Chapter 5. Priority Projects

5.1 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

The conceptual procedure for evaluating priority projects is shown in Figure 5.1-1. Each project has different characteristics in terms of urgency, importance and efficiency, so that projects were compiled by their contents and features. Furthermore, it should be noted that some project names have been altered after obtaining more detailed data at the time of the site surveys and other information.

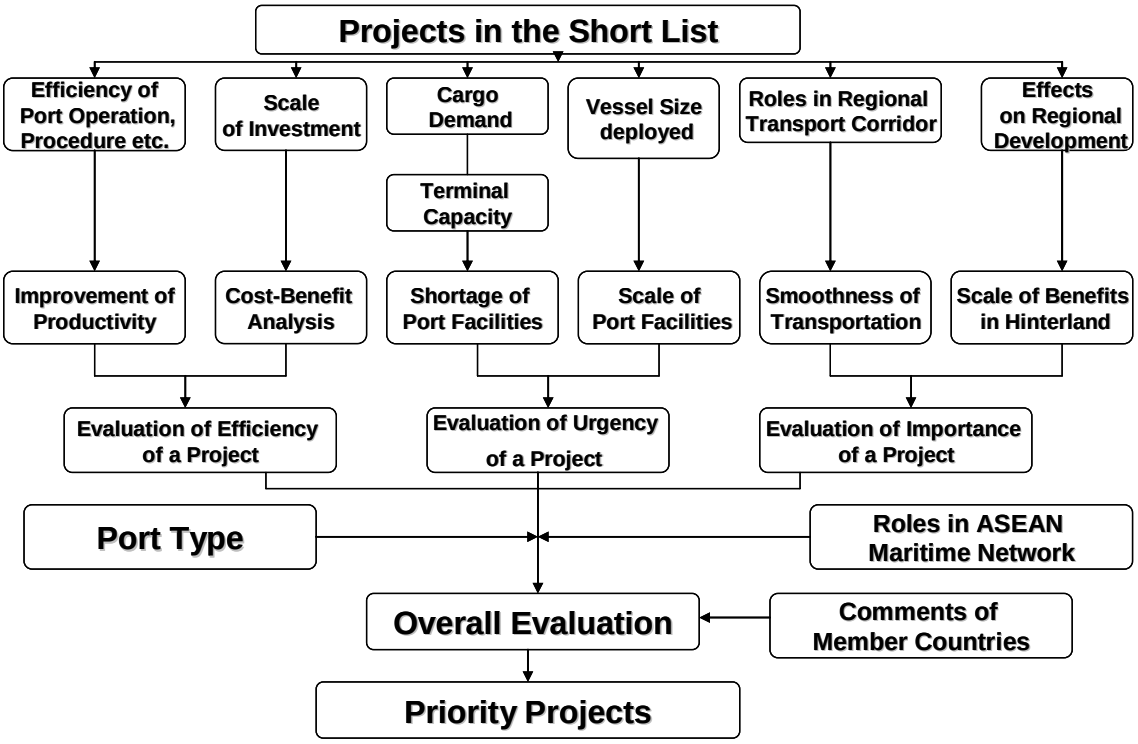


Figure 5.1-1 Conceptual Evaluation Flow for Priority Projects

5.2 Evaluation of the Priority Projects

5.2.1 Analysis of the Projects

Projects included in the short list are analyzed in terms of urgency, importance and efficiency in this section

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.

Urgency

The number of handling containers at Phnom Penh port has been rapidly increasing in recent years and the capacity of the present terminal will be exceeded in the near future. Furthermore, large scale container terminals in Cai Mep and Thi Vai area of Ho Chi Minh port have started operation, and the container handling volume of Phnom Penh port is expected to increase greatly because of its geographical location. Therefore, increasing the container handling capacity is an urgent issue.

Table 5.2-1 Container Handling Capacity and Demand Forecast

(unit: thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
73	47	58	125	244

Source: Capacity & Demand Forecast: the study on Measure 7,Actual Throughput: PAPP

Importance

The present terminal was not designed for handling containers and thus a dedicated container terminal is requested in terms of handling efficiency, cost reduction and safety improvement. Most of container cargoes come from and go to the vicinity of Phnom Penh areas, so that an increase of container handling capacity of Phnom Penh port will reduce transport cost. Furthermore, because the new terminal is being carried out in a new site, this project will ease traffic congestion around the present port. Therefore, this project is recognized to be a highly important project.

Efficiency

There are two transport routes for shipping to the United States. One is to use Sihanoukville port by road, the other is to transship at Cai Mep port in Ho Chi Minh using Phnom Penh port. The latter route is estimated to reduce transport cost to US$100 to 200 per container and lead time of 2 to 3 days. Furthermore, the project site is away from the city center and has an advantage in terms of access. Therefore, this project is recognized to be highly efficient.

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

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

Urgency

The first container terminal in Cambodia started operation in 2009 by Port Autonomous of Sihanoukville (PAS). It is necessary to realize high productivity of cargo handling and efficient terminal operation. Furthermore, in the midst of the changing container distribution structure in Cambodia because of opening of the Cai Mep container terminal in Ho Chi Minh port, it is an urgent

issue to establish competitive operation and management.

Table 5.2-2 Container Handling Capacity and Demand Forecast

(unit: thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
258	259	256	344	456

Source: Capacity: the study on Measure 6, Actual Throughput: PAS, Demand Forecast: the study on Measure 7

Importance

Sihanoukville port is the only deep sea port in Cambodia. It is very important for Cambodia that Sihanoukville port provides efficient cargo handling and becomes an effective terminal to reduce transportation cost and strengthen the international competitiveness of industries. Special economic zones developed and/or being planned in the vicinity of the port are basic infrastructure and of great worth for business activities.

Efficiency

Increasing the efficiency of handling cargoes in the terminal leads to a reduction in cargo transportation cost and lead time so that businesses using the port receive big benefits. Improving operational and management know-how of PAS personnel will also yield great effects for effective utilization of port facilities. Therefore, this project is recognized to be highly efficient.

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.

Urgency

Sihanoukville port does not have a dedicated terminal for passengers and is required to develop one to cope with increasing passengers in the near future. Therefore, this project is recognized to be an urgent project.

Table 5.2-3 Demand Forecast for Passenger at Sihanoukville port

(unit: person)

Year 2008	Year2010	Year 2015	Year 2020
12,000	24,518	90,715	143,499

Source: the study on Measure 7

Importance

Sihanoukville port is the only deep sea port and is able to accommodate large international passenger ships. Upgrading its function to meet international standards for a passenger terminal is very important for development of the tourism industry in Cambodia and will bring lots of benefits to the tourism industry. Furthermore, the purpose of this project is in line with the government's policy which is aiming at promoting international tourism. Therefore, this project is recognized to be highly important.

Efficiency

This project is to convert an old jetty which has already deteriorated to a terminal for passenger

use only. However, this jetty was constructed in 1959 and is in a severely deteriorated state. Therefore, the precise state of deterioration should be evaluated and then it can be determined whether or not it can be converted to a passenger terminal.

④ Expansion of Container Terminal: Belawan port (Indonesia) -Type-3

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

Urgency

The balance of demand and capacity of container cargo in Belawan port is tight and there will be a shortage of container handling capacity in the near future. Therefore, increasing container handling capacity is an urgent issue.

Table 5.2-4 Container Handling Capacity and Demand Forecast

(unit: thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
721	590	609	1,044	1,526

Source: Capacity: the study on Measure 6, Actual Throughput: PELINDO I, Demand Forecast: the study on Measure 7

Importance

Belawan port faces the Malacca Strait and has strong connections to the world class transship ports. Furthermore, Belawan port is a base port in the northern Sumatra region. Therefore, this project is recognized to be an important project.

Efficiency

According to the report conducted by the Islamic Development Bank, the economic rate of return for expansion of container terminal phase I is around 19% and the Phase II project is expected to yield a similar result because the scale of the project is almost the same as that of the phase I project. Therefore, this project is recognized to be highly efficient.

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

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

Urgency

The handling capacity of container cargo in Tanjung Priok is tight and there will be a shortage of container handling capacity in the near future. Therefore, increasing handling capacity is an urgent issue.

Table 5.2-5 Container Handling Capacity and Demand Forecast

(unit: thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
5,085	3,984	3,864	5,861	7,575

Source: Capacity & Demand Forecast: the study on Measure 7, Actual Throughput: PELINDO II

Importance

Tanjung Priok port is the biggest port in Indonesia and its hinterland is large. This port needs to play an important role in stimulating economic growth. Therefore, this project is recognized to be an important project.

Efficiency

Efficiency of the existing terminals in Tanjung Priok port is relatively low among type 2 ports. To cope with increasing container cargo, high productivity terminals with enough space and equipment are required to strengthen competitiveness. This project will develop full scale container terminals and will be expected to obtain high efficiency of handling containers, so that this project has a highly efficient project.

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.

Urgency

The handling capacity of container cargo in Tanjung Perak is tight and there will be a shortage of container handling capacity in the near future. Therefore, increasing container handling capacity is an urgent issue.

Table 5.2-6 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
2,300 ～2,700	2,213	2,242	3,670	5,141

Source: Capacity: the JICA study team, Actual Throughput: PELINDO III, Demand Forecast: the study on Measure 7

Importance

Tanjung Perak port is a base port of eastern Indonesia and the scale of beneficiaries is large. Therefore, this project is recognized to be an important project.

Efficiency

Terminals other than TPS handle containers cargo and other cargoes together and performance levels of handling cargo are not high. The new multi purpose terminals will male it possible to realize high operational efficiency. For reference, the economic rate of return of the total Lamong Bay project is estimated to be around 24 % as a result of a rough economic estimation by the JICA study team for reference. Therefore, this project is recognized to be highly efficient.

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.

Urgency

PPSB (Penang Port Management Company) is planning to change the status of Penang port from a feeder port to a premium port by the year 2012 in its master plan and deepening the channel is a part of the master plan. Therefore, this is a highly urgent project.

Table 5.2-7 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
930	918	864	996	1,122

Source: Capacity: the study on Measure 6, Actual Throughput and Demand Forecast: the study on Measure 7

Importance

Accommodating larger vessels on international maritime routes in front is one of the important requirements for Penang port to become a premium port. Deepening the channel is a very important project not only for the future development of Penang port but also from the viewpoint of strengthening the ASEAN maritime network.

Efficiency

Penang port is strategically located on an existing international maritime route and many larger vessels are passing so that transportation cost reduction will be expected when larger vessels are able to call on the port after channel deepening. Furthermore, North Butterworth container terminal has a depth of 12 m. Wharves and terminal capacity can be utilized to the maximum extent after deepening the approach channel and accommodating larger vessels. However, the volume of maintenance dredging for the channel will be more than that of the present.

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.

Urgency

Container handling volume at Tanjung Pelepas port is forecasted to increase rapidly and thus it is important to develop container terminals to cope with future demand in accordance with the previous program of expanding container terminals.

Table 5.2-8 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
5,850	5,600	6,143	9,680	14,900

Source: Capacity: the study on Measure 6, Actual Throughput: Tanjung Pelepas port, Demand Forecast: the study on Measure 7

Importance

Tanjung Pelepas port is specified as a port to expand the capacity for export/import cargoes in the 10th Malaysia development plan which was issued in 2010 and thus this project is recognized to be a highly important project for strengthening the competitiveness of Malaysian ports and the maritime

of metworks.

Efficiency

New terminal site has already been reclaimed and terminal development can be able to implement efficiently.

⑨ Kuantan Port Expansion: Kuantan port (Malaysia) -Type-4

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

Urgency

Container handling volume at Kuantan port is steadily increasing, however, there is currently enough capacity to cope with container cargo. Progress of the eastern area development which the government of Malaysia will push through might bring new demand toward Kuantan port. Regarding development of new container terminals offshore of the present port, it is proper to consider the trend of the said development plan.

Table 5.2-9 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
411	127	133	199	292

Source: Capacity: the study on Measure 6, Actual Throughput: Kuantan port, Demand Forecast: the study on Measure 7

Importance

Development of industries, free zones, oil refineries and so on in the East Coast Economic Region (ECER) is promoted while the eastern coast arterial road scheduled for completion in 2012 which was included in the 10th Malaysia development plan is a key project for expansion of Kuantan port. Therefore, the expansion project of Kuantan port in cooperation with the regional development is fairly important.

Efficiency

The expansion project of Kuantan port will greatly contribute to developing the eastern region. The project consists of construction of breakwater, reclamation dredging and so on and the scale of the project will be large. Therefore, as effects of the project will be affected by the location of industries and the progress of regional development, the movement of these related developments to port development should be monitored and the scale and implementation schedule of the project should be examined carefully.

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.

Urgency

Thilawa port and Yangon port are river ports and have shallow areas called the outer-bar and the

inner-bar in the approach channel, and thus these bars are bottlenecks for larger vessels to approach both ports. Therefore, dredging these two bars is an urgent issue.

Table 5.2-10 Possible Vessels Size to Accommodate

Largest vessel that can currently be accommodated		Target in the future
Yangon port	Thilawa port	
15,000 DWT	20,000 DWT	35,000 DWT

Source: MPA

Importance

Thilawa port and Yangon port are located in front of and near the biggest city and have important roles in supporting Myanmar's economy. The scales of beneficiaries are large. Therefore, this project is recognized to be an important project.

Efficiency

This project is expected to bring several effects such as reduction of transportation cost by accommodating larger vessels, reduction of vessel waiting time and storage cost, and improvement of navigational safety. Therefore, this project is recognized to be highly efficient.

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.

Urgency

The handling capacity in Cebu port is tight and there will be a shortage of container handling capacity in the near future. Furthermore, average vessel size for export/import is increasing from 8,740GRT in 2005 to 14,721GRT in 2009, and it is requested to cope with larger vessels. Therefore, this project is recognized to be highly urgent.

Table 5.2-11 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
630	496	503	622	734

Source: Capacity: the study on Measure 6, Actual Throughput: CPA, Demand Forecast: the study on Measure 7

Importance

Cebu port is a base port for the Visayas region which occupies the center of the Philippines and functions a center of the domestic maritime network. The scale of the hinterland is large. Therefore, this project is recognized to be a highly important project.

Efficiency

The economic rate of return of this project is estimated to be around 27 % as a result of a rough economic evaluation by the JICA study team. Full scale container terminals to be developed will be expected to improve the productivity of handling containers. Therefore, this project is recognized to be highly efficient.

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.

Urgency

The handling capacity of container cargo in Davao port is in tight and there will be a shortage of capacity in the near future. Therefore, implementation of this project is an urgent issue.

Table 5.2-12 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
420	349	355	444	524

Source: Capacity: the JICA study team, Actual Throughput: PPA, Demand Forecast: the study on Measure 7

Importance

Davao port is the biggest port in Mindanao and its scale of beneficiaries is large. Davao port is a collection center of bananas and the demand of them for export is increasing rapidly. Therefore, this project is recognized to be highly important.

Efficiency

This project is to install quay gantry cranes first and develop a full scale container terminal, and thereby greatly improve productivity. Therefore, this project is recognized to be highly efficient.

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

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

Urgency

Container handling volume at Singapore port is forecasted to increase rapidly and thus it is important to develop container terminals to cope with future demand in accordance with the previous program of expanding container terminals.

Table 5.2-13 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
34,291	29,918	29,697	37,512	45,299

Source: Capacity: the study on Measure 6, Actual Throughput: Singapore port, Demand Forecast: the study on Measure 7

Importance

Singapore port is specified as a port to expand the capacity for export/import cargoes and this project will be implemented according to plan. Therefore, this project is recognized to be a highly important project for strengthening the maritime network in ASEAN and the world.

Efficiency

New terminal site has already been reclaimed and terminal development can be able to implement efficiently.

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.

Urgency

Container cargo handled at Laem Chabang port is transported domestically by trucks, which generates traffic congestion and high transportation cost. Therefore, the promotion of modal shifting is an urgent issue. On the other hand, development of new terminals to cope with the increasing container demand is also being examined. Therefore, it is an urgent issue to develop facilities for coastal container shipping.

Table 5.2-14 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
6,890	5,240	5,282	7,505	10,382

Source: Capacity: the study on Measure 7, Actual Throughput: PAT, Demand Forecast: the study on Measure 7

Importance

The promotion of modal shifting is one of the important policies for the government of Thailand, and thus development of terminals for coastal shipping is in line with the policy to develop infrastructure for cargo distribution. Furthermore, this project will contribute to reducing transportation cost and traffic congestion, so that this project is also highly important from the viewpoint of the economy and environment.

Efficiency

Reduction of transportation cost using coastal shipping will be expected while reduction of traffic congestion will bring time savings and a positive effect to the environment. Therefore, this project is expected to have wide-ranging effects.

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.

Urgency

Container handling Volume at Ho Chi Minh port is rapidly increasing and at the same time enlargement of container vessels is in progress. Therefore, implementation of this project is recognized to be highly urgent.

Table 5.2-15 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
3,400	3,426	3,346	5,141	7,001

Source: Capacity, Actual Throughput: Vietnam Seaport Association and Saigon Port, Demand Forecast: the study on Measure 7

Importance

Ho Chi Ming port is located in and the vicinity of the capital city and the business activities are flourishing in the surrounding areas of the port. The scale of the benefits and beneficiaries are large. Ho Chi Minh port occupies a strategic position in the Great Mekong transport corridor. Therefore, this project is recognized to be highly important.

Efficiency

This project will contribute to reducing transportation cost by accommodating larger vessels and shortening waiting times for the right tide for navigation. Furthermore, improvement of operational efficiency will be expected due to enlargement of the capacity of the approach channel. Therefore, this project is recognized to be highly efficient.

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.

Urgency

The handling capacity of container cargo is tight and there will be a shortage of container handling capacity in the near future. Furthermore, the approach channel of the existing port is shallow and many vessels are forced to wait for the right tide for navigation which is hamper efficient operation of the port. Therefore, implementation of this project is recognized to be an urgent issue.

Table 5.2-16 Container Handling Capacity and Demand Forecast

(unit: Thousand TEUs)

Capacity	Actual Throughput in 2008	Demand Forecast		
		2010	2015	2020
2,500	1,399	1,442	2,552	4,002

Source: Capacity: the study on Measure 6 (including planning facilities), Actual Throughput: Hai Phong port, Demand Forecast: the study on Measure 7

Importance

Hai Phong port is a base port in northern Vietnam. Business activities in the surrounding area are becoming active and the scale of the hinterland is large. The government of Vietnam places a high priority on developing a deep sea port in Hai Phong. Therefore, this project is recognized to be highly important.

Efficiency

By implementing this project, larger vessels will not need to wait for the right tide and

operational efficiency will improve. Furthermore, maritime transport cost reduction will be expected using larger vessels. Therefore, this project is recognized to be highly efficient.

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

Urgency

This project is to introduce a port EDI system to the countries which lag behind the world standard in terms of electronization and standardization of port related procedures. Therefore, this project is recognized to have a high priority.

Importance

This project will bring benefits to port authorities as well as port users. The scale of benefits is very large. The government of Vietnam and Indonesia give high priority to introducing a port EDI system. Therefore, this project is recognized to be a highly important project.

Efficiency

This project is to promote operational efficiency through simplification and enhancement of port related procedures. Ratification of the FAL Convention which stipulates the standardization of port related procedure is important and effective for the smooth introduction of a port EDI system (Vietnam and Indonesia among the above five countries have already ratified it). Therefore, this project is a highly efficient project in these countries because the receiving system is set up to some extent.

5.2.2 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, as follows.

Table 5.2-17 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 type of ports.

Type-1 Ports

Ports in type-1 are world class hub ports. These ports have enough routes not only with the ASEAN network ports but also major ports of the world other than the ASEAN ports. Many of ASEAN network ports connect to everywhere of the world through transshipment at type-1 ports.

Projects of Tanjung Pelepas port and Singapore port to expand container handling capacity proposed by Malaysia and Singapore is included in the short list of projects. Port Klang port is also classified as type-1 ports. These ports play very important roles among ASEAN network ports. Therefore, every project of these ports to upgrade their functions is very important and contributes not only to their own development but also to the strengthening of the entire ASEAN maritime network.

Type-1 ports prepare their own development plans to cope with the future requirements. Therefore, each project of type-1 ports to expand their container terminals is highly important to strengthen the ASEAN maritime network.

Type- 2 Ports

Ports in type-2 are gateway ports in Indonesia, the Philippines, Thailand and Vietnam and are located near the center of industrial area and/or logistics hub. These ports play an important role in stimulating economic growth and are developing together with the economic development of each country. On the other hand, these ports are required to increase port capacity and accommodate larger vessels in accordance 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.

Accordingly, Projects of Tanjung Priok port and Laem Chabang port to expand container handling capacity and a project of Ho Chi Minh port to improve an approach channel included in the short list of projects are recognized to be very important.

Type-3 Ports

Ports in type-3 are base ports in the region of each country where mainly intra-regional container vessels call at. Ports in type-3 are also located in areas where economic activities expand to some extent next to the areas where type-2 ports are located. Economic activities are spreading nationwide in accordance with the growth of the national economy, and thus improvement and upgrading of port facilities are required for development of the region and for strengthening the inter-regional maritime network..

Accordingly, projects of Tanjung Perak port, Penang port and Hai Phong port to increase capacity of handling containers and improve the approach channel are included in the short list of project are recognized to be very important.

Type-4 Ports

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. Upgrading functions of type-4 ports will contribute to strengthening the entire ASEAN maritime network. Although characteristics, roles and functions of each port in each region are different, these ports should be improved and their functions upgraded steadily taking into consideration the location of each port , cargo demand, calling vessels and so on.

Accordingly, projects of Sihanoukville port, Belawan port, Kuantan port, Thilawa port/Yangon port, Cebu port and Davao port to increase capacity of handling containers, improve the productivity of container operation, improve the approach channel and a passenger terminal project included in the short list of projects are recognized to be very important.

Type-5 Ports

Ports in type-5 are small scale ports servicing coastal shipping and/or short distance maritime

routes. These ports are required to meet demands for development in a timely manner.

Accordingly, a project of Phnom Penh port to increase the container handling capacity selected for the short list of projects is recognized to be very important for coping with increasing container demand.

5.2.3 Roles of Projects for Strengthening the Network

Among the projects included in the short list of projects, eleven projects are to increase capacity of handling containers (including a project to improve the productivity of container operation), three projects are to improve the access channel, one project is to redevelop a passenger terminal and one is a soft project to improve operational efficiency.

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 important to fill the gap between the capacity and demand and then to set up a seamless network for physical distribution in the ASEAN region. In concrete terms, it is necessary to improve functions of ports and channels, and to realize a maritime network with sufficient capacity.

As shown in Table 2.3-2, Chapter 2, the ports in type 2, which trunk lines call at, and type 3 have strong connections with type 1 ports which are world class hub ports while type 4 ports such as Belawan port and Kuantan port have feeder routes to/from type 1 ports or type 2 ports. Therefore, projects of these ports greatly contribute to strengthening the network.

Furthermore, as shown in Table 2.3-1 ～Table 2.3-5, calling vessels in ASEAN network ports are steadily becoming larger and it will be necessary in the near future to be able to accommodate vessels of 2,000 TEUs class which have a draft of 10 m to 11 m even in type 4 port and type 5 ports.

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.

Increased economic activities in the ASEAN region have led to increased demand for ports and this trend is expected to continue. The result of the study on Measure 7 shows a steady increase of cargo volume at network ports. The ports which are located at regions with high economic growth or affected by remarkable change of maritime transportation or function as gateways are expected to strengthen the ASEAN maritime network.

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

There are ports such as Van Phong Port in Vietnam and Dawei Port in Myanmar which have received a lot of attention recently but are not designated as ASEAN network ports. Because the study on Measure 8 targets only the 47 ASEAN network ports, the projects at these ports are not examined in the study. However some projects at ports other than ASEAN network ports may also contribute to the enhancement of maritime networks in ASEAN.

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.

5.3 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.

Regarding the project of introducing/upgrading a port EDI system, every country is requested to realize smooth port related procedures. However, as mentioned in section 5.2-1, it is essential that the receiving system should be set up when introducing a port EDI system. Taking this into consideration, a port EDI system is expected to be introduced in Vietnam and Indonesia.

Priority Projects are seventeen projects shown below and the project profile outline of the projects are shown in reference materials.

Table 5.3-1 List of Priority Projects

Country	Name of Port	Name of Project
Cambodia	Phnom Penh	① *Construction of New Phnom Penh Container Terminal*
Cambodia	Sihanoukville	② Enhancement of Container Handling Productivity
Cambodia	Sihanoukville	③ Transfer the Old Jetty to Passenger Terminal
Indonesia	Belawan	④ *Expansion of Container Terminal*
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 *Development of Pasir Panjang Terminal Phase III & IV*
Thailand	Laem Chabang	⑭ *Coastal Terminal Development Project*
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 *Development of Hai Phong International Gateway Port*
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.

5.4 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 our funds while some projects will need to mobilize resources from inside and/or outside of the country. Efforts must be for the latter projects to proceed to the implementing stage to improve the maritime transport network in the ASEAN region by facilitating resource mobilization.

The present status and resource-raising of the projects are shown in the Table 5.4-1.

Table 5.4-1 Present status of the projects

Project	Present status	Fund
Phnom Penh Port Construction of New Phnom Penh Container Terminal	Under construction	Soft loan from China
Sihanoukville Port Enhancement of Container Handling Productivity	Conceptual Planning	Not fixed
Sihanoukville Port Transfer the Old Jetty to Passenger Terminal	Conceptual planning	Not fixed
Belawan Port Expansion of Container Terminal	Partially commenced	Islamic Bank fund for a part of the project
Tanjung Priok Port Container Terminal Development Project	Conceptual Planning	Not fixed
Tanjung Perak Port New Multi Purpose Terminal Development Project	Partially Commenced	Own fund for a part of the project
Penang Port Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and Kuala Perai Terminal	Planning	Own fund
Tanjung Pelepas Port Development of Container Terminal Phase II (#13 and #14)	Planning	Own fund
Kuantan Port Kuantan Port Expansion	Conceptual planning	Not fixed
Thilawa/Yangon Port Thilawa/Yangon Port Approach Channel Improvement	Conceptual Planning	Not fixed
Cebu Port Development of New Cebu Port	Conceptual Planning	Not fixed
Davao Port Davao Container Terminal Construction Project	Planning	Not fixed
Singapore Port Development of Pasir Panjang Phase III & IV	Under construction	Own fund
Laem Chabang Port Coastal Terminal Development Project	Designing	Own fund
Ho Chi Munh Port Improvement of the Approach Channel and Vessel Control and Development of Cai Mep Thi Vai Terminal	Planning	Not fixed
Hai Phong Port Development of Hai Phong International Gateway Port	Designing	Not fixed
Ports in Vietnam and Indoneisa Operational Improvement Project byIintroducing/Upgrading Port EDI System	Conceptual Planning	Not fixed

Source: JICA Study Team

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 needs 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.

Projects featured with project outlines are as follows.

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

(1) Enhancement of Container Handling Productivity: Sihanoukville (Cambodia)

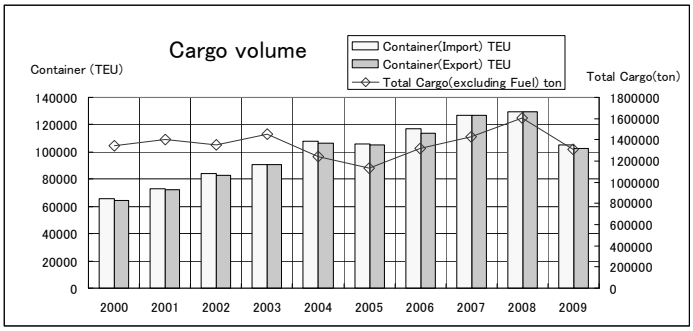
1) Characteristic of the Port

Port of Sihanoukville is located on the east coast of Kompong Som Bay 230km from Phnom Penh by national road no.4. The port is the only deep seaport in Cambodia and plays an important role as a gateway of Cambodia.

Port Autonomy of Sihanoukville (PAS) which is a state owned enterprise established by Sub Decree manages the port.

2) Background and Requirement of the Project

Container throughput of the port of Sihanoulville has increased since container handling started in 1992. Construction of a modern container terminal started in 2002. The container terminal with a quay length of 400m and a water depth of 10 m commenced in operation in 2009. Two gantry cranes along the quay and two rubber tired gantry cranes in the yard are installed. Containers were handled at the multipurpose terminal before the opening of the terminal and thus PAS had no experience in operation of a dedicated container terminal. Prior to the opening of the terminal, PAS made various efforts to overcome its lack of experience including staff training. After the opening of the terminal, PAS staff were given on-the-job training at the newly opened terminal under the instruction of experts and gained basic know-how and techniques on container terminal operation.



Source : PAS

Figure 5.4-1 Container throughput of Sihanoukville port

Table 5.4-2 Outline of Container Terminal of Sihanoukville Port

Facility	Quantity/Size/Capacity
Quay	Length/400m, Depth/10.0m
Quay Crane	Two(2), Capacity/30.5t、
Yard	Container Yard: 64,000m2, Capacity/4000TEU Empty Container Yard: 46,000m2, Capacity/13,900TEUs Reefer Container: 54 boxes Container Freight Station: 6,000m2, capacity/14,000TEUs
Equipment	Rubber Tired Gantry Crane (2, Capacity/35.5t), Super Stacker (7, Capacity 35.5t), Empty Stacker (8), Trailer (16), Fork Lift (1), Light Forklift (8),

Source: PAS

As of January 2010, Regional Container Line(RCL)、Maersk Sealand (MMC)、American President Line (APL)、Advanced Container Line (ACL) and Cosco Toho Shipping (COTS) deploy container service and nine container vessels call the terminal each week. Main Calling ports are the port of Singapore (5 loops), ports of Thailand such as Songkhara (6 loops) and Laem Chabang (2 loops) and ports of Malaysia such as Tanjung Pelepas (2 loops) and Kuantan (2 loops). Other than the

ports of these countries, vessels call the ports of Hong Kong (2 loops), Kaosiung (1 loop) and Saigon (1 loop).

These vessels call the port in the latter half of the week, especially on the weekend. Heavy congestion occurs in the terminal and the vicinity of the port on these days.

Table 5.4-3 Calling Container Vessel

Shipping Line	Route	TEUs
Regional Container Line(RCL)	SVP-Songkhara-Sin	1,018
	SVP -Shanhai-Hong Kong-Songkhara	628
	SVP -Songkhara-Kuantan-Sin	520
MMC(Maersk Sealand)	SVP -Tanjung Pelepass-Sin-Songkhara	912
	SVP -LC-Kaosiung-Saigon-Hong Kong	1,118
	SVP -Tanjung Pelepass-Sin- Kuantan	852
American President Line (APL)	SVP – Sin	322
Advanced Container Line (ACL)	SVP -Songkhara-Sin	628
Cosco Toho Shipping (COTS)	SVP -Songkhara-LC	198

SNV: Sihanoukville, Sin:Singapore, LC: Laem Chabang
Source : PAS

Productivity of cargo handling using quay gantry cranes is 22 boxes/hour/crane. It exceeds 7 boxes/hour/gear by ship gears operation. But some vessels do not use quay gantry cranes. To realize more efficient cargo handling and higher productivity it is imperative by making use of existing facilities and equipment.

Because of the opening of new container terminals at Cai-Mep area in southern Vietnam, some containers take the route of loading and/or discharging at the port of Phnom Penh and transshipment at the terminal at Cai-Mep Port in place of the route of loading and/or discharging at the port of Sihanloukville and transshipment at the port of Singapore. When a new container terminal of the Phnom Penh Port now under construction starts its operation in 2012, this trend may increase further.

3) Future Prospect

According to the report of the study on Measure 7, container throughput of Sihanukville in 2008 amounts to 256,000 TEUs and exceeds the capacity of the present terminal. Future container throughput in 2020 is forecasted as 456,000 TEUs. This means that expansion of the terminal is required urgently and further expansion is indispensable in order to correspond to the increase of container throughput in future. The capacity is estimated as 204 thousand TEUs using the model prepared in Measure 6.

Table 5.4-4 Terminal Capacity and Forecasted Container throughputs

Capacity	2008	2010	2015	2020
195 (258)	259	256	344	456

( ) based on Measure 6
Source; Report on Measure 7

The size of almost all vessels which call at the Port of Sihanoukville is less than 1000TEU class. However container vessels deployed to main ports in ASEAN have become larger and the Port of Sihanoukviulle is designated as an ASEAN network port and the only seaport in Cambodia which is expected to accommodate 2000 TEU class vessels. In addition, economic growth of ASEAN countries including Cambodia will result in an increase of volume and expansion of areas of container cargo from/to Cambodia. The role of the port of Sihanukville will become more important because it is the only deep seaport in Cambodia.

Based on the above, the port of Sihanoukville is expected to support the enhancement of international competitiveness of Cambodian industries by providing more attractive service to port users through cooperation and competition with the port of Phnom Penh. The port of Sihanoukville needs to develop a strategic management plan by making full use of its advantage as a deep seaport and connection with industries in SEZs near the ports.

It is a minimum requirement that a terminal provides service which can satisfy the request of users. To meet the needs of users, PAS has to firstly take necessary measures to raise the skill level of PAS staff and to make efficient use of terminal facilities and equipment. After that necessary facilities and equipment shall be improved and installed.

4) Purpose of the Project

The port of Sihanoulville is the only deep seaport in Cambodia and PAS has to make maximum use of the capacity of the present terminal. This project aims at enhancing productivity through up-grading skill on container terminal management and operation and improving the facilities and equipment required.

5) Outline of the Project

The project consists of two parts, the first one is technical assistance and the second one is improvement of facilities and equipment.

Technical Assistance

Management Plan

The management plan which shows the basic direction of container terminal management of PAS shall be drafted. The management plan will aim at the most effective use of management resources, especially the container terminal. The plan may include management targets, a basic direction of cargo handling (including a handling productivity target), maintenance of facilities and equipment, marketing and promotion, port security, financial plan, cooperation with related agencies/entities.

This component aims at capacity building of PAS staff in preparing a management plan and managing its progress. PAS and experts will draft a management plan together and PAS staff will manage the progress of the plan under the supervision of the experts.

Marketing and Promotion

Container terminal is a part of the international logistics system and thus the terminal operation has to be implemented considering container flow in the system. It is necessary to understand the movement of international maritime transportation, strategies of shipping companies and policy of shippers and to conduct port promotion.

This component aims at capacity building on marketing and promotion related to the container terminal. PAS and experts will draft a marketing plan and a promotion plan together and conduct marketing and promotion according to the plan. PAS staff will visit shipping companies and shippers with the experts for collecting information and port promotion during the term of the project.

Cargo handling

PAS has to arrange the system under which a series of tasks such as ship planning, yard planning and gate operation are implemented smoothly and efficiently. In this regard, it is necessary to make use of IT system.

The purpose of this component is capacity building on ship planning, yard planning and gate operation. Various kinds of unforeseen situations occur in actual terminal operation in which a quick response is required. Through the term of the project experts will supervise the staff of PAS on site and necessary know-how and techniques of terminal operation will be transferred to PAS staff.

Inspection and maintenance

In order to provide sufficient service to users continuously, it is indispensable to keep facilities and equipment in good condition at all times. Regular inspection and maintenance are fundamental work and PAS has to do this work in a planned and consistent way

The purpose of this component is capacity building on maintenance of facilities and equipment of container terminal. Inventory of facilities and equipment and an inspection and maintenance plan will be prepared by PAS staff and experts together and PAS staff will conduct inspection and maintenance work under the supervision of experts according to the plan.

Experts

The experts will have expertise in the fields of terminal management/marketing/operation, ship planning/yard planning/gate operation and inspection/maintenance

Improvement of facilities/equipment

Based on the result of the technical assistance, additional facilities and equipment necessary for enhancing the productivity will be installed as necessary.

Facilities which are planed to be added are as follows:

- Extension of a berth (100m), Expansion of a yard (3ha), Gantry Crane (2), RTG

6) Benefits of the Project

The enhancement of productivity of the port of Sihanoukville directly will increase the competitiveness of export and import industries in Cambodian. In addition, the enhanced productivity is expected to become an incentive for location of companies to SEZs near the port.

7) Term and Schedule of the Project

The project consists of two stages: technical assistance and enhancement of facilities and equipment. Necessary facilities and equipment will be identified after the technical assistance stage.

Activities	1st year	2nd year
Management Plan		
Preparation of Plan		
Progress Management of the plan		
Marketing and Promotion		
Preparation of Action Program,		
Marketing		
Promotion		
Study and Analysis		
Cargo Handling		
On-the-job-training		
Inspection and Maintenance		
Inspection and maintenance plan (facilities)		
Inspection and maintenance plan (equipment)		
On-the-job-training		

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

1) Characteristics of the Port

Port of Sihanoukville is located on the east coast of Kompong Som Bay 230 km from Phnom Penh by national road no.4. The port is the only deep seaport in Cambodia and functions as a gateway of Cambodia. All ocean going cruise vessels to Cambodia have to use this port.

Port Autonomy of Sihanoukville (PAS), which is a state owned enterprise established by Sub Decree, manages the port.

2) Background and Requirement of the Project

The government considers that tourism is one of the important industries in Cambodia and the number of tourists including those who visit Cambodia by cruise vessels will increase in future. However, there is no passenger terminal in the port and cruise vessels use the old jetty which was constructed in 1959. A new passenger terminal that meets international standards would increase the attractiveness of Cambodia in the international tourism market.

The number of passenger vessels calling at the port of Sihaoukville was 5 in 2005, 32 in 2006, 5 in 2007 and 17 in 2008. On the other hand, the number of foreign visitors to Cambodia is estimated as 3.010 millions in 2013 in the National Strategic Development Plan Update 2009-2013.

Table 5.4-5 Number of Foreign Visitors to Camodia

(unit: millions)

2008	2009	2010	2011	2012	2013
2.125	2.162	2.276	2.447	2.691	3.010

Source: National Strategic Development Plan Update 2009-2013

The old jetty whose depth and length are 9.0 m and 290 respectively can accommodate a passenger vessel of 50,000 GT whose average measurements are 255 m in LOA and 7.8 m in depth. The jetty is aging and was not designed as a passenger terminal.

In the report of the master plan study in 2007, the location of the old jetty is a candidate site for a passenger terminal. However, the physical condition of the existing jetty may not be suitable for a passenger terminal due to the aging structures. It is necessary for PAS to conduct further study in order to confirm that the existing old jetty can be converted to a passenger terminal that meets international standards from viewpoints of its locations and structural soundness.

A new passenger terminal has to be constructed according to the result of the study.

3) Future Prospect

Number of passengers through the port in 2004 was only 447 but increased to 11,788 in 2008 and will reach 143,000 in 2020 according to the study on Measure 7.

Table 5.4-6 Passengers Forecast

	Actual Passenger in 2008 (Thousand Person)	Forecast (Thousand Person)		
		2010	2015	2020
Passenger	12	25	91	143

Source: the study on Measure 7

4) Purpose of the Project

The purpose of the project is to construct a passenger terminal that meets international standards at the port of Sihanoukville which is the only port for ocean going cruisers in Cambodia.

5) Outline of the Project

The project components are as follows:

Maintenance and conversion of the old jetty to a passenger terminal

Construction of terminal building and office building

Installation of monitor and control system

Project cost was estimated as USD 1,5000,000 by PAS.

6) Economic Evaluation

The only terminal which can accommodate oceangoing cruisers can invite many tourists from the world and contribute to the promotion of the tourism industry in Cambodia.

Calls from passenger vessels are expected to have various economic effects such as the arrival and departure of vessels, port entrance fee and taxes from vessels, bunkering and ship store of vessels, terminal charge paid to the port and related companies, consumption of goods by visitors.

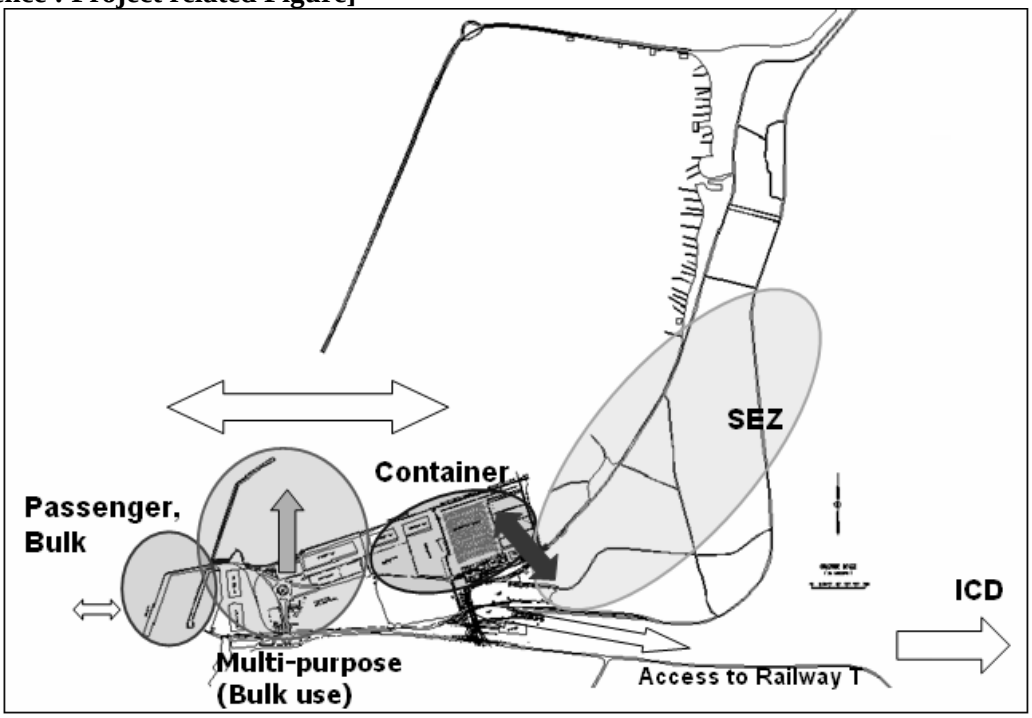
7) Term and Schedule the Project

Schedule is not yet decided now.

8) Implementation of the Project

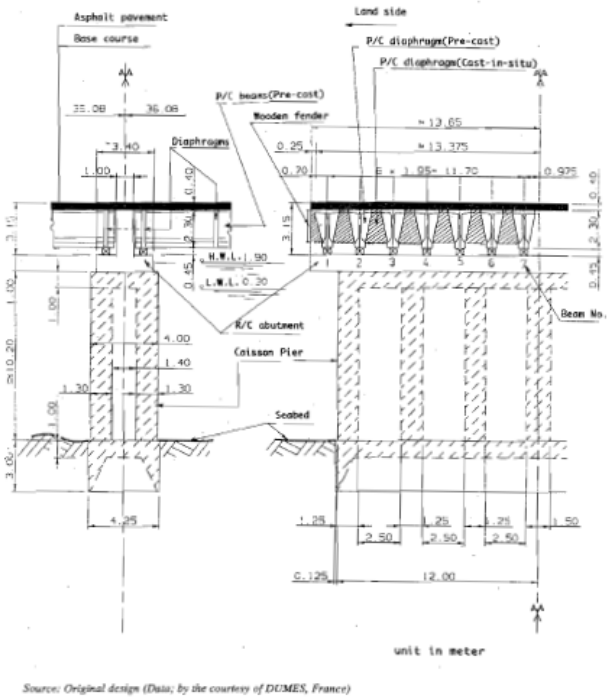
The jetty is used as a passenger terminal at present and physical conditions have to be inspected mainly from a viewpoint of safety.

[Reference : Project related Figure]



Source: The Study on the Master Plan for Maritime and Port Sectors in Cambodia

Figure 5.4-2 A candidate Site of a Passenger Terminal in the Master Plan



Source: *Original design (Data; by the courtesy of DUMES, France)*

Source: The study on the Master Planning and Feasibility study of the Sihanoukville Port in the Kingdom of Cambodia

Figure 5.4-3 Typical section of a Jetty

(3) Expansion of Container Terminal: Belawan (Indonesia)

1) Characteristic of the Port

The port of Belawan is located in the northern part of Sumatra Island and is the biggest port in Sumatra; its hinterland includes the city of Medan, the third biggest city in Indonesia, and north Sumatra. The port of Belawan is classified as Type 4 among ASEAN 47 network ports, which means it is a "Small scale port serving mainly for intra-regional container shipping". Belawan port faces the Malacca Straight which is navigated by more than 60 thousand ships annually and is considered to be the most important shipping route in the world, and thus Belawan port is connected to world famous hub ports such as Singapore and Port Klang, and is strategically an important port in northern Indonesia.

PELINDO I, which operates Belawan port, intends to develop it further as a base of north Sumatra by making the most of this geographical advantage.

2) Background and Requirement of the Project

The port of Belawan ranks third after the port of Tanjung Priok and Tanjung Perak in terms of container handling volume. The hinterland of Belawan port has a large population and industrial parks are located. International container handling volume at Belawan port is growing steadily and is expected to increase in the future due to its strategic location.

On the other hand, the number of containers handled per ship is increasing, so that the turn around time is in fact increasing as productivity continues to be low. Therefore, urgent issues in Belawan port are to secure new mooring facilities and improve productivity for the purpose of shortening the turn around time and coping with increasing containers.

The Directorate General of Sea Transportation, Ministry of Transport (DGST-MOT) formulated an expansion plan of the container terminal and the Islamic development Bank decided to finance it.

According to a project appraisal report conducted by the Islamic Development Bank, future international container demand will increase at a rate of 4-6 % per year and reach around 439 thousand TEUs in 2014 and around 466 thousand TEUs in 2015. The report pointed out that wharf expansion of 314m to 364m in length and an additional yard slots of 1,200 to 1,400 in number would be needed to cope with the future container demand.

Container throughput, the number of calling vessels, average handling volume and turn around time at Belawan port are as follows.

Table 5.4-7 Container Throughput of Belawan Port

(unit: TEU)

	2005	2006	2007	2008	2009
Import	130,069	145,280	154,724	172,475	162,380
Export	151,037	158,586	165,791	179,455	171,186
Total	281,106	304,002	320,515	352,522	333,568
Inbound	127,339	130,726	132,747	120,147	124,250
Outbound	111,604	125,178	128,092	117,400	117,958
Total	238,943	255,904	260,839	237,547	242,208

note: Total of Import/Export includes transshipment cargo
source: Belawan International Container Terminal, PELINDO I

Table 5.4-8 Vessel Calls, Handling Volume per Ship and Turn Around Time

	2005	2006	2007	2008	2009
Number of Calling vessels	456	569	548	506	479
Average Handling Volume (TEUs)	484.73	418.00	460.00	555.82	550.70
Turn Around Time (hours)	31.62	34.56	36.58	61.79	61.05

Source: Belawan International Container Terminal, PELINDO I

3) Future Prospect

From the study on Measure 7 conducted by Malaysia and Korea, container handling capacity and future container demand are as follows.

Table 5.4-9 Container Handling Capacity and Future Demand

Capacity (thousand TEUs)	Actual Container Handling Volume in 2008 (thousand TEUs)	Forecast (thousand TEUs)		
		2010	2015	2020
984	590	609	1,044	1,526

Source: the study on Measure 7

On the other hand, the container handling capacity of Belawan port is estimated to be 474 thousand TEUs for international containers, 170 TEUs for domestic containers on 644 thousand TEUs in total using the guideline proposed by the study on Measure 6.

Expected performance levels of container terminal operation of Type 4 port presented by Measure 6 is 125 thousand TEUs per berth as minimum performance and 190-260 thousand TEUs per berth as best performance. Belawan port has two international container berths and two domestic container berths.

Considering actual container throughput, container handling capacity of Belawan port is estimated as shown in Table 5.4-10. International figure is calculated using the guideline while domestic figure comes from the average actual throughput for the last five years.

Table 5.4-10 Container Handling Capacity of Belawan Port

International	474 thousand TEUs
Domestic	247 thousand TEUs
Total	721 thousand TEUs

Under the assumption of future demand proposed by Measure 7, shortage of capacity will occur around 2012、therefore implementation of the container terminal expansion project is an urgent issue.

According to the proposed plan, the wharf will be extended 350m in length, water depth along quay-side will be increased to 13 m, a container yard of 15.7 ha in area will be prepared and 3 units of quay gantry cranes will be installed. Using the guideline, the estimated capacity by the expansion project is 426 thousand TEUs, and then the total capacity after completion of the project will be 1,147 thousand TEUs. The capacity of Belawan port, however, will be exceeded before 2020 according to the future demand proposed by Measure 7.

4) Purpose of the Project

The purpose of this project is to resolve the following problems and issues that Belawan port has.

① Shortage of mooring facilities to cope with increasing international container cargo
② Longer turn around time per ship due to increase in the number of containers handled per ship

5) Outline of the Project and Rough Project Coat

As only one container terminal expansion will not be able to cope with the demand of 2020, two terminals are required. Therefore, expansion of two terminals is a project in this report. The project will be divided into two phases, with the second berth expansion to be conducted in Phase II.

DGST-MOT is the executing agency of this project. According to the report prepared by the Islamic Development Bank which is financing this project, outline of the project and rough project cost are as follows.

Table 5.4-11 Outline of the project

Major Facilities	Container Terminal	Quay Length：350m Depth along Quayside：-12m Container Yard：157,700 ㎡ Quayside Gantry Crane：3 units Transtainer Crane：6 units
Estimated Cost	Total：Rp 1.3 trillion（$ 139 million） Civil Works：Rp 0.71 trillion Equipment：Rp 0.44 trillion Consultancy Services, etc.：Rp 0.15 trillion	
Finance Source	Indonesia Government: 37% Islamic Development Bank: 63% (Loan Agreement; Autumn 2010)	
Construction Period	Four Years	

Source: compiled by the JICA study team based on Islamic Development Bank Project Appraisal Short Term Consultancy final report 18th February 2009

Financing from the Islamic development Bank is allotted mainly to infrastructure such as reclamation and other civil works, while the Indonesian government extends capital funding to superstructure such as quay gantry crane, transtainer crane and so on.

Total capacity after completion of the container terminal project Phase I will be 1,147 TEUs which falls 379 thousand TEUs short of the demand forecast of 2020. DGST-MOT and PELINDO I have a master plan which calls for the large scale expansion of the container terminals. Based on this master plan, a Phase II project to extend a container terminal is planned. Outline of the project is as follows.

Table 5.4-12 Extension of Container Terminal Phase II Project

Container Terminal	Quay Length：350m Depth along Quayside：-12m Container Yard：142,000 ㎡ Quayside Gantry Crane：3 units Transtainer Crane：6 units

Note1: Scale of the reclaimed land is 90% of Phase I because a rectangular area is not needed for Phase II. Scales of other major facilities are the same as in the expansion of container terminal project.

Extension of container terminal Phase II project will increase capacity by 414 thousand TEUs according to the guideline proposed by the study on Measure 6, so that total capacity will reach 1,561

thousand TEUs. This figure is sufficient to cope with the future demand of 2020.

Estimated cost of the Phase II project is as follows. As the scale of the reclaimed land is 90% of a Phase I project, civil works is 90% of that in the Phase I project. Other estimated costs are the same as in the Phase I project.

Total： Rp 1.06 trillion（$ 113 million）
Civil Works：Rp 0.46 trillion
Equipment：Rp 0.44 trillion
Consultancy Services, etc.：Rp 0.15 trillion
(Reference: Exchange Rate RP9,000/US$ (as of December 2010))

6) Economic Evaluation

Islamic Development Bank conducted a cost-benefit analysis of the Phase I project.

According to their report, benefits of this project were considered to be container unloading/loading benefits, ship turnaround time saving benefits and hinterland benefits. EIRR of this project was estimated to be 19.2% based on the costs shown in Table 1.3-9.

In spite of limited data obtained, a rough economic analysis of this project was conducted for reference using the same method adopted by the Islamic Development Bank. As a result of the rough economic evaluation, EIRR of the Total project including Phase I and Phase II is estimated to be around 20%.

In this analysis, costs of this project include construction costs, operational costs, maintenance costs, and depreciation costs. This project is assumed to have a life of 25 years including the construction and operation period. The exchange rate as of December 2010 is adopted for the analysis.

This economic analysis is just a trial, and needless to say, a more detailed economic analysis with enough data and information will be necessary before proceeding to the implementation stage.

7) Term and Schedule of the Project

The Indonesian government and the Islamic Development Bank have already agreed to finance the Phase I project and contracted a loan in autumn, 2010. According to the appraisal report、construction period is four years and the project is scheduled to be completed in 2014. On the other hand, shortage of capacity will occur by the year 2015 as shown in section 3., and thus this project should be conducted as soon as possible.

The relationship of future container demand and capacity to be developed is shown in Figure 5.4-4.

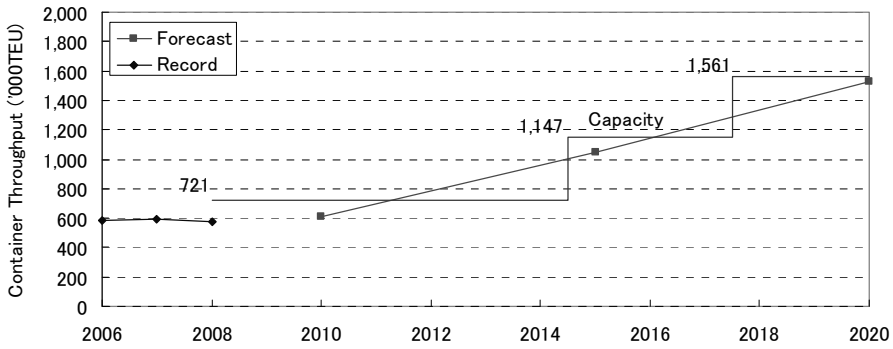


Figure 5.4-4 Container Demand and Developed Capacity

Furthermore, shortage of capacity will occur by the year 2020 even after completion of the Phase I and II projects. As the Phase II project will take three years to complete, construction works should be commenced around 2014-15.

8) Implementation of the Project

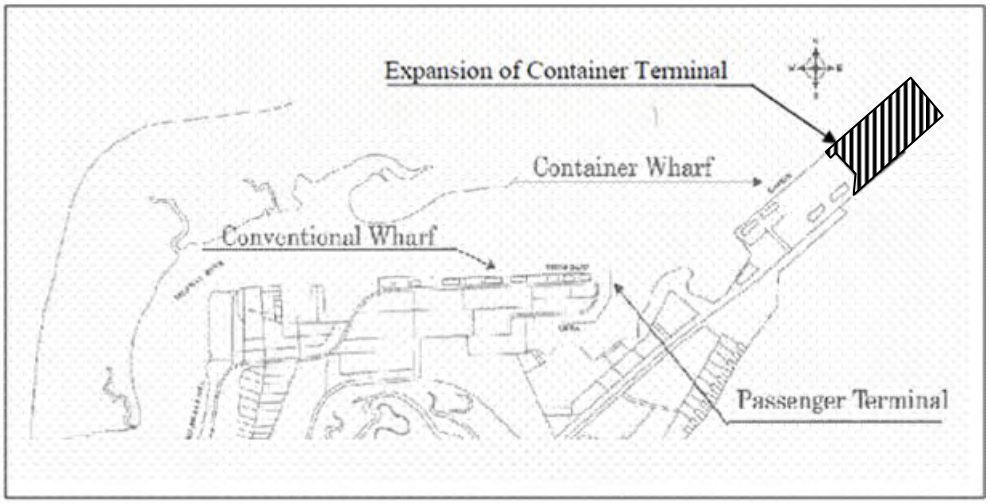
The executing agency is DGST-MOT and the funds necessary to develop infrastructure will be provided by the Islamic Development Bank.

On the other hand, the cost of superstructure should be shouldered by the Indonesian government; however, it is not clear how to secure the necessary funds to install equipment, etc. Introduction of private funds is one of the ideas to secure superstructure. Indeed, Belawan International Container Terminal, which is an operation company of the container terminal under PELINDO I umbrella, has already expressed their intension to invest in handling equipment for a new terminal. Due to the new shipping law, there is a possibility that other party except for PELINDO I will be the terminal operator.

Fund raising for the Phase II project is not yet considered. As the amount of initial investment will be large, the executing agency should seek a foreign donor and/or a international financial organization to finance the project.

In this report, the extension of container terminal Phase II project is proposed. Although actual demand will be carefully examined later, DGST and/or PELINDO I should study and implement the Phase II project in due time.

[Reference : Project related Figure]



Source: JICA Study team

Figure 5.4-5 Project Site

(4) Container Terminal Development Project: Tanjung Priok (Indonesia)

1) Characteristic of the Port

Tanjung Priok Port (TPP) is located in the west part of Java Island and in DKI Jakarta, the capital of Indonesia. The total area of TPP is 604 hectares and the total length of the berths is 13,444.6 meters; this port handles half of the total cargoes in Indonesia.

TPP is classified as Type 2 among ASEAN 47 Network Ports, which means it is a "world class port serving as a main gateway to/from a country."

TPP is under the management of PT (Persero) Pelabuhan Indonesia II (PELINDO II), which is located within the area of TPP.

2) Background and Requirement of the Project

TPP is the biggest port in Indonesia and can solely provide international container services in the western Java Area. It has been playing important and indispensable roles in supporting the national economy, particularly in the Jakarta Greater Metropolitan Area.

There are three container dedicated terminals: Jakarta International Container Terminal (JICT), KOJA Container Terminal and Multi Terminal Indonesia (MTI). Conventional terminals consist of general cargo terminals, multipurpose terminals, dry bulk terminals, liquid bulk terminals, car terminals and passenger boat terminals.

Table 5.4-13 Terminals at the Port of Tanjung Priok

		Berth	Length (m)	Water Depth (m)	Gantry Crane
Container Terminal	JICT	9	2,150	Over 8	21
	KOJA	3	650	14	6
	MTI	2	404	9	4
Conventional Terminal	General Cargo	42	6,541	5 - 10	
	Multi Purpose	5	514	8	
	Passenger	3	450	9	
	Dry Bulk	8	1,273	7 - 14	
	Liquid for Oil	4	100	12	
	Liquid for Chemical	1	204	8	
	Beaching Point	1	66	3	
	Car Terminal	2	308	10	
	Total	80	12,660	-	31

Source: PELINDO II, et al.

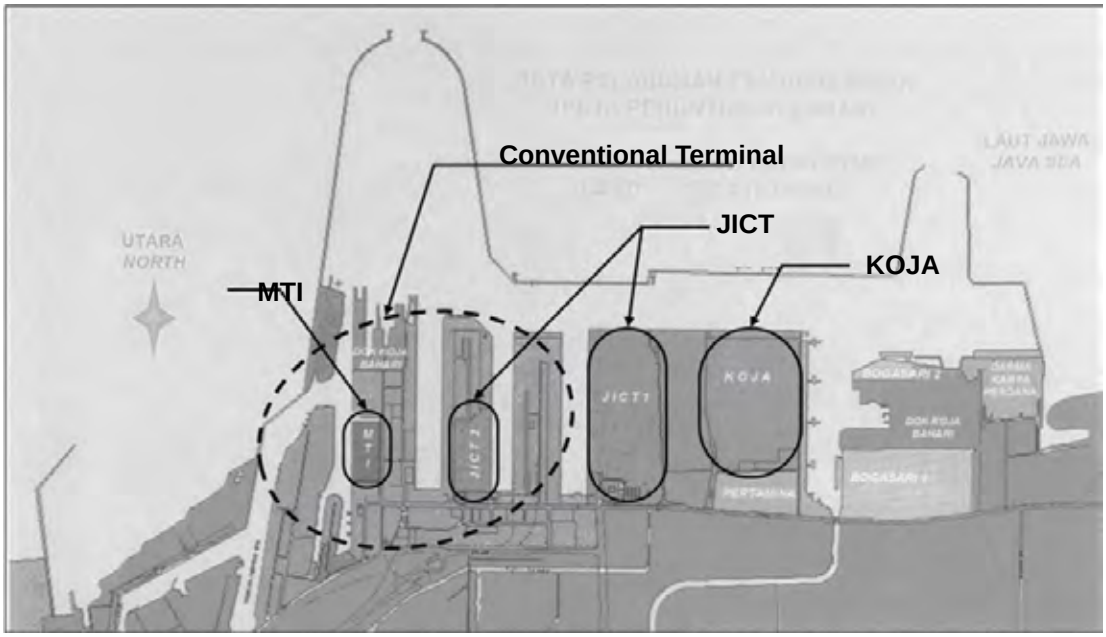
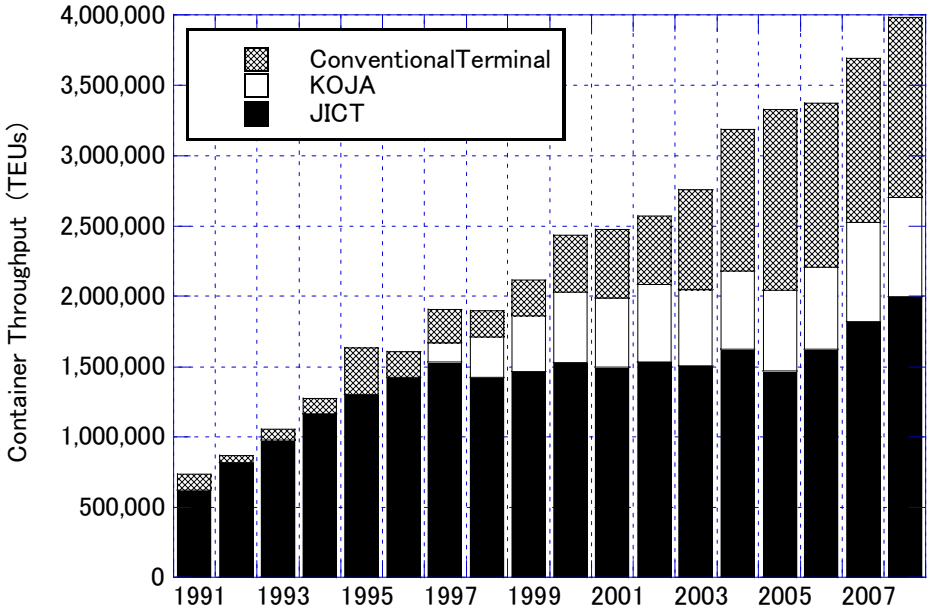


Figure 5.4-6 Terminal Layout at the Port of Tanjung Priok

The volume of container cargoes at the port has been increasing steadily and was about 4 million TEUs in 2008. Figure 5.4-7 shows the annual container throughput at JICT, KOJA and the conventional terminals including MTI. Most of the containers were handled at JICT until 1996 and then after the commencement of operation at KOJA, the share of container handling volume at JICT and KOJA was more than 80% until 2002. But the container throughput at JICT and KOJA has not greatly increased since 2003. This is because the container handling capacity at JICT and KOJA seemed to reach their limits. To cope with this situation, the volume of containers handled at conventional terminals has been increasing, particularly since 2004, and its share reached more than 30%.



Source: PELINDO II, JICT and KOJA Terminal

Figure 5.4-7 Evolution of Container Throughput at Each Terminal

The non-container cargo throughput is also increasing and recorded more than 30 million tons in 2007 and 2008 (see Table 5.4-14)

Table 5.4-14 Non-Container Cargo Throughput by Package Type at the Port of Tanjung Priok

(Unit: thousand tons)

Cargo Type	2003	2004	2005	2006	2007	2008
General Cargo	5,952	4,035	5,532	7,866	7,889	9,156
Bag Cargo	2,374	1,434	1,821	1,160	1,763	1,706
Liquid Bulk Cargo	10,486	11,035	9,147	8,614	8,201	7,985
Dry Bulk Cargo	7,107	10,178	9,969	10,741	13,636	12,094
Total	25,919	26,682	26,469	28,381	31,489	30,941

Source: PELINDO II

To cope with the increasing cargo volume at the Port of Tanjung Priok, "The Study for Development of the Greater Jakarta Metropolitan Ports" (March 2002 to November 2003) was conducted by JICA, in response to a request by the Government of Indonesia. In the study, widening the main channel and developing an automobile terminal as an urgent rehabilitation plan of Tanjung Priok and developing a new container terminal in Bojonegara were recommended. The widening of the main channel is now ongoing and the development of an automobile terminal was already completed. But the development of the new container terminal in Bojonegara has not yet been implemented, and PELINDO II which owns the area for the new container terminal in Bojonegara intends to convert the area into a petroleum port. Therefore, it is necessary to develop a new container terminal in an alternative site.

3) Future Prospect

The annual container handling capacity at TPP is estimated as 5,085,000 TEUs in the study on Measure 7. On the other hand, the annual container handling capacity at each container dedicated terminal can be estimated as shown in Table 5.4-15 based on the guidelines presented in the study on Measure 6. The total of the container handling capacity at container dedicated terminals in TPP can be calculated as 3,149,000 TEUs in 2008. Therefore, the container throughput at TPP already exceeded the total capacity of container dedicated terminals in 2008 which meant that 800,000 TEU containers were handled inefficiently at conventional terminals.

Table 5.4-15 Container Handling Capacity at Container Dedicated Terminals

Terminal	Number of Berth	Length of Terminal (m)	Number of QGC (unit)	Capacity (TEU)	Container Throughput in 2008 (TEU)
JICT-1	7	1,640	17	2,016,000	1,995,782
KOJA	3	650	6	735,000	704,618
MTI	2	404	4	398,000	n/a
Total	12	2,694	27	3,149,000	-

Source: PELINDO II and JICA Study Team

The cargo handling capacity and the cargo demand forecast are shown in Table 5.4-16.

Table 5.4-16 Cargo Handling Capacity and Future Demand

Cargo Volume/Capacity	Capacity	Record 2008	Forecast [1]		
			2010	2015	2020
Container (1,000 TEUs)	5,085 [1]	3,984 [2]	3,864	5,861	7,575
Break Bulk (1,000 MTs)	10,977 [1]	9,156 [2]	8,934	11,868	14,258

Source: 1) Data of Measure 7, 2) PELINDO II

The container demand is forecasted in Measure 7 to increase by 7% annually. On this assumption, the container cargo volume is expected to exceed the container handling capacity by 776 thousand TEUs in 2015 and by 2.49 million TEUs in 2020. Consequently, the first priority project should be to develop a new container terminal with a handling capacity at 2.5 million TEUs.

To satisfy the forecasted demand in 2020, 6 berths with the following scale and facilities will be needed:

Scale, facilities & capacity:

length of quay: 300 meters, width of yard: 600 meters, QGC: 3 units, productivity of QGC: 25 moves/hour/unit; container handling capacity: 450,000 TEUs/year/berth.
(Container handling capacity is estimated based on the guidelines in Measure 6.)

Consequently, phase 1 of the project with 3 berths should be completed by 2015 and phase 2 project with 3 berths should be completed by 2018.

4) Purpose of the Project

The purpose of this project is to solve the following problems and issues that the Port of Tanjung Priok has:

① Container throughput at JICT and KOJA is almost reaching their container handling capacities.
② To cope with the increasing container cargoes, conventional terminals are used for container handling.
③ The container cargo volume is expected to exceed the container handling capacity in 2015.

5) Outline of the Project and Rough Project Cost

Outline of the project is shown in Table 5.4-17. It is recommended to implement the project in two phases because the container volume is expected to exceed the handling capacity in 2015.

Table 5.4-17 Outline of the Project

Development of a container terminal and installing container handling equipment: Quay Length: 1,800 m, Number of Berth: 6 Container Yard: 108 ha Gantry Cranes: 18 units Container Handling Capacity: 2,700,000 TEUs/year

The project cost is estimated as 3 times the project cost of the container terminal plan in Bojonegara, as the scale of the new container terminal is about 3 times larger. In consideration of the inflation rate, the project cost will be about IDR 11 trillion.

(Reference: Exchange Rate RP9,000/US$ (as of December 2010))

6) Economic Evaluation

The following benefits are expected through the implementation of this project:

- Savings in handling cost by discharge afloat for excess cargo.
- Savings in ship and cargo staying cost for cargo handling.
- Savings in sea transportation cost.
- Savings in land transportation cost by being forced to utilize other ports.
- Increase in employment opportunities and income.

- Promotion of regional economic development and business activities.
- Reduction of cargo damage and accidents, etc.

7) Term and Schedule of the Project

Phase 1 of the project should be completed in 2014, followed by the phase 2 project, as the container cargo volume is expected to exceed the handling capacity at the Port of Tanjung Priok in 2015.

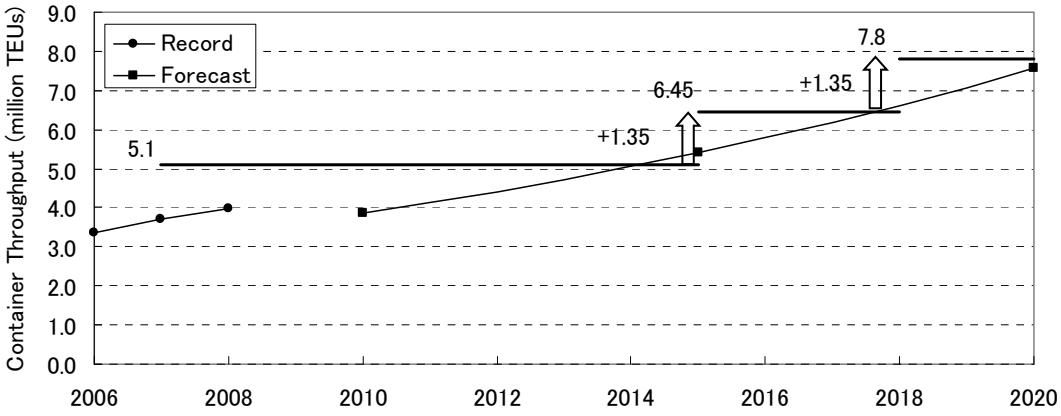


Figure 5.4-8 Container Volumes and Container Handling Capacity at the Port of Tanjung Priok

The tentative recommended schedule is shown in Table 5.4-18.

Table 5.4-18 Tentative Schedule of the Project

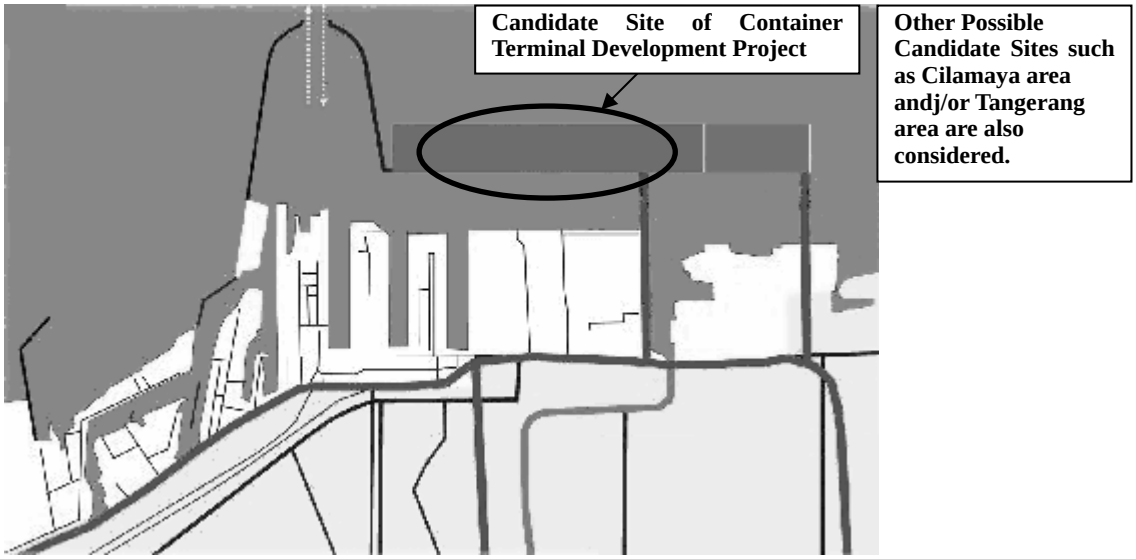
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Phase 1	Financing, D/D	Implementation of Phase 1 Project			Capacity: + 1,350,000TEUs					
Phase 2				Financing, D/D	Implementation of Phase 2 Project			Capacity: + 1,350,000TEUs		

8) Implementation of the Project

This project will be implemented by the Directorate General of Sea Transportation (DGST), Ministry of Transportation, but the fund source has not yet been determined.

Project formulation for a container terminal development project at the Port of Tanjung Priok is being conducted in another study, therefore the facilities, the project cost, the construction site and the schedule are expected to be shown in the said study.

[Reference : Project related Figure]



Source: DGST, Ministry of Transport

Figure 5.4-9 Candidate Site of Container Terminal Development Project

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

1) Characteristic of the Port

The port of Tanjung Perak, the second largest port in Indonesia, is located in the eastern part of JAVA Island and its hinterlands include Surabaya city, the second largest city, and east JAVA. The port of Tanjung Perak is classified as Type 3 among ASEAN 47 network ports, which means it is a "Large scale port serving mainly for inter-regional container shipping". It has many liner routes to the port of Singapore, Tanjung Priok and others, and functions as the base port in eastern Indonesia.

The Indonesian government has a policy to develop the port of Tanjung Perak as a hub port in eastern Indonesia.

2) Background and Requirement of the Project

A study to develop port facilities at Lamong Bay was started in the mid 90s because the existing port area did not have enough space for new development. At the initial stage, a reclaimed area of 350 ha for port development was planned at the center of Lamong Bay, however, the central government approved only a reclaimed area of 50 ha for development in the mid of 2000s due to environmental issues in Lamong Bay. PELINDO III, which is the executing agency of this project, started construction works on November 6, 2010.

Two other development projects are now being planned by the private sector in Lamong Bay; one is a resort development project by reclamation of 200 ha at the north-west site of Lamong Bay, while the other is a port development project of multi purpose terminals and container depots next to TPS. These two projects have already been approved by the central government. Furthermore, PELINDO III has a plan to improve the existing west approach channel from a depth of 9.5 m and a width of 100 m to 12.0 m and 200 m respectively over a length of 14 km. A study on this project has already been commenced.

In addition, JICA conducted a study titled "The Study for Development of The Great Surabaya Metropolitan Ports in the Republic of Indonesia" in 2007 for the purpose of formulating a master plan of Tanjung Perak port to cope with the increasing container demand. This study, under the assumption that PELINDO III would carry out Lamong Bay development, proposed five candidate sites for new port development.

The purpose of examining several development projects is to resolve the present problems and issues which the port of Tanjung Perak has; namely its difficulty in coping with the increasing container demand because of limited space for container handling and no room for expansion and its difficulty in accommodating larger vessels because of the relatively shallow water depth of the quay-side and the channel.

Table 5.4-19 Container Throughput at the port of Tanjung Perak

(unit: thousand TEUs)

Terminal	2005	2006	2007	2008	2009
TPS	1,065	1,52	1,113	1,153	1,118
BJTI	588	636	747	822	825
Nilam, the rest	123	165	181	216	327
Total	1,776	1,853	2,042	2,190	2,270

Source: PELINDO III

The present container handling capacity is insufficient compared with the actual demand. Shortage of mooring facilities and productivity cause chronic ship congestion. Table below shows the waiting times for ship moorage by vessel types.

Table 5.4-20 Waiting Time for Ship Moorage (Day)

Container	Liquid Bulk	Dry Bulk	General Cargo	Average
1.9	2.9	4.0	4.0	3.2

Source: PELINDO III

PELINDO III is planning to execute this project by dividing it into two phases. In Phase I, a 500 m long wharf will be developed and 20 ha of land will be reclaimed. In the total project, the wharf will eventually be extended to 1,280 m and reclaimed land will reach 50 ha.

3) Future Prospect

From the study on Measure 7, container handling capacity and future container demand are as follows.

Table 5.4-21 Container Handling Capacity and Future Demand

Capacity (thousand TEUs)	Actual Container Handling Volume in 2008 (thousand TEUs)	Forecast (thousand TEUs)		
		2010	2015	2020
1,804	2,213	2,242	3,670	5,141

Source: the study on Measure 7

On the other hand, the container handling capacity of each terminal is calculated as follows using the guideline proposed by the study on Measure 6.

Table 5.4-22 Container Handling Capacity by the Guideline

Terminal	Capacity
TPS	1,354 thousand TEUs
Lamong Bay Phase I	414 thousand TEUs
Lamong Bay Total	1,480 thousand TEUs

Future container demand and container handling capacity obtained through data and hearings from PELINDO III and TPS are as follows.

Table 5.4-23 Future Container Demand

(unit : thousand TEUs)

	2009	2010	2011	2012	2013	2014	2015
From PELINDO III	2,314	2,559	2,,559	2,559	4,659	4,659	4,659

Table 5.4-24 Container Handling Capacity

Terminal	Capacity
TPS	1,500 ～ 1,800 thousand TEUs
BJTI	800 thousand TEUs
Nilam	315 thousand TEUs

These future demand and terminal capacity are estimated by different methods; however, figures do not greatly differ. Therefore, estimated container handling capacity of Tanjung Perak port is assumed as follows.

Table 5.4-25 Estimated Capacity of Tanjung Perak port

	2009	2010	2013
TPS	1.4～1.8M	1.4～1.8M	1.4～1.8M
BJTI	0.8M	0.8M	0.8M
Nilam 他	0.1M	0.3M	0.3M
Lamong Bay Phase I			0.4M
Total	2.3～2.7M	2.5～2.9M	2.9～3.3M

Under the assumption of the future demand proposed by Measure 7, shortage of capacity will occur around 2014 even though Phase I will be completed in 2013 because the container demand at that time will reach 3,330 thousand TEUs. PELINDO III has estimated the container handling capacity of Phase I to be 500 thousand TEUs while that for the total project will reach 1,500 thousand TEUs. Even including these figures in the total capacity of Tanjung Perak,, capacity shortage will again occur around 2017～2018 even after completion of the total project.

4) Purpose of the Project

The purpose of this project is to resolve the following problems and issues that the port of Tanjung Perak has.

① Shortage of mooring facilities to cope with increasing container cargo
② Low productivity of container handling because of mixture of container and conventional cargoes

5) Outline of the Project and Rough Project Cost

Outline of the projects which PELINDO III is planning is as follows.

Table 5.4-26 Outline of the Project

		Phase I	Total Project
Major Facilities	Infrastructure	Quay：500m（Width：50m） Depth：-14m Trestle：380m×12.5m Reclamation：20ha Bridge：1,412m Causeway：7ha（500×140 ㎡） Access Road Mechanical & Electrical	Quay：1,280m（Width：50m） Depth：-14m Trestle：380m×12.5m Reclamation：50ha Bridge：1,412m Causeway：7ha（500×140ha） Access Road Mechanical & Electrical
	Superstructure	Container Crane：3 units RTG：15 units Head & Chassis：35 units	Container Crane：12 units RTG：36 units Head & Chassis：84 units

Source: PELINDO III

Rough project costs which PELINDO III are estimated as follows.

Infrastructure	Around Rp 1,800 billion	Around Rp 4,400 billion
Superstructure	Around Rp 1,000 billion	Around Rp 3,600 billion

(Reference: Exchange Rate RP9,000/US$ (as of December 2010))

6) Economic Evaluation

PERINDO III has not conducted a cost-benefit analysis and/or economic evaluation of this

project.

Effects of this project are savings in handling cost by discharge afloat for excess cargo, ship turnaround time saving effects, and other operational effects etc. Furthermore, industrial development, employment opportunities, increased income, etc. are expected by this project.

In spite of limited data obtained, a rough economic evaluation of this project was conducted using the same method conducted by the Islamic Development Bank. As a result, EIRR of the project of Lamong Bay Phase I project is estimated to be around 25%, while that for the total Lamong Bay project is around 24%.

In this analysis, the benefits items of this project are container unloading/loading benefits, ship turnaround time saving benefits and hinterland benefits. Costs of this project are construction costs, operational costs, maintenance costs, and depreciation costs. The project is assumed to have a life of 25 years including the construction and operation period. The exchange rate as of December 2010is used for the analysis.

This economic evaluation is just a trial, and needless to say, a more detailed economic analysis with enough data and information will be necessary before proceeding to the implementation stage.

7) Term and Schedule of the Project

The relation ship between container demand and capacity to be developed is shown in

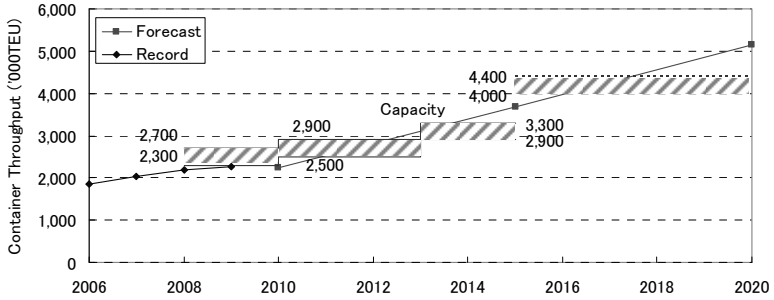


Figure 5.4-10 Container Demand and Developed Capacity

PELINDO III started the construction works of this project last November, 2010 and expects to complete Phase I in three years. According to the construction schedule by PELINDO III, part of the 500m quay will be completed within 20 months and then part of the bridge and reclamation works, and finally the access road will be completed.

Regarding the next stage of Phase I, PELINDO III will carefully examine the timing of commencement and completion of the project, and operational needs. As described in section C, shortage of capacity will occur within a couple of years even after completion of the phase I project. Therefore, the total project should be commenced as soon as possible after Phase I.

8) Implementation of the Project

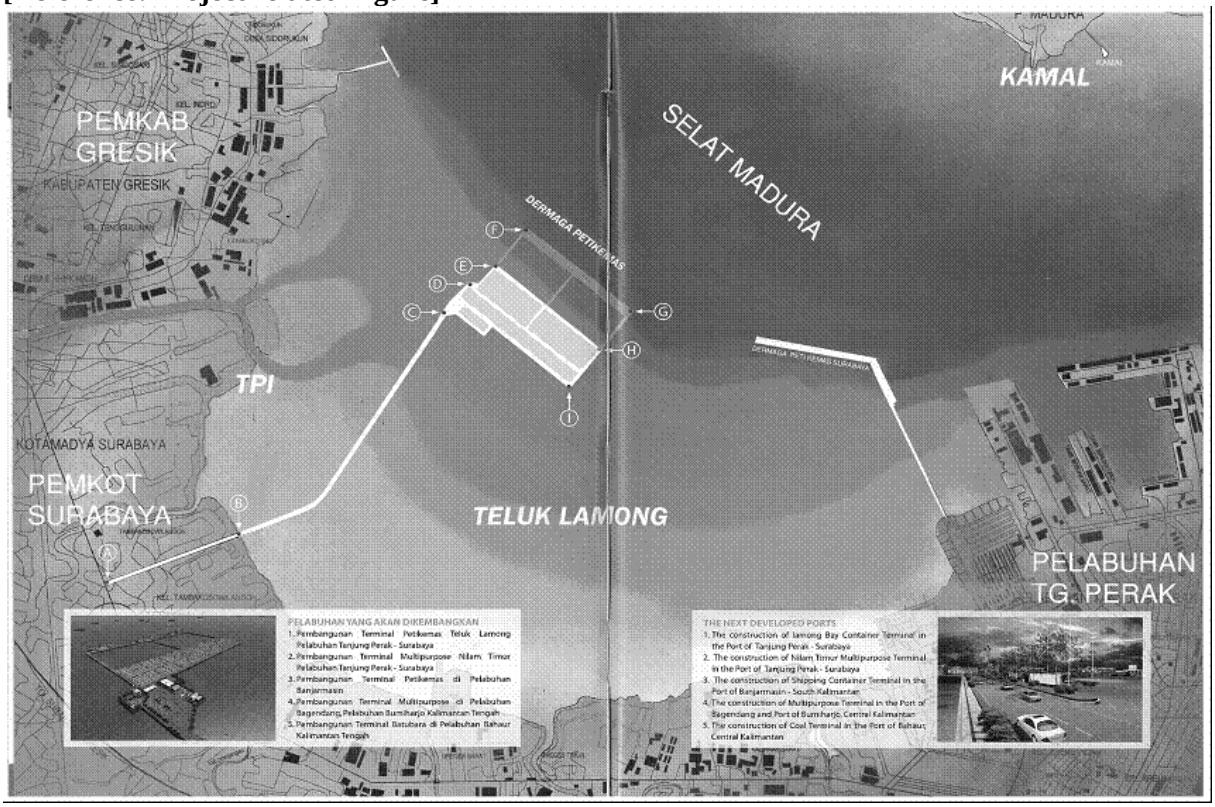
This project is implemented by PELINDO III and is also financed by PELINDO III itself. However, total cost is estimated at Rp 2.8 trillion and the method of fund-raising for it at present is not clear.

One of the reasons that this project had not progressed for more than five years even after approval is difficulty in securing funds.

The Lamong Bay multi-purpose development project is an urgent one to bridge the gap between

capacity and demand. Therefore, alternatives for fund-raising, such as utilization of private funds, public-private partnerships and so on should be examined.

[Reference: Project related Figure]



Source: Tanjung Perak Port Directory 2008

Figure 5.4-11 Lamong Bay Project Site

(6) Kuantan Port Expansion ; Kuantan (Malaysia)

1) Characteristic of the Port

Kuantan Port is strategically situated on the eastern seaboard of Peninsula Malaysia, overlooking the major sea-lanes transiting the South China Sea linking Kuantan Port with the Pacific Rim.

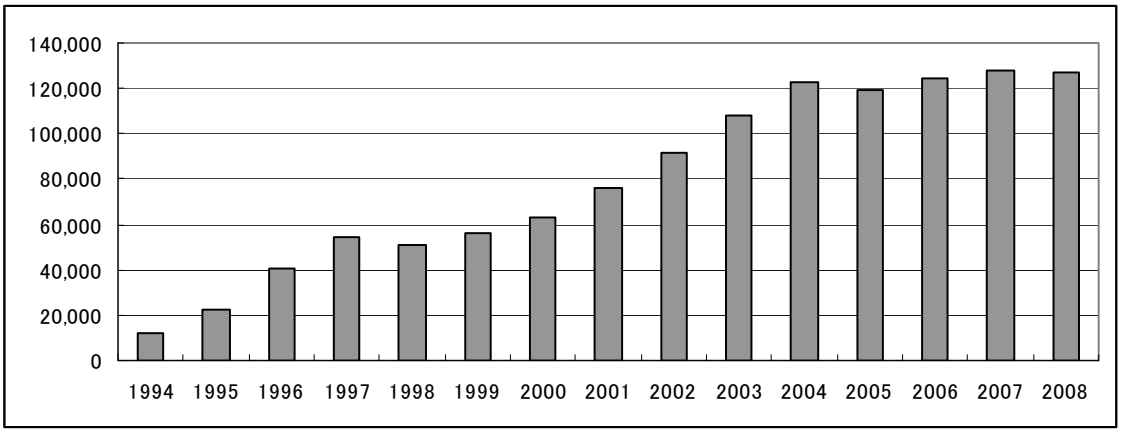
The port acts as a gateway and supports the economic activities in the Eastern Corridor which is one of the economic development corridors of Malaysia and an indispensable logistics platform for the industrial park of Gebang Industrial Estate and Kertieh Industrial Area in Terengganu State.

Kuantan Port Authority (KPA) currently administrates the port as a management body of the Kuantan Port. The operation of the port has been transferred to Kuantan Port Consortium Sdn. (KPC).

2) Background and Requirement of the Project

The port is expected to play a role of one of the driving forces underpinning the economic development of East Coast Economic Region. Tenth Malaysia Plan states that the East-Highway from Kuantan to Kuala Terengganu which is coupled with the expansion of the Kuantan Port will be completed in 2012. The basic infrastructures for trade activities and cargo movement along the east coast corridor are being improved.

At present, main cargo types of the port of Kuantan are break bulk, dry bulk and liquid bulk but container cargo is increasing steadily. The port aims at becoming a logistics center by making use of its advantageous location.



Source: Kuantan Port Authority

Figure 5.4-12 Container throughput of Kuantan Port

According to East Coast Region Development Council, the cargo throughput of the port is forecasted as 25-30 million tons in future and in order to meet the future demand, it is necessary for the port to expand its capacity by construction of a new container terminal.

3) Future Prospect

From the study on Measure 7 etc. cargo handling capacity and future demand are as follows. According to the table, the present capacity can meet the future demand. The activity of the port depends on industrial activities in the vicinity of the port and the area connected by the East highway.

Table 5.4-27 Cargo Handling Capacity and Future Demand

Cargo Volume/Capacity	Capacity	Actual Throughput in 2008	Forecast		
			2010	2015	2020
Container (1,000 TEUs)	355	127	133	199	292
Break Bulk (1,000 MTs)	1,594	1,712	1,389	1,224	1,017

Source : Capacity: the study on measure 6, Actual Throughput: KPC, Demand forecast: The study on Measure 7

4) Purpose of the project

The project aims at developing a new container terminal outside of the existing port in correspondence to the economic development of East Coast Economic Region.

5) Outlines of the Project

A new container terminal development outside of the existing port

Breakwater: more than 5000 m (from KUANTAN PORT LAYOUT)
Channel: 400 m in width
Basin: 16.5 m
Quay: 6 berths, 2000 m in length
1st stage: 3 berths, 1,000 m, 2nd stage: 3 berths, 1,000m
Container Yard: 120 ha
1st stage: 60ha, 2nd stage: 60ha

The project cost shall be estimated when the details of private sector participation become clear.

6) Economic Evaluation

The project contributes:

to reduce transportation costs due to increased frequency and economies of scale
to energize industrial activities along the east coast corridor

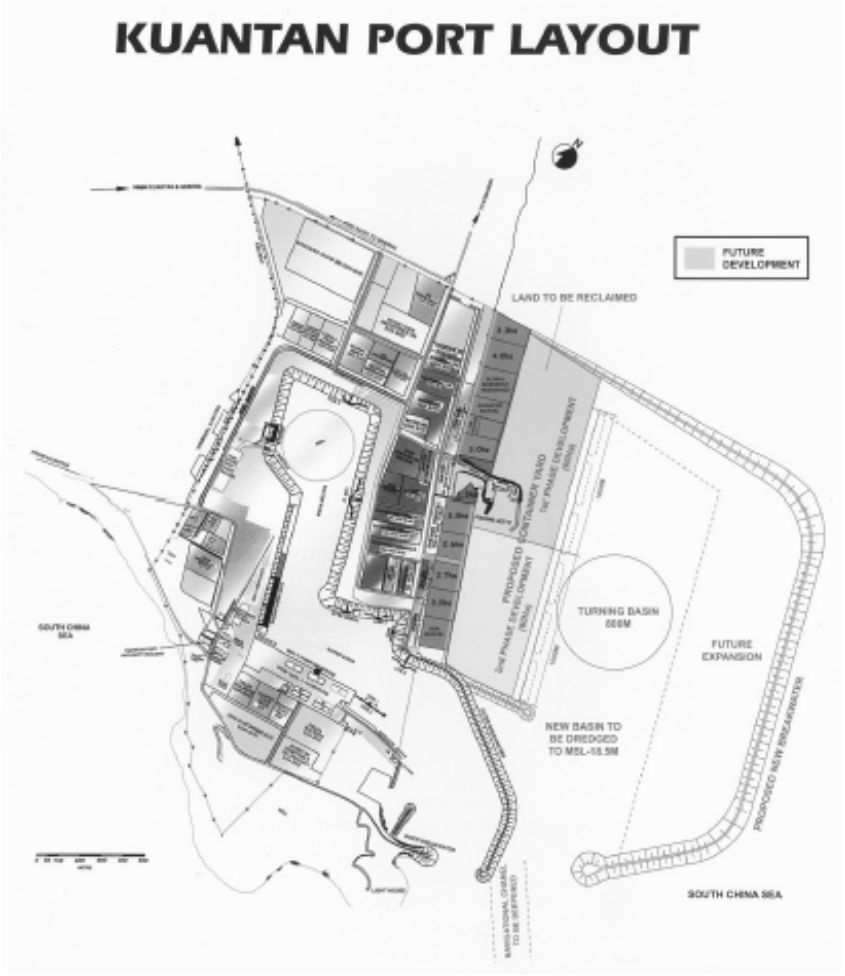
7) Terms of Schedule the Project

The project shall be commenced based on the result of a feasibility study which shall be conducted after the project scheme is fixed.

8) Project Implementation

Because certain parts of the project will be shared by the private sector and connected with industrial activities in the vicinity of ports, the project will be implemented under close coordination with related entities.

[Reference: Project related Figure]



Source: Kuantan Port Authority

Figure 5.4-13 Project Map

(7) Thilawa/Yangon Port Approach Channel Improvement: Thilawa port/Yangon port (Myanmar)

1) Characteristic of the Port

The Port of Yangon and The Port of Thilawa are situated on the Yangon River about 32 km and 16 km inland from Elephant Point in the Gulf of Martaban. There are several international terminals: Sule Pagoda Wharf, Bo Aung Gyaw Wharf and Ahline Wharf at Yangon port area and MITT wharf and MIPL wharf at Thilawa port area. The port of Thilawa was developed because of difficulties of Yangon port expansion. Myanmar Port Authority (MPA) which manages all ports in Myanmar regards the ports of Yangon and Thilawa as one port. Most of the import/export cargo of Myanmar are handled at these two ports. At present, privatization of port construction and operation is progressing according to the policy of the government.

The ports of Yangon and Thilawa are designated as ASEAN network port and function as the gateway of Myanmar. The ports contribute the economic growth of Myanmar as an essential infrastructure in international trade.

2) Background and Requirement of the Project

The ports of Yangon and Thilawa are required to enhance their functions as the infrastructure which supports economic growth and expansion of Myanmar's trading activities. However, the maximum size of accessible vessels to the port of Yangon is limited to 15,000DWT, 9 m in draft and 167 m in LOA, and that to the port of Thilawa is limited to 20,000DWT, 9 m in draft and 200 m in LOA. Vessels which enter or leave the ports navigate through shallow areas on the channel by making use of the 5.85 m tidal range at spring and 2.55 m at neap tide. The approach channel is a bottleneck of expansion of activities of these ports.

Regarding wharves, construction and operation of terminals are transferred to the private sector from MPA according to the policy of the government. Asia World Port Terminal Management Company (AWPT) and Myanmar Industrial Port (MIP) started operation of terminals which were developed by BOT scheme in 1997 and 2003 respectively at the port of Yangon. Operation of Bo Aung Gyaw Wharf was transferred from MPA to Union of Myanmar Economic Holding Limited in 2010. At the port of Thilawa, Myanmar International Terminal Thilawa (MLTT) and Integrated Port Services Pte Ltd (MIPL) started operation of terminals which were developed by BOT scheme in 1997 and 1998 respectively.

Table 5.4-28 Wharves of the ports of Yangon and Thilawa

Wharf	Length	Draft	Size of Vessel	Owner	cargo	Year
Yangon Port Sule Pagoda Wharves (1-7)						
No1,2,3	411	9	15000	MPA	GC	1941
No4	137	9	15000	MPA	GC	1932
No5,6,7	478.5	9	15000	MPA	GC	1962
Bo Aung Gyaw Wharves (1-3)						
No.1,2	274	9	15000	Lann Pyi Marine Co,.Ltd	GC,CC	1941
No.3	183	9	15000	Lann Pyi Marine Co,.Ltd	CC	1998
Ahlone Wharves (1-3)						
No.1	198	9	15000	Asia World Company Ltd	CC,GC	2001
No.2	156	9	15000			1997
No.3	105	9	15000			2005
Myanmar Industrial Port						
No.1	155	9	15000	Ministry of Industry	CC,GC	2003
No.2	155	9	15000			
Thilawa Port Myanmar International Terminals, Thilawa (plot5-9)						
No,5,6,7,8,9	1000	9	20000	Myanmar International Terminals Thilawa Ltd.	CC,GC	1997
Myanmar Integrated Port Limited (Plot 4)						
No.4	198	9	20000	Myanmar Integrated Port Limited	GC,L	1998

GC: General cargo, CC: Container Cargo, L: Liquid Bulk
Source: MPA

Activities of the ports Yangon and Thilawa have been expanding in these ten years. Calling vessels, cargo throughputs and container throughputs of both ports are shown in Table Table 5.4-29.

Table 5.4-29 Activities of the ports of Yangon and Thilawa

Activity	Calling Vessel	Cargo Handling Throughput (1000ton)			Container Throughput (TEU)		
		Total	Import	Export	Total	Import	Total
2000/2001	1,089	10,668	6,286	4,382	108,695	54,323	54,372
2001/2002	1,098	10,179	5,201	4,978	131,361	66,451	64,910
2002/2003	951	10,840	6,005	4,835	159,497	80,406	79,091
2003/2004	971	9,800	5,191	4,609	188,849	95,366	93,483
2004/2005	1,087	9,981	5,208	4,773	195,713	97,573	98,140
2005/2006	1,102	10,239	5,514	4,725	173,324	86,867	86,457
2006/2007	1,152	10,955	5,623	5,332	155,584	78,223	77,361
2007/2008	1,293	11,859	6,240	5,619	171,905	86,130	85,775
2008/2009	1,289	12,316	6,150	6,166	197,279	99,942	97,337
2009/2010	1,598	14,717	7,977	6,740	226,503	115,267	111,236

Source: MPA

According to the statistics on vessel size, the share of vessels over 10,000GRT exceeded 10 % from the end of the 1990s to the mid 2000s. In the mid 2000s, the share decreased but larger vessels have been increasing in recent years. According to MPA, the vessels whose actual drafts exceed 9 m

share more than 8 % in the beginning of the 2000s.

Table 5.4-30 Size of Calling vessels (DWT)

Year	Under 1,000	1,001 2,000	2,001 3,000	3,001 4,000	4,001 5,000	5,001 6,000	6,001 7,000	7,001 8,000	8,001 9,000	9,001 10,000	above 10,000	total
1998/1999	210	204	48	120	109	68	66	66	16	71	104	1,082
1999/2000	239	172	45	79	91	106	58	71	21	95	133	1,110
2000/2001	206	194	63	105	98	53	68	82	19	142	105	1,135
2001/2002	194	127	50	107	135	64	49	104	56	136	149	1,171
2002/2003	249	132	27	67	153	98	23	92	47	126	201	1,215
2003/2004	224	223	28	76	181	67	36	98	43	80	175	1,231
2004/2005	206	268	37	104	208	43	13	81	51	76	133	1,220
2005/2006	186	254	49	128	236	71	11	93	43	75	110	1,256
2006/2007	182	220	51	150	210	86	24	110	5	117	95	1,250
2007/2008	218	221	107	157	185	95	38	136	11	146	75	1,389
2008/2009	145	203	102	110	172	104	74	122	22	170	84	1,308
2009/2010	162	192	133	115	222	160	91	134	39	205	133	1,586

Source: MPA

The approach channel to the ports of Yangon and Thilawa starts at the area near the pilot station and ends at the port of Yangon, the total length is 46 km (32 km is in the Yangon river area). The port of Thilawa is located at the half way point of the channel, 16 km upstream from the mouth of the Yangon River. On the way to the ports, two shallow areas named as outer bar near the mouth of the Yangon River and the inner bar at the confluence of the Dago River and the Yangon River exist. The channel bends sharply near the mouth of the Yangon River and confluence of both rivers.

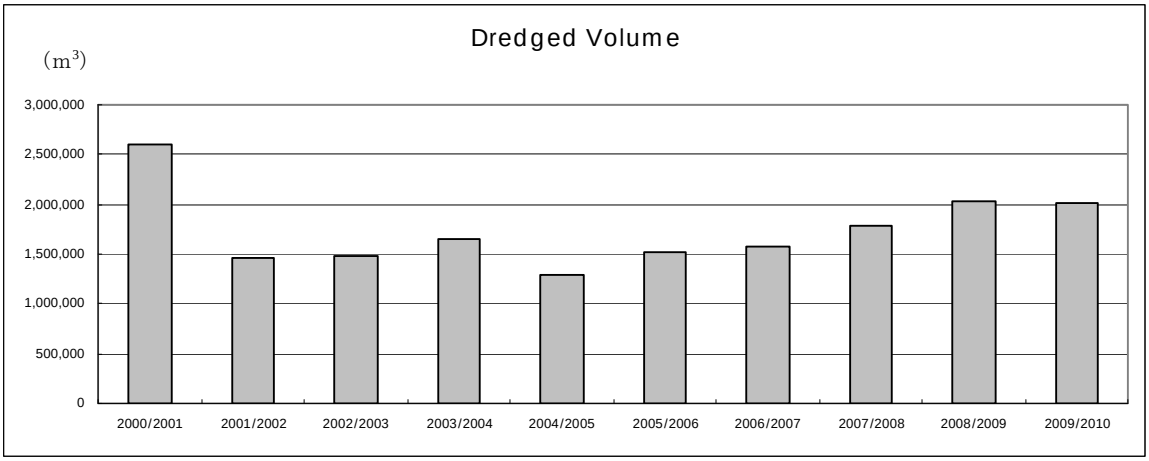
Shape of the seabed near the outer bar alters periodically. MAP designated the channel at the deep area as Western channel, SPIT channel or Eastern Channel according to the situation of the seabed. It is not necessary to carry out maintenance dredging. At the area of the inner bar, named monkey point channel, there is heavy sedimentation and maintenance dredging is carried out across an area of 1850 m in length and 100 m and more in width constantly by MPA's dredgers. Design depth of maintenance dredging is 14 feet (4.27m) at present. The dredgers which MPA owns are listed in the Table 5.4-31. Regular maintenance dredging at Monkey point channel is indispensable for the port of Yangon.

The annual dredging volumes since 2000 are shown in the following figure.

Table 5.4-31 Dredgers of MPA

Name	Measurement(m)			Tonnage (ton)	HP	Capacity (m3)	Delivery (year)
	Length	Breadth	Draught				
Ramanya	65.32	14.00	4.58	459	1,080	850	1989
Areindamar	65.75	14.22	4.58	459	1,080	1,000	1989
Thiha-Dipa	68.33	14.00	4.58	500	3,000	1,000	1998
Yadana Theinkha	68.33	14.00	4.58	500	3,000	1,000	1998

Source: MPA



Source : MPA

Figure 5.4-14 Dredged volume

Regarding navigation aids, 28 buoys placed along the channel are equipped with a solar power panel and are planned to be changed to plastics ones. Eight leading light stations were set up but all of them have been damaged. One station was restored in 2010 but seven stations remain out of commission. If a serious navigation accidents were to occur in the channel, all ports activities would cease and economic activities of Myanmar would suffer. Thus measures for securing safe navigation are indispensable.

The government of Myanmar's policy regarding the development of the ports of Yangon and Thilawa is to accommodate vessels up to 35,000DWT. The terminal operators have ideas to improve wharves in order to meet 35000DWT vessels when the channel is improved.Dimensions of the channel required for general cargo vessels of 35000 DWT is calculated as 12.4 m in depth, 147.5 m in width and 760 m of curvature radius of an alignment. Actual dimensions have to be decided by taking consideration into various factors such as navigation aid, navigational situation etc based on these values. It will takes several years to upgrade up the channel and before and during maintenance dredging for securing appropriate channel conditions should continue to be conducted. In addition, reliable and accurate information on the channel situation including water depth needs to be provided to persons concerned and regular survey of the channel depth is also required for smooth and safe navigation.

3) Future Prospect

Total volume of the ports of Yangon and Thilawa in 2020 is shown in the report of the study on Measure 7. Container volume is forecasted as 434,000TEUs (1.64 times the volume in 2008) and brake bulk is 2,330,000 (1.38 times of the volume in 2008). According to the report, the cargo volume will increase but the capacity of present facilities can meet the future demand.

Table 5.4-32 Forecasted Cargo Volume of the ports on Yangon and Thilawa

Cargo Volume/Capacity (Report on Measure7)		Capacity	Record 2008	Forecast		
				2010	2015	2020
Yangon	Container (1,000 Teas)	301	226	217	254	277
	Break Bulk (1,000 MTs)	1,752	1,266	1,295	1,569	1,489
Thilawa	Container (1,000 TEUs)	122	38	51	97	157
	Break Bulk(1,000 MTs)	967	425	538	695	841

Source : Report on Measure 7

Regarding vessels, the size of almost all vessels which call at the ports of Yangon and Thilawa is

less than 1000TEU class. However container vessels deployed to main ports in ASEAN have become larger and the ports of Yangon and Thilawa are expected to accommodate larger container vessels.

4) Purpose of Project

It is necessary for the economic growth of Myanmar that the ports Yangon and Thilawa enhance their function as an international infrastructure and provide sufficient service which meets the requests of port users. Under the government's policy that the ports of Yangon and Thilawa be able to accommodate 35000DWT vessels, the project aims at improving the approach channel and safety of navigation in a step-by-step approach.

5) Outline of the Project and Rough Project Cost

The project consists of three components:

-Sustainable channel maintenance
Renewal of a dredger and hydrographic survey vessel
-Securing safe navigation
Restoration of leading lights and installation of facility corresponding to AIS
-Deepening channel for 35,000DWT vessel
Deepening of the channel

The project is divided into two phases and the purpose of each phased project is as follows:

Phase I

1. to secure safe navigation including navigation at night
2. to maintain the depth of channel necessary for 10 m draft class vessels which have called at the ports in the past

Phase II

3. to deepen the channel in order to accommodate 35000DWT class vessels

The cost of Phase I is estimated as follows. The costs below are not calculated by component but estimated roughly by reference to similar projects. Therefore they are subject to change based on studies implemented later. The costs of the Master Plan Study and feasibility study are not included. The cost of Phase II shall be estimated based on the result of further study.

Phase I		
Improvement of navigational safety		
Recovery of Leading light station (installment of facilities)	USD	1 million
Installation of an information system on vessel navigation (AIS related system)	USD	3 million
Securing necessary depth		
Consolidation of maintenance dredging (a dredger)	USD	30 million
Consolidation of bathymetric survey and data processing (a survey boat with data processing system)	USD	5 million

Corresponding to the improvement of the channel, terminals shall be improved by the terminal owner/operators. Present terminal facilities are sufficient for the phase I project and the cost of terminal improvement corresponding to the Phase II project shall be estimated by each terminal owner/operator.

6) Economic Evaluation

This project will contribute to the:

-Reduction of transportation cost by calling of larger size vessels
-Regular service of larger vessels
-Reduction of demurrage loss
-Reduction of Holding Cost owing to reduction of waiting time for high tide
-Improvement of navigation from the viewpoint of safety etc.

Because the purpose of Phase I project is recovery/maintaining of original/presently designed situations, Myanmar present economic situation might worsen if the project is not carried out in the near future

Regarding deepening of the channel, master plans study/feasibility study including economic analysis should be conducted.

7) Term and Schedule of the Project

MPA is going start the study on the development of the port/channel for accommodating 35000DWT vessels related to the project. After the study, further study and design necessary for implementation of the project needs to be conducted, especially for Phase II. Therefore the project includes those studies.

The project shall be phased; Phase I for recovery/maintaining and Phase II for a new development. Phase I is further divided into 1st stage and 2nd stage.

Main Components year	1	2	3	4	5	～
Study						
Study (Phase 1 Project)						
MP/FS(Phase 2 Project)						
Phase 1 Project						
Phase I-1						
Detail Design						
Leading Lights						
AIS facility						
Phase I-2						
Detail Design						
Hydrographic Survey Ship						
Dredger						
(Dredging)						
Phase II project						
Detail Design						
Capital Dredging						
*Maintenance after Capital Dredging						
*Terminal improvement by the private sector						

8) Implementation of the Project

Phase I of the project aims at carrying out regular maintenance dredging and securing safe navigation under the direction of the channel improvement for larger vessels. Therefore the Phase I project needs to be implemented urgently.

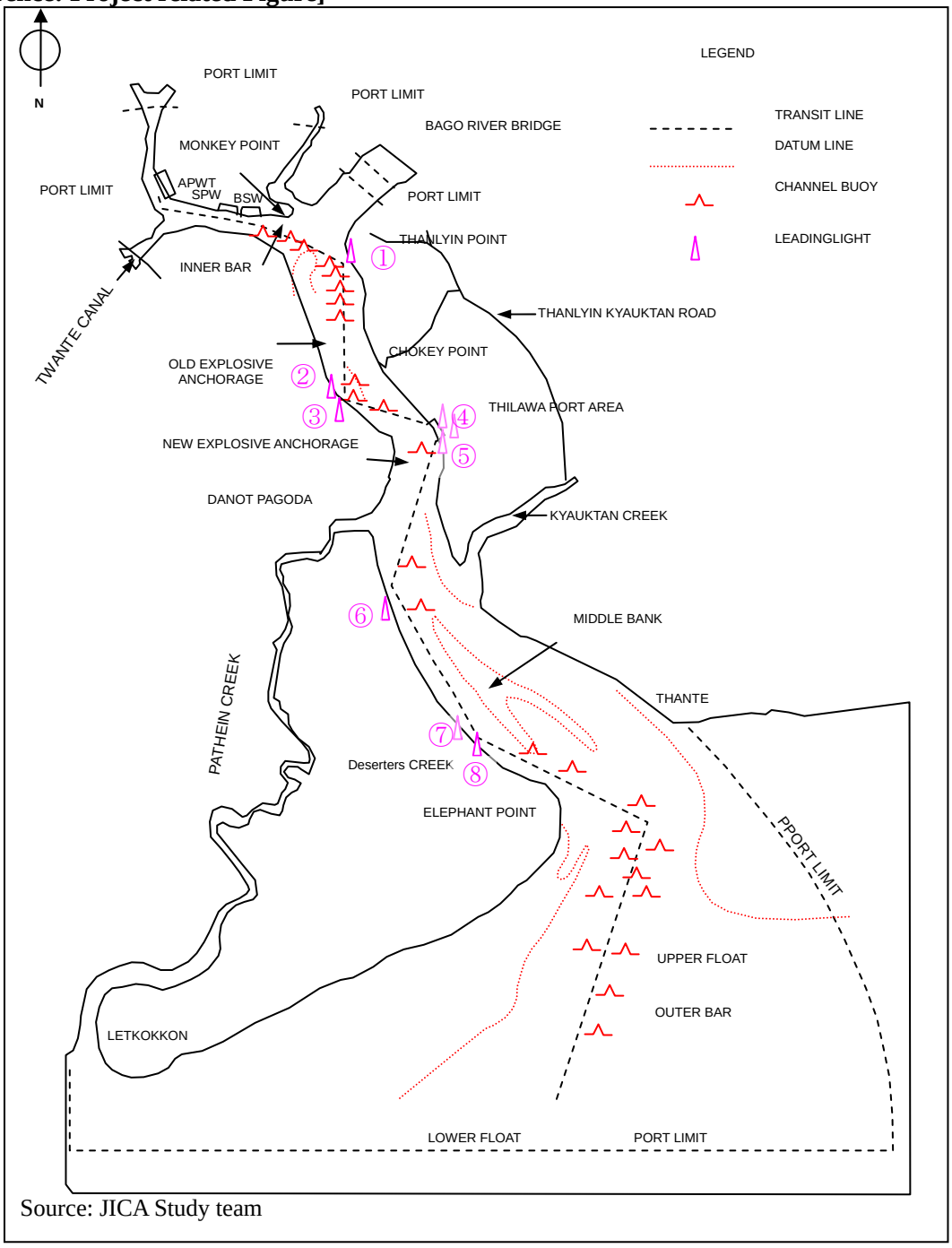
Because leading light stations, a dredger, a survey boat belong to MPA, MPA has to prepare

necessary arrangements for the appropriate operation and maintenance of them.

After completion of the Phase II project, volume of maintenance dredging will become bigger than at present and consolidation of the dredging system will be needed. Then the system established in the Phase I project will be made use of effectively.

Regarding the Phase II project, it is necessary to prepare a plan based on the result of Master plan study and feasibility study. The study will examine the functional allotment between the ports of Yangon and Thilawa as well as between these ports and coastal ports, Improvement of the terminals which belong to the private sector, environmental consideration, economic analysis etc.

[Reference: Project related Figure]



Source: JICA Study team

Figure 5.4-15 Outline of the Channel

(8) Development of New Cebu Port: Cebu port (Philippines)

1) Characteristic of the Port

The port of Cebu, the second largest port in the Philippines, is adjacent to the center of Cebu city which is the second largest city in the Philippines and its hinterland includes Cebu island and the Visayas region. The port of Cebu is classified as Type 4 among ASEAN 47 network ports, which means it is a "Small scale port serving mainly for intra-regional container shipping". The port of Cebu functions as the base port in Visayas region in terms of cargoes and passengers.

Port management body of Cebu port is the Cebu Port Authority (CPA) which has jurisdiction over ports in Cebu Island. CPA has a policy to expand port functions and also has an idea to redevelop the present port area into an urbanized area.

2) Background and Requirement of the Project

Cebu port is the largest in terms of passenger volume and has a very important role in terms of domestic shipping networks because it is located in the center of the country.

On the other hand, Cebu port has a lot of problems and issues such as limited space for port activities and no room for port expansion because the urbanized area is just behind the port and the channel is positioned in front, relatively shallow water depth in front of wharfs and channel whose water depth is only 8.5m, serious traffic congestion just behind the port and so on. Furthermore, the city government introduced a two hour on trucks ban on weekday mornings from the beginning of 2010 due to neary traffic congestion.

It was previously pointed out in the JICA study conducted in 1993-94 that a new international container port should be developed in a new place. After that, JICA conducted a study titled "the Cebu Integrated Port Development Plan" from 2000 to 2002 at the request of CPA and the Department of Transportation and Communication (DOTC). The study proposed the development of a new Cebu port in Consolacion which is 10 km north away from the present Cebu port and formulated a master plan with a target year of 2020 and a short term plan with a target year of 2010. Project components of each plan are as follows.

Table 5.4-33 Major Project Components by the JICA Study

Major facilities	Master Plan	Short Term Plan
Container Terminal	Length: 1,200 m Width: 500 m Water Depth: 13 m	Length: 600 m Width: 500 m Water Depth: 13 m
Multi Purpose Terminal	Length: 380 m Water Depth: 10 m Backyard: 10 ha	Length: 190 m Water Depth: 10 m Backyard: 4 ha

Source: JICA study conducted in 2000～2002

Regarding port related projects, CPA concentrated RO-RO facilities in the center of the port and will transfer the international break bulk cargo handling function to the southern part of the port. Furthermore, CPA plans to dredge the basin in front of CIP and the channel up to 12 m in depth with financing of 500 million pesos from the Philippine Development Bank.

A large scale development project named "South Road Property" for a commercial and business center is about to start in the southern area next to the port and large scale facilities for commerce and a hotel have already been developed just behind Cebu international port (CIP).

Cebu port is facing several problems and issues, namely the limited space for cargo handling, no space for expansion and inability of present port facilities to accommodate larger vessels. In addition, resolving chronic traffic congestion is an urgent issue both for port and city activities, and conversion

from port function to urban function is a request from the city government and port itself.

Table 5.4-34 Cargo Throughput at Cebu Port

		2005	2006	2007	2008	2009
Container (TEU)	International	128,802	146,459	169,190	157,633	178,608
	Domestic	345,107	316,415	371,486	338,196	310,843
	Total	473,909	462,874	540,676	495,829	489,451
Non-Container (Ton)	International	4,703,955	5,317,656	5,680,926	5,425,518	5,759,312
	Domestic	15,151,748	15,157,883	16,315,629	15,964,995	15,542,548
	Total	19,855,703	20,475,539	21,996,555	21,390,513	21,301,860

Source: CPA

Table 5.4-35 Average Size of Calling Vessels

	2005	2006	2007	2008	2009
International	8,740GRT	9,444	11,594	11,633	14,721
Domestic	3,557GRT	3,246	3,336	3,451	4,123

Source: CPA

3) Future Prospect

From the study on Measure 7 conducted by Malaysia and Korea, cargo handling capacity and future demand are as follows.

Table 5.4-36 Cargo Handling Capacity and Future Demand

	Capacity	Actual Handling Volume in 2008	Forecast		
			2010	2015	2020
Container(thousand TEUs)	270	496	503	622	734
Break Bulk (thousand tons)	26,408	21,391	21,172	24,761	27,578

Source: the study on Measure 7

Container cargo and non-container cargo such as break bulk, RO-RO cargo and other cargoes are not handled separately at the wharfs and yards in the present port. According to CPA, most domestic container cargoes are transported by RO-RO ships. Therefore, international container handling capacity can be estimated by applying the guideline on Measure 6. The domestic container capacity is estimated to be the actual number of handling containers in recent years because it seems to have reached the limit.

Container handling capacity at Cebu port is thus estimated as follows.

Table 5.4-37 Container Handling Capacity

International	294 thousand TEUs
Domestic	336 thousand TEUs
Total	630 thousand TEUs

Note: Domestic capacity is estimated to be the average actual handling volume for the last five years.

Under the assumption of the future demand proposed by Measure 7, container handling volume will be estimated to exceed its capacity around 2015-16. Therefore, the new Cebu port development project needs to be expedited. Coping with larger vessels is also essential because enlargement of international container vessels is progressing.

Capacity of a new container terminal previously proposed as a new Cebu port is estimated to be 304 thousand TEUs based on length of 300 m, yard of 6.9 ha, 2.5 units of quay gantry crane and productivity of 25 moves per hour using the guideline of Measure 6. As a result, container handling capacity will be 934 thousand TEUs, so a capacity shortage will not occur until 2020.

However, considering the heavy traffic congestion behind CIP, inefficient operation due to separating international cargo handling function into two parts, relocating the international cargo handling function to another place and converting the site to an urban and waterfront function which the Cebu city and CPA is considering and so on, two container terminals are required in the new Cebu port as previously proposed. After completion of the two container terminals, handling capacity for international containers will be 608 thousand TEUs and thus total container handling capacity, including that for domestic containers, will be 944 thousand TEUs.

On the other hand, break bulk handling capacity will be exceeded by the year 2020 under the assumption of the demand forecast estimated by Measure 7. It is also necessary to cope with larger vessels for break bulk. Furthermore, as function of international breakbulk is planned to be relocated by CPA, its function will be lost after redevelopment of CIP. Therefore, multi-purpose terminal for handling break bulk is needed as previous studies proposed.

4) Purpose of the Project

The purpose of this project is to resolve the following problems and issues that Cebu port has.

① Limited space for port activities, no room for expansion and difficulties for coping with demand increase and larger vessels
② Serious condition of traffic congestion behind the port
③ Redeveloping the port area to an urban function

5) Outline of the Project and Rough Project Cost

Two sites are identified as candidates for a new Cebu port.

One is the Consolacion area which was proposed by the JICA study in 2000-2002. The other is the northern area of the west end of the second Mactan Bridge. The latter candidate site came up recently and the former mayor granted permission for reclamation of 360 ha and development to a joint venture company between a local company and a Belgium company. The new Cebu port would be developed in a part of this area. CPA will form a technical working group and select the site by mid 2011.

Contents and scale of the project may depend on the site, however, outline of the project proposed for developing a new port by the JICA study in 2002 is as follows.

Table 5.4-38 Outline of the Project

Container Terminal	Quay Length：600m Depth along Quayside：-13m Container Yard：13.8 ha Quay-side Gantry Crane：5 units Transfer Crane：14 units
Multipurpose Terminal	Quay Length：190m Depth along Quayside：-10m Back Yard：2 ha
Access Road	Access Road：1,500m Causeway：300m

Source: JICA study in 2002

Rough estimated cost is calculated to be PHP 12.3 billion based on that shown in the JICA study.

(Reference: Exchange Rate PHP44/US$ (as of December 2010))

6) Economic Evaluation

This project is under planning, and a possible site for a new development is undecided yet.

Effects of this project are land & sea transport cost-reduction by avoiding the use of other ports, and sea transportation cost reduction by deploying larger vessels. Furthermore, industrial development, promotion of business activities, job creation, increased income, etc. are expected by this project.

In spite of limited data obtained, a rough economic analysis of this project was conducted based on the JICA study of 2002. AS a result, EIRR of this project was estimated to be around 27 %.

In this analysis, Manila port is assumed to be a substitute for Cebu port in the “without case”. Transportation cost reduction such as reduction of domestic sea transportation cost, reduction transshipment cost at Manila port, etc.) by avoiding the use of Manila port are assumed to be benefits in the “with case”. Costs of this project include construction costs and maintenance costs. This project is assumed to have a life of 30 years including the construction and operation period. The exchange rate as of December 2010 is adopted.

This economic analysis is just a trial, and needless to say, a more detailed economic analysis with enough data and information will be necessary before proceeding to the implementation stage.

7) Term and Schedule of the Project

CPA has not prepared a concrete schedule for implementation of this project. Term and schedule will be examined based on the JICA study in 2000-2002.

However as described in section 3, international container demand is estimated to exceed capacity around early 2016 and demand for break bulk is also estimated to be in short supply in 2018. Therefore, the new Cebu port should be opened from 2016 to 2018.

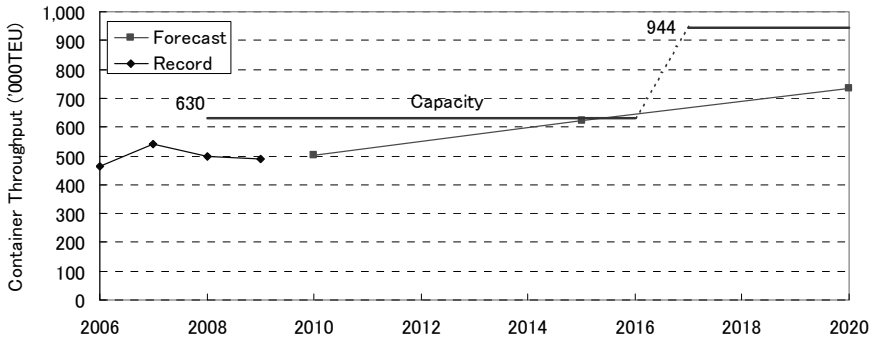


Figure 5.4-16 Container Demand and Developed Capacity

Preparation for implementation is estimated to be 3 to 4 years and construction of facilities and procurement of equipment will take 2 to 3 years referring to the implementation plan and construction schedule proposed by the JICA study in 2000-2002. Preparation for implementation includes review of the plan using the latest information, determining the site, formulation of implementation schedule, procedure for fund-raising, procurement of consultant and contractor and so on.

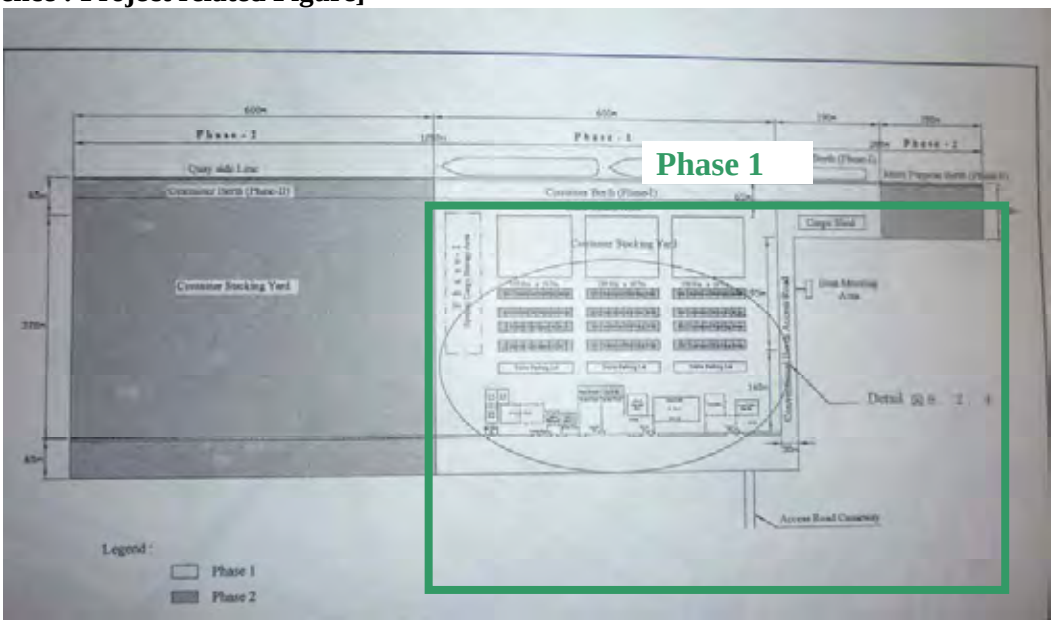
Therefore, preparation of this project should commence as soon as possible. Construction works should start in 2014.

8) Implementation of the Project

The executing agency is CPA. However, CPA does not have a concrete plan for fund-raising. Because of the huge initial investment cost, CAP is planning to request donor agencies to extend necessary funds for this project. Public-private partnerships is one idea to secure the necessary funds, however, detailed demarcation of public and private roles for implementation of this project has not been examined yet.

Another issue is to establish a cooperation system among DOTC, local government and other agencies concerned, and to arrange an implementing organization in CPA itself because this seems to be the first and biggest project since CPA was established.

[Reference : Project related Figure]



Layout Plan

Source : JICA Report 2002

Figure 5.4-17 Layout Plan of New Cebu Port

(9) Davao Container Terminal Improvement Project: Davao (Philippines)

1) Characteristic of the Port

Port of Davao is located on the south-east coast of Mindanao Island, at 7o 07'N and 125o 40'E, opposite Samal Island accross the Pakiputan Strait. The port is the largest port in Mindanao Island, supporting the economic activities of Southern Mindanao.

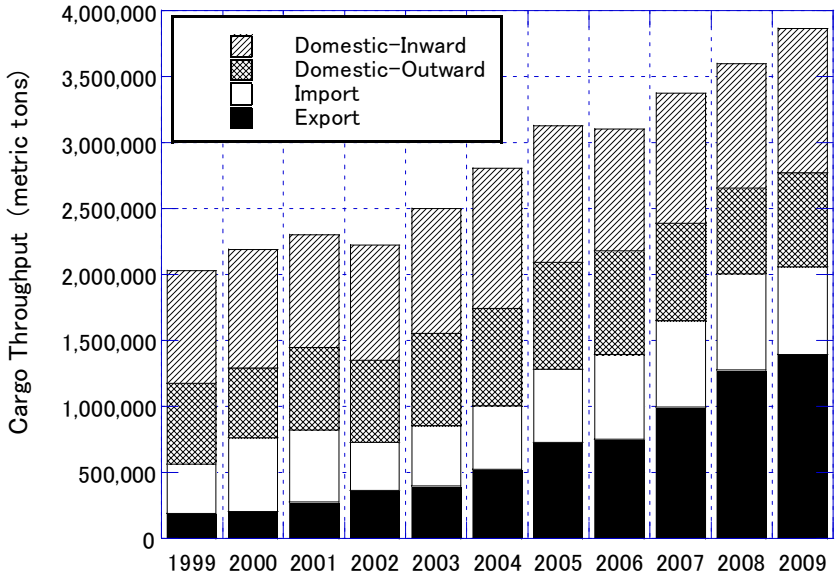
The Port of Davao is classified as Type 4 among ASEAN 47 Network Ports, which means it is a "small scale port used for intra-regional container shipping services."

The wharf of the port is called Sasa Wharf, Davao City, comprised of the south quay and the north quay. The south quay (length: 575 meters) was developed in the 1960s and the north quay, adjoining the south quay (length: 413 meters) was developed in the 1980s. The depth along quayside is 9.5 to 10 meters. The north quay was expanded to 113 meters in December 2008 and went into service from May 2009. The present depth of along this 113 meter berth is 13 meters and the design depth is 15 meters.

Port of Davao is under the management of the Port Management Office-Davao in the Port District Office-Southern Mindanao of the Philippine Ports Authority (PPA).

2) Background and Requirement of the Project

Port of Davao is the largest port in Mindanao Island and handles agricultural products such as bananas and other fruits, coconuts, raw rubber and wood. The cargo throughput in 2009 was 3.9 million tons, nearly doubling the amount in 1999 (see the Figure 5.4-18). Export cargo, in particular, has increased 7.2 times in these 10 years. This increase is due mainly to the vigorous demand for bananas in China and the Middle East.

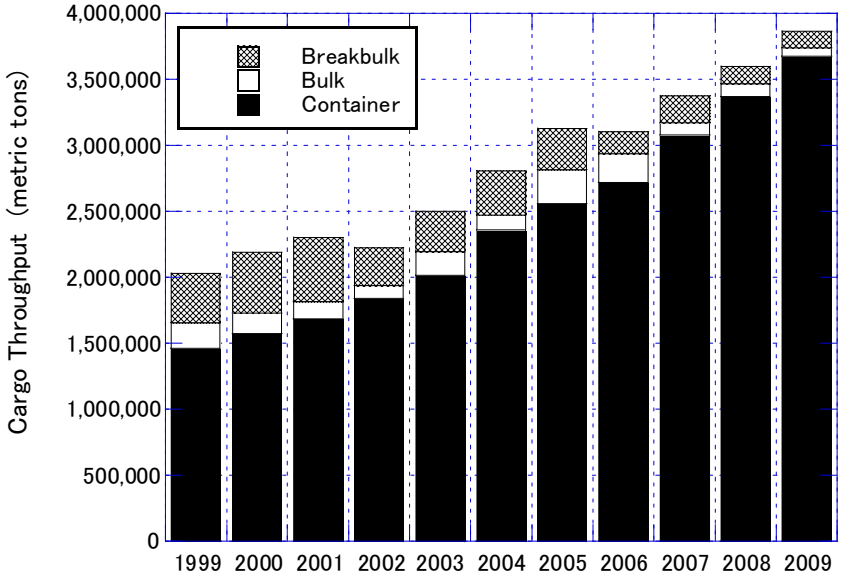


Source : PPA

Figure 5.4-18 Evolution of Cargoes at Port of Davao

Another feature of this port is the high ratio of containers. Source : PPA

Figure 5.4-19 shows the cargo throughput by type at the port; the ratio of containers exceeded 80% in 2002 and 90% in 2007.



Source : PPA

Figure 5.4-19 Cargo Throughput by Type at Port of Davao

In spite of the high ratio of containers handled, there is no gantry crane at the Port of Davao. All containers are handled by ship-gears and efficiency is low.

Even though some measures such as expanding the north quay and container yard were implementd to handle the increasing cargoes, the container cargoes are expectd to exceed the handling capacity in 2015.

An additional issue is that the Port of Davao does not have a dedicated ferry terminal for the Super Ferry. The Super Ferry is operated twice a week, connecting Manila, Cebu, Zamboanga and General Santos. When it visits the port, the center of the wharf is used for berthing. This causes mainly two problems: one is that cargo handling works cannot be carried out at such times and the other is the safety of passengers.

3) Future Prospect

From the study on Measure 7 conducted by Malaysia and Republic of Korea, the container handling capacity and the container demand forecast are considered as follows.

Table 5.4-39 Container Handling Capacity and Future Demand

Cargo Volume/Capacity (based on the data of Measure 7)	Capacity	Record in 2008	Forecast		
			2010	2015	2020
Container (1,000 TEUs)	333	349	355	444	524
Break Bulk (1,000 MTs)	358	134 *)	114	134	149
	*) Port Statistics from PPA Website				

The annual container handling capacity is estimated as 333,000 TEUs in the study on Measure 7. This figure almost corresponds to the capacity (330,000 TEUs) estimated by ADB, excluding the capacity of the 113 meter expanded quay in service from June 2009. Adding its annual capacity of 90,000 TEUs, the annual container handling capacity is set to 420,000 TEUs.

The container demand is forecasted to increase by 3.4% annually in Measure 7. On this

assumption, the container cargo volume is expected to exceed the container handling capacity in 2015.

Consequently, it is recommended to increase the container handling capacity to cope with the increasing container cargoes at the Port of Davao.

4) Purpose of the Project

The purpose of this project is to resolve the following problems and issues that the Port of Davao has:

① There is no gantry crane at the Port of Davao and containers are handled inefficiently by ship-gears.
② The container cargo volume is expected to exceed the container handling capacity in 2015.
③ Port of Davao does not have a dedicated ferry terminal for the Super Ferry.

5) Outline of the Project and Rough Project Cost

An outline of this project is shown in Table 5.4-40. PPA is the implementation body of this project.

In this project, strengthening of the existing quay is needed in order to install quay-side gantry cranes. As shown in Figure 5.4-22, the sea-side crane foundation is constructed by steel pipe piles, concrete beams and a crane rail. The land-side crane foundation will consist of steel pipe piles, concrete footing and a crane rail after the pavement in the container yard is removed.

During the strengthening work, the quay cannot be used for loading and unloading. The execution scheme for the strengthening work will be very important in order to minimize the influence on cargo handling at the existing quay.

Table 5.4-40 Outline of the Project

I. Infrastructure Reinforced Quay Length: 500 m Expansion of Container Terminal: 184 m Depth along Quayside: 13 m (15 m) below MLLW II. Container Handling Equipment Quay-side Gantry Crane: 3 units

Source: PPA

The project cost is estimated by PPA as follows:

Civil Works

A. Widening and strengthening of RC wharf (500 m x 15 m) and installation of quay crane rail	PHP 3,610 M
B. Concrete paving with RTG lanes of newly completed back-up area (1.3 ha)	PHP 100 M
C. Relocation of the passenger terminal	PHP 369 M
D. Expansion (184 m) of the container terminal	PHP 871 M
E. Sub-Total (Budgetary Estimate)	PHP 4,950 M

Equipment

F. Quayside Gantry Crane (3 units)	PHP 860 M

Total Cost (E+F): PHP 5,810 million

(Reference: Exchange Rate PHP44/US$ (as of December 2010))

6) Economic Evaluation

PPA has not conducted a cost-benefit analysis and/or economic evaluation of this project.

Effects of this project are land & sea transportation cost-reduction by avoiding the use of other ports, transportation cost-reduction by deploying larger vessels and ship waiting time saving. Furthermore, industrial development, promotion of business activities and improved safety by separating passengers and cargoes, etc. are expected by this project.

In spite of limited data obtained, a rough economic analysis of this project was conducted for reference. As a result, EIRR of the project is estimated to be around 13%.

In this analysis, General Santos port which is the nearest open port from Davao port is assumed to be the substitute port in the “without case”. Transportation cost reduction by avoiding the use of General Santos port, reduction of sea transportation by deploying larger vessels and ships waiting time reduction are assumed to be benefits in the “with case”. Costs of this project include construction costs, maintenance costs and replacement cost of quay crane. This project is assumed to have a life of 30 years including the construction and operation period. The exchange rate as of December 2010 is adopted.

This economic analysis is just a trial. At this time, data/information for the economic analysis were limited/lacked, benefits to be considered were also limited. Therefore, if other direct benefits and ramifications of the projects could be considered, benefits from the project would become larger and the result of economic analysis would be expected to be surely more positive. It is needless to say that a detailed economic analysis with enough data and information will be necessary before proceeding to the implementation stage.

7) Term and Schedule of the Project

The project should be completed in 2014 as the container cargoes are expected to exceed the handling capacity at the Port of Davao in 2015. Figure 5.4-20 shows the container volume and the container handling capacity from 2004 - 2020.

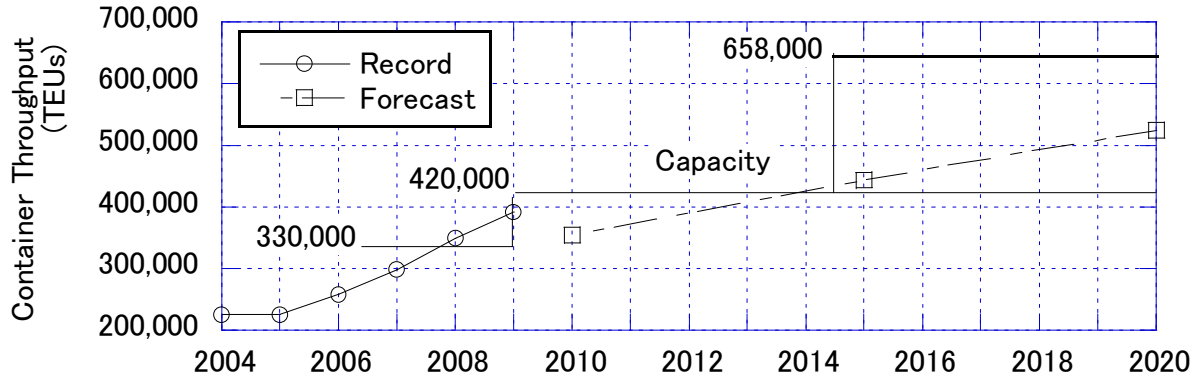


Figure 5.4-20 Container Volumes and Container Handling Capacity at the Port of Davao

It is important to allot enough time for the construction, because the strengthening work for the existing quay has to be divided into several blocks in order to minimize the influence on cargo handling at the existing quay.

A recommended rough schedule is shown in Table 5.4-41.

Table 5.4-41 Rough Schedule of the Project

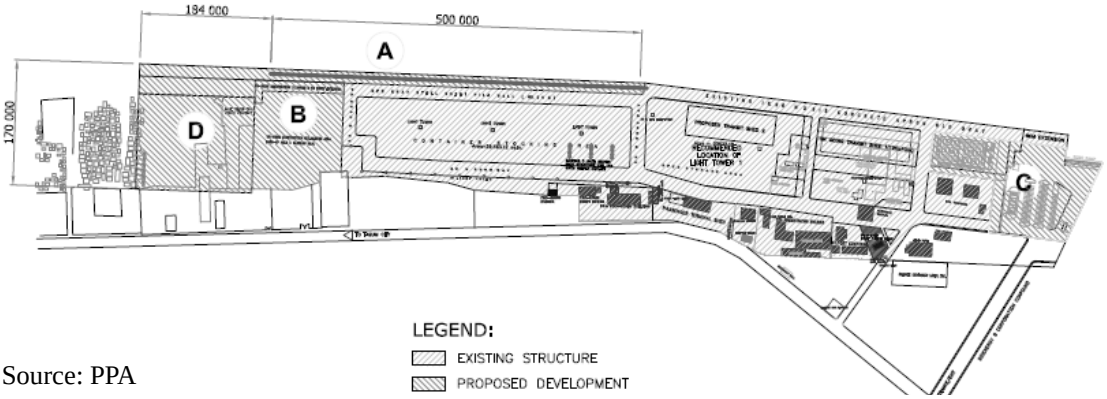
2011	2012	2013	2014	2015
Preparation, Financing	Implementation of this project			Capacity: 658,000TEUs

8) Implementation of the Project

This project will be implemented by PPA, but the fund source has not yet been determined.

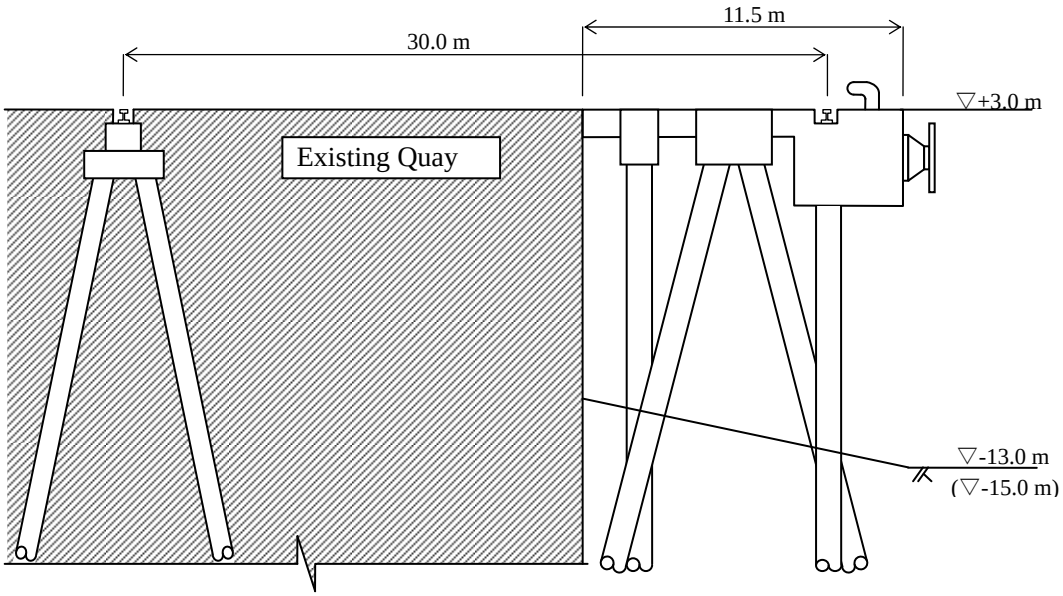
The south terminal is operated by Filipinas Port Services, Inc. and the north terminal is operated by Davao Integrated Port Stevedoring Services Corp. (DIPSSCORP), an affiliate of ICTSI. The strengthening work (500 meters), the expansion of the container terminal (184 meters) and installation of quay-side gantry cranes (3 units) will be implemented in the north terminal. It is necessary to define the separate roles and finances for PPA and DIPSSCORP.

[Reference : Project related Figure]



Source: PPA

Figure 5.4-21 Outline of the Project



Source : PPA

Figure 5.4-22 Strengthening of the Existing Quay

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

1) Characteristic of the Port

Ho Chi Minh City Port consists of many terminals developed on the banks of the rivers streaming in Ho Chi Minh City including the Sai Gon River, Dong Nai River, Nha Be River, Soai Rap River, and Long Tau River. Representative terminals in HCM City Port are Sai Gon, Cat Lai, Ben Nghe, and VICT (Vietnam Inter-national Container Terminal).

The approach to HCM City Port requires more than 80 km navigation along the Long Tau River and Sai Gon River, in which the shallowest point has a depth of 8.6 meters and the maximum size of navigable vessels is 30,000 DWT. As the HCM City Port is located in the middle of the city, truck transportation is not allowed during the daytime hours except on special roads and in special cases. The shallow, long approach channel and traffic restrictions are the main problems facing HCM City Port.

New deep water terminals were therefore recently developed along the Thi Vai River, which are called Cai Mep Thi Vai Port or Vung Tau Port. This new port is located in Vung Tau Province and not included in HCM City Port. In Cai Mep Thi Vai Port, large container vessels of 80,000 DWT class have been calling since 2009 and three terminals, namely SIVT, TCCM, and SP-PSA, have been in operation as of 2010. These terminals are developed by joint stock companies invested by Sai Gon Port, VINALINES, or Sai Gon New Port and foreign operators.

2) Background and Requirement of the Project

In Cai Mep Thi Vai Port, there are 11 commercial terminals in its layout plan, in which three terminals are in operation, four terminals are under construction and four terminals are now under planning. Details of each terminal are shown in Table 5.4-42. Terminals under construction will be completed by 2012 and enter into operation and terminals under planning will soon enter the construction phase. To cope with the dramatic increase in calling vessels and introduction of larger vessels, deepening of the approach channel to Cai Mep Thi Vai Port is required and ship traffic control system will be necessary to improve the capacity of ship traffic.

Table 5.4-42 Scale of Commercial Terminals and Operators of Cai Mep Thi Vai Port

	Terminals	Berth Length (m)	Area (ha)
1	Cai Mep Ha General Container Terminal	1,200	86.6
2	Gemadept-Terminal Link Caimep Terminal (JV between Gemadept and CMA-VGM)	1,150	72
3	SP-SSA International Container Services (JV betwwen Vinalines, Saigon Port and SSA Marine)	600	60.5
4	Cai Mep Container Terminal (ODA, Vinamarine)	600	48
5	CMIT Terminal (JV between Vinalines, Saigon Port and A.P. Moller Terminals)	600	48
6	Tan Cang Cai Mep Terminal Phase I Saigon New Port (SNP) Phase II JV between SNP, MOL, Hanjin, and Wan Hai	900	61
7	SP-PSA Terminal (JV between Vinalines, Saigon Port and PSA Singapore)	1,200	54
8	Thi Vai Multi-purpose Terminal (ODA, Vinamarine)	600	27
9	Thi Vai Port	674	41
10	Saigon International Terminals Vietnam (SITV) (JV between Hutchison Port Holdings and Saigon Investment C.C.)	730	33.7
11	My Xuan International Terminal	1,115	52.5

Source: JICA Study Team on ASEAN Maritime Roadmap Measure No.8

The master plan on the development of Vietnam's seaport system through 2020 with orientations toward 2030 indicates that target vessels of terminals No.1 to No.6 are 80,000 - 100,000 DWT with a loading capacity of 6,000 - 8,000 TEUs, and terminals No.7 to No.11 are 50,000 - 80,000 DWT with a loading capacity of 4,000 - 6,000 TEUs.

The approach channel has a depth of -14m from the entrance to terminals No.1 to No.6, and a depth of -12m from No.7 to No.11. In order to ensure ship entry and departure without tidal restrictions, the approach channel shall be deepened to -16m and -14m respectively.

Further to channel deepening, introduction of a vessel traffic control system will play an important role in ensuring navigation safety as it can give prompt instructions to entering and departing vessels and prevent congestion that could be caused by the mixture of vessels to/from HCM City Port and to/from Cai Mep Thi Vai Port.

Table 5.4-43 Container Throughput (HCM City Port & Vung Tau Port)

(TEUs)

Year	2003	2004	2005	2006	2007	2008	2009
HCM							
Export	722,000	871,000	1,002,000	1,163,000	1,380,000	1,498,000	1,436,000
Import	701,000	826,000	917,000	1,093,000	1,369,000	1,436,000	1,351,000
Domestic	150,000	215,000	252,000	285,000	421,000	492,000	609,000
Total	1,573,000	1,912,000	2,171,000	2,541,000	3,170,000	3,426,000	3,396,000
Vung Tau							
Export	0	0	0	0	0	0	80,000
Import	0	0	0	0	0	0	72,000
Domestic	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	152,000

Source: VINAMARINE

3) Future Prospect

Future demand for container throughput at HCM City Port is estimated by the study on ASEAN Maritime Roadmap Measure No.7 as shown in Table 5.4-44. Capacities of terminals of Cai Mep Thi Vai Port are estimated using the method in the guidelines prepared by the study on ASEAN Maritime Roadmap Measure No.6 as shown in Table 5.4-45 and Table 5.4-46. Capacities of terminals in HCM City Port are estimated by the Sai Gon Port Company.

Table 5.4-44 Future Demand for Container Throughput, HCM City Port

(TEUs)

Year	2005	2010	2015	2020
Ho Chi Minh (Import & Export)	2,171,000	3,346,000	5,141,000	7,001,000
Ho Chi Minh (Transshipment)	-	-	-	-

Source: Study on Maritime Roadmap Measure No.7

Table 5.4-45 Capacity of Present Terminals in HCM City Port

Capacity	Throughput (1000 TEUs)
Cat Lai	1,500
VICT	450
ICDs, TSM, Others	650
Saigon Port	450
Ben Nghe Port	350
Total	3,400

Source: Vietnam Seaports Association and Saigon Port

Table 5.4-46 Capacity of Each Commercial Terminal in Cai Mep Thi Vai Port

	Terminals	Est. Container Cap. (TEUs)
1	Cai Mep Ha General Container Terminal	1,728,000
2	Gemadept-Terminal Link Cai Mep Terminal (JV between Gemadept and CMA-VGM)	1,588,000
3	SP-SSA International Container Services (JV between Vinalines, Saigon Port and SSA Marine)	996,000
4	Cai Mep Container Terminal (ODA, Vinamarine)	996,000
5	CMIT Terminal (JV between Vinalines, Saigon Port and A.P.Moller Terminals)	996,000
6	Tan Cang Cai Mep Terminal Phase I Saigon New Port Phase II JV between Saigon New Port, MOL, Hanjin, Wan Hai	1,551,000
7	SP-PSA Terminal (JV between Vinalines, Saigon Port and PSA Singapore)	1,840,000
8	Thi Vai Multi-purpose Terminal (ODA, Vinamarine)	-
9	Thi Vai Port	-
10	Saigon International Terminals Vietnam (SITV) (JV between Hutchison Port Holdings and Saigon Investment C.C.)	1,014,000
11	My Xuan International Terminal	-
	Total	10,709,000

Source: An Estimate by Guidelines for Assessing Port Development Priorities including Acceptable Performance Levels in ASEAN (Measure No.6)

Total container handling capacity of HCM City Port is estimated at about 3.4 million TEUs and that of Cai Mep Thi Vai Port is estimated at 11.1 million TEUs. As future demand is estimated at about 7 million TEUs in 2020, the Port should be able to cope with cargo throughput up to 2020. However, as the actual cargo throughput in 2008 has already exceeded the forecast in 2010, the forecast in 2020 may be underestimated. In addition, transshipment cargo, which will be handled at each terminal, may not be included in the forecast.

4) Purpose of the Project

It is concluded that Cai Mep Thi Vai Port will have enough capacity if all terminals under planning are completed, unless transshipment containers increase dramatically. Therefore, this project aims to:

① Develop terminals under planning in due course;
② Deepen the approach channel to accept larger container vessels;
③ Introduce vessel traffic control system to ensure navigation safety, to control entering and departing vessels effectively, and to avoid congestion that may be caused by the mixture of vessels to/from HCM City Port and Cai Mep Thi Vai Port; and
④ Develop access roads to Cai Mep Thi Vai Port.

5) Outline of the Project and Rough Project Cost

Investments in commercial terminals in Cai Mep Thi Vai Port are estimated as shown in Table 5.4-47. Total investment in 11 terminals may amount to about USD 2.7 billion. As of November 2010, Terminals No.6, 7 and 10 are in operation and No.3, No.4, No.5 and No.8 are under construction. Terminals No.4 and No.8 are funded by ODA funds and others are by private terminal operating companies.

In addition to the development of terminals, investment in channel deepening and vessel traffic control is expected for effective of operation of all terminals. Estimated cost shown in Table includes investment in both infrastructure and superstructure including cargo handling equipment. Cost for channel deepening includes capital dredging but does not include maintenance dredging, which shall be carefully studied before implementation.

Table 5.4-47 Estimated Investment in Each Commercial Terminal

	Terminals	Estimated Cost (million USD)
1	Cai Mep Ha General Container Terminal	360
2	Gemadept-Terminal Link Caimep Terminal (JV between Gemadept and CMA-VGM)	345
3	SP-SSA International Container Services (JV between Vinalines, Saigon Port and SSA Marine)	180
4	Cai Mep Container Terminal (ODA, Vinamarine)	180
5	CMIT Terminal (JV between Vinalines, Saigon Port and A.P.Moller Terminals)	180
6	Tan Cang Cai Mep Terminal Phase I Saigon New Port Phase II JV between Saigon New Port, MOL, Hanjin, Wan Hai	270
7	SP-PSA Terminal (JV between Vinalines, Saigon Port and PSA Singapore)	360
8	Thi Vai Multi-purpose Terminal (ODA, Vinamarine)	135
9	Thi Vai Port	200
10	Saigon International Terminals Vietnam (SITV) (JV between Hutchison Port Holdings and Saigon Investment C.C.)	219
11	My Xuan International Terminal	270
	Total	2,699

Dredging (-16m, 9 million m3)	90
Navigation Control System	-

Source: JICA Study Team on ASEAN Maritime Roadmap Measure No.8

6) Economic Evaluation

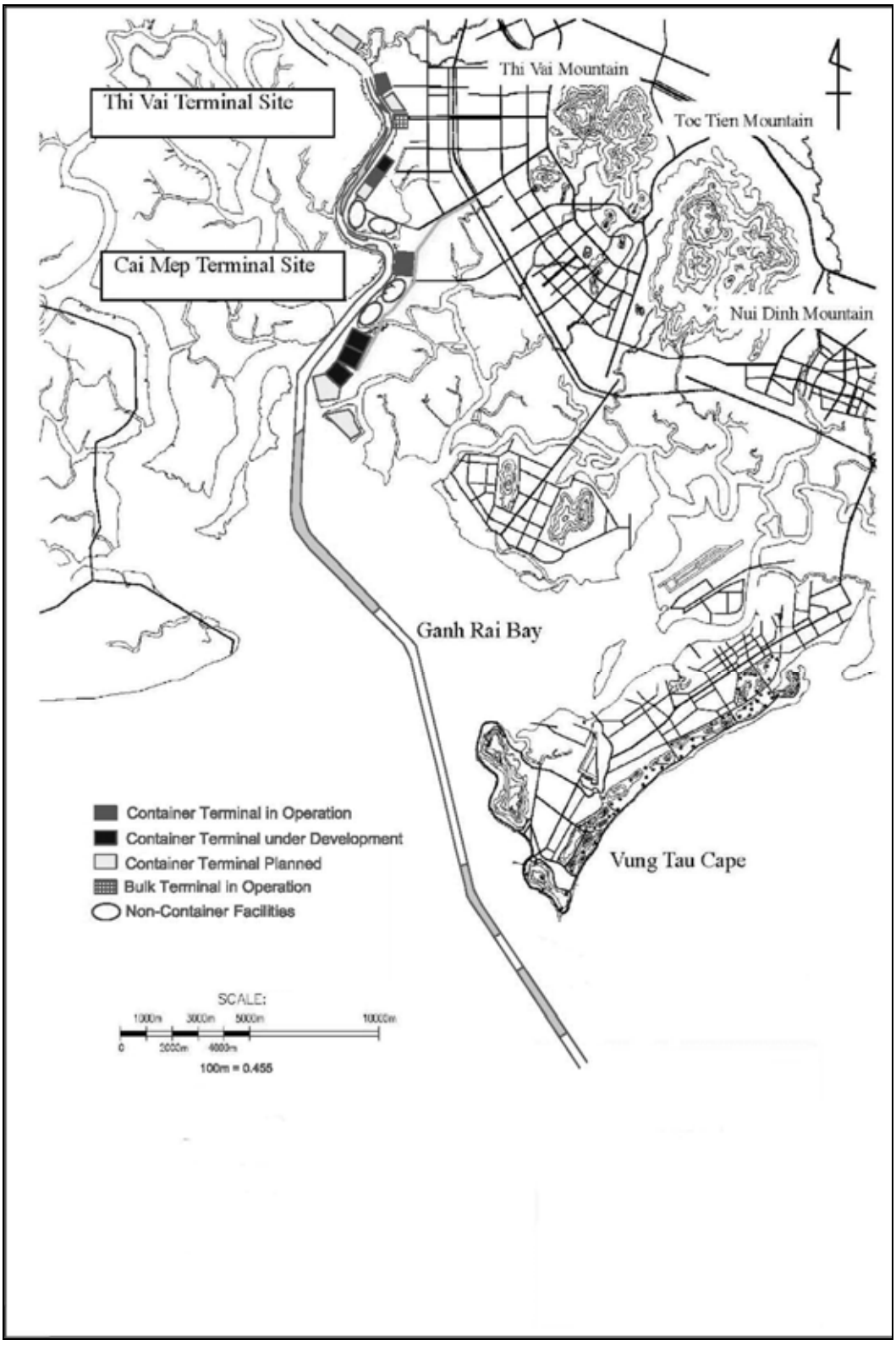
Cost benefit analysis on the development of Cai Mep Thi Vai Port may be implemented separately by each terminal. Further public investment is expected in channel deepening and vessel traffic control system in Vung Tau and Cai Mep Thi Vai areas. Major benefits of channel deepening and vessel traffic control system is to enable larger container vessels over 100,000 DWT to call at the port, to reduce waiting time for high tide hours, and to increase vessel traffic capacity in the approach channels. Cost benefit analysis on public investment may not include private investments by terminal operators.

7) Term and Schedule of the Project

Development of Cai Mep Thi Vai Port was commenced in 2005 and the first commercial terminal was opened in June 2009. Approach channel dredging is to be completed up to -14m by the end of 2010. CMIT and additional two berths of TCCM will open in early 2011. SP-SSA Terminal, Cai Mep Container Terminal and Thi Vai Multi-Purpose Terminal will open in 2012.

Taking into consideration the increase in calling ships and introduction of larger vessels, a project for approach channel deepening and vessel traffic control system is expected to be completed by 2015 or little later. Feasibility study on this project shall be implemented in the near future.

[Reference : Project related Figure]



Source: JICA Study Team on ASEAN Maritime Roadmap Measure No.8

Figure 5.4-23 Terminals in Cai Mep Thi Vai Port and Approach Channel

(11) Development of Hai Phong International Gateway Port: Hai Phong port (Vietnam)

1) Characteristic of the Port

Port of Hai Phong is located in the downstream of Cam River, and very close to the center of the city. The distance from Hanoi is about 100 km by national road no.5. The port is also connected to Hanoi by road no.18 through the north route and to Thai Binh province by road no.10. Necessary travel time from Hanoi to the port is about 2.5 hours by passenger car and 4-6 hours by truck. These roads are designed for general traffic and not suitable for the traffic of container trucks, so that a highway between Hai Phong and Hanoi is under construction.

Total length of the approach channel to the Port of Hai Phong is 36km, of which Lach Huyen Channel has a width of 100m and depth of 7.5m, and Ha Nam Canal and Bach Dang Channel have a width of 80m and depth of 5.5m. Container ships therefore navigate the channel during the time of high tide. Maximum size of calling vessels is 16,000 DWT at Transvina Terminal and 40,000 DWT at Chua Ve Terminal. The design depth of Dinh Vu Terminal is the same as that of Chua Ve Terminal.

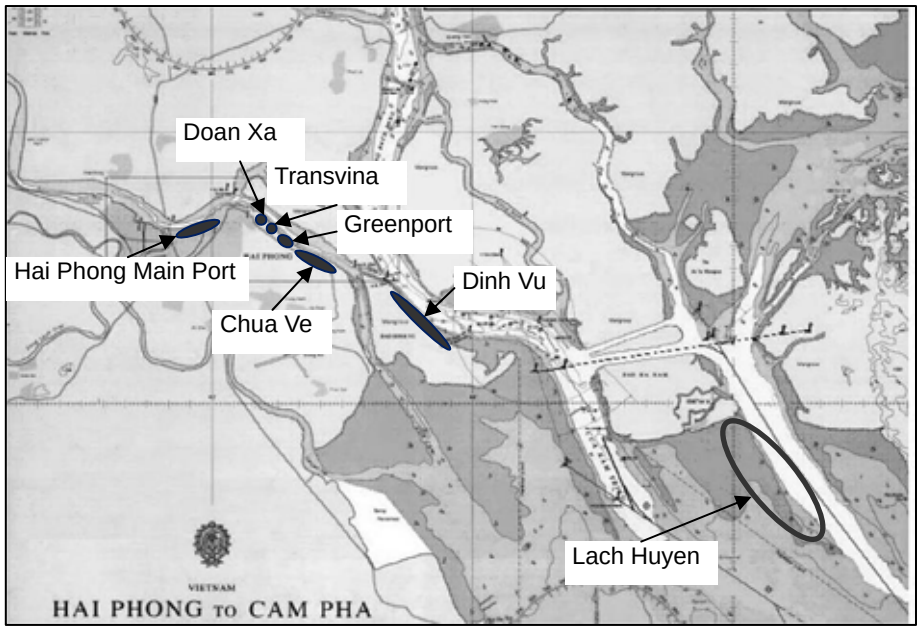


Figure 5.4-24 Location of Terminals, Hai Phong Port

2) Background and Requirement of the Project

There are 28 terminals in Port of Hai Phong, of which 6 terminals are used for container handling. Others are small scale private facilities of industrial companies. The six terminals are listed in Table 5.4-48. Main Port and Chua Ve Terminal are managed by Hai Phong Port Company under VINALINES. Doan Xa, Transvina, Green Port, and Dinh Vu terminals are operated by individual port companies, some of which VINALINES has shares in. In Dinh Vu area, Dinh Vu Investment Company began operation of a container terminal from 2005 and now has completed two berths. Hai Phong Port Company also began operation of a container terminal in Dinh Vu area from 2008 and has completed 2 berths as of 2010.

Table 5.4-48 Terminals in Hai Phong Port

Terminals	Type	Operator	Berth (m)	Water Depth (m)	Yard Area (m2)
Main Port	Conventional	Port of Hai Phong Co.	1,717	8.7	163,000
Chua Ve	Container General	Port of Hai Phong Co.	500 348	8.4	179,400
Doan Xa	Multi Purpose	Doan Xa Port Joint Stock Co.	235	7.8	120,000
Transvina	Multi Purpose	Vietnam Hi-Tech Transportation Co.	169	7.8	41,200
Green Port	Multi Purpose	Vietnam Container Shipping JSC.	320	7.8	105,000
Dinh Vu	Container	Dinh Vu Investment and Development JSC Port of Hai Phong Co.	805 (690)	8.7	354,000 (304,000)

Note: ( ) is a plan
Source: Interview with each operator

The master plan on the development of Vietnam's seaport system through 2020 with orientations toward 2030 shows the features of important port development projects, in which Lach Huyen Port is listed as Hai Phong International Gateway Port. The port is planned to accommodate vessels up to 50,000 DWT without any restriction of tidal height and up to 80,000 DWT within a certain tidal range. Loading capacities of these vessels are 4,000 TEUs and 6,000 TEUs respectively.

Dinh Vu area is planned to develop container terminals, general cargo berths and tanker berths. Container terminals are designed to have a total of 7 berths, in which 4 berths are completed.

Dinh Vu container terminals are developed to cope with the increasing container cargoes, but the size of calling vessels is limited due to the depth of approach channels. After the completion of container terminals planned in Lach Huyen, Dinh Vu container terminals will be used by coastal ships and terminals along the Cam River will be redeveloped for other purposes in the future.

Table 5.4-49 Container Throughput of Hai Phong Port and Cai Lan Port

(TEUs)

Year	2003	2004	2005	2006	2007	2008	2009
Hai Phong							
Export	150,962	148,056	212,766	247,986	386,988	461,221	562,839
Import	153,412	154,992	220,433	264,501	438,529	572,286	705,487
Domestic	145,103	80,028	105,208	135,260	325,348	365,147	463,918
Total	449,477	383,076	538,407	647,747	1,150,865	1,398,654	1,732,244

Year	2003	2004	2005	2006	2007	2008	2009
Cai Lan							
Export	0	3,768	14,941	18,837	11,003	36,386	45,321
Import	0	17,512	39,915	29,982	16,751	24,913	64,771
Domestic	0	39,158	68,395	80,647	6,396	9,711	0
Total	0	60,438	123,251	129,466	34,150	71,010	110,092

Source: VINAMARINE

3) Future Prospect

Future demand for container throughput at Hai Phong Port and Cai Lan Port is estimated by the

study on ASEAN Maritime Roadmap Measure No.7 as shown in Table 5.4-50. Capacities of terminals are estimated using the method in the Guidelines prepared by the study on ASEAN Maritime Roadmap Measure No.6 as shown in the Table 5.4-51.

Table 5.4-50 Future Demand for Container Throughput, Hai Phong Port

(TEUs)

Year	2005	2010	2015	2020
Haiphong	538,000	1,442,000	2,552,000	4,002,000
Cai Lan	146,000	89,000	109,000	116,000

Source: Study on Maritime Roadmap Measure No.7

Table 5.4-51 Capacity of Each Terminal, Hai Phong Port

Capacity	Throughput (1000 TEUs)
Chua Ve	579
Doan Xa	131
Transvina	81
Green Port	176
Dinh Vu (*)	1,533
Total	2,500

Note (*) includes terminals planned
Source: Study on Maritime Roadmap Measure No.6

Port of Hai Phong experienced heavy congestion during a period from 2007 to mid 2008, and Chua Ve Terminal controlled container entry into the yard. Ship waiting time worsened during that period and some shipping lines skipped calling at Hai Phong. Since the opening of Dinh Vu Terminal and an economic recession in 2008, port congestion has eased for the time being. Capacity of container handling at Hai Phong Port is estimated at about 2.5 million TEUs subject to completion of all terminals in Dinh Vu area.

Since the ASEAN Maritime Roadmap Study forecasts container throughput in 2010 at 1.4 million TEUs and in 2020 at 4 million TEUs, the actual throughput in 2009 has already exceeded the forecast in 2010. Container throughput in 2020 may exceed the forecast if the Vietnamese economy continues to grow at this pace. In this connection, a new container terminal in Lach Huyen area is necessary by 2015 and more terminals by 2020.

4) Purpose of the Project

Since container handling capacity of the Port of Hai Phong will fall short of demand in the near future, development of a new terminal is urgently needed in the Lach Huyen area. It is also important to develop a deep water terminal due to the fact that even a container vessel of 30,000 DWT has to wait for high tide to enter or leave the present terminals. Therefore, this project aims to:

① Accommodate container vessels up to 50,000 DWT without tidal restriction and up to 80,000 DWT during high tide at terminals in Lach Huyen area;
② Increase the capacity of container handling to 4 million TEUs by 2020;
③ Shift container vessels more than 5,000 - 10,000 DWT from present terminals to Lach Huyen terminals;
④ Construct an access road and bridge connecting Lach Huyen terminals and Dinh Vu area;
⑤ Develop access roads from the hinterland, including Hanoi, to the Port of Hai Phong.

5) Outline of the Project and Rough Project Cost

Development of Lach Huyen Terminals is now under study by JICA, and scale and cost estimation of the project are also examined in the study. This Project includes the development of the approach channel, land reclamation from the sea, ground consolidation, breakwater revetment, training dike, navigation aids, the construction of berths, buildings and yards, and procurement of cargo handling equipment.

In addition to these facilities, an access road from Dinh Vu to Lach Huyen is indispensable. The road should have a total length of 14.5km inclusive of a bridge with a length of 4.8km.

6) Economic Evaluation

Cost benefit analysis of the development of Lach Huyen Port is implemented by another study and will be released in the near future. Major benefit of this project is accommodation of larger vessels up to 50,000 - 80,000 DWT, which enables direct call of mother vessels and direct transportation from/to origin or destination ports. It will considerably reduce transshipment at Hong Kong, Kaohsiung, or Singapore and will reduce ocean freight rates from/to Hai Phong. Shippers and consignees will enjoy a reduction in transportation cost, which may encourage industrial activities in the north region of Vietnam.

Sample comparison of ocean freight rates from Shanghai and Guangzhou to Hai Phong and HCM is shown in Table 5.4-52. Ocean freight rates from Shanghai to Hai Phong are higher than those to HCM by USD 100 in case of a 20 foot container and by USD 150 in case of a 40 foot container. This difference may be caused by the scale of economy of transportation resulting from the size of calling container vessels engaged and the volume of containers transported. After the opening of Lach Huyen terminals, ocean freight rates to Hai Phong are expected to drop to the level of HCM.

Table 5.4-52 Comparison of Ocean Freight Rates to Hai Phong and HCM

(USD, Surcharges are not included)

Origin Port	Destination Port	20F	40F	No. of Samples
Shaghai	Hai Phong	$488	$876	209
	Ho Chi Minh	$381	$724	198
Guangzhou	Hai Phong	$422	$741	71
	Ho Chi Minh	$281	$445	28

Note; * Freight Rates to Hong Kong are not reliable due to few samples
1) Ocean freight rates based on samples posted on website "SHIPPING CHINA", (http://en.shippingchina.com/)
2) Freight rates based on “CY to CY”
3) Any surcharges are not included
4) Sample period: May-June 2010
5) Compiled by OCDI

7) Term and Schedule of the Project

The Lach Huyen Port Project is being negotiated between the government of Japan and the government of Vietnam and it will be commenced as soon as an agreement is reached.

(12) Operational Improvement Project by Introducing/Upgrading Port EDI System: Vietnam, Indonesia

1) Background and Requirement of the Project

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

Enhancement, simplification and standardization of port related procedures are essential to improve the efficiency of port operations and secure competitiveness. On the other hand, those of Vietnam and Indonesia lag behind the world standard. Therefore, it is necessary to introduce a port EDI system properly in accordance with the current state of electronic port documentation.

In the case of Vietnam, the port EDI system will be introduced for all four network ports while in the case of Indonesia, only the major four network ports are considered because the present situation of the fourteen network ports are considerably different.

2) Purpose of the Project

The purpose of this project is to improve operational efficiency by introducing/upgrading a port EDI system in four network ports of Vietnam and major four network ports of Indonesia.

3) Outline of the Project and Rough Project Cost

Table 5.4-53 Outline of the Project

Outline of the Project	Estimated Cost
・ Definition of Requirements & System Design ・ System Development ・ Procurement of Hardware ・ Installation and Calibration, etc.	0.5～1 billion Yen/System (largely depending on the System Design)
・ Operational Support, Maintenance, etc.	70～100 million Yen/Year (largely depending on the service levels)

Source: Estimated Cost is prepared by the JICA study team based on Japan's experience in introducing a port EDI system

(Reference: Exchange Rate 84Yen/US$ (as of December 2010))

4) Benefits of the Project

The benefits of this project are to realize improved operational efficiency and then contribute to strengthening competitiveness among world port through enhancement, simplification and standardization of port related procedures.

According to a report issued by the Ministry of Land, Infrastructure, Transport and Tourism, economic benefits by promoting the one-stop services of port related procedures are as follows. Similar benefits will be expected in Vietnam and Indonesia.

1. Direct economic benefits:
   Cost reduction of applicants such as shipping companies/shipping agents, etc.
2. Indirect economic benefits:
   Reduction of the transaction by government offices/port authorities
   Reduction of fuel cost related to submission of the documents by car
   Data utilization for port statistics after application
   Other qualitative effects - reduction of space for documents
   - reduction of communication cost

Source: compiled by the JICA study team referring to the report "Evaluation report for promotion of the

one-stop services of port related procedures" issues by MLIT in March 2006

5) Term and Schedule of the Project

The system design will take one to one and half years and the system development will take one to two years. Therefore, total project term will be around three years. To introduce the system, it is first necessary to define the requirements and design the system, then to develop the system and procure the hardware, and finally to install and calibrate the system in the site.

6) Implementation of the Project

In the case of Vietnam, Vinamarine and maritime administration are the managing agencies of the four network ports and thus they will be implementing agencies.

In the case of Indonesia, DGST (Directorate General of Sea Transportation, Ministry of Transport) and the port authorities which will be established in the major four ports will serve as the implementing agencies.

Operational support and maintenance are especially important for efficient operations.

Furthermore, an implementing organization in the preparation stage and an operating organization after introduction should be organized because the new system needs to be utilized and maintained properly.

As the initial investment cost will be relatively large, requesting foreign donor countries and/or international financing organizations to extend the funds necessary to introduce a port EDI system is one idea.

7) Term and Schedule of the Project

When a port EDI system is introduced, setting up the receiving system from the viewpoint of legislation and institution is essential. Furthermore, as mentioned in section F, setting up a support system for operation is also important. Requesting donor countries to extend technical cooperation is one of the ideas in the stage of preparation and operation.

It is customary that the handwritten signature of a person in authority is usually needed in an official document. However, this custom might often be an obstacle to introduce a electronic system. Therefore, introduction and spread of a reliable authentication system is essential for replacing the handwritten signature system.

Reference Materials

Reference Material-1	・	ASEAN Maritime Roadmap
Reference Material-2	・	The program for the workshop
	・	List of delegates
	・	Summary of the ASEAN-JAPAN MARITIME TRANSPORT WORKSHOP ON MEASURE NO.8
Reference Material-3	・	Project Profile Sheet

ROADMAP TOWARDS AN INTEGRATED AND COMPETITIVE MARITIME TRANSPORT IN ASEAN

No	MEASURES	IMPLEMENTING BODY	TIMELINE
I. Developing a single ASEAN voice			
1	Adopt the general principles and framework for a common shipping policy. **(Done)**	Senior Transport Officials Meeting (STOM) through the Maritime Transport Working Group (MTWG), in consultation with ASEAN Ports Association (APA), ASEAN Federation of Forwarders Associations (AFFA), Federation of ASEAN Shipowners Associations (FASA) and Federation of ASEAN Shippers Councils (FASC).	December 2007
2	Establish mechanism for the consultation, coordination and consensus of ASEAN responses to emerging maritime issues, which may have an impact on the interest of ASEAN Member Countries. **(Lead Coordinator: Malaysia)**		December 2008
II. Infrastructure			
3	Review list of ports[1] in the ASEAN transport network to ensure that all ports of regional significance are included. **(Done. On-going)**	STOM through the MTWG in coordination with the APA. *(For measures 5-8, to be done through seeking technical assistance from external donors institutions)*	December 2007
4	Compile a database on ASEAN network ports. This could include inventory of the facilities available, shipping services, port tariffs, and other indicators. **(Lead Coordinator: APA)**		December 2008
5	Develop a database of maritime trade movements to and from within ASEAN. **(Lead Coordinator: Malaysia)**		December 2009
6	Develop guidelines for assessing port development priorities, including acceptable performance levels. **(Lead Coordinator: Brunei Darussalam)**		December 2009

I. _____

[1] *Insertion of ASEAN ports of regional significance will be done through the proper channels of MTWG.*

No	MEASURES	IMPLEMENTING BODY	TIMELINE
7	Identify required improvement areas in ASEAN network port performance and capacity, based among others, on regular forecasts of maritime trade and requirements. **(Lead Coordinator: Malaysia)**		December 2009
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. **(Lead Coordinator: Viet Nam)**		December 2010
9	Explore funding mechanisms, where necessary, to support the implementation of identified projects in the ports of ASEAN Member Countries.	ASEAN Member Countries, with assistance of the ASEAN Secretariat	December 2012
10	Ensure that all ASEAN network ports meet the acceptable performance and capacity levels. **(Lead Coordinator: Brunei Darussalam)**	ASEAN Member Countries	December 2015
III. Market Integration			
11	Confirm the principle of open access to the international maritime trade of all ASEAN Member Countries, as per the decisions of the other relevant ASEAN sectoral bodies, such as the ASEAN Coordinating Committee on Services (CCS), and ASEAN Maritime Transport Sectoral Negotiation Working Group. **(Lead Coordinator: Indonesia)**	STOM through the MTWG	December 2009
12	Develop the strategies for an ASEAN Single Shipping Market. **(Lead Coordinator: Indonesia)**		December 2009
13	Implement the ASEAN Single Shipping Market.		December 2011

No	MEASURES	IMPLEMENTING BODY	TIMELINE
IV. Harmonisation			
14	Develop guidelines on acceptable practices in the provision of fiscal support for shipping operations **(Lead Coordinator: The Philippines)**	STOM through the MTWG	December 2009
15	Harmonise ship registration practices. **(Lead Coordinator: The Philippines)**		
16	Develop guidelines for structure of port tariffs in ASEAN transport network ports. **(Lead Coordinator: Thailand)**		
V. Human Resources and Capacity Development			
17	Establish centres of logistics excellence at selected tertiary institutions within ASEAN. **(Lead Coordinator: Singapore)**	STOM through the MTWG	December 2009
18	Develop strategy, including encouraging private sectors, for enhanced shipboard placements. **(Potential Lead Coordinators: Indonesia and the Philippines – tbc. Or ASEAN Association on Maritime Education & Training Institutions)**		December 2009
19	Establish regional centres of maritime excellence to provide advanced training in high technology aspects of maritime operations and specialised courses in areas such as port and shipboard security **(Lead Coordinator: Singapore)**		December 2011
20	Implement single labour market for ASEAN seafarers[2].		December 2013

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[2] *In accordance with the decisions of the other relevant ASEAN sectoral bodies, such as the ASEAN Coordinating Committee on Services (CCS), and ASEAN Maritime Transport Sectoral Negotiation Working Group.*

Workshop Program

September 23rd, 2010		
08:30 - 09:00	Registration	
09:00 - 09:30	Opening Remarks	by Chairperson and JICA representative
09:30 - 10:00	Adoption of Agenda	
	(Coffee Break)	
	Session 1: Introduction of studies on Measure 6 and 8	
10:30 - 12:00	1.1 Study on Measure 8 – following the outcomes of Measure 6 – 1.2 Basic idea of the long list 1.3 Outline of initial evaluation	by JICA study team
	(Lunch)	
	Session 2: Presentation on projects in ASEAN network ports	
13:30 - 15:30	2.1 Brunei 2.2 Cambodia 2.3 Indonesia 2.4 Malaysia 2.5 Myanmar	by Brunei by Cambodia by Indonesia by Malaysia by Myanmar
	(Coffee Break)	
16:00 - 18:00	2.6 Philippines 2.7 Singapore 2.8 Thailand 2.9 Vietnam	by Philippines by Singapore by Thailand by Vietnam
	(Break)	
18:30 - 20:30	Welcome Reception	
September 24th, 2010		
	Session 3: Discussion of projects in ASEAN network ports	
08:30 - 11:00	3.1 Discussion of projects with JICA study team Venue A: Indonesia 8:30- 9:30 Philippines 9:40 – 10:40 Venue B: Brunei 8:30 – 8:50 Malaysia 8:50 – 9:40 Singapore 9:50 – 10:10 Thailand 10:10 – 10:40 Venue C: Cambodia 8:30 – 9:00 Myanmar 9:00 – 9:40 Vietnam 9:50 – 10:40	
	(including Coffee Break)	
11:00 - 12:00	3.2 Review of long list and discussion of short list	by JICA study team
12:00 - 12:30	Session 4: Proposal of a method to develop project priorities	by JICA study team
	(Lunch)	
14:00 - 17:30	City tour	
	(Break)	
18:00 - 18:30	Consideration and adoption of the minutes	Conference room
18:30 - 20:30	Farewell Party	

Final and Confidential

SUMMARY RECORD OF THE ASEAN-JAPAN MARITIME TRANSPORT WORKSHOP ON MEASURE 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"

23 – 24 September 2010, Ha Noi, Viet Nam

INTRODUCTION

1. The ASEAN-Japan Maritime Transport Workshop on Measures no 8 was held on 23-24 September 2010 in Ha Noi, Viet Nam. The Workshop was attended by representatives from nine (9) ASEAN Member States, ASEAN Secretariat, and Japanese delegates from the Japan International Cooperation Agency (JICA), the JICA study team. The representatives from the Republic of Korea also participated in the Workshop as observer. The list of participants appears as **ANNEX A.**

2. Brunei Darussalam conveyed her regrets for not being able to attend the Workshop.

OPENING SESSION

3. Mr. Do Duc Tien, Deputy Director General of Viet Nam Maritime Administration delivered his Opening Remarks. In his speech, he welcomed all participants to the ASEAN-Japan Maritime Transport Workshop on Measure no 8 and expressed thanks and high appreciation to JICA for the kind support. He highlighted the importance of port sector in the economic development and development of the infrastructure and facilities of ports in ASEAN. He also looked forward for continued support and cooperation for Viet Nam in accomplishing its role as lead coordinator for measure no. 8.

4. Mr. Sakudo Shunsuke, Planning Division, Southeast Asia Department 2, JICA, in his Opening Remarks, welcomed ASEAN Member States and the ASEAN Secretariat to the Workshop. He reiterated JICA's commitment to support the ASEAN integration as well in the implementation of measure no 8 of the Roadmap towards an Integrated and Competitive Maritime Transport in ASEAN. Further, he wished the Workshop fruitful and productive deliberations.

5. Mr. Le Tuan Anh, Director of International Cooperation Department of Vietnam Maritime Administration served as the Chairperson of the Workshop.

6. The participants considered and adopted the agenda which appears as **ANNEX B.**

SESSION 1: INTRODUCTION OF STUDIES ON MEASURE NO. 6 AND 8

1.1 Study on Measure 8 – Following the outcomes of Measure 6

7. The representative from the JICA study team gave a general introduction to study on measure no 8, including the background, objectives, and conception of the Study as well as the evaluation steps of the long list, short list and priority projects. The participants noted that the long list of projects and the draft short list of projects will be presented at the 20th ASEAN Maritime Transport Working Group Meeting for discussion/consideration. The participants also noted that site surveys of the Study with the view to confirm the priority projects will take place in October-November 2010. The JICA study team will inform the detailed schedule of site survey to all ASEAN Member States in due course. The ASEAN Member States were requested to provide their support in coordinating the site survey activities with the competent agencies. The JICA study team's presentation paper appears as **ANNEX C.**

1.2 Basic Idea of the Long List of Projects in ASEAN 47 Network Ports

8. The participants noted the presentation paper prepared by the JICA study team, which appears as **ANNEX D**, regarding the overview of ASEAN network ports, problems and required measures to solve the problems, and projects expected to be implemented at each port / projects in long list of projects which appears as **ANNEX E**. The participants noted that the long list of the projects in ASEAN 47 network ports consist of 85 projects. The number of projects related to the issues of channel, terminal, transport and management is shown below.

Projects related to:	**Number of Projects**
Channel, among others: channel improvement and approach channel dredging	11
Container Terminal and Non Container terminal, including development of new port	65
Transport, among others: access road improvement / development	6
Port Management, among others: cargo handling productivity enhancement and operational improvement	3
Total	85

1.3 Outline of Initial Evaluation

9. The representative from the JICA study team presented the outline of initial evaluation of projects in the long list, in particular, the basic framework, the flow for initial evaluation including conceptual of evaluation flow which appears as **ANNEX F**. As

for the basic framework, the participants were given a comprehensive explanation on the five (5) items/points that need to be considered in the initial evaluation for project screening, namely: responding to maritime transport demand, effects on regional development, reduction in transportation cost, coping with regional transport corridors and basic requirements.

10. In the deliberation of the important factors of the items on 'Effects on Regional Development', i.e. "Interest of foreign investment in port development", the participants agreed that it should not be limited to foreign investment only. Therefore, the participants agreed to delete the word 'foreign' before the word 'investment'.

SESSION 2: PRESENTATION ON PROJECTS IN ASEAN NETWORK PORTS

11. The participants noted with appreciation the presentation papers submitted by ASEAN Member States, which appear together as **ANNEX G**, on the following:

a. Port Development Plan for Cambodia

- Cambodia introduced the background, ongoing projects, management structure, port facilities, port equipments, and port development plan of the Phnom Penh Autonomous Port (PPAP) and Port Autonomous of Sihanoukville (PAS). It was noted that the new Phnom Penh Container Terminal is expected to be in operation by 2012.

b. ASEAN Network Ports in Indonesia

- Indonesia highlighted the ongoing and proposed development, major obstacles, proposed solution, priority projects and proposed short list projects among the 14 ports in the ASEAN Network Ports. The proposed short list projects, which were considered to be completed by the year of 2015, were in Tanjung Priok port, i.e. channel and basin improvement, inner road development, and development of new access road, and in Belawan port, i.e. expansion of container terminal.

c. Project Priorities to Upgrade Performance and Capacity of ASEAN Network Ports

- Malaysia outlined her long list projects and proposed 5 projects to be taken out from long list, namely: (i) Penang port: north channel deepening project; (ii) Kuching port: Approach channel improvement: (iii) Sandakan port: development of Barge berth near Main Wharf; (iv) Tanjung Pelepas port: development of container terminal phase II and development of new container terminals phase III and IV; and (v) Kemaman port: development of new access road.

d. Port Development, Improvement, Rehabilitation Projects and Other Related Projects in Myanmar

- Myanmar introduced her future development programmes, rehabilitation of Kyaukpyu general cargo jetties, development of Kyaukpyu and Dawei deep seaport projects (Dawei port in not included in ASEAN network ports), and development of Yangon port. The rehabilitation of Kyaukpyu general cargo is expected to be finished in August 2011.

e. The Philippines' Presentation Paper

- The Philippines presented additional information on various port projects included in the long list. In the presentation, it was highlighted that the Philippine Port Authority (PPA) had entered into a 25 year contract with Manila North Harbor Port Inc. for development, management, operation and maintenance of North Harbor, the largest and leading domestic port in the Philippines. The contractor is committed to modernise, redevelop and reconfigure so as to handle larger vessels and enhance the operational efficiency.

f. Singapore's Port Development

- Singapore gave a presentation on Maritime Port Authority (MPA)'s key roles as a port planner and developer, Singapore's past performance, overview of current facilities, future port development projects, application of technology to improve performance, as well as challenges faced by Singapore. With regard to the project on the reclamation work for Pasir Panjang Terminal Phases 3 and 4, the reclamation work is expected to be completed by 2014. Some access roads in the area will also be lengthened and upgraded in anticipation of heavier road traffic from an expanded port.

g. Port Authority of Thailand (PAT) Development Plan for Bangkok and Laem Chabang Ports

- Thailand presented the overview of Songkhla port, Bangkok Port and Laem Chabang Port (LCP) and the development projects, particularly, on the development of rail transfer terminal in LCP and coastal terminal in order to promote logistics transport, and the development of LCP Phase III.

h. Presentation on Saigon and Hai Phong Ports

- Viet Nam briefed the participants on the Hai Phong and Saigon ports, including port development plan, port relocating plan and converting plan of Saigon port. The Phase I of Saigon port relocation project is expected to be

finished by 2014. As to the converting plan, Viet Nam would convert the existing area of Saigon port into the complex of passenger port, maritime and commercial center.

SESSION 3: DISCUSSION OF PROJECTS IN ASEAN NETWORK PORTS

12. The consultation between JICA study team and the participants from each ASEAN Member State were held in conjunction with the Workshop. The main objective of the bilateral consultation is to discuss in detail the projects in ASEAN Network Ports.

13. The participants noted the highlights of the bilateral consultation, as follows:

i. The participants from ASEAN Member States and JICA Study team had constructive discussions on the situation ineach port including "Required measures and projects" to improve performance or expand capacity;

ii. Some ASEAN Member States proposed amendments on their respective projects under the long list of projects. The revised long list of projects appears as **ANNEX H**;

iii. The participants from ASEAN Member States agreed to undertake internal consultation with relevant parties on the "Required measures and projects", the "Revised long list of projects in ASEAN 47 Network Ports", and possible projects for inclusion in the short list. The participants noted that the number of possible projects is limited to 2-3 projects per country;

iv. The participants from ASEAN Member States were requested to provide their comments/inputs on the abovementioned documents, namely; "Required measures and projects", "Revised long list of projects" and "Possible Short List of Projects" to Viet Nam (Mr. Le Tuan Anh – anhlt@vinamarine.gov.vn), and copy to JICA Study Team (Mr. Akira Koyama - koyama@ocdi.or.jp) by **4 October 2010**.

SESSION 4: PROPOSAL OF A METHOD TO DEVELOP PROJECT PRIORITIES

14. The participants welcomed the proposal of a method to develop project priorities, in particular, on the preliminary examination of framework for selection of priority project, preliminary cost estimation of projects listed in the short list, conceptual evaluation flow of selecting the priority projects, description of priority projects, candidate countries for site survey, and collaboration with MTWG and the ASEAN Secretariat. The participants noted that the JICA Study team would conduct site surveys to Indonesia, Myanmar, the Philippines and Viet Nam. The objective of the site survey is to collect detailed information related to priority projects such as the issues to be solved for the implementation of the project and supplemental data. The proposal appears as **ANNEX I.**

SESSION 5: ADOPTION OF SUMMARY RECORD

15. The participants considered and adopted the Summary Record of the ASEAN-Japan Maritime Transport Workshop on Measure 8 held on 23-24 September 2010 in Ha Noi, Viet Nam.

ACKNOWLEDGEMENT

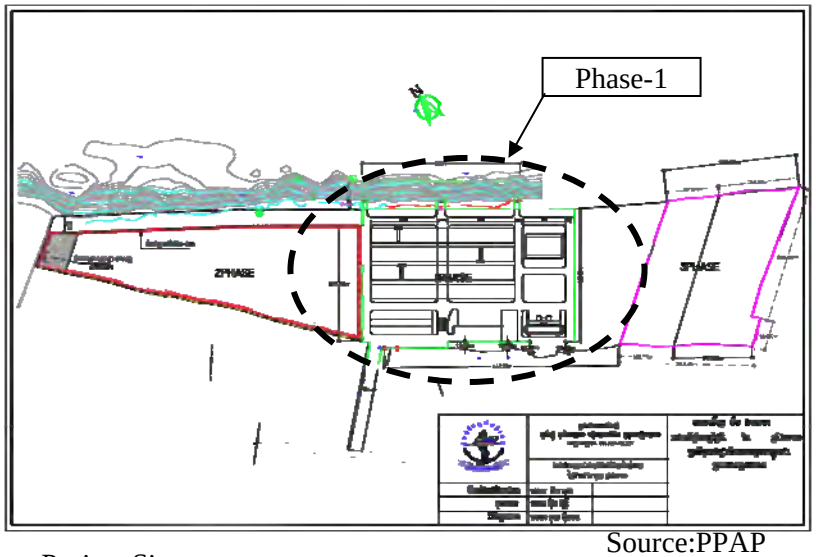
16. All participants expressed their sincere appreciation to the Government and people of Viet Nam, in particular, to Viet Nam Maritime Administration (VINAMARINE) for the warm hospitality accorded to the participants and the excellent arrangements made for the meeting. The ASEAN Member States and the ASEAN Secretariat also expressed gratitude to JICA for the technical assistance rendered.

Project Profile Sheet

① Phnom Penh (Cambodia)

Country	Cambodia					
Port	Phnom Penh Autonomous Port		**Classification**	Type 5		
Characteristics of the Port	A port located a capital of Cambodia 332 km from the mouth of the Mekong River					
Cargo Volume/Capacity (Report on Mesure7)	Capacity	Actual Throughput in 2008	Demand Forecast			
			2010	2015	2020	
Container (1,000 TEUs)	73	47*)	58	125	244	
Break Bulk (1,000 MTs)	98	36	38	56	83	
	*) PAPP					
Project Name	Construction of New Phnom Penh Container Terminal					
Purpose/Background	Development of a dedicated new container terminal at 25 km downstream along the Mekong River from the existing port					
Outline of the Project	Capacity: 300,000TEUs/year (at the stage of Phase II) Accommodated Vessel size: 5000DWT Phase 1 (the capacity of 120,000TEUs/year) Berth: 300m in length, 22m in width, 11.5 m in depth along quayside Yard: approximately 20 ha Phase 2 (the capacity of 300,000TEUs/year) Yard: expansion Phase 3 Logistics facilities next to the terminal					
Estimated Cost	USD 28 million (from PPAP)					
Benefit Items	Reduction of Transportation cost and lead time by taking a route of PP-Cai Mep-USA from that of PP-Cai Mep-USA USD 200 in cost and two(2) days shorter in lead time *According to the study of Mekong River Commission					
Fund Source	Phase I :Chinese Soft Loan Phase II and III: not yet decided					
Executing Agency	Phase I : Phnom Penh Autonomous Port Phase II and Phase III: not decided					
Project Schedule	Phase I Mar 2009 – Sep 2012(30 month)					

Plane Map



Source:PPAP

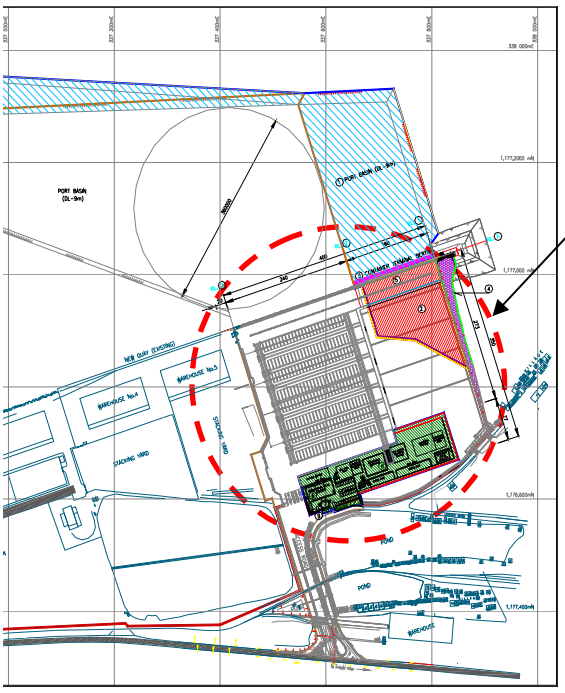
Project Site

Project Profile Sheet

② Sihanoukville (Cambodia)

Country	Cambodia					
Port	Sihanoukville Port		**Classification**	Type 4		
Characteristics of the Port	Only one deep sea port in Cambodia with a function of a gateway of the country					
Cargo Volume/Capacity (Report on Mesure7)	Capacity	Actual Throughput in 2008	Demand Forecast			
			2010	2015	2020	
Container (1,000 Teas)	258*)	259**)	256	344	456	
Break Bulk (100TEUs)	290	287	281	417	614	
	*) The study on Measure6 **) PAS					
Project Name	Enhancement of Container Handling Productivity					
Purpose/Background	To enhance productivity through up grading skill on container terminal management and operation and to expand/install facilities/equipment					
Outline of the Project	Technical assistance by Experts Management Plan Marketing and Promotion Cargo Handling (Ship planning, Yard Planning, Gate operation) Inspection and Maintenance Fields of Expert Container Terminal management/marketing port-promotion Ship planning/Container yard Planning/Gate Operation Maintenance of port facility/equipment Expansion/installation of of facilities/equipment Identified based on the result of technical assistance					
Estimated Cost	-					
Benefit Items	-					
Fund Source	Assistance by foreign countries/international organizations					
Executing Agency	Sihanoukville Autonomous Port					
Project Schedule	Two years for technical assistance					

Plane Map



Source:PAS

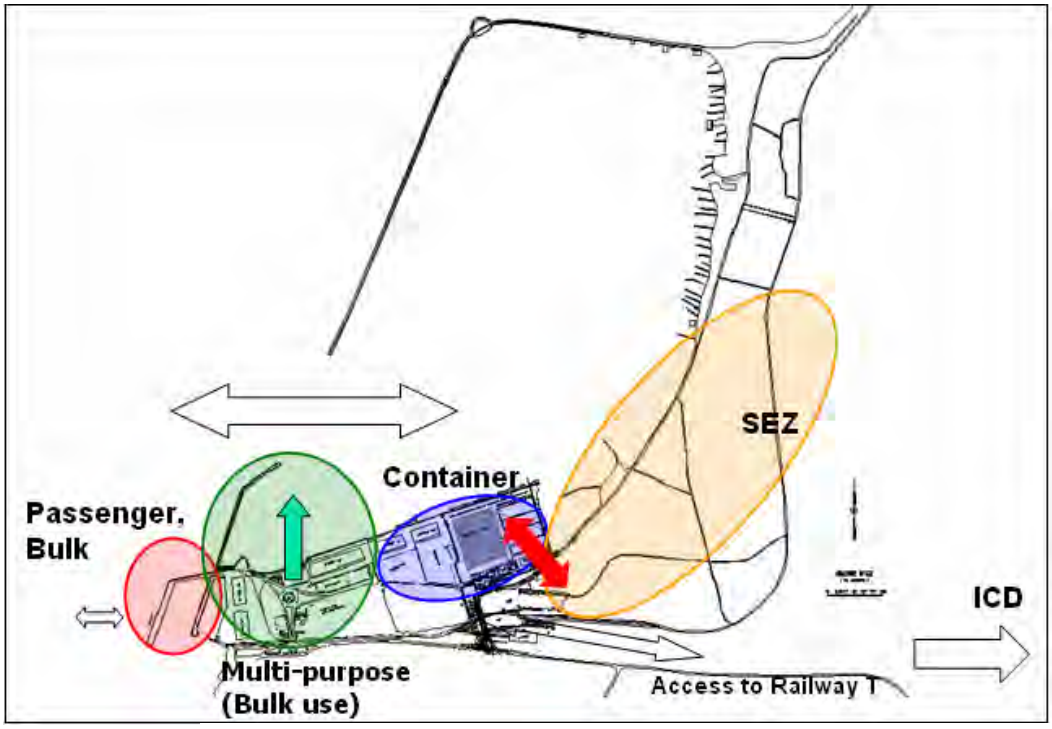
Project Site

Project Profile Sheet

③ Sihanoukville (Cambodia)

Country	Cambodia				
Port	Sihanoukville port		**Classification**	Type 4	
Characteristics of the Port	Only one deep sea port in Cambodia with a function of a gateway of the country				
Passenger (1,000 person) (Report on Mesure7)	Capacity	Actual Throughput in 2008	Demand Forecast		
			2010	2015	2020
	—	12	25	91	143
Project Name	Transfer the Old Jetty to Passenger terminal				
Purpose/Background	Transfer the Old Jetty to a passenger terminal with international standards				
Outline of the Project	Maintenance and transfer of the old jetty to a passenger terminal Construction of terminal building and office building Installation of monitor and control system				
Estimated Cost	USD 1,500,000				
Benefit Items	Promotion of the tourism industry in Cambodia.				
Fund Source	not yet decidedt				
Executing Agency	Sihanoukville Autonomous Port				
Project Schedule	not yet decided				

Plane Map



Source: The Study on the Master Plan for Maritime and Port Sectors in Cambodia

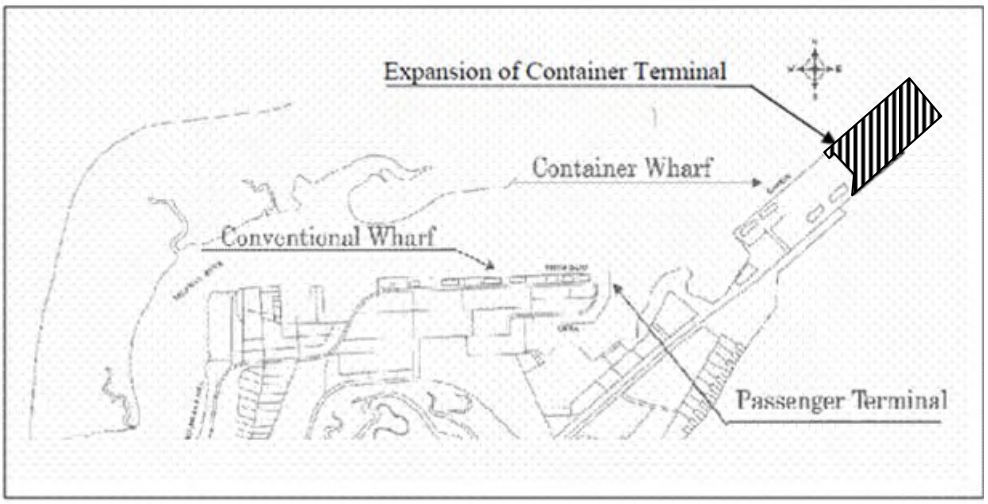
A Candidate Site of a Passenger Terminal in the Master Plan

Project Profile Sheet

④ Belawan (Indonesia)

<table>
<tr><td>Country</td><td colspan="5">Indonesia</td></tr>
<tr><td>Port</td><td colspan="3">Belawan</td><td>Classification</td><td>Type 4</td></tr>
<tr><td>Characteristics of the Port</td><td colspan="5">Major port in North Sumatra, with a large population in its hinterland.
Connected to Port Klang and the Port of Singapore crossing the Malacca Strait by international feeder vessels as well as to the Port of Tanjung Priok.</td></tr>
<tr><td rowspan="2">Cargo Volume/Capacity
(Report on Measure7)</td><td rowspan="2">Capacity</td><td rowspan="2">Actual Throughput in 2008</td><td colspan="3">Demand Forecast</td></tr>
<tr><td>2010</td><td>2015</td><td>2020</td></tr>
<tr><td>Container (1,000 TEUs)</td><td>721*)</td><td>590**)</td><td>609</td><td>1,044</td><td>1,526</td></tr>
<tr><td>Break Bulk (1,000 MTs)</td><td>23,361</td><td>14,973</td><td>14,214</td><td>17,595</td><td>19,706</td></tr>
<tr><td></td><td colspan="5">*) The study on Measure6 **) Perindo I</td></tr>
<tr><td>Project Name</td><td colspan="5">Expansion of Container Terminal</td></tr>
<tr><td>Purpose/Background</td><td colspan="5">To increase the capacity of the container terminal in Belawan Port in order to cope with the increasing container cargoes, thereby contributing to the overall economic growth of the North Sumatra Province.</td></tr>
<tr><td>Outline of the Project</td><td colspan="5"><table><tr><td></td><td>Phase I</td><td>Phase II</td></tr><tr><td>Major Facilities</td><td>Quay Length: 350 m
Depth along Quayside: 12 m
Container Yard: 157,700 m
QGC: 3 units
Transtainer Cranes: 6units</td><td>Quay Length: 350 m
Depth along Quayside: 12 m
Container Yard: 142,000 m
QGC: 3 units
Transtainer Cranes: 6units</td></tr></table></td></tr>
<tr><td>Estimated Cost</td><td colspan="5">Phase I
Total: Rp 1.3 trillion ($139 million)
Civil Works: Rp 0.71 trillion, Equipment: Rp 0.44 trillion
Consultancy Services,etc.: Rp 0.15 trillion
(source: the report by the Islamic Development Bank)
Phase II
Total: Rp 1.06 trillion ($113 million)
Civil Works: Rp 0.46 trillion, Equipment: Rp 0.44 trillion
Consultancy Services, etc.: RP 0.15 trillion
(source: estimated from the report by the Islamic Development Bank)</td></tr>
<tr><td>Benefit Items</td><td colspan="5">Operational Benefits
Ships turn-around time savings
Hinterland benefits</td></tr>
<tr><td>Fund Source</td><td colspan="5">Phase I: Government of Indonesia (37%)
Islamic Development Bank (IDB) (63%) -Loan Agreement 2010
Phase II: Not yet determined</td></tr>
<tr><td>Executing Agency</td><td colspan="5">Phase I: DGST-MOT
Phase II: Not yet determined</td></tr>
<tr><td>Project Schedule</td><td colspan="5">Phase I: 2011 to 2014 (for four years)
Phase II: not yet determined. Construction works will take three years. It shall be completed before the year 2020</td></tr>
</table>

Plane Map



Source: JICA study

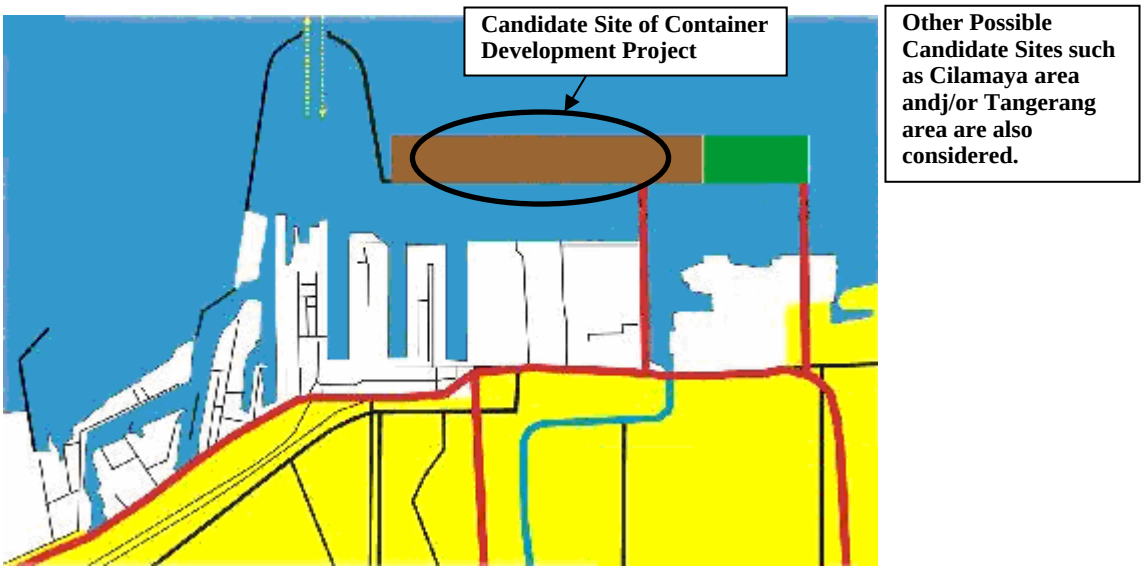
Project Site

Project Profile Sheet

⑤ Tanjung Priok (Indonesia)

Country	Indonesia				
Port	Tanjung Priok		**Classification**	Type 2	
Characteristics of the Port	Base port and located near the industrial and logistics center in Indonesia. Main gateway to/from Indonesia and handling half of the total cargoes in Indonesia.				
Cargo Volume/Capacity (Report on Measure7)	Capacity	Actual Throughput in 2008	Demand Forecast		
			2010	2015	2020
Container (1,000 TEUs)	5,085	3,984*)	3,864	5,861	7,575
Break Bulk (1,000 MTs)	10,977	9,156	8,934	11,868	14,258
	*) PELINDO II				
Project Name	Container Terminal Development Project				
Purpose/Background	To increase the container handling capacity to cope with the increasing container cargoes				
Outline of the Project	Development of container terminals and installation of equipment: Phase I / Phase II Quay Length: 900 m / 900 m Number of Berth: 3 / 3 Container Yard: 54 ha / 54 ha Gantry Cranes: 9 units / 9 units Capacity('000TEUs/year): 1,350 / 1,350				
Estimated Cost	IDR 11 trillion (Estimated from the estimated cost of Bojonagara development project proposed by JICA in 2003; estimated cost is three times the said project because the scale of this project is three times larger. Price escalation and exchange rate are taken into consideration.)				
Benefit Items	Savings in handling cost by discharge afloat for the excess cargo, Savings in ship and cargo staying cost for cargo handling, Savings in sea transportation cost, etc.				
Fund Source	To be determined				
Executing Agency	Directorate General of Sea Transportation, Ministry of Transportation				
Project Schedule	Advisable Schedule: Phase I: year 2011 – 2014 Phase II: year 2014- 2017				

Plane Map



Source: DGST, Ministry of Transportation

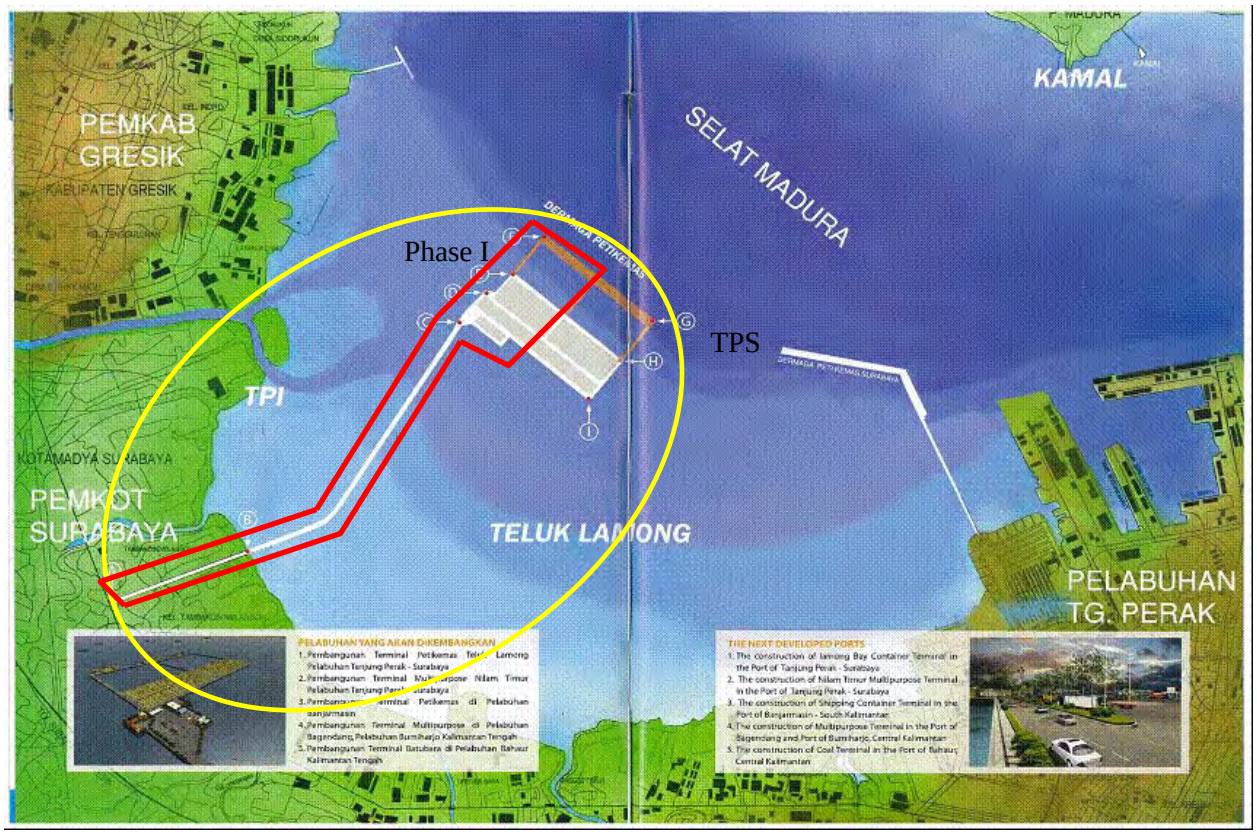
Candidate Site

Project Profile Sheet

⑥ Tanjung Perak (Indonesia)

Country	Indonesia				
Port	Tanjung Perak		**Classification**		Type 3
Characteristics of the Port	Second largest port in Indonesia, key position in East Indonesia. Conventional terminals are being used as stopgap container terminals to make up for the lack of container handling capacity.				
Cargo Volume/Capacity	Capacity	Actual Throughput in 2008	Demand Forecast		
			2010	2015	2020
Container (1,000 TEUs)	2,300～2,700*)	2,213**)	2,242	3,670	5,141
Break Bulk (1,000 MTs)	4,980	4,173	3,993	5,043	5,764
*) JICA study team **) PELINDO Ⅲ					
Project Name	New Multipurpose Terminal Development Project				
Purpose/Background	Development of a new terminal for multipurpose use at Lamong Bay to cope with the increasing container cargoes and improve efficiency of handling containers.				
Outline of the Project		Phase I	Total		
	1. Civil Works				
	Quay	500 m x 50 m	1,280 m x 50 m		
	Trestle	380 m x 12.5 m	same as in the left		
	Reclamation	20 ha	50 ha		
	Bridge	1,412 m	same as in the left		
	Causeway	500 m x 140 m	same as in the left		
	2. Equipment				
	Quayside Gantry Crane	3 units	12 units		
	RTG	15 units	36 units		
	Head Truck & Chassis	35 units	84 units		
Estimated Cost	Phase I : IDR 2.8 trillion Civil Works: IDR 1.8 trillion, Equipment: IDR 1.0 trillion Total: IDR 8.0 trillion Civil Works: IDR 4.4 trillion, Equipment: IDR 3.6 trillion (source: PERINDO III)				
Benefit Items	Operational benefits Ships turn-around time savings Hinterland benefits				
Fund Source	Phase I: PERINDO III Phase II: Not yet determined				
Executing Agency	Phase I: PELINDO III Phase II: Not yet determined				
Project Schedule	Phase I was started on November 6, 2010 and will be completed in 3 years. Phase II shall be started as soon as possible after Phase I and be completed before 2020.				

Plane Map



Source: Tanjung Perak Port Directory 2008

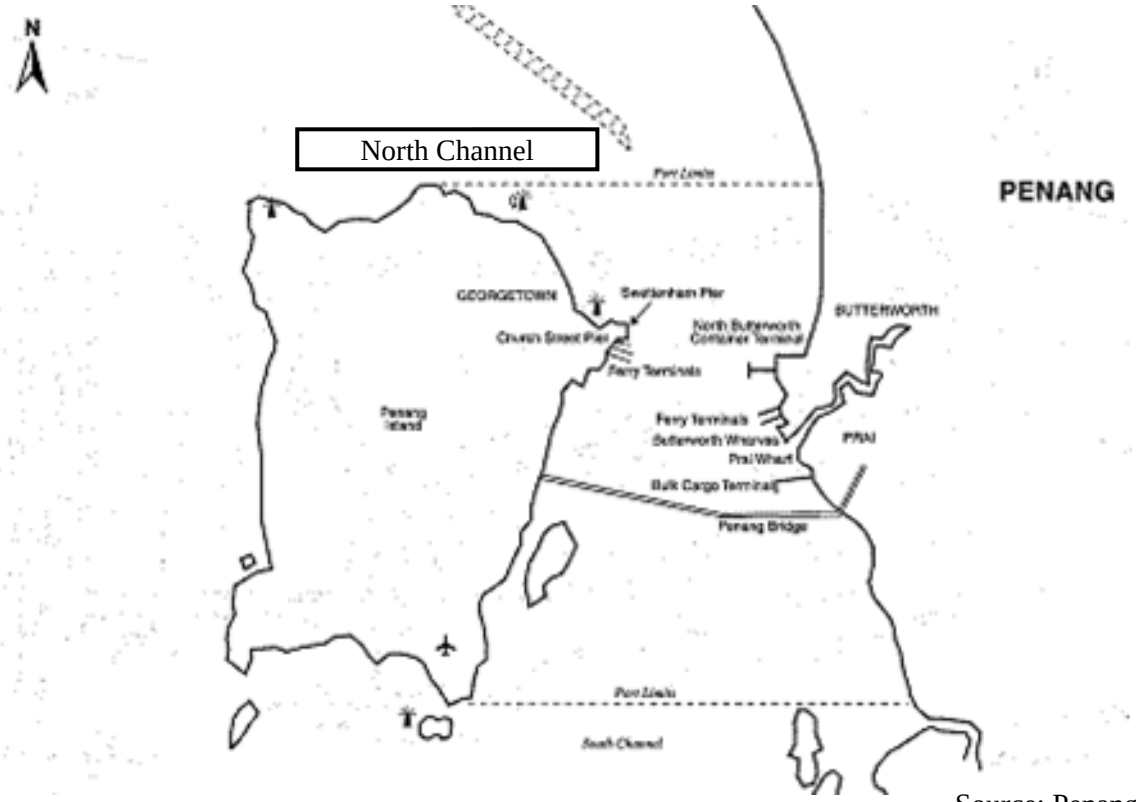
Project Site

Project Profile Sheet

⑦ Penang (Malaysia)

Country	Malaysia					
Port	Penang			**Classification**	Type	
Characteristics of the Port	The port of Penang plays important roles in the economic activities of northern Malaysia and in the international trade with southern Thailand, Myanmar and northern Sumatera.					
Cargo Volume/Capacity (Report on Mesure7)	Capacity	Actual Throughput in 2008	Demand Forecast			
			2010	2015	2020	
Container (1,000 TEUs)	930*)	918	864	996	1,122	
Break Bulk (1,000 MTs)	2,049	1,555	1,262	1,114	928	
Passenger	-	2,306	2,269	2,280	2,442	
	*) The study on Measure6					
Project Name	Capital Dredging of North Channel and Approaches to North Butterworth Container Terminal and Kuala Perai Terminal					
Purpose/Background	Deepening of the North Channel to 14.5 meters in depth for larger vessel accommodation					
Outline of the Project	Depth of Channel: 14.5 m (Present Depth: 11m) Length of Channel: 10 n.m.					
Estimated Cost	RM 351,250,000					
Benefit Items	More efficient use of existing berth Reduction of transportation costs Expansion of its hinterland area etc.					
Fund Source	The Government of Malaysia					
Executing Agency	Penang Port Commission (PPC)					
Project Schedule	2011-2012					

Plane Map



Project Site

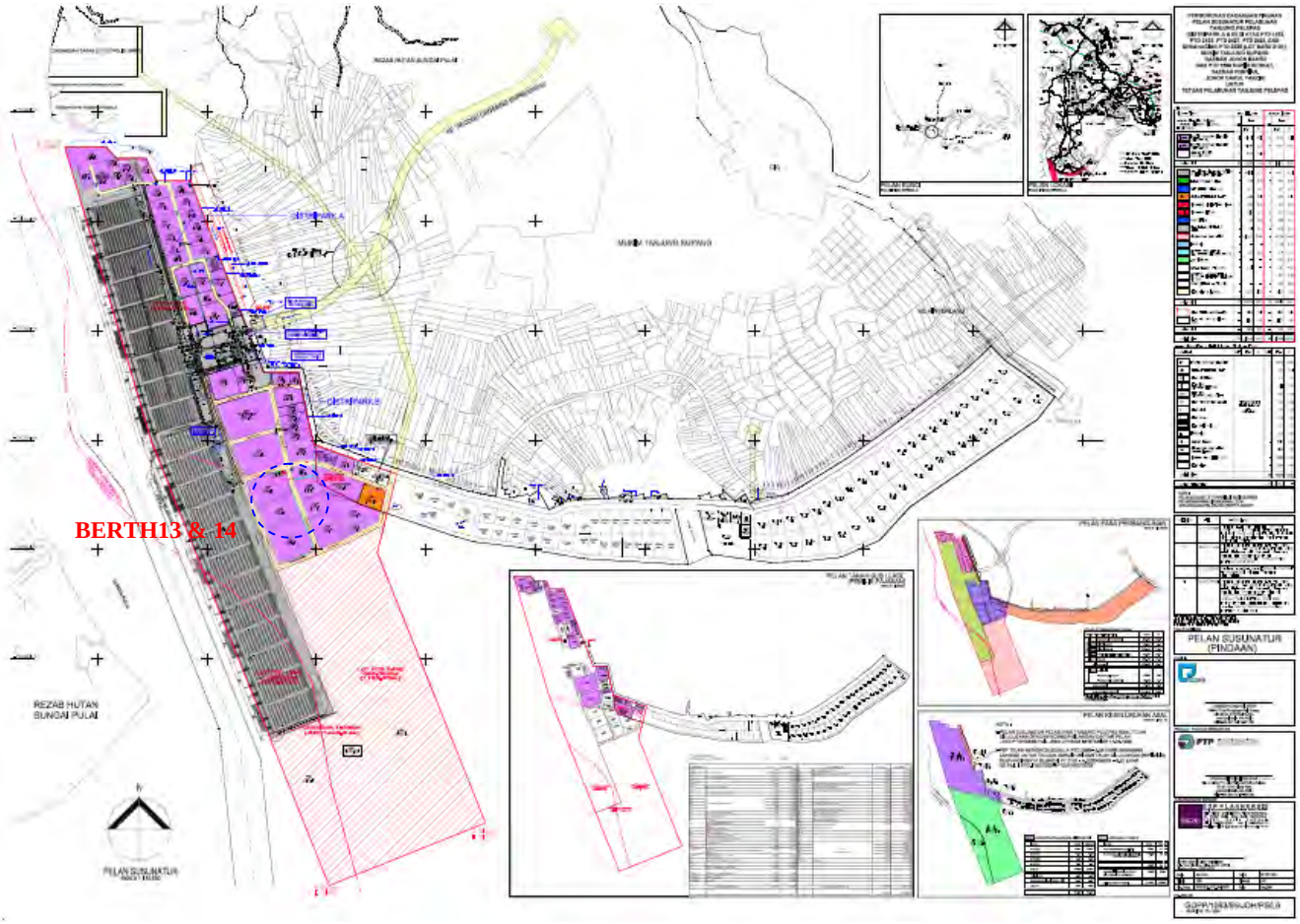
Source: Penang Port

Project Profile Sheet

⑧ Tanjung Pelepas (Malaysia)

Country	Malaysia				
Port	Tanjung Pelepas Port		**Classification**	Type 1	
Characteristics of the Port	An international hub port located 45 minutes from the confluence of the Straits of Malacca.				
Cargo Volume/Capacity (Report on Mesure7)	Capacity	Actual Throughput in 2008	Demand Forecast 2010	2015	2020
Container (1,000 TEUs)	5,850*)	5,600**)	6,143	9,680	14,900
	*) The study on Measure6 **) Tanjung Pelepas Port				
Project Name	Development of Container Terminal Phase II (No. 13 and No. 14)				
Purpose/Background	To expand the container handling capacity by construction of berth 13 and 14				
Outline of the Project	Maximum Vessel Size: 397 m, 156,907 DWT (15,000 TEUs) Cargo Handling Capacity: 1,247,400 TEUs/year Quay: Length: 720 m (Number of Berth: 2 berths) Depth along Quayside: - 19.5 m Quayside Gantry Crane: 8 units (80 tons) Yard: 30 ha				
Estimated Cost	Civil Works: RM 325,500,000		(Quantity)	(RM)	
	Berths 13 & 14		2 berths	180,500,000	
	Container Yard Blocks 19, 20 & 21		3 blocks	145,000,000	
	Equipment: RM 349,322,400		(Quantity)	(RM)	
	Quay Side Crane (Twin Lift)		8	219,000,000	
	Rubber Tires Gantry		26	105,362,400	
	Prime Mover		78	19,500,000	
	Trailer		78	5,460,000	
	(Source: PTP)				
Benefit Items	Vitalizing activities of all ports which have shipping routes to the Tanjung Perlepas Port Promotion of industrial activities in FTZ				
Fund Source	Pelabuhan Tanjung Pelepas				
Executing Agency	Pelabuhan Tanjung Pelepas				
Project Schedule	Reclamation for No. 13 and 14 has already finished. Development of terminals will be completed within 17 months				

Plane Map



Source: PTP

Project Site

Project Profile Sheet

⑨ Kuantan (Malaysia)

Country	Malaysia				
Port	Kuantan		**Classification**	Type	
Characteristics of the Port	A gateway in the Eastern Corridor and a logistics platform for the industrial park				
Cargo Volume/Capacity (Report on Mesure7)	Capacity	Record 2008	Demand Forecast		
			2010	2015	2020
Container (1,000 TEUs)	411*)	127**)	133	199	292
Break Bulk (1,000 MTs)	1,594	1,712	1,389	1,224	1,017
	*) The study on Measure6 **) Kuantan Port				
Project Name	Kuantan Port Expansion				
Purpose/Background	A new container terminal development outside of the existing port				
Outline of the Project	Breakwater: more than 5000 m Basin: 16.5 m Quay: 2000 m in length (1st stage: 1,000 m, 2nd stage: 1,000m) Container Yard: 120 ha (1st stage: 60ha, 2nd stage: 60ha)				
Estimated Cost	not yet estimated				
Benefit Items	Reduction in transportation costs due to increased frequency and economies of scale Vitalization of the activities of industries located along the east coast corridor				
Fund Source	not yet decided				
Executing Agency	The project shall be led by the private sector				
Project Schedule	not yet decided				

Plane Map

Source: PELABUHANKUANTANMALAYSIA

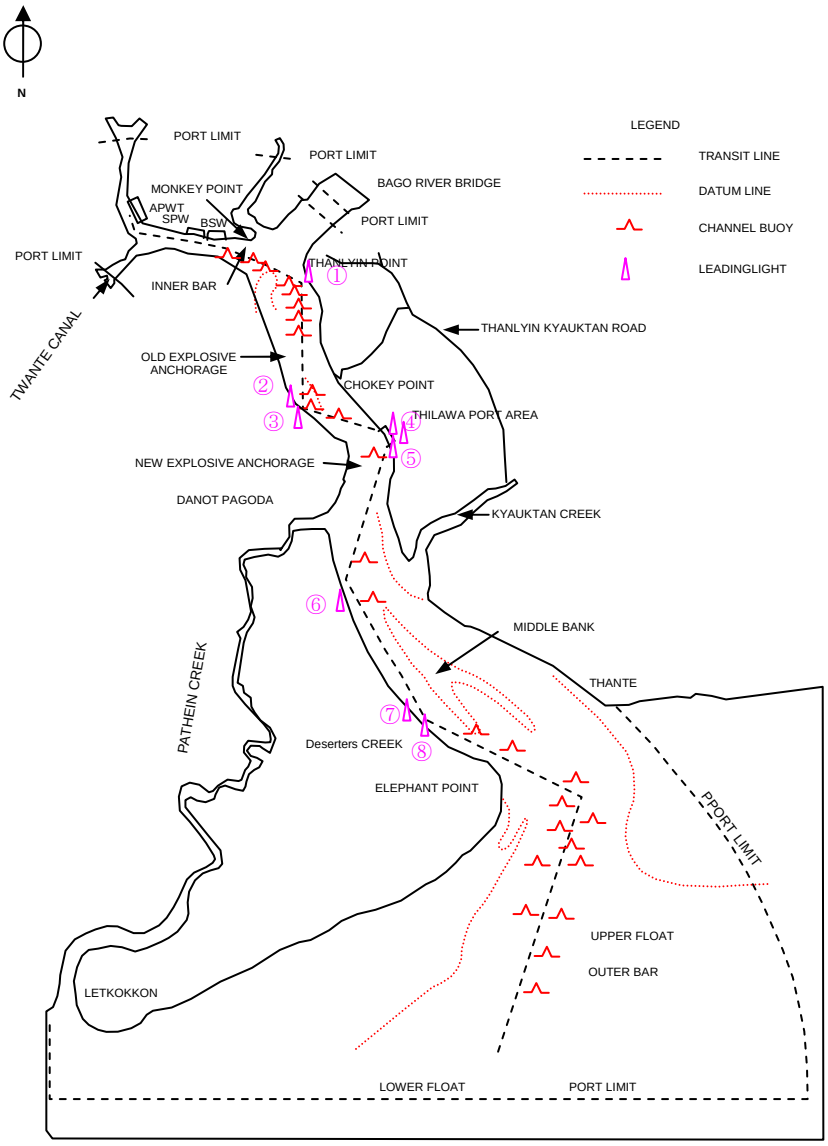
Kuantan Port Layout

Project Profile Sheet

⑩ Yangon/Thilawa (Myanmar)

Country		Myanmar				
Port		Yangon/Thilawa Port		**Classification**		Type 4
Characteristics of the Port		The port of Yangon and the port of Thilawa are located 32km and 16 km from the mouth of the Yangon River respectively. The ports are managed as one gateway port of Myanmar.				
Cargo Volume/Capacity (Report on Mesure7)		Capacity	Actual Throughput in 2008	Demand Forecast		
				2010	2015	2020
Yangon	Container (1,000 Teas)	301	226	217	254	277
	Break Bulk (1,000 MTs)	1,752	1,266	1,295	1,569	1,489
Thilawa	Container (1,000 Teas)	122	38	51	97	157
	Break Bulk (1,000 MTs)	967	425	538	695	841
Project Name		Yangon/Thilawa Port Approach Channel Improvement				
Purpose/Background		Channel improvement including sustainable channel maintenance, securing safe navigation and deepening channel for 35,000DWT vessels				
Outline of the Project		Phase I(1) Restoration of Leading lights, Installation of facility corresponding to AIS Phase I(2) Renewal of dredgers and a hydrographic survey vessel Phase II Deepening of the channel				
Estimated Cost		Phase I USD 39 million (estimated referring to the cost of similar projects). Phase II (to be estimated based on the result of further study)				
Benefit Items		Reduction of transportation cost by calling of larger size vessels Regular service of larger vessels Reduction of demurrage loss Reduction of Holding Cost owing to reduction of waiting time for high tide Improvement of navigation from the viewpoint of safety etc.				
Fund Source		Not yet decided				
Executing Agency		Myanmar Port Authority				
Project Schedule		Phase I(1) two years including a term for design Phase I(2) three years including a term for design Phase II three years after completion of FS				

Plane Map



Source: Prepared by JICA Study Team based of the information from MPA

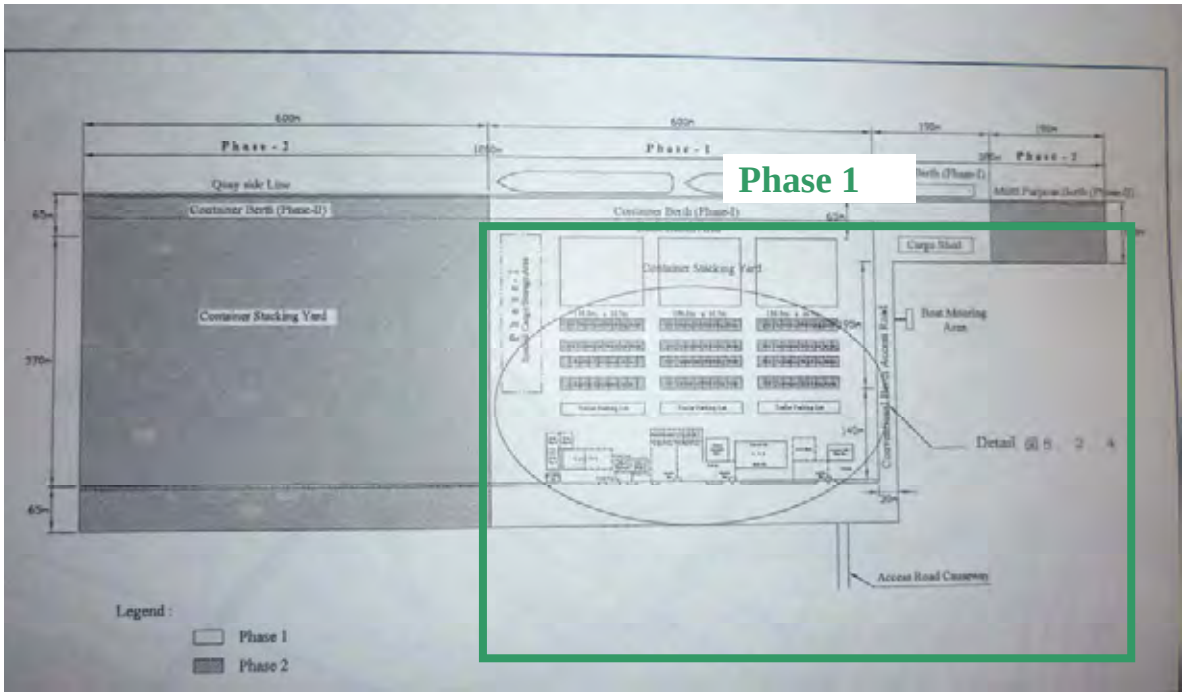
Outline of the Channel

Project Profile Sheet

⑪ Cebu (Philippines)

Country	Philippines				
Port	Cebu		**Classification**	Type 4	
Characteristics of the Port	Second largest port in the Philippines and intra regional hub port in Visayas. Located in the center of Cebu City, cargo traffic by truck and trailer causes chronic traffic jams. Cebu City has imposed a truck ban from7:00 to 9:00 since January 2010, and is considering its further extention.				
Cargo Volume/Capacity (Report on Measure7)	Capacity	Actual Throughput in 2008	Demand Forecast		
			2010	2015	2020
Container (1,000 TEUs)	630*)	496**)	503	622	734
Break Bulk (1,000 MTs)	26,408	21,391	21,172	24,761	27,578
	*) The study on Measure6 **) CPA				
Project Name	Development of New Cebu Port				
Purpose/Background	To increase cargo handling capacity to cope with the increasing cargoes and to improve operational efficiency.				
Outline of the Project	[Container terminal] Quay Length: 600 m, Depth along Quayside: - 13 m Container Yard: 13.8 ha Quay-side Gantry Crane: 5 units, Transfer Crane: 14 units [Multipurpose Terminal] Quay Length: 190 m, Depth along Quayside: - 10 m, Yard: 2 ha [Access Road & Causeway] Access Road: 1,500 m, Causeway: 300 m				
Estimated Cost	PHP 12.3 billion (PHP 9.3 billion was updated.) (source: Project site is not yet determined. However, PHP 9.3 billion is based on the JICA Study 2002. Price escalation and exchange rate are taken into consideration)				
Benefit Items	Savings in sea/land transportation cost and additional cargo handling cost by being forced to utilize other ports. Savings in sea transportation cost with being deployed larger vessels.				
Fund Source	Not yet determined				
Executing Agency	Cebu Port Authority				
Project Schedule	Not yet determined To handle the increasing container traffic, this project shall be completed between 2015 and 2020. Preparation for Implementation: Three to four years Construction and Procurement: Two to three years				

Plane Map



Source: The Study on the Cebu Integrated Port Development Plan in the Republic of the Philippines

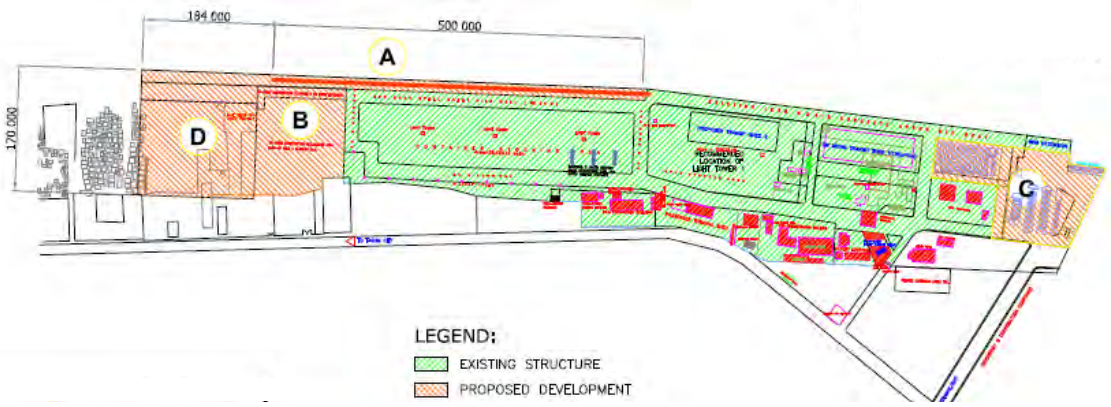
Layout Plan

Project Profile Sheet

⑫ Davao (Philippines)

Country	Philippines				
Port	Davao		**Classification**	Type 4	
Characteristics of the Port	Regional hub port in Mindanao, handling approx. 350,000 TEUs of container cargoes per year. Lack of quay-side gantry cranes causes low productivity in container handling and congestion at Sasa Wharf.				
Cargo Volume/Capacity	Capacity	Actual Throughput in 2008	Demand Forecast		
			2010	2015	2020
Container (1,000 TEUs)	420*)	349**)	355	444	524
Break Bulk (1,000 MTs)	358	73	114	134	149
	*) JICA study team **) PPA				
Project Name	Davao Container Terminal Construction Project				
Purpose/Background	Expansion and improvement of container terminals by installing quayside gantry cranes including its structural support to cope with the increasing container cargoes. Separation and development of a passenger terminal from the cargo terminal for safety.				
Outline of the Project	I. Infrastructure Reinforced Quay Length: 500 m Expansion of Container Terminal: 184 m Depth along Quayside : 13 m (15 m) below MLLW II. Container Handling Equipment Quay-side Gantry Crane: 3 units				
Estimated Cost	Total: PHP 5,810 million Civil Works: PHP 4,950 million Equipment: PHP 860 million				
Benefit Items	Savings in sea/land transportation cost by being forced to utilize other ports. Savings in sea transportation cost with being deployed larger vessels.				
Fund Source	Not yet determined				
Executing Agency	PPA (Philippine Port Authority)				
Project Schedule	Not yet determined To handle the increasing container cargo, this project shall be completed in 2014. (Recommended rough schedule) 2011-2012: Preparation, Financing 2012-2014: Implementation of the Project 2015: Completion (Capacity: 658,000 TEUs)				

Plane Map



Source: PPA

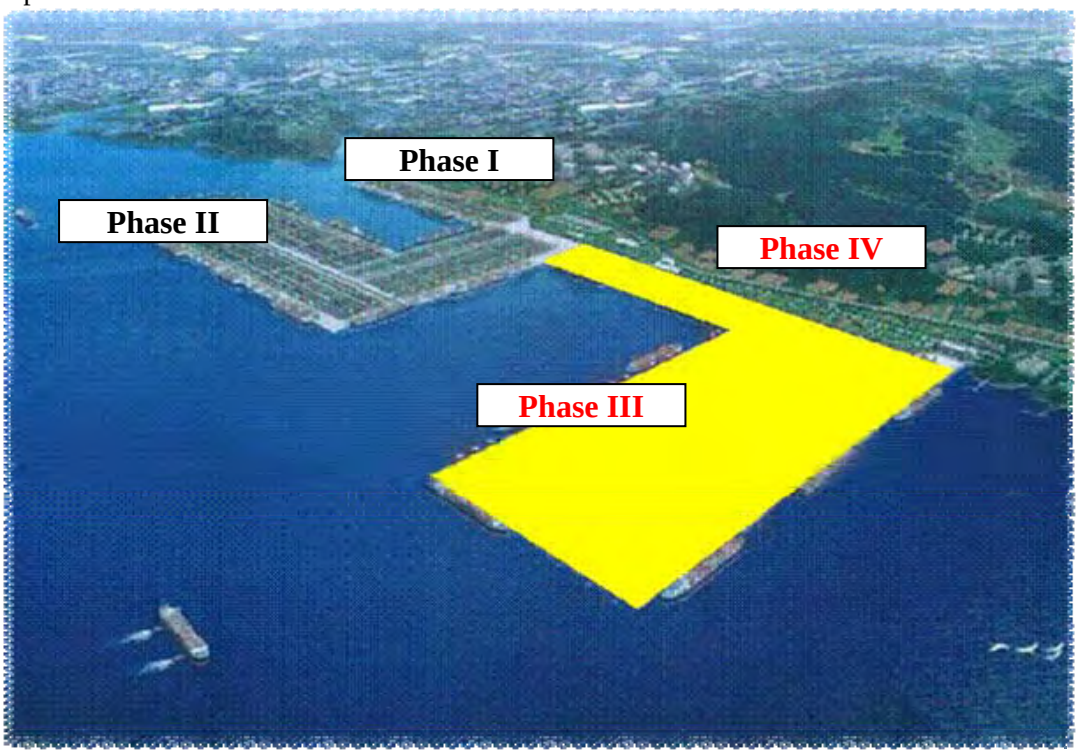
Outline of the Project

Project Profile Sheet

⑬ Singapore (Singapore)

Country	Singapore				
Port	Singapore Port		**Classification**	Type 1	
Characteristics of the Port	The world number one container port which plays a key role in container transshipment				
Cargo Volume/Capacity (Report on Mesure7)	Capacity	Record 2008	Demand Forecast		
			2010	2015	2020
Container (1,000 TEUs)	34,291*)	29,918	29,697	37,512	45,299
Break Bulk (1,000 MTs)	37,581	27,935	28,341	37,724	47,870
	*) The study on Measure6				
Project Name	Development of Pasir Panjang Terminal Phase III and IV				
Purpose/Background	To expand the container port capacity.				
Outline of the Project	Capacity: 14,000,000 TEUs Total number of Berths: 16				
Estimated Cost	-				
Benefit Items	Vitalizing activities of all ports which have shipping routes to the port of Singapore Promotion of industrial activities in Free Trade Zone				
Fund Source	Land d reclamation: Government Development and equipment of the port: Terminal operator .				
Executing Agency	Government (for land reclamation)				
Project Schedule	2007-2014(for land reclamation)				

Plane Map



Source: PSA

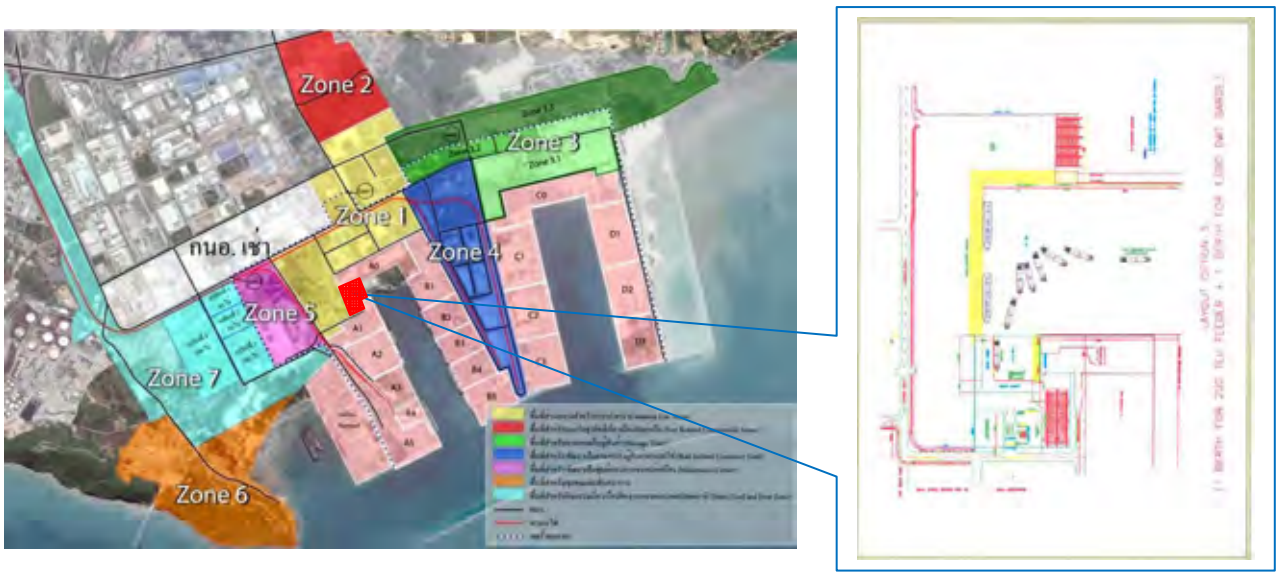
Project Site

Project Profile Sheet

⑭ Laem Chabang (Thailand)

Country	Thailand				
Port	Laem Chabang Port		**Classification**	Type 2	
Characteristics of the Port	A deep sea and a main gateway port of Thailand located 130 km from Bangkok				
Cargo Volume/Capacity (Report on Mesure7)	Capacity	Record 2008	Demand Forecast 2010	2015	2020
Container (1,000 TEUs)	6,890	5240*)	5,282	7,505	10,382
Break Bulk (1,000 MTs)	4,052	2,731	2,668	3,399	4,246
					*) PAT
Project Name	Coastal Terminal				
Purpose/Background	To develop a coastal terminal for serving containers transported from/to LCP by coastal ship				
Outline of the Project	Design vessel: 3000DWT Capacity 300,000 TEUs/year Quay; 150 meters in length, 10m (MSL) in depth Backup area; 17.2 acres Equipment				
Estimated Cost	Approximately 35 million USD (1,802 million Bath) for Infrastructure and major equipment (from LCP)				
Benefit Items	Reduction of logistics cost Reduction of traffic congestion Reduction of the environmental impact by land transportation				
Fund Source	Laem Chabang Port, Port Authority of Thailand				
Executing Agency	Port Authority of Thailand				
Project Schedule	Completion of Engineering detail design: Early 2011 Construction and installation: 18 months Completion of the project: Early 2013				

Plane Map



Source: PAT

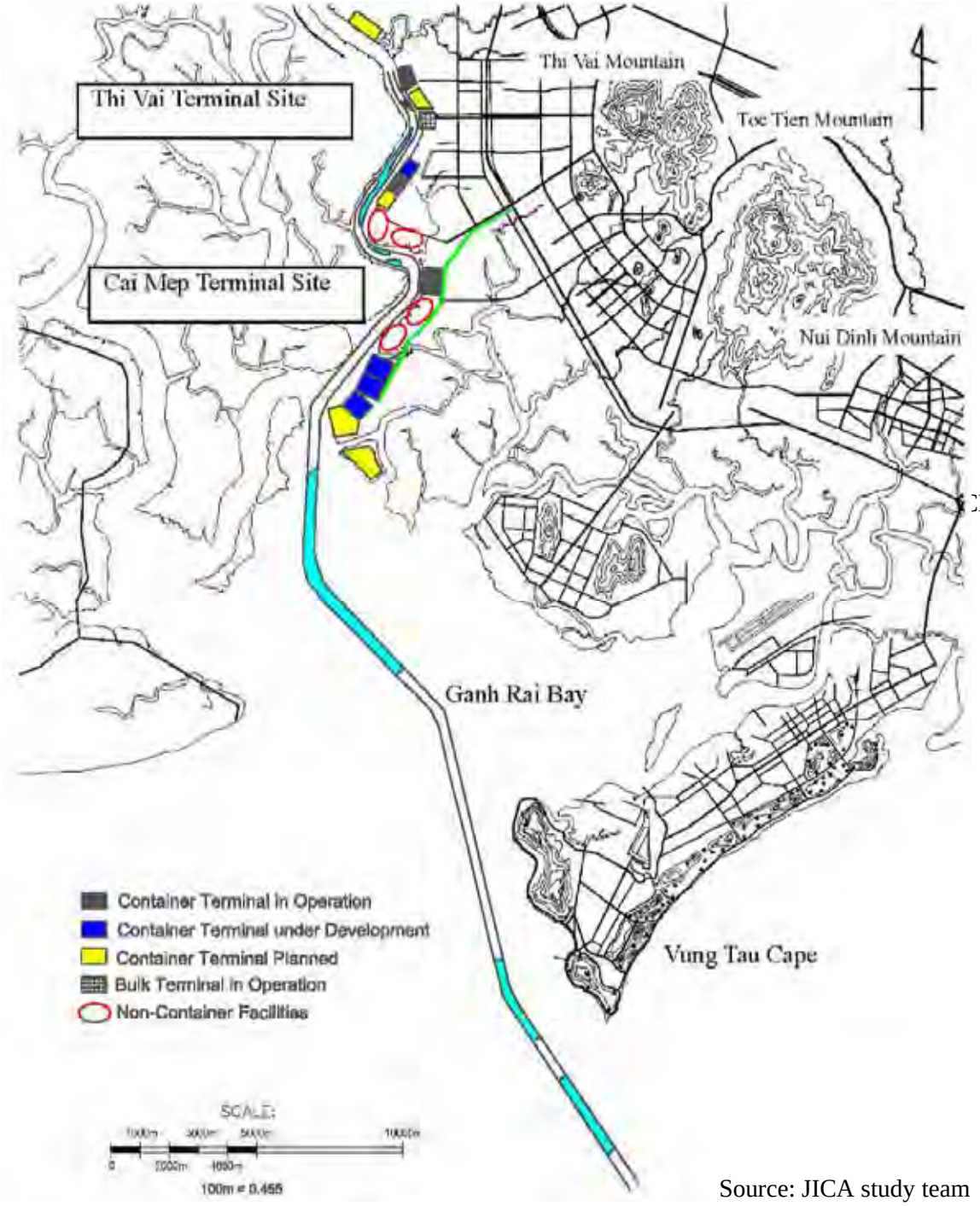
Project Site

Project Profile Sheet

⑮ Ho Chi Minh (Vietnam)

Country	Vietnam				
Port	Ho Chi Minh		**Classification**	Type 2	
Characteristics of the Port	A large scale hub port in the Greater Mekong Subregion				
Cargo Throughput	Capacity	Actual Throughput in 2008	Demand Forecast		
			2010	2015	2020
Container(1,000 TEUs)	3,400*)	3,426*)	3,346	5,141	7,001
	*) Vietnam Seaport Association and Saigon Port				
Project Name	Improvement of the Approach Channel and Vessel Control and Development of Cai Mep Thi Vai Terminals				
Purpose/Background	1) To accommodate larger container vessels up to 100,000 DWT (without tidal restriction) and over 100,000 DWT (with tidal restriction) 2) To control ship navigation in Vung Tau water areas and ensure smooth ship operation to Cai Mep, Thi Vai and HCM areas. 3) To increase cargo handling capacity of Cai Mep Thi Vai terminals for serving the south region of Vietnam				
Outline of the Project	1) Approach Channel Dredging (-16m, 9 million m3) 2) Introduction of Navigation Control System 3) Development of 11 commercial terminals in Cai Mep Thi Vai area by mainly private operators				
Estimated Cost	1) Approach Channel Dredging: USD 90 million 2) Navigation Control System: n.a. 3) Development of 11 commercial terminals: USD 2,700 million (Mainly by Private Operators)				
Benefit Items	Savings in ships' waiting cost for the right tide for navigation Savings in sea transportation by deploying larger vessels				
Fund Source	Not yet determined				
Executing Agency	VINAMARINE and Project Management Unit, MOT				
Project Schedule	Firstly, master plan for the group 5 ports will be finalized by 2011 and then detailed study on navigation channel and traffic control will be carried out in due course. The project will be commenced after the detailed study on further development of Cai Mep, Thi Vai and Vung Tau terminals				

Plane Map



Source: JICA study team

Terminals in Cai Mep Thi Vai Port and Approach Channel

Project Profile Sheet

⑯ Hai Phong (Vietnam)

Country	Vietnam				
Port	Hai Phong		**Classification**		Type 3
Characteristics of the Port	Gateway port for the north region of Vietnam and the south area of Yunnan and Guangxi Zhuang of China				
Cargo Throughput (Report on Measure7)	Capacity	Actual Throughput in 2008	Demand Forecast		
			2010	2015	2020
Container(1,000 TEUs)	2,500	1,399	1,442	2,552	4,002
Project Name	Development of Hai Phong International Gateway Port (Lach Huyen Area)				
Purpose/Background	1) To increase cargo handling capacity of Hai Phong Port for serving the north region of Vietnam 2) To accommodate larger container vessels up to 50,000 DWT (without tidal restriction) and over 80,000 DWT (with tidal restriction) 3) To encourage relocation of container port functions to Lach Huyen area. 4) To develop an access road and railway from Lach Huyen to the hinterland				
Outline of the Project	1) Approach Channel Dredging 2) Reclamation of Land and Consolidation of the Ground 3) Revetment Breakwater 4) Training Dikes 5) Installation of Navigational Aids 6) Container Terminals 7) Multi-Purpose Terminals Details of project outline is implemented by another study				
Estimated Cost	Cost estimation is implemented by another study				
Benefit Items	Savings in sea transportation cost by deploying larger vessels Savings in sea transportation cost for transshipment Promotion of regional economic development and business activities				
Fund Source	Not yet determined				
Executing Agency	VINAMARINE and Project Management Unit, MOT				
Project Schedule	Project schedule is examined by another study				

Project Profile Sheet

⑰ Port EDI (Indonesia, Vietnam)

Country	Vietnam, Indonesia		
Port	Network Ports (Major four ports in the case of Indonesia,)	**Classification**	Indonesia, Vietnam
Project Name	Operational Improvement Project by Introducing/Upgrading a Port EDI System		
Purpose/Background	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.		
Outline of the Project	Preparation Stage Definition of Requirements & System Design System Development Procurement of Hardware Installation and Calibration, etc. Operation Stage Operational Support Maintenance, etc.		
Estimated Cost	Preparation stage: 0.5 – 1.0 billion yen/system/country (largely depending on the system design) Operation stage: 70 -100 million yen/year/country (largely depending on the service levels) (source: based on Japan's experience in introducing a port EDI system)		
Benefit Items	Improvement of operational efficiency Cost reduction of applicants as a direct effect		
Fund Source	Not yet determined		
Executing Agency	Central Government and/or Port Authority		
Project Schedule	Not yet determined It is estimated to be taken three years.		