) which was previously conducted by JICA and the study on “Identify required improvement areas in ASEAN network port performance and capacity, based among others, on regular forecasts of maritime trade and requirement” which was carried out by Korea under the lead coordination of Malaysia will be utilized for examining the framework.

Items and important factors to access port development priorities were proposed in the benchmark study as a checklist for initial assessment of port development priorities. These indices of assessment are considered to contain the following meanings.

- 1) Responding to Maritime Transport Demand: a port/terminal, through implementation of a project shall ensure sufficient capacity, necessary scale of facilities and necessary performance levels in regard to maritime transport demand.
- 2) Effects on Regional Development: a port/terminal, through implementation of a project, shall support government policies and industrial development.
- 3) Reduction in Transport Cost: a port/terminal, through implementation of a project, shall contribute to the reduction of transport cost.
- 4) Coping with Regional Transport Corridors: a port/terminal shall be incorporated in ASEAN logistics networks.
- 5) Basic Requirement: a port/terminal, through implementation of a project, shall satisfy basic requirements from the national/social point of view.

Based on the abovementioned idea, initial evaluation shall be conducted to narrow the projects down from the long list of projects to the short list of projects. Cost benefit method is a good tool to evaluate project alternatives; however, it seems to be sufficient at the initial stage of project evaluation to grasp the outline of effects of each project. Therefore, initial evaluation for screening projects shall be conducted by means of rating important factors, such as “High, Middle and Low” (see Table 4.1-1).



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Table 4.1-1 Initial Evaluation of the Long List of Projects

Items	Important Factors	Rating
(i) Responding to Maritime Transport Demand	a) Measures coping with the shortage of port capacity	High, Mid., Low
	b) Measures responding to larger vessels being deployed	High, Mid., Low
	c) Measures for improving productivities	High, Mid., Low
(ii) Effects on Regional Development	a) Development of Economic Special Zones/Industrial Zones around the port	High, Mid., Low
	b) Interest of investment in port development	High, Mid., Low
	c) Scale of the hinterland and beneficiaries	High, Mid., Low
(iii) Reduction in Transportation Cost	a) Reduction in maritime transportation cost	High, Mid., Low
	b) Reduction in land transportation cost	High, Mid., Low
(iv) Coping with Regional Transport Corridors	a) Roles in line with regional corridor projects	High, Mid., Low
	b) Roles in ASEAN maritime network	High, Mid., Low
(v) Basic Requirements	Consideration on securing navigational safety, rehabilitation of port facilities and port environment protection	High, Mid., Low

A lot of projects were proposed in the long list of projects; however, there was not enough information for the JICA study team to conduct an initial evaluation on some of the projects. Furthermore, projects which are difficult to conduct an initial evaluation such as Special Economic Zone development projects, projects which are not related to strengthening maritime networks such as coal terminal development projects and projects which are still in a pre-planning stage are included in the long list of projects. In these cases, the JICA study team set up a pre-screening stage and did not conduct an initial evaluation. (See Table 4.1-2)

Regarding a passenger terminal development project, strengthening the maritime network for passengers, similar to a physical distribution project, is also an important issue to realize an integrated and competitive maritime transport in ASEAN.

Initial evaluation for a project related to passenger transport such as the development of a passenger terminal will be conducted from the view point of responding to demands for maritime transport, effects on regional development, cost reduction through providing proper facilities and services, and coping with regional transport corridors which are similar items for a physical distribution project. Important factors for evaluating of passenger traffic will also be identified.



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Table 4.1-2 Projects List for Initial Evaluation

Country	Port	Type	Project Name	Purpose/Background
Brunei	Muara	4	Container Terminal Construction Project (Phase 1) on Pulau Muara	Construction of a new container terminal (Capacity: 800,000 TEUs/year) as part of the development of Pulau Muara Besar
Cambodia	Phnom Penh	5	Construction of new Phnom Penh Container Terminal	To develop a new modern and easily accessible container port and reduce traffic congestion around the present port area
			Redevelopment of Phnom Penh Port	To rehabilitate and reform the present multi-purpose terminal for the redevelopment of the waterfront
	Sihanoukville	4	Multi-Purpose Terminal Development	To improve the bulk cargo facilities and increase the capacity in bulk/general cargo handling and provide a wharf for oil supply base
Indonesia	Belawan	4	Enhancement of Container Handling Productivity	To improve the productivity of container operation through the installation of additional cargo handling equipment and quay cranes, and united IT system
			Transfer the old jetty to Passenger terminal	To maintain and transfer the old jetty to be Passenger Terminal. Establish New Passenger Terminal with International Standard. Contribute to attract the International Tourisms.
			Expansion of Container Terminal	To increase the capacity of container handling for international and domestic
	Tanjung Priok	2	Relocation of Passenger Terminal	To improve the connectivity between passenger ship and railway by relocating the passenger terminal in the vicinity of the railway station
			Improvement of container terminal	To improve the productivity of container handling in the container yard
			Channel and Basin Improvement	To improve the safety and efficiency in manoeuvring vessels in the port
			Development of New Access Road	To improve the connectivity to the expressways by directly linking the port to the roads of Jakarta Outer Ring Road / Jakarta Intra Urban Tollway / Jakarta Harbour Road.
			Yard & Pier Improvement	To improve the efficiency in cargo handling at the yard and mooring at the pier, and coping with the growing container volume
	Palembang	4	Railway Extension	To link the railway directly to container terminals
			Container Terminal Development Project (former East Ancol Development. The project site will likely be changed.)	To improve the effectiveness and safety of the port function through the redevelopment of the port and to increase container handling capacity
	Panjang	4	Improvement of Approach Channel	To reduce the restriction of the shallow and narrow channel
	Pontianak	4	Quayside Container Crane	To improve the productivity of loading/unloading at quayside
			Yard reorganization	To streamline the yard operation by reorganizing / expanding the container yard and introducing RTGs
	Tanjung Perak	3	Approach channel improvement	To reduce the restriction of the shallow channel
			New Multipurpose Terminal Development Project	Development of a new terminal for multipurpose use at Lamong Bay
	Tanjung Emas	3	Western Channel Deepening and Widening Project	Deepening and widening of the Western Channel (depth: from 9.5 meters to 12 meters, width: from 100 meters to 200 meters) to accommodate larger vessels
			Container Terminal Expansion Project	Expansion of the container terminal to increase the container handling capacity at Tanjung Emas Port
	Banjarmasin	4	Container Terminal Redevelopment Project (Phase 2)	Redeveloping a container terminal as Phase 2
	Makassar	4	Makassar Container Terminal Expansion Project (will be completed in 2013)	Expansion of the container terminal to cope with the increasing container throughput at Makassar Port
			Makassar New Port Project (Phase I)	Construction of a new container terminal as part of the urban complex development project
Balikpapan	4	New Container Terminal Construction Project (will be completed in 2011)	Construction of a new container terminal at Kariangau, about 10 kilometers north of Semayang terminal, to cope with the congestion at Semayang Terminal now used as a multipurpose terminal	
Bitung	5	Container Terminal Expansion Project (Phase 2)	Construction of a container terminal as Phase 2	
		Container Terminal Expansion Project (Phase 3)	Construction of container terminals as Phase 3	
Sorong	5	Terminal expansion	To increase the capacity of container handling	
Jayapura	5	Quay extension	To resolve the shortage of mooring facilities	
Port Klang	1	North Port Expansion	To increase the cargo handling capacity	
		West Ports Expansion (Development of CT6-600meter)	To increase the container handling capacity	



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Country	Port	Type	Project Name	Purpose/Background
Malaysia	Penang	3	North Butterworth Container Terminal Expansion Project <i>(will be completed in 2011)</i>	Expansion of the North Butterworth Container Terminal (NBCT) to increase container handling capacity and centralise all container operations at the NBCT
			North Channel Deepening Project	Deepening of the North Channel (depth: from 11 meters to 15 meters) to accommodate larger vessels
	Kuching	3	Tebedu Inland Port Development Plan	To facilitate movement of goods (transshipment) from Sarawak to Kalimantan Barat (Indonesia) and vice versa through Kuching Port Authority.
			Approach Channel Improvement	To reduce the restriction due to shallow channel
	Bintulu	4	Container Terminal Expansion Project <i>(will be completed in 2011)</i>	Expansion of the container terminal to cope with the increasing container cargoes
	Tanjung Pelepas	1	Development of Container Terminal Phase II (#13 and #14)	To expand the capacity of container handling
	Kuantan	4	Kuantan Port Expansion	To increase the container handling capacity
Kemaman	5	Development of New Terminal	To increase the cargo handling capacity	
Myanmar	Yangon	4	Development of AWPT Wharf IV	To increase the capacity of container handling
			Yabgon Port Approach Channel Deepening Project	To accommodate larger vessels at the port of Yangon
	Thilawa	4	Thilawa Port Development Project (plot 10,11,12,13,14)	—
	Thilawa		Thilawa Port Development Project (plot 10,11,12,13,14)	To increase modern container terminal and general /bulk cargo terminals in the outer port of Yangon
	Thilawa		Thilawa Port Approach Channel Deepening Project	To accommodate 30,000 DWT class vessels at the Port of Thilawa
	Kyaukpyu	5	Kyaukpyu Deep Seaport Project Crude Oil Terminal/Jetty	To develop deep seaport for container ships, bulk carriers and crude oil tankers
Urgent Rehabilitation of General Cargo Jetties			To rehabilitate jetties used for loading and unloading general cargo and fishery products	
Philippines	Manila	2	Manila North Harbor Redevelopment Project	Manila North Harbor, having 11 piers/wharves of 5 to 6 meters deep, is the country's leading domestic port and handles more than 16 million tons of cargoes per year. This project aims to redevelop and expand the port so as to handle large vessels and supply sufficient storage areas.
	Cebu	4	Development of New Cebu Port	To increase the capacity of cargo handling
			Re-Development of Cebu Baseport	1)To exploit real estate potential of the Baseport for commercial and tourism-oriented purposes; 2)The port activity creates traffic congestion on the roadways leading to the Baseport with cargo trucks/vans clogging the roads 3)No further space available for expansion
			Upgrading/Improvement of CIP Berths & Dredging of Cebu Channel	Upgrading/Improvement of CIP Berths & Dredging of Cebu Channel
			Construction of Fast Ferry Terminal	To provide one terminal for all outgoing/incoming passengers of fast ferries in line with the berth rationalization of the Cebu Domestic Baseport; There are presently four (4) fast ferry passenger terminals located at different sites within
	Iloilo	4	Cargo Handling Productivity Enhancement Project	Installing cargo handling equipment to increase the productivity at the Port of Iloilo.
	Cagayan de Oro	4	Expansion of Terminal	To increase the capacity of cargo handling
	Davao	4	Davao Container Terminal Construction Project	Construction of a container terminal to cope with the increasing container cargoes of 349,000 TEUs in 2008. (PPA 2000-2009 Port Traffic Statistics as 395, 828 TEUs in 2009).
	Zamboanga	4	New Passenger Terminal Project	The passenger terminal is very congested because more than 2 million domestic passengers and more than 20 thousand international passengers use it in a year. This project is aim to separate international passengers from domestic passengers from the view point of security control and improvement of CIQ services.
	Plural Ports		Quayside Gantry Crane Installation Project	To improve the productivity of container operation through the installation of quayside gantry cranes.
Singapore	Singapore	1	Development of Pasir Panjang Terminal Phase III and IV	To expand the container port capacity.
Thailand	Laem Chabang	2	Rail Transfer Terminal (RST)	To increase the efficiency of rail transfer in LCP, and subsequently make the operation faster and safer.
			Coastal Terminal	To develop the coastal terminal for serving containers transported from/to LCP by coastal ship from southern part of Thailand or barge from inland waterway.
			LCP Phase 3 Development	To serve the increasing throughput in the future
	Songkhla	5	Development of the Second Songkhla Port	To cope with future demand for the Songkhla Port



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Country	Port	Type	Project Name	Purpose/Background
Vietnam	Ho Chi Minh	2	Development of Access Roads (will be completed in 2015)	To improve the connectivity between the port and the hinterland
			Improvement of Approach Channel in Cai Mep area and Vung Tau area	To accommodate larger vessels which will call the deep-water terminals at Cai Mep area
	Hai Phong	3	Development of the Hai Phong International Gateway Port (former Lach Huyen Gateway port)	Development of a deep sea outer port of Hai Phong
			Deepening and Widening of Hai Phong Approach Channel	To improve the approach channel with two way lanes and reduce waiting time for navigation
	Da Nang	4	Tho Quang Terminal Project	Development of terminal for general cargo at Tho Quang at Da Nang Port as a substitute for Han River Terminals
Cai Lan	3	Container Terminal Development Berths No.2-4	To develop a new container terminal	
Plural Countries (Cambodia, Indonesia, Myanmar, Philippines, Vietnam)	Project by a country (Plural Ports in a country)		Operational Improvement Project	Introduction / Upgrading of Port EDI System for smooth operation.

4.1.2 Method for Initial Evaluation

(1) Responding to Maritime Transport Demand

An initial evaluation concerning “Responding to Maritime Transport Demand” shall be conducted from the viewpoint of three important factors, namely; measures coping with the shortage of port capacity, measures responding to larger vessels being deployed and measures for improving productivities.

Details of each method are as follows.

1) Measures coping with the shortage of port capacity

Measures coping with the shortage of port capacity shall be evaluated mainly to determine whether a project is intended to increase the capacity of a port.

In the study on Measure 7 conducted by the Korean study team, the capacity and future demand of ASEAN 47 network ports were calculated. These figures will be utilized to conduct an initial evaluation.

Details of rating this important factor are as follows.

- Effect “High”: in the case that a project mainly aims at increasing the capacity of the port, and the port’s demand is forecasted to exceed the present capacity by the year of 2015, the project is given a “High” rating.
- Effect” Middle”: in the case that a project aims at increasing the capacity of the port and the port’s demand is forecasted to exceed the present capacity by the year of 2020 or the capacity will increase secondarily by improvement of productivity, the project is given a “Middle” rating.
- Effect “Low”: in the case that though a project aims at increasing the capacity of the port, the port’s demand will not exceed the present capacity up to the year of 2020, or a project does not aim at increasing the capacity of the port, the project is given a “Low” rating.

The capacity and future demand abovementioned are limited to the container handling facilities and container cargo, while ports which do not handle containers or do not have container handling facilities shall be evaluated by the general cargo volume, the results of the benchmark study and so on. Ports corresponding to these conditions are Bitung port, Jayapura port, Sorong port, Kemaman port,



Kyaukphyu port, Davao port and General Santos port.

2) Measures responding to larger vessels being deployed

Measures responding to larger vessels being deployed are to deepen approach channels, to relocate port functions to a new place where larger vessels can be accommodated and so on.

The characteristics of location of ports in the ASEAN region are that many ports are located in the vicinity of the river mouth or in the coastal area with a gently shelving bottom. Therefore, securing the water depth or maintenance dredging are common issues among the said ports.

An initial evaluation concerning “Measures responding to larger vessels being deployed” shall be conducted from the viewpoint of the water depth of channels, for which is considered to be relatively easy to get information. In the benchmark study, a method taken from the PIANC report was adopted. Based on the PIANC report, effect of a project shall be evaluated by the relationship between the shortage of the water depth which is calculated from performance of the PIANC’s standard and the tidal differences. Furthermore, a project in which a new port will be developed in a new place where larger vessels can be easily accommodated shall be evaluated.

Details of rating this important factor are as follows.

- Effect “High”: in the case that a channel deepening project mainly aims at accommodating larger vessels or where the shortage of water depth exceeds the tidal difference, the project is given a “High” rating.
- Effect “Middle”: in the case that a channel deepening project where the shortage of water depth at the channel of the port does not exceed the tidal difference, the project is given a “Middle” rating.
- Effect “Low”: in the case that a channel of the port has sufficient water depth or a project that does not aim at accommodating larger vessels, the project is given a “Low” rating.

Ports which have a channel deepening project are Tanjung Priok port, Palenbang port, Pontianak port, Tanjung Perak port, Penang port, Kuching port, Thilawa port/Yangon port, Cebu port, Ho Chi Minh port and Hai Phong port.

On the other hand, ports which aim at developing a new port in a new place where larger vessels can be easily accommodated are Lach Huyen area of Hai Phong port, Cai Lan port, Cai Mep area of Ho Chi Minh port, Cebu port, Phnom Penh port and Thilawa port. Manila port also has a project to accommodate larger vessels by redeveloping north harbor of the port.

3) Measures for improving productivities

Measures for improving productivities shall be evaluated mainly to determine whether a project is intended to improve the present productivity.

Common measure for improving productivities is to install handling equipment in the quay side and/or yard side. An initial evaluation here shall be conducted focusing on handling capacity at the quay side.

Details of rating this important factor are as follows.

- Effect “High”: in the case that a project mainly aims at improving productivity by installing/increasing/replacing handling equipment, the project is given a “High” rating.
- Effect “Middle”: in the case that a project contributes to a secondary effect on improving productivity by improving yard layout etc., or a newly developed terminal attains similar productivity as the present terminal, the project is give a Middle” rating.
- Effect “Low”: in the case that a project does not aim at improving productivity, the project is



given a “Low” rating.

(2) Effects on Regional Development

An initial evaluation concerning “Effects on Regional Development” shall be conducted from the viewpoint of three important factors, namely; development of economic special zones/ industrial zones around the port, interest of investment in port development and scale of the hinterland and beneficiaries.

Details of each method are as follows.

1) Development of Economic Special Zones/Industrial Zones around the Port

The development of Economic Special Zones/Industrial Zones (a general term for zones, including export processing zones, free trade zones and so on, which are given special advantages in term of administrative and legal fields to promote economic development/export) can be used as an index for how a port can contribute to accelerating private investment and promoting exports. Therefore, this important factor shall be evaluated at each port.

Rating is evaluated according to the present situation of Economic Special Zones/Industrial Zones (ESZ/IZ).

- Effect “High”: in the case that ESZ/IZ has already been developed around a port, the port is given a “High” rating.
- Effect “Middle”: in the case that ESZ/IZ is planned, the port is given a “Middle” rating.
- Effect “Low”: in the case that there is no plan to develop ESZ/IZ, the port is given a “Low” rating.

2) Interest of Investment in Port Development

Extent of interest of investment in port development and/or regional development is to indicate the future development possibility of the port because private/ public investment in/around the port is a very important factor for evaluating the effects of regional development.

Rating is evaluated according to the extent of interest in port development and or regional development.

- Effect “High”: in the case that the extent of interest is large, the port is given a “High” rating.
- Effect “Middle”: in the case that the extent of interest is small, the port is given a “Middle” rating.
- Effect “Low”: in the case that there are no expressions of interest, the port is given a “Low” rating.

3) Scale of the hinterland and beneficiaries

Considering regional characteristics, the scale of the hinterland and beneficiaries shall be evaluated by spheres of liners which are explained in the previous JICA study. Spheres of liners consist of five (5) spheres, namely; the sphere of liners in East Indochina Peninsula, the sphere of liners in the Philippines, the sphere of liners in Indonesia, the sphere of liners in domestic Malaysia and the sphere of liners to connect to other spheres and the world (Singapore liner sphere).

Details of this important factor are as follows.

- Effect “High”: in the case that a port is a leading port by a sphere of liners from the viewpoint of extent of the hinterland and beneficiaries, the port is given a “High” rating.



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Sphere of liners	Idea of evaluation
Indochina liner sphere	Leading ports shall be evaluated from the north, south, middle and west area.
Philippines liner sphere	Leading ports shall be evaluated from Luzon, Visayas and Mindanao region.
Indonesia liner sphere	Leading ports shall be evaluated from the east and west of the Java island.
Malaysia liner sphere	Leading ports shall be evaluated from the peninsula Malaysia and Sabah Sarawak area.
Singapore liner sphere	Leading ports shall be evaluated from world class transshipment ports.

- Effect “Middle”: in the case that a port is a major port in the region and from the view point of the scale of the hinterland other than the ports evaluated as rating “High” by a sphere of liners, a port is given a “Middle” rating.
- Effect “Low”: ports other than ports given a “High” rating and a “Middle” rating are given a “Low” rating.

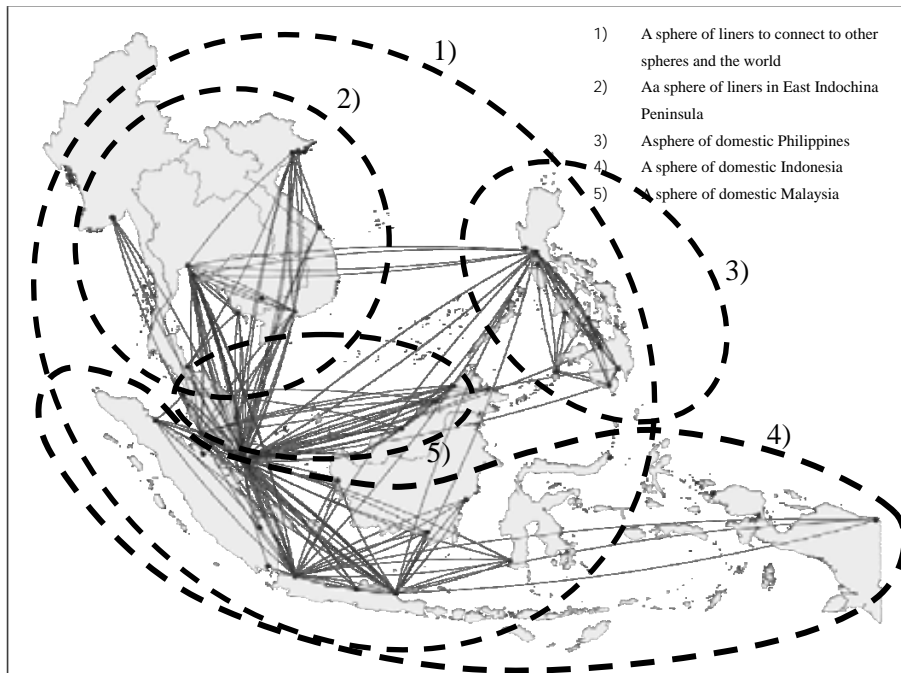


Figure 4.1-1 Liner Spheres in the Region

(3) Reduction in Transportation Cost

An initial evaluation concerning “reduction in transportation cost” shall be conducted from the viewpoint of two important factors, namely; reduction in maritime transportation cost and reduction in land transportation cost.

Details of each method are as follows.

1) Reduction in Maritime Transportation Cost

The deployment of larger vessels and/or improvement of terminal efficiency contribute to reducing maritime transportation cost, and thus these factors shall be evaluated.



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Details of rating this important factor are as follows.

- Effect “High”: in the case that a project mainly aims at accommodating larger vessels and improving terminal efficiency, the project is given a “High” rating.
- Effect “Middle”: in the case that a project contributes to accommodating larger vessels or improving terminal efficiency, the project is given a “Middle” rating.
- Effect “Low”: other projects are given a “Low” rating.

2) Reduction in Land Transportation Cost

Improving the access to a port contributes to reducing land transportation cost, and thus this factor shall be evaluated. Furthermore, in the case that a project shorten or increase transportation distance to a port by developing new port facilities, these factors shall be also evaluated.

Details of rating this important factor are as follows.

- Effect “High”: in the case that a project mainly aims at improving access significantly or shortening land transportation distance, the project is given a “High” rating.
- Effect “Middle”: in the case that a project is expected to have a secondary effect on improving access, the project is given a “Middle” rating.
- Effect “Low”: other projects re given a “Low” rating.

(4) Coping with Regional Transport Corridors

An initial evaluation concerning “Coping with Regional Transport Corridors” shall be conducted from the viewpoint of two important factors, namely; roles in line with regional corridor projects and roles in ASEAN maritime network.

Details of each method are as follows.

1) Roles in line with Regional Transport Corridor Projects

Concerning roles in line with regional transport corridors, several inter-regional corridor plans are in progress to strengthen the connectivity in the ASEAN region for the purpose of creating an ASEAN Economic Community (AEC). Specifically, there are three regional corridor plans in the Great Mekong sub region, namely; north – south corridor, east- west corridor and southern corridor. There are also plans to strengthen the connection between the Philippines and Malaysia by ferry from Zamboang to Sandakan, and the connection between Malaysia and Indonesia by RO-RO and/or Ferry service from Penang to Medang.

Besides these routes, there are important domestic connections among island nations such as the Philippines, Indonesia and Malaysia to strengthen maritime transportation network.

Therefore, ports located in these corridors and routes are considered to be important bases to realize AEC, and thus these factors shall be evaluated.

Details of rating this important factor are as follows.

- Effect “High”: in the case that a port is located in an inter-regional corridor, the port is given a “High” rating.
 - Effect “Middle”: in the case that a port is located in domestic connection routes in island nations, the port is given a “Middle” rating.
 - Effect “Low”: other ports are given a “Low” rating.
-



2) Roles in ASEAN Maritime Network

In the benchmark study, network ports are classified into five (5) types from the viewpoint of the scale of cargo throughput, transshipment port or origin-destination port, area of partner ports on liner services, and the dimensions of port facilities. The number of ports connected by liner routes and connection with higher ranking types of port are considered when evaluating the extent of effect.

Therefore, concerning roles in ASEAN maritime network, utilizing the data “ASEAN Liner Service Network Matrix” and types of port, the numerical value of the port by the weighted values by types of port shall be calculated and evaluated.

Details of rating this important factor are as follows.

Firstly, the number of ports connected by liner routes is counted by types of port. Next, weights are assigned according to types of port. In the case that a port connects to a port three or more ranks above it, weighting is 3.0, in the case that a port connects to a port one or two ranks above it, weighting is 2.0 and in the case that a port connects to a same or lower ranking port, weighting is 1.0. The numerical value of the port is then multiplied by the weighted values and summed up. Rating is carried out based on the numerical value of the port.

- Effect “High”: in the case that a port places in the top third in the order of the numerical value, the ports are given a “High” rating.
- Effect “Middle”: in the case that a port places in the middle third from the top, the ports are given a “Middle” rating.
- Effect “Low”: in the case that a port places in the bottom third in the order of the numerical value, the ports are given a “Low” rating.

Table 4.1-3 Example for calculating the numerical value

	No. of Ports connected among 47 Ports	No. of Ports connected by types					Numerical Value
		Type 1	Type 2	Type 3	Type 4	Type 5	
A Port	13	3	2	4	4	0	16.0
B Port	5	2	1	1	1	0	8.0
C Port	4	1	1	0	1	1	7.0

□ : Own Port Type

Calculation

$$\text{Numerical Value of A Port} = 3 \times 2.0 + (2 + 4 + 4) \times 1.0 = 16.0$$

$$\text{Numerical Value of B Port} = (2 + 1) \times 2.0 + (1 + 1) \times 1.0 = 8.0$$

$$\text{Numerical Value of C Port} = 1 \times 3.0 + 1 \times 2.0 + (1 + 1) \times 1.0 = 7.0$$

(5) Basic Requirements

When implementing a port development project, basic and fundamental issues such as navigational safety, environmental protection and so on should be considered and be satisfied from the national/ social point of view.

An initial evaluation concerning “Basic Requirements” shall be conducted with consideration on securing navigational safety, rehabilitation of port facilities and port environment protection.

Details of rating this important factor are as follows.

Effect “High”: in the case that a project mainly aims at one of the above three factors, the project is given a “High” rating.



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Effect “Middle”: in the case that a project is expected to have a secondary effect on one of three factors, the project is given a “Middle” rating.

Effect “Low” other projects are given a “Low” rating.

Measures on port security that conform to the ISPS code are also a basic and important requirement and an obligation when developing facilities which accommodate foreign vessels and cargo. Therefore, all the projects accommodating foreign vessels and cargo require that proper measures on port security be taken.

Overall Evaluation

Each project is evaluated by five items/eleven important factors and compiled as follows. Then total score by project is calculated by using a formula (the number of “High” x 2.0 + the number of “Middle” x 1.0). Considering port types, liner route spheres and views/opinions of the member countries, the overall evaluation will be conducted and the short list of projects will be compiled among the projects which obtained high scores.

As two projects which are pertinent to plural ports are not suited for adopting an initial evaluation method explained here, these projects will be examined respectively using different ways.

Consequently, the number of projects for which the initial evaluation will be conducted is sixty-six (66) projects within the thirty-nine (39) ports.

Table 4.1-4 Example of the overall evaluation for an Initial Evaluation

Items and important factors Name of Port and Project	1) Responding to Maritime Transport Demand			2) Effects on Regional Development			3) Reduction in Transportation Cost		4) Coping with Regional Transport Corridors		5) Basic Requirements	Project listed in a short List
	Measures coping with the shortage of port capacity	Measures responding to larger vessels being deployed	Measures for improving productivities	Development of Economic Special Zones/Industrial Zones around the port	Interest of foreign investment in port development	Scale of the hinterland and beneficiaries	Reduction in maritime transportation cost	Reduction in land transportation cost	Roles in line with Regional Corridor projects	Roles in ASEAN maritime network	Consideration on securing navigational safety / rehabilitation of port facilities / port environment protection	
A Port OO Project	L	L	H	L	M	M	M	L	L	H	L	×
B Port XX Project	H	H	M	H	H	M	M	H	H	L	M	⊙
C Port ++ Project	H	L	H	H	H	H	H	L	M	H	H	⊙
D Port zz Project	L	H	L	L	L	L	M	L	L	L	M	×

Rating: H:High, M: Middle, L:Low

	a No. of “H”	b No. of “M”	c No. of “L”	Total Score $a \times 2 + b \times 1$
A Port OO Project	2	3	6	7
B Port xx Project	6	4	1	16
C Port ++ Project	8	1	2	17
D Prot zz Project	1	2	8	4



4.2 Initial Evaluation of Projects

4.2.1 Results of the Initial Evaluation

(1) Responding to Maritime Transport Demand

1) Measures coping with the shortage of port capacity

Container throughput in the ASEAN region has been steadily increasing. Container cargo demand forecast indicates that most container handling ports are expected to increase their container throughput. On the other hand, in terms of port capacity, some ports are suffering from a shortage of handling capacity even at present. Therefore, bridging of the gap between demand and capacity is one of the impending issues among the ASEAN network ports.

The results of an initial evaluation on coping with the shortage of port capacity by each port are as follows. The gap between demand and capacity at many ports is becoming tight.

Rating	Name of the port
High	Muara, Phnom Penh, Sihanoukville, Belawan, Tanjung Priok, Palembang, Pontianak, Tanjung Perak, Tanjung Emas, Banjarmasin, Makassar, Balikpapan, Port Klang, Kuching, Bintulu, Kota Kinabalu, Sandakan, Tanjung Pelepas, Yangon, Manila, Cebu, Iloilo, Davao, Singapore, Laem Chabang, Songkhla, Da Nang, Ho Chi Minh (Total: 28 ports)
Middle	Panjang, Bitung, Thilawa, Cagayan de Ore, Hai Phong, (Total: 5 ports)
Low	Dumai, Sorong, Jayapura, Kuantan, Kemaman, Johore, Penang, Kyaukphyu, Batangas, Subic Bay, General Santos, Zamboanga, Bangkok, Cai Lan (Total :14 ports)

2) Measures responding to larger vessels being deployed

Ten ports have a channel deepening project. The results of an initial evaluation concerning measures responding to larger vessels being deployed by eight ports are as follows.

	Performance of PIANC standard	Water Depth (m)	Shortage of Water Depth (m)	Tidal Difference (m)	Rating
Tanjung Priok	0.9	14.0	1.4	1.7	Middle
Palembang	0.3	10.0	7.0	4.0	High
Pontianak	0.5	4.0	2.0	1.5	High
Tanjung Perak	0.7	9.5	2.9	2.4	High
Penang	0.7	11.0	3.3	1.6	High
Kuching	0.5	4.9	2.5	3.9	Middle
Thilawa/Yangon	0.5	9.0	4.5	3.3	High
Cebu	0.8	8.7	1.7	1.5	High
Ho Chi Minh (Saigon Riv.)	0.7	8.5	2.6	2.2	High
(Cai Mep Riv.)	0.9	14.0	1.4	3.8	Middle
Hai Phong	0.6	7.5	3.0	3.5	Middle

Each port has a channel deepening plan to secure the necessary water depth. However, some ports would not realistically be able to secure the sufficient water depth even by utilizing the tidal difference because of the massive dredging cost.

Ports which aim at developing new port/terminals in a new place where larger vessels can be easily accommodated will be given a “High” rating. These ports are Hai Phong port, Cai Lan port, Ho



Chi Minh port, Cebu port, Manila port, Phnom Penh port and Thilawa port.

3) Measures for improving productivities

Each port shows a strong interest in improving productivities. Among sixty-six (66) projects screened by an initial evaluation, projects which aim at improving productivities and/or contribute to improvement of productivities totaled 44, of which twenty (20) projects had a “High” rating and twenty-five (25) projects had a “Middle” rating. These projects belong to 36 ports among 39 ports for which conducted an initial evaluation was conducted.

(2) Effects on Regional Development

1) Development of Economic Special Zones/Industrial Zones around the Port

Concerning development of Economic Special Zones/Industrial Zones (SEZ/IZ), questionnaire data and hearings from member countries, a report titled “ASEAN Investment Area Facilitation Series No.1” compiled by ASEAN secretariat in 2002 and website of each port and so on were used to grasp the situation of SEZ/IZ.

As a result of the survey, twenty-two (21) ports are given a “High” rating and nine (9) ports are given a “Middle” rating among thirty-nine (39) ports.

2) Interest of Investment in Port Development

Concerning interest of Investment in port/port related development, questionnaire data and hearings from member countries, a report titled “ASEAN Investment Area Facilitation Series No.1 2002” compiled by ASEAN secretariat in 2002 and websites of each port and so on were used to grasp the extent of interest of investment.

As a result of the survey, a “High” rating is given to sixteen (16) ports and a “Middle” rating is given to nine (9) ports among thirty-nine (39) ports.

3) Scale of the Hinterland and Beneficiaries

Considering the characteristics of each sphere of liners, it is reasonable that two to four ports be chosen and given a “High” rating. Therefore, effect “High” is given to the following port projects.

Sphere of Liners	Name of Port	Description
East Indochina Peninsula		
	North: Hai Phong, Cai Lan	Largest port in the said area and its supplemental port, large population in the hinterland
	South: Ho Chi Minh	Largest port in the said area, large population in the hinterland
	Central: Laem Chabang	Largest port in the said area, large population in the hinterland
	West: Yangon/Thilawa	Largest ports in the said area, large population in the hinterland
Philippines		
	Luzon: Manila	Largest port in the Philippines, large population in the hinterland
	Visayas: Cebu	Largest port and key position in the said area,
	Mindanao: Davao	Largest port and key position in the said area
Indonesia		
	Central: Tanjung Priok	Largest port in Indonesia, large population in the hinterland
	Central: Tanjung Perak	Second largest port in Indonesia, key position in east Indonesia



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Malaysia	
Peninsula: Johore	Key position between Peninsula and island
Sabah: Kota Kinabalu	Key position in Sabah
Sarawak: Bintulu	Key position in Sarawak and Peninsula
Singapore	
Singapore, Port Klang, Tanjung Pelepas	World class Transshipment ports

Considering the characteristics of each sphere of liners and the scales of the hinterland other than the abovementioned ports in each sphere of liners, one to five ports are given a “Middle” rating by spheres of liners. Therefore, effect “Middle” is given to the following port projects.

Sphere of Liners	Name of Port	Description
East Indochina Peninsula		
	East: Da Nang	Major port in central Vietnam
	South: Sihanoukville, Phnom Penh	Major ports in Cambodia
	Central: Bangkok	Major port in Thailand
Philippines		
	South: Cagayan de Oro	Major port in Mindanao
Indonesia		
	West: Belawan	Major port in north Sumatra, large population in the hinterland
	West: Dumai	Major port in Central Sumatra, high accumulation of industries in the hinterland
	Central: Tanjung Emas	Major port in central Java, large population in the hinterland
	East: Balikpapan	Major port in east Kalimantan, high accumulation of industries in the hinterland
	East: Makassar	Major port in south Sulawesi, high accumulation of industries and large population in the hinterland
Malaysia		
	Peninsula: Penang	Major port in north Peninsula and south Thailand
	Peninsula: Kuantan	Major port in east Peninsula
	Island: Kuching	Major port in Sarawak

Other ports are given a “Low” rating by spheres of liners

Sphere of Liners	Name of Port
East Indochina Peninsula	Kyaukphyu, Songkhla
Philippines	Batangas, Subic Bay, Iloilo, General Santos, Zamboanga
Indonesia	Palembang, Panjang, Pontianak, Banjarmasin, Bitung, Sorong, Jayapura
Malaysia	Sandakan, Kemaman

(3) Reduction in Transportation Cost

1) Reduction in Maritime Transportation Cost

Effect for reduction in maritime transportation cost is evaluated by whether a project aims at



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accommodating larger vessels and/or improving terminal efficiency. Among projects included in the long list, many contain components of dredging a channel and/or installing handling equipment and so on, and thus many of ports are very interested in this field.

Among sixty-six (66) projects, fifty-three (53) projects are considered to directly or indirectly contribute to reducing maritime transportation cost.

2) Reduction in Land Transportation Cost

Effect for reduction in land transportation cost is evaluated by whether a project aims at improving access or shortening/increasing transportation distance to a port.

The number of projects which contains a component to improve access conditions to a port is limited. A port which is growing rapidly and/or being developed newly in a new place needs to develop new access transportation.

Phnom Penh port explicitly seeks to short transportation distance by implementing port development projects and thus the projects of these ports are given a “High” rating. Conversely, the transportation distance will be increased by the port development projects being implemented at Balikpapan port, Cebu port and Lach Huyen area of Hai Phong port, and thus the projects of these ports are given a “Low” rating.

Among 66 projects, 8 projects are considered to directly or indirectly contribute to reducing land transportation cost.

(4) Coping with Regional Transport Corridors

1) Roles in line with Regional Corridor Projects

There are five inter-regional corridors in the ASEAN region, namely; north - south corridor, east – west corridor and southern corridor of the Great Mekong sub region, the connection between the Philippines and Malaysia, and the connection between Malaysia and Indonesia.

Ports located in these corridors are as follows and are given a “High” rating.

Name of Inter-regional Corridors	Name of Port
North – South Corridor of the Great Mekong sub region	Hai Phong, Cai Lan, Bangkok
East – West Corridor of the Great Mekong sub region	Da Nang, Yangon/Thilawa
Southern Corridor of the Great Mekong sub region	Ho Chi Minh, Sihanoukville, Phnom Penh, Laem Chabang
The Philippines and Malaysia route	Zamboanga, Sandakan
Malaysia and Indonesia route	Penang, Belawan

In island nations such as the Philippines, Indonesia and Malaysia, major domestic maritime routes are selected from the viewpoint of the liner connections, and thus ports located on these routs are given a “Middle” rating as follows.

Major Domestic Maritime Route	Name of Port
Luzon – Visayas – Mindanao in the Philippines	Manila, Cebu, Cagayan de Oro
Java – Kalimantan/ Sulawesi in Indonesia	Tanjung Priok, Tanjung Perak, Banjarmasin, Makassar, Bitung
Peninsula – Sabah/Sarawak	Johore, Kuching



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Projects of Other ports which are not included in the above Tables are given a “Low” rating.

2) Roles in ASEAN Maritime Network

Based on the order of the numerical values which were calculated with the method explained in 4-2) of the previous section, ports from the top third, the middle third and the bottom third are as follows and are given a “High”, “Middle” and “Low” rating respectively.

	Effect “High”	Effect “Middle”	Effect “Low”
Type 1	Port Klang, Tanjung Pelepas, Singapore		
Type 2	Tanjung Priok, Laem Chabang, Ho Chi Minh		
Type 3	Tanjung Perak, Johore, Manila	Tanjung Emas, Penang, Kuching, Bangkok, Hai Phong	Cai Lan
Type 4	Muara, belawan, Bintulu, Da Nang	Sihanoukville, Pontianak, Banjarmasin, Kuantan, Kota Kinabaru, Yangon, Thilawa, Davao, Cebu, Cagayan de Oro	Makasaar, Palembang, Panjang, Balikpapan, Iloilo, Zamboanga, Subic Bay, Batangas
Type 5	General Santos	Bitung, Sandakan, Songkhla	Phnom Penh, Sorong, Jayapura, Dumai, Kemaman, Kyaukphyu

(5) Basic Requirements

The number of projects which directly or indirectly affect navigational safety, rehabilitation of port facilities and port environment protection tops thirty-three (33) projects among sixty-six (66) projects for which conducted an initial evaluation was conducted. A “High” rating is given to six (6) projects

Many ASEAN network ports are focusing on responding to the demand, improving productivity and contributing to regional development, and thus it seems that the number of projects contributing to the abovementioned issues is not so large.

4.3 Compiling of the Short List of Projects

Based on the framework for compiling the short list of projects and considering importance of policies and views of member countries for the port development projects, results of initial evaluation of the long list of projects which the JICA study team compiled as the short list of projects are as follows.

Introduction of an IT system and single window for port procedures is very important for enhancing the performance of port operation and strengthening the maritime network. However, introduction of electronic port documentation in some of ASEAN countries lags behind the world standard. Therefore, an operational improvement project for introducing/upgrading a port EDI system is included in the short list.



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Table 4.3-1 Short List of Projects

Country	Name of Port	Name of Project
Cambodia	Phnom Penh	① <i>Construction of New Phnom Penh Container Terminal</i>
Cambodia	Sihanoukville	② Enhancement of Container Handling Productivity
Cambodia	Sihanoukville	③ Transfer the Old Jetty to Passenger Terminal
Indonesia	Belawan	④ <i>Expansion of Container Terminal</i>
Indonesia	Tanjung Priok	⑤ Container Terminal Development Project (former East Ancol Development. The project site will likely be changed.)
Indonesia	Tanjung Perak	⑥ New Multi Purpose Terminal Development Project
Malaysia	Penang	⑦ Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and Kuala Perai Terminal
Malaysia	Tanjung Pelepas	⑧ Development of Container Terminal Phase II (#13 and #14)
Malaysia	Kuantan	⑨ Kuantan Port Expansion
Myanmar	Thilawa/Yangon	⑩ Thilawa/Yangon Port Approach Channel Improvement
Philippines	Cebu	⑪ Development of New Cebu Port
Philippines	Davao	⑫ Davao Container Terminal Improvement Project
Singapore	Singapore	⑬ <i>Development of Pasir Panjang Terminal Phase III & IV</i>
Thailand	Laem Chabang	⑭ <i>Coastal Terminal Development Project</i>
Vietnam	Ho Chi Minh	⑮ Improvement of the Approach Channel and Vessel Control and Development of Cai Mep Thi Vai Terminal
Vietnam	Hai Phong	⑯ <i>Development of Hai Phong International Gateway Port</i>
Cambodia, Indonesia, Myanmar, Philippines, Vietnam	Project by a country (plural ports in a country)	⑰ Operational Improvement Project by Introducing/Upgrading Port EDI System

Note 1: Projects in italics are on-going projects. Projects in the DD stage are included.

Note 2: Name of a project of Penang port was changed from North Channel Deepening Project to the above.

The short list of projects is compiled of seventeen (17) projects in eight (8) countries which includes one capacity development project for port EDI system in five (5) countries.

Table 4.3-2 Ports included in the short list of projects

	Type-1	Type-2	Type-3	Type-4	Type-5
Indochina Lines Sphere		Laem Chabang Ho Chi Minh	Hai Phong	Sihanoukville Thilawa/Yangon	Phnom Penh
Philippines Liner Sphere				Cebu Davao	
Indonesia Liner Sphere		Tanjung Priok	Tanjung Perak	Belawan	
Malaysia Liner Sphere			Penang	Kuantan	
Singapore Liner Sphere	Tanjung Pelepas Singapore				

The results of the initial evaluation of the short list of projects which the JICA study team compiled are shown in Table 4.3-3.



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Table 4.3-3 Initial Evaluation of the Short List of Projects

Country	Port	Type	Project Name	Purpose/Background	Port			Development			Transpatial Network			Others	Overall evaluation score
					Shortage of Capacity	For Larger Vessels	Productivities	SEZ/Industrial Zones	Interest of Investment	Scale of the Hinterland	Marine Transportation Cost	Land Transportation Cost	Regional Corridor		
Cambodia	Phnom Penh	5	Construction of new Phnom Penh Container Terminal	To develop a new modern and easily accessible container port and reduce traffic congestion around the present port area	H	H	M	H	M	H	H	L	M	17	
	Shamoukville	4	Enhancement of Container Handling Productivity Transfer the Old Jetty to Passenger Terminal	To improve the productivity of container operation through the installation of additional cargo handling equipment and quay cranes, and united IT system To maintain and transfer the old jetty to be Passenger Terminal. Establish New Passenger Terminal with International Standard. Contribute to attract the International Tourisms.	H	L	H	H	M	M	M	H	M	L	13
Indonesia	Belawan	4	Expansion of Container Terminal	To increase the capacity of container handling for international and domestic	H	L	H	M	M	M	H	H	L	13	
	Tanjung Priok	2	Container Terminal Development Project (former East Ancol Development. The project site will likely be changed.)	To improve the effectiveness and safety of the port function through the re-development of the port and to increase container handling capacity	H	M	H	H	H	M	M	H	M	16	
Malaysia	Tanjung Perak	3	New Multipurpose Terminal Development Project	Development of a new terminal for multipurpose use at Lamong Bay	H	M	M	H	H	H	M	H	L	14	
	Penang	3	Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and Kuala Perak Terminal	Deepening of the North Channel (depth: from 11 meters to 15 meters) to accommodate larger vessels	M	H	L	H	M	M	H	M	M	13	
Myanmar	Tanjung Petapas	1	Development of Container Terminal Phase II (#1,3 and #14)	To expand the capacity of container handling	H	M	M	H	H	M	L	H	L	13	
	Kuantan	4	Kuantan Port Expansion	To increase the container handling capacity	L	M	M	H	M	H	H	L	L	12	
Philippines	Thilawa Yangon	4	Thilawa Yangon Port Approach Channel Improvement Project	To accommodate 30,000 DWT glass vessels at the Port of Thilawa	M	H	L	H	M	M	L	M	H	14	
	Cebu	4	Development of New Cebu Port	To increase the capacity of cargo handling	H	H	H	H	H	H	M	M	M	18	
Singapore	Davao	4	Davao Container Terminal Construction Project	Construction of a container terminal to cope with the increasing container cargoes of 349,000 TEUs in 2008. (PPA 2000-2009 Port Traffic Statistics as 395,828 TEUs in 2009).	H	M	H	H	M	M	L	M	L	12	
	Singapore	1	Development of Pasir Panjang Terminal Phase III and IV	To expand the container port capacity.	H	M	M	H	H	M	L	H	L	13	
Thailand	Laem Chabang	2	Coastal Terminal	To develop the coastal terminal for serving containers transported from/to LCP by coastal ship from southern part of Thailand or barge from inland waterway.	H	L	L	H	M	M	H	H	M	15	
Vietnam	Ho Chi Minh	2	Improvement of Approach Channel and Vessel Control and Development of Cai Mep area	To accommodate larger vessels which will call the deep-water terminals at Cai Mep area	M	H/M	L	H	M	M	H	H	M	14	
Plural Countries (Cambodia, Indonesia, Myanmar, Philippines, Vietnam)	Hai Phong	3	Development of Hai Phong International Gateway Port	Development of a deep sea outer port of Hai Phong	H	H	M	H	H	M	H	H	M	17	
	Project by a country (Plural Ports in a country)		Operational Improvement Project by Introducing/Upgrading Port EDI System	Introduction / Upgrading of Port EDI System for smooth operation.	-	-	-	-	-	-	-	-	-	-	



Regarding the seventeen (17) projects which the JICA study team compiled, some points of the initial evaluation are as follows.

① Construction of New Phnom Penh Container Terminal: Phnom Penh (Cambodia)

This project is to develop a container terminal downstream of the existing Phnom Penh port.

The balance between demand and capacity of container cargo in Phnom Penh port is tight and demand is forecasted to increase continuously and rapidly. This project aims at accommodating larger vessels. A SEZ/IT in Phnom Penh is being developed and the Chinese government financed a port development project and thus investors are interest in port related development. Effect on reducing transportation cost is expected as Phnom Penh port is closer than Sihanoukville port. This port has an important role as a port located in the southern corridor plan of the Great Mekong sub-region.

Therefore, this project was evaluated as a highly beneficial project and included in the short list of projects

② Enhancement of Container Handling Productivity: Sihanoukville (Cambodia)

This project is to install handling equipment to improve productivity.

The capacity to handle container cargo in Sihanoukville port will be exceeded as demand is forecasted to increase continuously. This project aims at improving cargo handling productivity by expanding the berth and yard and installing quay side cranes and yard cranes. Development of a SEZ/IT is in progress and foreign investors have expressed great interest in development projects related to the port. This port is located in the southern corridor plan of the Great Mekong sub-region and thus is expected to play an important role in the south of this region.

Therefore, this project was evaluated as a highly beneficial project and included in the short list of projects.

③ Transfer the Old Jetty to Passenger Terminal : Sihanoukville (Cambodia)

This project is to convert the old Jetty to a Passenger Terminal and establish a new passenger terminal with international standards that can attract international tourists.

Demand of the international passenger for tourism is expected to increase in Sihanoukville port and the government of Cambodia recognizes that tourism industry is very important for the development of the region. Furthermore, reconstruction of the old jetty in Sihanoukville port for accommodating international cruise ship is to strengthen the network of passenger movement in the ASEZN region. This project will contribute to regional development and development of the regional transport corridor. Accordingly, this project is very important due to improving the accessibility to Cambodia.

④ Expansion of Container Terminal: Belawan (Indonesia)

This project is to expand the existing container terminal to increase the port capacity.

The balance of demand and capacity of container cargo in Belawan port is tight and demand is forecasted to increase continuously and rapidly. Productivity improvement is expected through the development of a full- scale container terminal. Islamic Development Bank has decided to finance a port development project and investors are interested in port related investment. Belawan port is connected to Penang port on the other side of the Malacca straight by international ferry, and maintains dense connections in ASEAN maritime networks.

Therefore, this project was evaluated as a highly beneficial project and included in the short list



of projects.

⑤ Container Terminal Development Project (former East Ancol Development): Tanjung Priok (Indonesia)

This project is to develop new container terminals to cope with the shortage of container handling facilities.

The balance of demand and capacity of container cargo in Tanjung Priok port is tight and demand is expected to increase continuously and rapidly. Productivity improvement is expected at the new terminals. Investors are interested in port related development and the scale of the hinterland is also large as many industries are accumulated there. This port has a very important role specifically in the domestic maritime networks.

(The name of this project has been changed from “East Ancol Development” because the project site will likely be changed and for the sake of consistency with on-going JICA study on “The Project of Master Plan Study on Port Development and Logistics in Greater Jakarta Metropolitan Area”)

Therefore, this project was evaluated as a highly beneficial project and included in the short list of projects

⑥ New Multi Purpose Terminal Development Project; Tanjung Perak (Indonesia)

This project is to develop large scale multi purpose terminals to cope with increasing cargo demand.

The balance of cargo demand and capacity in Tanjung Perak is tight and demand is forecasted to increase continuously and rapidly. Some SEZ/IZ have been developed and the scale of the hinterland of Tanjung Perak is large because it is a base port in the eastern Indonesia. Although a portion of the west channel is narrow, lower maritime transport costs can be expected by developing deeper port facilities.

Therefore, this project was evaluated as a highly beneficial project and compiled in the short list of projects.

⑦ Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and Kuala Perai Terminal: Penang (Malaysia)

This project is to increase the depth of the north channel from 11m to 15m and thereby accommodate larger vessels.

Some SEZ/IT have been developed and investors are very interested in port related development. Penang port was connected to Belawan port on the other side of the Malacca straight by ferry and thus is located in a very important place in terms of maritime networks.

Therefore, this project was evaluated as a highly beneficial project and included in the short list of projects.

⑧ Development of Container Terminal Phase II (#13 and #14) : Tanjung Pelepas(Malaysia)

This project is to expand the capacity of container handling to cope with the increasing containers.

Tanjung Pelepas port is a world class transshipment port, so that this is a very significant and important project for strengthening the maritime network. This project is included in the existing development plan of Tanjung Pelepas port and will be implemented according to plan.



⑨ Kuantan Port Expansion : Kuantan (Malaysia)

This project is to increase the container handling capacity.

Kuantan port is in the center of the East Coast Economic Region (ECER) which is a development plan of east Peninsula. The Malaysian government included this port expansion project in the 10th Malaysia development plan, so Kuantan port is expected to develop in the near future.

⑩ Thilawa/Yangon Port Approach Channel Improvement: Thilawa/Yangon (Myanmar)

This project is to deepen an approach channel to Thilawa port and Yangon port by dredging at the mouth of the Yangon River.

This project contributes to both Thilawa port and Yangon port which is located in the capital city. Improvement of navigational safety is expected. A SEZ/IT is in operation and the scale of the hinterland is large as these are the largest ports in the west part of the Indochina liner sphere. These ports are located in the east-west corridor plan of the Great Mekong sub-region.

Therefore, this project was evaluated as a highly beneficial project and included in the short list of projects.

⑪ Development of New Cebu Port: Cebu (Philippines)

This project is to develop full scale container terminals in a new site apart from the existing Cebu port.

The balance of demand and capacity of container cargo in Cebu port is tight and demand is forecasted to increase continuously. This project aims at accommodating larger vessels and improving productivity. Some SEZ/IT have been developed and foreign investors have expressed great interest, and the scale of the hinterland is large and includes the center city of the Visayas region. This project also contributes to reducing maritime transportation cost by accommodating larger vessels.

Therefore, this project was evaluated as a highly beneficial project and included in the short list of projects.

⑫ Davao Container Terminal Improvement Project: Davao (Philippines)

This project is to develop a container terminal by expanding the existing terminal.

The balance of demand and capacity of container cargo in Davao port is tight and demand is forecasted to increase continuously. A new full-scale container terminal is expected to improve productivity. A SEZ/IT has been developed and the scale of the hinterland of Davao port is large as it is the base port of southern Mindanao.

Therefore, this project was evaluated as a highly beneficial project and include in the short list of projects.

⑬ Development of Pasir Panjang Terminal Phase III & IV) : Singapore(Singapore)

This project is to expand the capacity of container terminals to cope with the increasing containers.

Singapore port is a world class transshipment port, so this is a very significant and important project for strengthening the maritime network. This project is included in the existing development plan of Singapore port and will be implemented according to plan.

⑭ Coastal Terminal Development Project: Laem Chabang (Thailand)



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This project is to develop a terminal for coastal shipping for the promotion of modal shifting.

The balance of demand and capacity of container cargo in Laem Chabang port is tight and demand is forecasted to increase continuously and rapidly. Some SEZ/IT have been developed, investors are very interested in port related field, and the scale of the hinterland is large. Utilizing coastal shipping contributes to reducing land transportation cost. This port is located in the southern corridor plan of the Great Mekong sub-region and maintains dense connections in the ASEAN maritime networks.

Therefore, this project was evaluated as a highly beneficial project and included in the short list of projects.

⑮ Improvement of the Approach Channel and Vessel Control and Development of Cai Mep Thi Vai Terminal: Ho Chi Minh (Vietnam)

This project is to deepen an approach channel to ease the passage of larger vessels

In the midst of growing demand, Many SEZ/IT have been developed and investors are greatly interested in port development and other related fields, and the scale of the hinterland is large. This port is located in the southern corridor plan of the Great Mekong sub-region and maintains dense connections in the ASEAN maritime networks.

Therefore, this project was evaluated as a highly beneficial project and included in the short list of projects.

⑯ Development of Hai Phong International Gateway Port (former Lach Huyen Gateway Port): Hai Phong (Vietnam)

This project is to develop a new deep seaport offshore of the existing port.

This project aims at accommodating larger vessels. Many SEZ/IT have been developed and investors are greatly interested in port development and related fields. This port is the largest port in the north of the Indochina liner sphere and the scale of the hinterland is large, and also located in the north- south corridor plan of the Great Mekong sub-region. Full-scale container terminals are able to accommodate larger vessels and thus reduction on maritime transportation cost is expected.

Therefore, this project was evaluated as a highly beneficial project and included in the short list of projects.

One capacity development project for a port EDI system is as follows.

⑰ Operational Improvement Project by Introducing/Upgrading a Port EDI System: (Cambodia, Indonesia, Myanmar, Philippines, Vietnam)

This project is to introduce/upgrade port EDI system.

Smoothness, simplification and standardization of port related procedures are pressing issues, and thus the introduction of an IT system and single window for port documentation is important for enhancing the performance of port operation. Introduction of electronic port documentation in ASEAN countries lags behind the world standard. Therefore, port related documentation will be divided into three aspects, namely, international standardization, electronization and single window, and at the same time the situation of each country in regard to those aspects will be grasped. And then, necessary actions/measures for introducing/upgrading a port EDI system should be taken properly corresponding to the said situation. This will be the first step in realizing the ASEAN single window.

The JICA study team would like to recommend this project for creating a smooth and competitive maritime network.
