

Summary

1. Socio-economic and Port Development Situation in the Philippines and Cebu Province

1.1 Socio-economic Situation

(1) Present Socio-economic Characteristics of the Country

1) Population

Population of the Philippines has steadily increased. Population of the Philippines in 2000 is 76,498,735 and the average growth rate of population for the period of 1995-2000 was 2.20 %.

2) GDP

In 2000, GDP of the Philippines amounted to about 954,962 million pesos at constant prices of the year 1985. Average growth rates of the Philippine GDP at constant 1985 prices are 3.50 % (1985-2000) and 2.24 % (1998-2000).

(2) Present Socio-economic Situation in Region

1) Population

The population of Region 7 is 5,701,064 which is the fifth largest Region accounting for 7.5 % of the Philippine population. Population in Region 7 has steadily increased in the period of 1995 - 2000. Its growth rates in the period of 1990-1995 and 1995-2000 are 1.65 % and 2.60 % respectively while those for the whole Philippines are 2.32 % and 2.20 %.

2) GDP

GDP of Region 7 in 1999 at constant 1985 prices represents 6.9 % of the whole Philippines. Average growth rates of Region 7 GDP are 4.2 % (1985-1999).

(3) National Development Plans

1) The Philippine National Development Plan: Directions for the 21st Century (Plan 21)

The National Economic and Development Authority (NEDA) started to coordinate the preparation of the above captioned guide on August 21, 1997 and eventually published in 1998. It is organized in three parts.

Part I: Sources of long-run economic growth and equitable development; sustainable human development, science and technology, protection of the environment and management of natural resource

Part II: Modernization strategies; regional or spatial development, agro-industrial modernization, infrastructure investment

Part III: Foundations or preconditions for long-run growth; macroeconomic policies and development financing

2) Medium-Term Philippine Development Plan 1999-2004

The Medium-Term Philippine Development, 1999-2004, has six sectoral chapters pertaining to the six priority areas: (1) delivering basic social development services; (2) accelerating rural development; (3) accelerating infrastructure development; (4) enhancing global competitiveness; (5) ensuring macroeconomic stability; and (6) reforming governance.

(4) Regional Development Plans

1) Central Visayas Medium-Term Development Plan, 1999-2004

The Regional Development Plans (RDPs) are the accompanying documents of Plan 21. The RDPs spell out the long-term development vision of the specific regions and provide details of regional strategies for the period of 1999-2004 to guide the local government units in the formulation of their Local Development Plans or LDPs.

2) Regional Physical Framework Plan

The revised Regional Physical Framework Plan (RPFPP) 1993-2022 is the latest contribution. The RPFPP provides a ready reference for our sub regional planners in the preparation of their Physical Framework and Comprehensive Land Use Plans (CLUPs). The preparation of the RPFPP is considered crucial as this provides input to the formulation of the National Framework Plan and also serves as the framework for lower level land use and physical plans.

1.2 Port Development Situation

1.2.1 Outline of Institutional Frameworks

(1) Outline of Philippine Port System

Cebu Port Authority was created through R.A. 7621 in 1992 to administer all ports located in Cebu province, effectively separating them from the PPA system. CPA began operations and took over all Cebu ports on 01 January 1996, 5 years ago. Cebu port authority and Philippine Port Authority are under the supervision of the Department of Transportation & Communications.

1) PPA Port System

There are 122 ports at present in PPA port system designated by the Management-Executive Committee of the PPA.

2) CPA Port System

There are 113 ports at present in Cebu province under control of CPA. These ports are classified into 2 main groupings, which are Government ports and Private ports.

(2) Functions and Organization of the DOTC

The Department of Transportation and Communications has responsibility for maintenance and expansion of viable, efficient and dependable transportation and communications systems as effective instruments for national recovery and economic progress.

Main functions of Water Transportation Planning & Project Development Division which is in charge of port related activities are ① Coordinates with Marine Industry Authority and the Ports Authority. ② Identifies and / or rationalizes water transportation needs and facilities. ③ Maintains liaison with other government and private offices / organizations related to water transportation.

(3) Functions and Organization of the PPA

Philippine Ports Authority was created in July 1974 under Presidential Decree (PD) N0.505, subsequently amended by P.D.857 (Charter) on December 23, 1975:

The general objective of the Authority is to implement the State policy for the planning, development, financing, operation and maintenance of ports or port districts for the entire country. According to the Charter (P.D.857), the PPA has the following functions. ① To formulate port development plan, to administer its implementation, renew. ② To supervise, control, regulate, construct, maintain, operate and provide facilities. ③ To prescribe rules and regulations, procedures, etc.

The policy formation level is the PPA Board of Directors consisting of nine members. As of December 1999, the total number of PPA employees is 2183.

(4) National Privatization Policy

To make good use of private sector skills, the government of the Philippines introduced the Republic Act (RA) No, 6957 in 1990. In 1994, the government introduced RA 7718 (an amendment to RA 6958) entitled " An act authorizing the financing constructor operation and maintenance of infrastructure projects by the private sector, and for other purposes". RA 7718 allows ①BOT ②BT ③BOO ④BLT ⑤BTO ⑥CAO ⑦DOT ⑧ROT ⑨ROO .

(5) Privatization Policy in the Port Sector

The BOT Law and the joint venture schemes will be explored to expedite the provision of port infrastructure and services. Primary emphasis will be accorded to private sector participation and will be vigorously promoted in the effort to minimize future direct involvement of the government in port infrastructure projects. BOT and JV projects, involving little or no cost on the part of CPA, will be the focus of this plan.

(6) Incentives of Private Investor

Project proponents under the BOT Law may avail of fiscal incentives and government undertakings. ① Income tax holiday for 4 to 6 years from commercial operation. ② Tax and duty exemption on imported capital equipment. ③ Exemption from contractor's tax. ④ Exemption from taxes and duties on imported spare parts

1.2.2 Port Development Policies

(1) Medium-Term Philippine Development Plan (1994 - 2004) (MTPDP)

MTPDP stated the basic national development policies and strategies for transportation sector. The policies and strategies for water transportation were described as follows;

- a) Transfer regulatory functions to an independent regulator (or regulators), which shall have jurisdiction over all ports.
- b) Encourage maximum private sector participation and investment in the sector.
- c) Formulate effective policies and implementation of projects to enhance safety practices and strengthen enforcement.

(2) Central Visayas Medium - Term Development Plan (1999 - 2004) (CVMTDP)

CVMTDP stated situation and strategies for port sector as follows;

In general, the physical condition of the ports in the region needs improvement. These are poorly maintained and short of facilities such as passenger terminals and warehouses. Berthing facilities are inadequate. Cargo handling equipment is far from satisfactory. Even the Port of Cebu needs further improvement to accommodate more and larger vessels. Ro-Ro ports will be established in Regional Development Council (RDC) prioritized sites while existing Ro-Ro ports will be rehabilitated and provided with appropriate facilities. CVMTDP also stated that the involvement of local government units in municipal port development should be enhanced and private sector participation in port development should be promoted.

(3) The Study on the Cebu Integrated Area Development Master Plan

This study was conducted from 1993 to 1994 by the JICA study team. Concerning port and sea transport, this report put the first priority on the development of Cebu Baseport. It is emphasized that improvement of the existing port facilities must be undertaken smoothly and a new international port needs to be developed at an alternative place by 2010, because the present location of Cebu Baseport has no sufficient space for its expansion. The New Cebu Port shall be an international deep-sea port with the international standard of containerization. This report also stated five candidate sites were conceivable, namely,

- Consolacion;
- Mactan North reclamation area;
- Mactan South reclamation area;
- The Planned Cebu South Reclamation Area, and
- Minglanilla Reclamation area.

1.2.3 Environmental Consideration Policy in the Philippines

(I) Environmental Legislations in the Philippines

The 1987 Philippine Constitution lays down the basic framework for policy on the environment. Section 16, Article II states that “ *The State shall protect and advance the rhythm and harmony of nature.*” Section 15 of the same Article also mandates the State “ *to protect and promote the people’s right to health.*”

The basic environmental ordinance consists mainly of two Presidential Decrees (P.D.).

- The P.D. No. 1151 (Established and enacted on June 1977) known as the "Philippine Environmental Policy"
- P.D. No. 1152 (Established and enacted on July 1977) known as the "Philippine Environmental Code".

The latest DENR Administrative Order (DAO) No.37, series of 1996 or DAO 96 - 37, which expressly supersedes DAO 21, series of 1992. DAO 96 - 37 is an attempt to further streamline the EIA system and to strengthen the processes for its implementation.

Table 1.2.1 Philippines EIA System Legal and Regulation Framework

Law / Regulation	Year	Feature
Presidential Decree (P.D) 1151	1977	Philippine Environmental Policy: requires sponsors of all government and private projects affecting the quality of the environment to prepare an environmental impact assessment (EIA)
P.D 1586	1978	Establishing an Environmental Impact Statement (EIA) System: centralized the EIA System under the National Environmental Protection Council(NEPC), & authorizes the President and NEPC to proclaim projects and activities subject to the EIS system
Proclamation 2146	1981	Proclaims certain area and types of projects as environmentally critical and within the scope of the EIS system
DENR Administrative Order 96 - 37	1996	Revising DAO 21, Series of 1992, to further strengthen the implementation of the EIA System

(2) The Philippine Environmental Impact Statement (EIS) System

The procedure of Environmental Impact Assessment in the Philippines is shown in Fig. 1.2.1.

Participatory of resident living around the project site from the beginning of the development planning is added to the former EIA procedure.

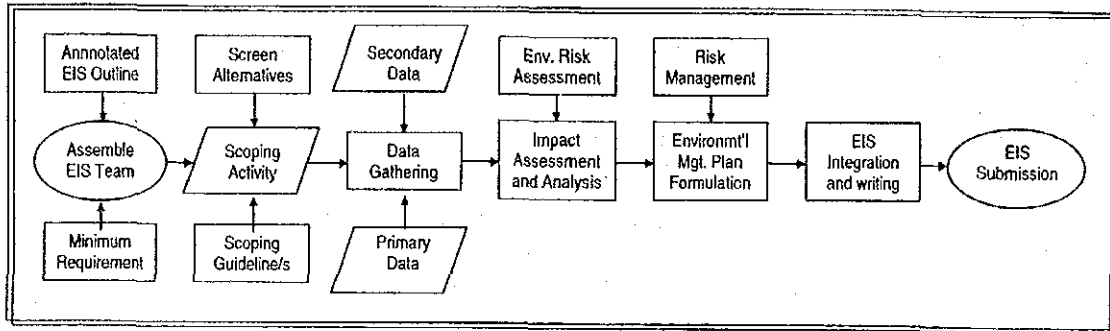


Fig. 1.2.1 Procedure of EIA System in the Philippines

(3) Type of Document Required and Principal Reviewing Agency

The EIS System covers the following projects and undertaking:

- 1) Environmentally Critical Projects (ECPs)
- 2) Projects Located in Environmentally Critical Areas

Environmental Critical Projects (ECPs) is defined as a project that has high potential for significant impact and is listed as such under Presidential Proclamation No.2146, series of 1981 and Presidential Proclamation No. 803, series of 1996, as well as other projects which may be proclaimed as environmentally critical in accordance with Section 4 of PD 1586.

As checking the Environmentally Critical Projects above mentioned major reclamation projects in the Infrastructure projects is applicable to the port development projects. The major reclamation projects is defined as a project which involve the filling or reclaiming of areas (foreshore, marshes, swamps, lakes, rivers, etc.) equal to or exceeding twenty-five (25) hectares.

(4) Role and Responsibility of CPA and Study Team for Preparation of EIA

Table 1.2.2 shows the roles and responsibilities of Cebu Port Authority and JICA study team.

Table 1.2.2 Roles and Responsibilities of Each Organization

Organization	Roles and Responsibilities
<p>CEBU PORT AUTHORITY: Organization which is the owner of the port development projects</p>	<ul style="list-style-type: none"> ➤ Provides project description ➤ Facilitates and assist the consultants in the gathering of secondary data, letter of introduction, permits and other pertinent requirements from the LGU of identified communities ➤ Introduces the project and consultants to the LGU of identified communities through a formal meeting ➤ Preparation of Information, Education and Communication materials about the project, the projected impacts and mitigations, as well as , the benefits ➤ Acts as liaison of the project in relation to the consultants, government line agencies, non-government agencies and people's organizations ➤ Submission of IEE / EIA to DENR relevant secession
<p>JICA STUDY TEAM (OCDI / PCI) : Technical expert team to carry out the port development project formulation</p>	<ul style="list-style-type: none"> ➤ Provides the technical expertise in the assessment process ➤ Informs the identified LGU and the affected people about the IEE/EIA process using IEC materials. That this is being done by the multidisciplinary team to ensure that the project shall be environmentally sound following strictly the parameters set-forth by DAO 96-37 and JICA ➤ Presents the results of the study (impacts and mitigations) to the affected communities for validation of findings ➤ Coordinates with the EMB Regional Director, PENRO, CENRO and the Review Committee in relation to the progress of the study , up to its final review

1.3 Present Situation of Major Ports in the Surrounding Islands of Cebu Province

1.3.1 Port Facilities and Future Development Plans

Port facilities and Future Development Plans are shown in Table 1.3.1.

Table 1.3.1 Port Facilities and Future development Plans

Province	Name of port	Major facilities			Other facilities	Remarks
		Type	Dimension(m)	Depth(m)		
Northern and Southern Leyte	Tacloban	Wharf	683.1	-6	Passenger terminal.	- Passenger terminal no longer used - New RC wharf (138m x 18m) under construction
		RORO ramp	18 x 18			
	Ormoc	Pier (conventional)	282	-4 to -5	Passenger terminal	- Passenger terminal for fast craft only - New pier for fast craft (63m x 9m), R.C. pier extension (69m x 12m) in future development plan, and widening of R.C. pier (18m) is completed
		Pier (fast craft) RORO ramp	63 9 x 11			
	Baybay	Pier	312	-6	None	- 2.5m widening of existing causeway and reclamation for storage, fast craft berth in future development plan
	Maasin	Pier	77 + 77	-7	Passenger terminal	- Reclamation for storage, parking area (A=1.2ha), New R.C pier (102m x 18m) and New RORO ramp (15m x 15m) in future development plan
Bohol	Tagbilaran	Pier RORO ramp	180 4 nos	-6 to -8	Passenger terminal, cargo shed	- Reclamation (parking area), widening of existing caseway (20m) and pier (78m x 6m) under construction. Extension of existing wharf (150m x 83m) and further widening of existing caseway (20m) in future development plan
	Tubigon	Pier RORO ramp	123 9 x 9	-2.8 to 4.1	Cold storage, warehouse	- Reclamation along existing causeway (100m x 20m)
Negros Oriental	Dumaguete	Pier One Pier Two Pier Three RORO ramp	30 x 166 16 x 80 12 x 162 9 x 11 12 x 12	-4 to -7	Container yard, passenger shed	- Reclamation alongside the squatter's area under construction - Reclamation and passenger/fast craft terminal bldg. (A=1.3ha), extension of pier1 (100m x 30m), widening /extension of Pier 2 and 3 and reclamation/R.C marginal wharf (A=12.6ha) in future development plan
	Tandayog	Pier RORO ramp	24 15 x 20	-7	Passenger terminal	- Extension of existing pier (L=51m) and reclamation/RORO ramp (9m x 11m) in future development plan
Misamis Oriental	Cagayan de Oro	Quay RORO ramp	983 1 unit	-8.5 to -11	Passenger terminal, weighbridge	- Bulk fertilizer facility, berth rehabilitation (1-5), integrated passenger terminal, fast craft terminal, bulk grains facility and port extension (L=625m) in future development plan
Iloilo	Iloilo	Quay -commercial - foreign pier - river wharf RORO - commercial	26.26 x 400 513 2,175 x 12 15 x 15	-10.5 -6.1 -5 -10.5	Warehouse, passenger terminal	- Quay extension (commercial:L=750m, foreign:L=72m) in future development plan. Further extension of the quay in commercial complex is planned

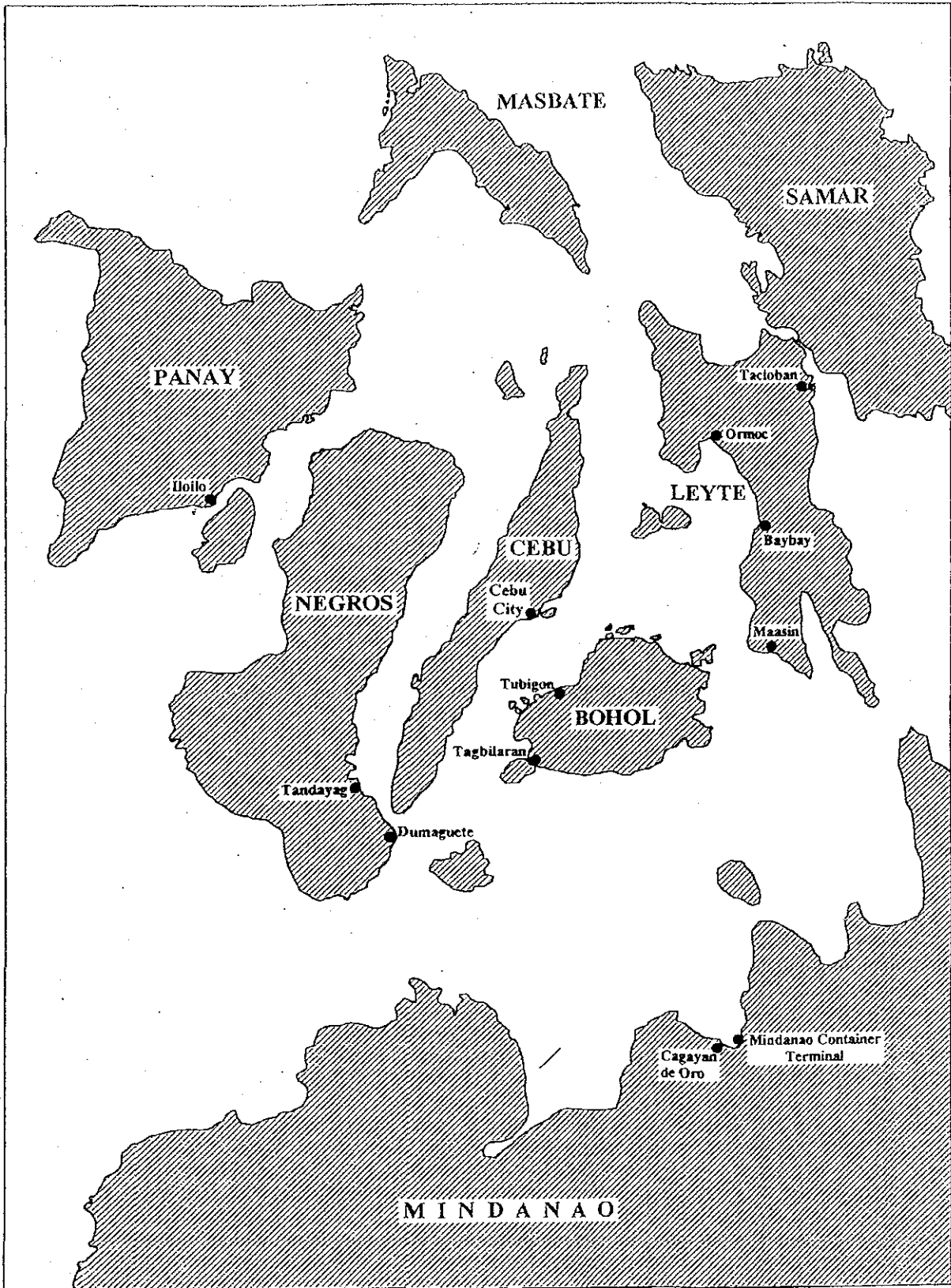


Fig. 1.3.1 Surrounding Islands of Cebu Province

1.3.2 Cargo and Passenger Movement Through Cebu Baseport

(1) Cargo Movement

Fig. 1.3.2 shows the ratio of the cargo movement from Cebu Baseport to other regions by sea transport. The data was made from origin and destination survey of cargo movement by National Statistics Office. The total average number of cargo for 4 years from 1995 to 1998 is used for the analysis. Region 7 consists of Cebu Island, Bohol Island and Negros Oriental.

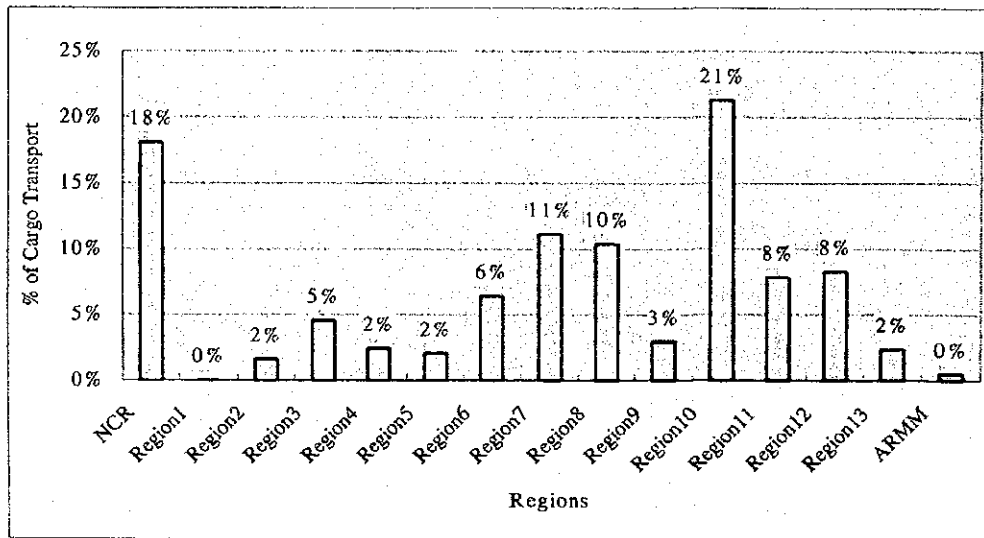


Fig. 1.3.2 Commodity Flow Ratio between Region 7 and Other Regions, 1995-1998

Table 1.3.2-1 shows the ratio of cargo movement incoming to the Region 7 from other regions and outgoing from the Region 7 to other regions. According to the O-D Analysis the cargo movement through Cebu Baseport is summarized as follows:

- Mindanao, region 10 and National Capital Region (NCR) have a large share around 40 % of the total cargo movement of Region 7.
- 21 % of cargo is from Cebu incoming and outgoing to Region 10, North Mindanao.
- Cargo movement within Region 7, which is 11 % of the total, is transported to Bohol, Negros Oriental, Bantayan Island, Camotes Island and to Siquijor Island.
- Almost the same amount as within Region 7 is transported to Region 8, Leyte and Samar.
- Cargo originated from Cebu Baseport is transported to all 15 Regions in the Philippines.

Table 1.3.2 Share of Cargo Movement in Each Region To and From Cebu Baseport

In 1999

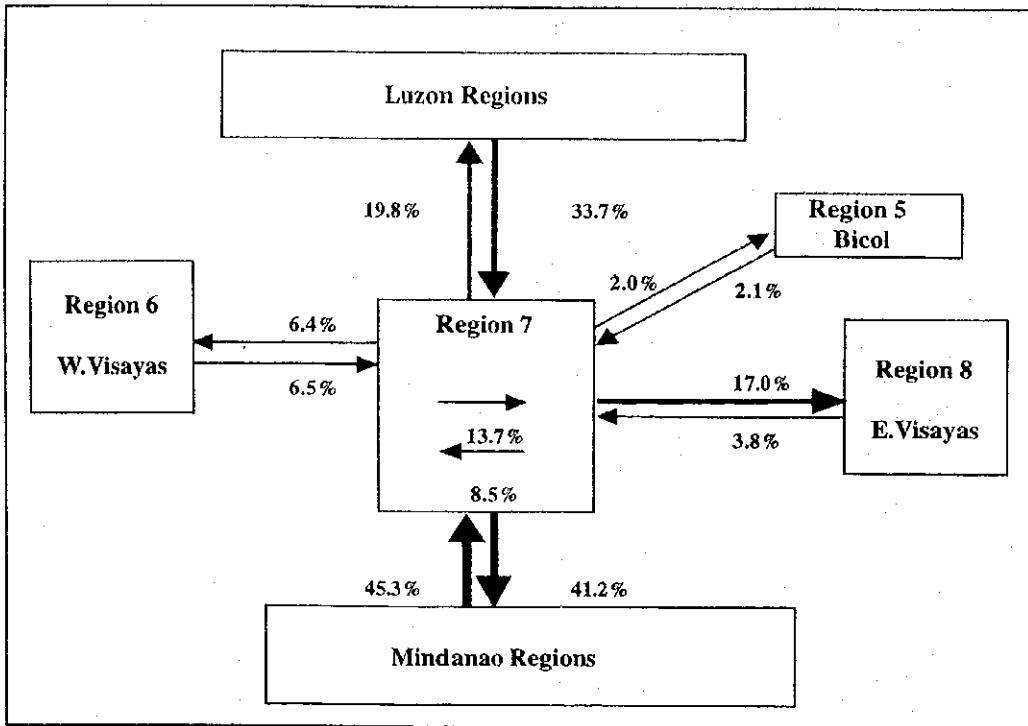
Cargo (1000 kg)

Name	Region	O-D Cargo			Share of Region 7		Share from Region 7	
		Volume	Order	%	Order	%		
Region 10	N. Mindanao	1,397	1	21%	1	31%		
NCR	National Capital R.	1,187	2	18%	6	13%		
Region 7	C. Visayas	732	3	11%	8	11%		
Region 8	E. Visayas	681	4	10%	2	26%		
Region 12	C. Mindanao	543	5	8%	3	20%		
Region 11	S. Mindanao	516	6	8%	5	14%		
Region 6	W. Visayas	422	7	6%	9	10%		
Region 3	C. Luzon	301	8	5%	12	5%		
Region 9	W. Mindanao	195	9	3%	7	11%		
Region 4	S. Tagalog	159	10	2%	12	6%		
Region 13	Caraga	157	11	2%	11	9%		
Region 5	Bicol	136	12	2%	10	9%		
Region 2	Cagayan Valley	106	13	2%	4	15%		
ARMM	ARMM	32	14	0%	14	5%		
Region 1	Ilocos	3	15	0%	15	0%		
Total		6,567		100%				

Note: Estimation by Study Team based on the O-D Data of National Statistics Office.

Fig. 1.3.3 shows the ratio of incoming and outgoing cargo movement of 1999 between the Region 7 and other regions. Incoming and outgoing cargo movement from region 7 are summarized as follows:

- a. Average 43 % of cargo volume of outgoing and incoming from region 7 is transported to Mindanao Island.
- b. Incoming and outgoing cargo volume is balanced with the same volume except between Luzon and East Visayas regions.
- c. In region 8, East Visayas outgoing cargo from Cebu is 17 % against 4 % for incoming cargo from region 7.
- d. Outgoing cargo volume from region 7 to Luzon region is 20 %, while incoming cargo from there to region 7 is 34 %.



Source: Philippine Statistical Year Book, 1998, 1999, 2000 (p13-26,29)
 Result of origin & destination survey of commodity flow by water transportation

Fig. 1.3.3 Cargo Flow between Region 7 and other Regions

(2) Passenger Movement

The ratio of passenger traffic volume by ships to other regions from the Cebu Baseport is shown in Fig. 1.3.4.

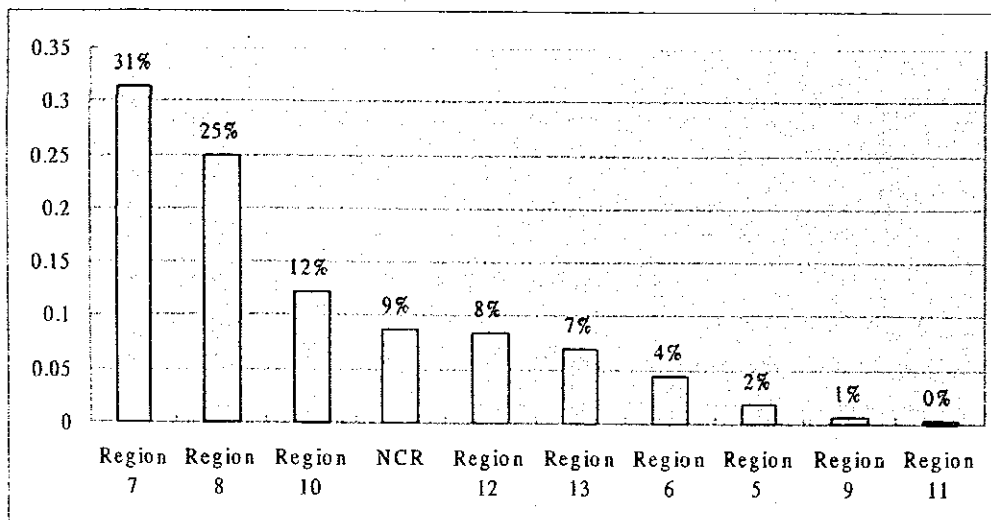


Fig. 1.3.4 Ratio of Passengers using Boats for travel to Neighbor Regions

Main points of passenger movement by O-D survey through the Cebu Baseport are summarized as follows:

- Traveling destinations of passenger are limited to 10 regions instead of 15 regions of destination of cargo. Generally, traveling distance of passenger is shorter than that of cargo.
- Share of passenger traffic within region 7 is 31 %, which is larger than 11 % in the case of cargo.
- Total share of Region 7 and Region 8 is 55 % of the total passenger traffic.

Fig. 1.3.5 shows the ratio of passenger traffic movement of 1999 from Cebu Baseport to neighboring islands.

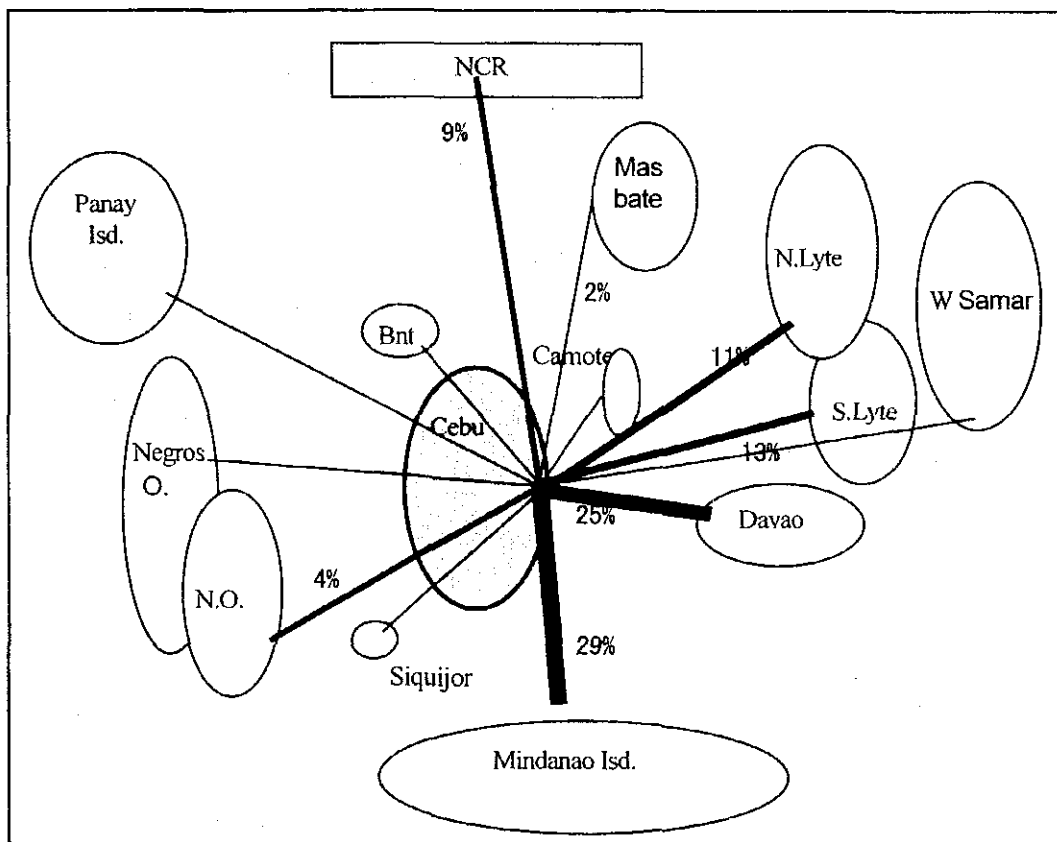


Fig. 1.3.5 Passenger Movement from Cebu to Neighboring Islands, 1999

Note: N.O.: Negros Oriental province
 Negros O.: Negros Occidental province
 Bnt: Bantayan Island of Cebu province
 S. Lyte: South Leyte Island
 N. Lyte: North Leyte Island
 W. Samar: West Samar Island
 Camote: Camotes Island of Cebu province
 Masbate: Masbate Island

2. Natural and Environmental Conditions of Cebu Province

2.1 Natural Conditions

Cebu Island is located in approximately Lat. 11°N, Longit. 124°E, in the central part of the Philippines Archipelago. It belongs to typical monsoon region in climate and occasionally typhoons approach it.

Geomorphological base of the island is upheaved coral reef, therefore limestone layer crop out in the whole island. Topography of coast shows variations in which shoal consists of marsh origin and shallow estuary.

Natural conditions are investigated basically by way of field observation and analysis of topographical maps and charts.

(1) Meteorology

1) Weather

There are few rainy days between March and May, numbering about 5 to 6 days a month only. On the other hand, more than one-third of the month are rainy days between June and December.

2) Temperature

Throughout the year, monthly average temperature is higher than 30°C. The lowest temperatures are in January and February at around 30°C and the highest are in May, June and July at around 33°C. In the past 28 years, the lowest temperature recorded was 19.2°C and the highest was 36.4°C.

3) Humidity

Humidity is almost constant throughout the year, valued approximately at 80 %.

4) Rainfall

The annual average rainfall is 1,503 mm, which shows that this area belongs to the tropical monsoon region. According to the monthly record, February to May is relatively dry (40 to 70 mm in rainfall quantity).

The greatest one-day rainfall recorded was 276.1 mm during Typhoon Ruping on November 13, 1990.

5) Wind

Two typical monsoons blow in the whole Cebu except during typhoon time. Those are North-East (bearing 40°) wind from October to May and South-West (bearing 220°) wind from June to September. Wind speed is generally gentle, about 3 meters per second.

On the other hand regarding the wind of typhoon, the highest speed of 240 km per hour (67 m/s) was recorded at the time of Typhoon Amy on December 10, 1951.

6) Tropical Cyclones / Typhoons

The Philippine sea is known for the occurrence of tropical cyclone. The number of cyclone which affected Cebu Island were 56 in total and the number of typhoons was 29. In the past 10 years, the two typhoons which remarkably affected Cebu Province were Ruping (max wind speed of 205 kmh, and minimum pressure 971 hpa) and Puring (max wind speed of 120 kmh, and minimum pressure 984 hpa).

(2) Topography

The topographic forms with regard to coastal morphology are strait/channel, gulf, bay, coral reef, shoal and estuary. On the other hand, terrace, lagoon and back marsh are shown as a remarkable morphology in the hinterland area.

(3) Bathymetry

The notable bathymetric features of Cebu Province are as follow:

- 1) The coasts of Cebu Island and other adjacent islands are surrounded by the upheaved coral reef, as a result shoal zone less than 3 m deep with 100 to 200 m wide is extended towards the outer sea.
- 2) Marsh and swamps are widely distributed close to the hinterland of bay and estuary, in which shoal zone 1 to 2 m deep becomes wider (Example: Carmen Port)
- 3) In the place where river drains in the hinterland shallow mud flat less than 1 m deep is formed widely (Example: Cebu South Area)
- 4) In the straight coast except for bay/estuary which directly faces to outer sea, width of shallow zone less than 3 m deep is 50 to 100 m (Example: Tuburan Port and Oslob Port)

(4) Oceanography

1) Wave

There are two dominant waves which are caused by two tropical monsoons, i.e. N-E monsoon (October to May) and S-W monsoon (June to September).

With regards to wave height, occurrence of high wave is rare since the average wind speed is approximately 2 m per second and the sea is surrounded by islands.

2) Ocean Current

At present, wider regional ocean current adjacent to Cebu Island is not surveyed. Two littoral currents have been observed at Cebu Baseport (flood flow direction from S to N, and ebb flow

from N to S and speed is 0.7 m per second) and in the north of Santander (flood flow direction from SE to NW, and ebb flow direction from NW to SE, and speed is 0.5 to 1 m per second).

(5) Geotechnical Conditions

Cebu Island and its surroundings are basically uplifted coral island. Supposedly the upheaval was started late Tertiary of geo-age and stopped recently. Limestone crops out generally in the whole region of the island, however, if observed locally in detail, geological type represents variations in accordance with each geomorphology. The geological type is classified as follows:

- Coral Reef: It consists of mainly corals and hard rock and it is shallow with dotted live corals.
- Sand/Gravel Beach: Relatively long and wide beach usually consists of coral origin sand and gravel.
- Shoal: It is shallow and is less than 3m deep, geological type of bed is sand and/or gravel.
- Coral Bed: Basically corals distribute, but surface is covered by sand and /or mud.
- Mud Flat: Thick muddy sediment overlies the bed which originated from back marsh and/or river deposit of hinterland.

(6) Seismology

Large earthquakes (magnitude ≥ 6) periodically attack many regions of the nation. However, in the vicinity of Cebu island, including Negros and Bohol, large earthquake rarely occurs. Occasionally low intensity (2-3) earthquakes are recorded.

2.2 Environmental Condition

Current environmental situation in candidate New Cebu Port is shown in Table 2.2.1 and out port in Cebu Province is shown in Table 2.2.2. Important environmental evaluation items "Resettlement of people" and "Fauna and Flora" like mangroves, corals in particular are evaluated for selecting the new development ports.

Table 2.2.1 Summary of Environmental Evaluation Matrix of Candidate Area of the New Cebu Port

New Port Candidate Areas	Environmental Description	Evaluation / Mitigation Measures
1. Consolacion Area	Some kinds of mangrove species scattered in the proposed reclaimed areas are <i>Sonneratia alba</i> , <i>Avicennia marina</i> , <i>Rhizophora apiculata</i> . But all of <i>Sonneratia</i> trees were already cut for fuel wood. And sea grass of family <i>Zosteraceae</i> and sea urchins habit in the area.	Mangrove planting plan should be formulated on the substitution areas surrounding the port development area. The planting cost will be included in port construction cost.
2. North Mactan Area	Coral reef and mangrove communities occur on the reef edge in Magellan Bay North Mactan. Squatter's houses exist on the coastline north Mactan, so project activities must properly and humanly treat the squatters living around proposed area. Scabed off the shore of north Mactan is covered with sea grass and scattered small corals. Be attentive to treat the corals and sea grass	Coral reef and marine ecosystem is the precious resources in resort island Mactan. Port development project is not recommended from the view point of environmental aspect.
3. South Mactan Area	Mangrove community exists at the coastline and lagoon off the shore. Mangrove species : <i>Avicennia marina</i> , <i>Sesuvium portulacastrum</i> <i>Rhizophora apiculata</i> . Coral reef exists on the lagoon and on the reef edge. There are swimming beach and diving spots at the east and south Mactan and shall pay attention to contamination of replacement from ships. There are fish ponds in the south Mactan and environmental impacts will be expected to the fish ponds while access road are constructed.	Lagoon in south Mactan is precious resources in resort island Mactan and fishery resources. Port development project is not recommended from the view point of environmental aspect.
4. Cebu South Area	Large reclaimed land filled on the swamp area by the Cebu South Coastal Road Project, back mangrove species are remaining along the channel. Proposed project activities shall be carried out in the front of existing reclaimed area seaward, corals, mangroves do not exist on the area in front of existing reclaimed area. Thick siltation must be expected on the sea bed rather than corals from the result of field survey.	No mangroves and coral reefs exist in front of existing reclamation area. The area has been already covered with the soil from catchments area through the river. The sedimentation with siltation are anticipated in future.
5. Minglanilla Area	Mangroves and coral reef are not seen in the relevant area, it is not considerable to raise significant environmental impacts for fauna and flora. Small fishery village occurs Minglanilla area, they are using the coastline for swimming and gathering shellfish Coastal erosion will be expected after reclamation in the vicinity area	Predicted natural environmental impacts may be negligible.

Table 2.2.2 Environmental Description of Ports in Cebu

Major Outports	Environmental Description
1. Sta Fe	Sta Fe port is located in Bantayan, the north remote island of the Province. Few residence surround the port, Water quality seems to be good, coral reefs occur off shore, soil erosion and siltation is not predicted at present.
2. San Remigio	Proposed port construction area is located on lifted coral at the mouth of canal. Water and air quality seems to be good. Few residences are in the relevant area. North wind in rainy season will be predicted strong.
3. Carmen	The port Carmen forms an inlet, shallow bay. There are small mangrove and fish ponds at the base of causeway.
4. Danao	Some stores and restaurants are existing on the causeway, thus, dumped trash is considered as environmental issues. There are no residence. Mangrove and corals are found surrounding the port.
5. Balamban	Balamban port is located north of West Industry Complex, There are few residents surrounding the causeway. Sand beach exist along the shore, so coral is not expected near the causeway.
6. Toledo	Causeway is located adjoining the public market, so traffic congestion and accident may happen during construction phase. Squatters houses are situated at the base of the causeway. Resettlement of resident will be expected during construction phase.
7. Argao	The port Argao is located in the south west of Cebu city. Few residence is surrounding the port, water right issues is not expected. Water quality is good, but soil erosion, topography and current change and siltation are predicted during and after the port development construction.
8. Oslob	Resettlement of residence, water right issues is not anticipated surrounding the Oslob port, Topographical change and soil erosion is expected while the port is constructed.
9. Polo	Polo port is located in the east remote island. No resettlement and water right of residence is anticipated. Topographical, current, change and soil erosion will be expected during construction.
10. Tabuelan	Relocation of residence and compensation of water right will not be predicted, and also water pollution does not occur at present. Topographical and current change will not be anticipated.
11. Tuburan	Water is muddy at present. Soil erosion is anticipated while the port is constructed. Other environmentally checking items meet to be negligible.
12. Santander	Water quality at present is turbid, resettlement of residence and topographical and current change is not expected. Soil erosion seems to be negligible
Overall Evaluation :	All of outports in Cebu province is quite smaller compared with the Cebu Baseport, so few squatters occupied the area surrounding each port. Also water right issues between the project and fisherman is not predicted as significant environmental impacts. Regarding other environmental screening items such as soil erosion, topographical and current change by the project activities should be negligible. But coral reefs exist in the front of proposed development area of San Remigio and existing Sta Fe port.

3. Present Situation of Cebu Baseport and Major Outports in Cebu Province

3.1 Port Activities

3.1.1. Sea Transport

(1) Outline of Marine Transport

In recent years, marine transport activities involving the Philippines have been developed remarkably in line with the great strides being taken to improve the socioeconomic situation of the country. According to the CPA statistics in 2000, international shipping accounted for 1.15 million tons of the volume quantity of the total foreign trade for year, highlighting the important role of marine transport.

Keeping in step with the global practice of container shipment, most of the general merchandise have been containerized. As for the other major commodities such as steel products, transport equipment, animal feeds, cereals etc, conventional vessels and/or bulk carriers are employed. Based on the CPA's data of 1999, the distribution ratio of total shipping container cargoes is about 21% foreign; 79% domestic in term of quantity. 60% of foreign cargo is containerized while 40% is non-containerized cargo.

Table 3.1.1 Present Foreign Vessel Calling at Cebu Baseport (Average Per Month)

Foreign Container Vessel	Foreign Conventional Vessel
Major 9 Shipping Lines	Tramping Cargo Ship
Total 31 Vessels Call	9 Vessels Call

Table 3.1.2 Present Domestic Vessels Calling at Cebu Baseport (1st Quarter of 2000)

	Total Domestic Ship		RORO Ferry/Passenger		Conventional Tramping	
	No. of Vessel	Total GRT	No. of Vessel	Total GRT	No. of Vessel	Total GRT
Jan 2000	1,790	2,334,970	1,289	2,025,487	501	309,483
Feb2000	1,769	2,303,556	1,287	1,998,335	482	305,221
Mar2000	1,996	2,474,932	1,418	2,146,463	578	327,932
Total	5,555	7,113,458	3,994	6,170,285	1,561	942,636
Av./Month	1,851	2,371,153	1,331	2,056,762	520	314,214

Source: CPA Port Traffic Statistics Data, JICA Study Term

(2) Trends in World Wide Container Shipping

In general, it is apparent that the shipping market will be characteristic by development focusing on the further consolidation of ownership of major ocean going container lines. The past few years have witness considerable concentration of power in these markets both by mergers and acquisitions and by re-vitalization of the consortia approach.

These trends will be further boosted by the continued pressure to introduce larger vessels into the world trade. The effect will increase vessels sizes and consignment sizes that will increase competition for Hub-Port status. The physical berthing requirement of current larger container vessels is already a constraint in some places and this will intensify in the next few years.

The concentration of ocean going container handling at larger capacity terminals will be accompanied with the increase of transshipment cargoes. It also increases the demand of feeder services. In this service, some further increase in the size of employed vessels can be anticipated. Ports in the South-East Asia will face the harder competition with Singapore port and other hub-ports.

Table 3.1.3 World-Wide Demand of Container Vessels Capacity

Year	Supplied Transport Capacity by TEU	Total Container Movement/Year	Annual Round	Comparison with Previous Year
1997	4,578,000	69,927,000 TEUs	15.28	--
1998	5,076,000	73,851,000 TEUs	14.55	- 4.70%
1999	5,436,000	81,813,000 TEUs	15.05	+3.40%
2000(e)	6,007,000	89,468,000 TEUs	14.89	- 1.10%
2001(e)	6,520,000	97,387,000 TEUs	14.94	+0.30%

(e): Estimate Source: Japan Maritime News, JICA Study Team

Table 3.1.4 Summary of World Container Fleet in Service and on Order by Vessels-type & Size

Kind of Vessel-Type	Under 1,000 TEU	1,000-1,999	2,000-2,999	3,000-3,999	Over 4,000
Fully Cellular Type	Total ①4,237,048TEUs②2,563Vessels③717,510TEUs④247Vessels				
①Present Slots(TEU)	509,907	1,124,684	917,188	740,886	944,383
②Present Vessels	983	799	368	217	196
③Slot on Ordered	24,948	105,042	71,902	99,445	416,173
④Vessel on Order	39	70	32	29	77
RORO Container Type	Total: ①134,241TEUs②188Vessels③4,285TEUs④5Vessels				
①Present Slots(TEU)	54,092	43,939	20,660	15,550	0
②Present Vessels	141	33	9	5	0
③Slots on Ordered	1,585	2,700	0	0	0
④Vessel on Ordered	3	2	0	0	0
Semi-Container Type	Total: ①1,010,467TEUs②2,854Vessels③61,791TEUs④93Vessels				
①Present Slots(TEU)	845,659	164,808	0	0	0
②Present Vessels	2,729	125	0	0	0
③Slots on Ordered	36,631	25,160	0	0	0
④Vessels on Ordered	73	20	0	0	0

Source: Containerization International Year-Book, JICA Study Term

3.1.2 Cargo and Passenger Movement

(1) Cargo Movement through Cebu Baseport

Main features of cargo volume handled at Cebu Baseport and Outports in Cebu province, including both government and private in 1999 were as follows:

Total cargo volume handled by all ports in Cebu Province in 1999:	13,030,875 metric tons
Cargo volume throughput at Cebu Baseport in 1999:	7,451,967 metric tons (57 % of the total)
Cargo volume throughput at Outports in 1999:	5,578,908 metric tons (43 % of the total)
Average yearly growth rate of cargo throughput of Cebu Baseport for 10 years:	6.9 %
Average yearly growth rate of cargo throughput of Outports for 10 years:	0.2 %

Main features of containerization cargo volume handling by Cebu Baseport in 1999 was as follows:

a. Containerization of Domestic cargo in 1999

Total throughput of domestic cargo in 1999:	6,567,406 metric tons
Volume of containerized cargo volume:	2,109,024 metric tons
Containerization ratio:	32 %
Containerization in 1990:	40 %

Thus, containerization is not progressing.

b. Containerization of Foreign cargo in 1999

Total throughput of Foreign cargo in 1999:	884,561 metric tons
Volume of containerized cargo volume:	567,440 metric tons
Containerization ratio:	64 %
Containerization in 1990:	35 %

Growth rate of containerization of foreign cargo per year is 6.8 %.

Table 3.1.5 shows the component of cargo types at Cebu Baseport in 1999.

Table 3.1.5 Cargo Types at Cebu Baseport in 1999

Unit: Metric Tons

1) Domestic Cargo						
Cargo Type	Inbound	%	Outbound	%	Total	%
1) Container	1,203,963	36%	659,604	39%	1,863,567	37%
3) Break Bulk	1,005,824	30%	963,902	57%	1,969,726	39%
2) Bulk	1,132,982	34%	53,272	3%	1,186,253	24%
Total	3,342,769	100%	1,676,778	100%	5,019,547	100%
2) Foreign Cargo						
Cargo Type	Import	%	Export	%	Total	%
1) Container	312,485	50%	183,714	89%	496,198	60%
3) Break Bulk	14,889	2%	8,269	4%	23,158	3%
2) Bulk	299,407	48%	14,757	7%	314,163	38%
Total	626,781	100%	206,739	100%	833,520	100%

Source: Cebu Port Authority

Note: Figure is not included total throughput of Cebu Baseport

Types and Kinds of Commodity at Cebu Baseport:

- a. Containerized foreign cargo 60 %
- b. Containerized domestic cargo 37 %
- c. Crude minerals such as stone, sand, salt, grabble, sulfur and iron pyrites, salt 23 % of total domestic cargo
- d. Iron and steel (ingots, plates, wire, and pipes) and chemicals (medical, plastic, coloring) 30 % of total foreign cargo

(2) Cargo Movement of Management Offices of Outports

Cargo and Passenger statistics are collected at four Management Offices. According to CPA's port list, there are 118 ports in total, 10 primary government ports, 42 secondary government port and 66 private port. Actually statistical data were collected from 26 Outports; 6 from Danao, 4 from Santa Fe, 5 from Toledo and 11 from Argao Management Office..

The ratio of total cargo handling volume (1998+1999) of Outport management office is as follows

- Argao management Office 57 %
- Danao Management Office 22 %
- Toledo Management Office 18 %
- Santa Fe Management Office 4 %

Fig. 3.1.2 shows the classified domestic and foreign cargo volume of 1999 handled by government ports and private ports. The private ports handles 71 % of total domestic cargo volume of Outport. Foreign cargo is 100 % handled by private ports, but such cargo volume is only 22 % of the total Outport cargo. The government owned ports mainly handle passenger traffic.

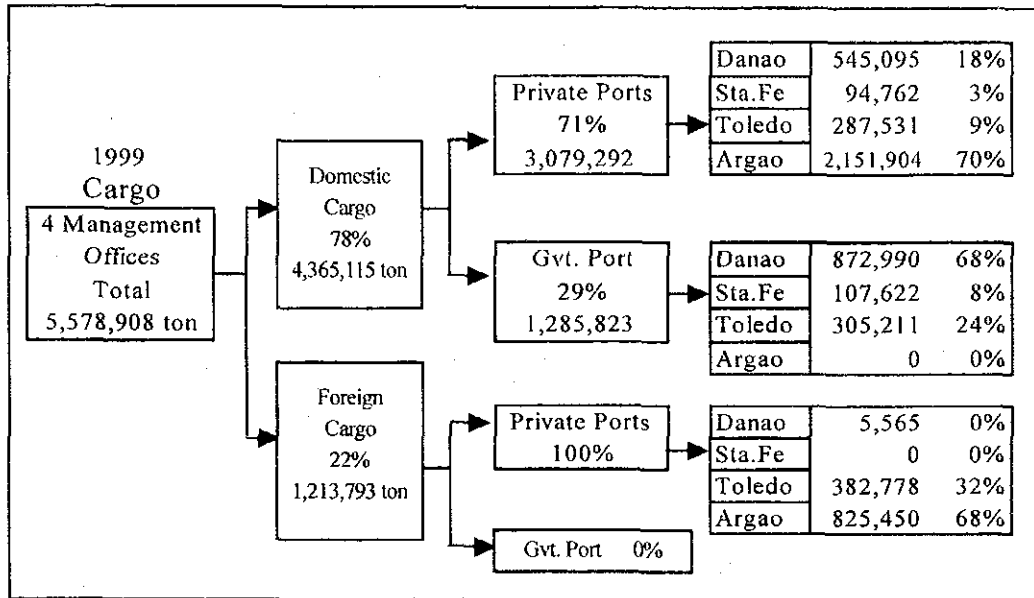


Fig. 3.1.2 Cargo Throughput at Outport by Management Office

Table 3.1.6 Cargo Volume Throughput at Outport by Management Offices, 1998-1999

Unit: Metric Tons

Management Office	Year	Domestic Cargo				Foreign Cargo				Grand Total
		Inbound	Outbound	Total	%	Inbound	Outbound	Total	%	
1) Danao	1998	321,014	385,252	706,266	21%	50,624	0	50,624	4%	756,890
	1999	447,459	970,626	1,418,085	32%	3,543	2,022	5,565	0%	1,423,650
2) Santa Fe	1998	150,661	68,540	219,201	7%	0	0	0	0%	219,201
	1999	140,942	61,442	202,384	5%	0	0	0	0%	202,384
3) Toledo	1998	255,069	289,677	544,746	16%	251,729	340	252,069	22%	796,815
	1999	232,231	360,511	592,742	14%	382,778	0	382,778	32%	975,520
4) Argao	1998	290,412	1,583,516	1,873,928	56%	429,664	415,707	845,371	74%	2,719,299
	1999	274,211	1,877,693	2,151,904	64%	291,974	533,476	825,450	68%	2,977,354
Total	1998	1,017,156	2,326,985	3,344,141	100%	732,017	416,047	1,148,064	100%	4,492,205
	1999	1,094,843	3,270,272	4,365,115	100%	678,295	535,498	1,213,793	100%	5,578,908

Source: Cebu Port Authority

1) Characteristics of Ports Under the Danao Management Office

a. Name of ports and Location

6 ports under this Office. Compostela, Danao, Dungan, Carmen have direct hinterland of Danao City and Carmen town located 20 km to 40 km north from Cebu City. Camotes (Poro) port located at eastern Camotes Island and Mandaue port located beside Cebu Baseport.

b. Service Area

Ports serve Camotes Island and Western coast of Leyte island. No cargo movement by sea transport between Cebu Baseport.

c. Mandaue Port

Management of Mandaue port was moved from Danao Management Office to Cebu Baseport Head Office in 1997 since Mandaue city also served the same economic activity zone.

d. Cargo Throughput

Total cargo throughput by 6 ports in 1999 is 1,423,650 metric tons.

The ratio in the traffic of ports is as follows

Compostela Government port	34 %
Dunguan Private port	36 %
Carmen Government port	18 %
Camotes Government port	2 %
Danao government port	11 %

e. Kinds of Commodity

Copra, cement, empty bottles, rice and daily goods. Sugarcane factory, cement factory, computer parts factory and plywood factory are the main business activities in this area.

2) Ports Under the Santa Fe management Office

a. Name of ports and Location

Santa Fe and Bantayan ports in Bantayan Island. Hagnaya port located at the northwestern end of San Remigio in Cebu Island. Hagnaya port is located 11km northwest from Bogo district center and 100km north from Cebu Baseport.

b. Service Area

San Remigio is the gate port to Negros through Bantayan Island. Bogo port is basically the fishing center and Polambato port is the gate for cargo transport located closely to Leyte Island.

c. Cargo Throughput

Following is the cargo throughput in 1999.

Santa Fe port	103,216 metric tons, 280 metric tons/day
Baigad private ports	95,120 metric tons, 260 tons /day

d. Kinds of Commodity

Mainly daily goods such as sugar, meat, eggs, vehicles, and rice, etc.

3) Ports Under the Toledo Management Office

a. Name of ports and Location

Government port: Toledo port and Tuburan port located far north from Toledo City. Private ports; T.H.I port for ship rehabilitation of Tsuneishi Heavy Industry, A.F.C port of Atlas Fertilizer Corporation and P.T.C port of Toledo Power Company.

b. Service Area

The Toledo port is gate port to the Negros Island and toward to Panay Island through the RORO services

c. Cargo Throughput

Total cargo throughput of Toledo management office is 975,520 ton in 1999. Private ports handle about 70 % of the total cargo. Outbound cargo by private ports 185,112 metric tons, out of which 90 % is fertilizer, and 10 % is sulfuric acid to Leyte.

Toledo government port

Outbound of domestic cargo	175,400 metric tons
Inbound of domestic cargo	129,811 metric tons

T.H.I. A.F.C port and P.T.C private ports

Outbound of domestic cargo	185,111 metric tons
Inbound of domestic cargo	102,420 metric tons
Import of foreign cargo	382,778 metric tons

d. Kinds of Commodity

Toledo port handles mainly daily commodities between Cebu and Negros Island. The main incoming commodities are

Coal	291,119 metric tons	60 %
Sulfuric acid, Gypsum	97,040 metric tons	20 %
Material for ship repair	97,040 metric tons	20 %
Total	485,198 metric tons	100 %

4) Ports under Argao Management Office

a. Name of ports and Location

11 ports under the management office scarcely located along the 100 km southeastern coast, of which the Santander port is on southern end and Dumamjug on the west coast.

b. Service Area

Most ports in Argao management office are private ports and handle cargo traffic only. These ports are connecting points of the southern parts of the Visayas region between the Negros Island and Bohol, through the Cebu Island

c. Cargo Throughput

Total cargo volume of Argao management office is 2,977,354 metric tons in 1999.

d. Kinds of Commodity

Bulk cargo like cement, sands, gravel, etc. Cement cargo is transported from private ports of Apocemco, Grand Cement and NPC.

(3) Passenger Movement through Cebu Baseport and Outports

The passenger traffic through outports has increased at very high growth rate every year. But the total passenger traffic is 1,560,000, which is still 15 % of the total of Cebu Baseport (10,612,000 in 1999). Table 3.1.7 shows the number of passengers that passed through Cebu Baseport and Outports.

Table 3.1.7 Number of Passenger Handled at Cebu Baseport and Outport Unit: Passenger

Year	A. Cebu Base Port			B. Outport		
	Disembark	Embark	Total	Disembark	Embark	Total
1997	4,936,680	4,580,758	9,517,438	619,399	560,808	1,180,207
1998	5,248,964	5,030,840	10,279,804	753,843	721,985	1,475,828
1999	5,283,770	5,328,152	10,611,922	801,516	759,258	1,560,774
Growth Rate	13%	13%	13%	14%	16%	15%

Source: Cebu Port Authority

1) Movement of Passenger traffic to Region 7

Passengers from Cebu City do not use sea transport to go to south or north end of Cebu Island - utilizing land transportation instead.

Following is the number of passenger transported to islands by boat within Region 7 in 1999.

Total Cebu Baseport	Ratio to total Cebu Baseport	Traffic Volume
		10,611,922
Within Region 7	31.0 %	3,336,174
To Bohol (East of Cebu)	25.0 %	2,868,066
To Camotes Island (East of Cebu)	1.0 %	116,728
To Bantayan Island (North of Cebu)	0.9 %	109,206
To Siquijor Island (South of Cebu)	0.6 %	69,179
To Negros Oriental (West of Cebu)	0.3 %	36,098

2) Passenger Transport under Management Office of Outport

Fig. 3.1.2 shows the passenger traffic through government ports and private ports.

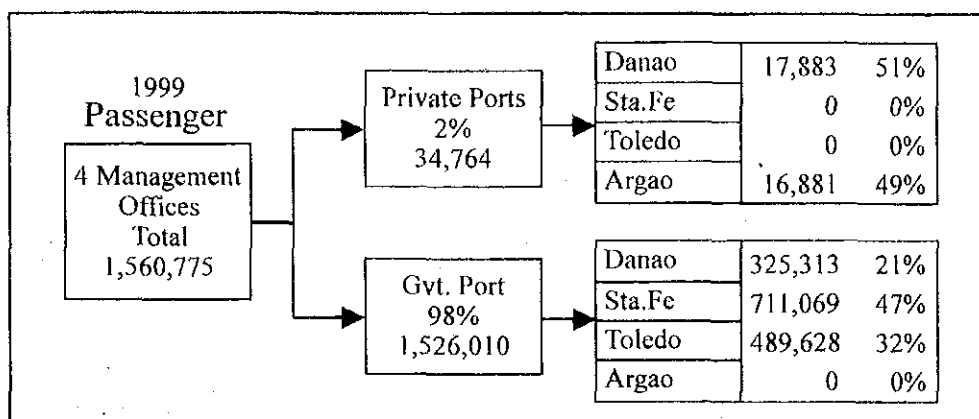


Fig. 3.1.2 Passenger Traffic at Outports under Management Office, 1999

The ratio of cargo and passengers traffic through each management office in 1999 is shown below.

	Cargo Transport	Passenger Transport
a. Danao Management Office	22 %	20 %
b. Santa Fe Management Office	4 %	47 %
c. Toledo Management Office	18 %	32 %
d. Argao Management Office	57 %	1 %

The passenger traffic that disembark and embark at each out ports management office in 1998 - 1999 is shown in Table 3.1.8.

Table 3.1.8 Passenger Transport at Outports 1998 - 1999

Unit: Passenger

	Year	Disembark			Embark			Total
		Gov.	Private	Total	Gov.	Private	Total	
Danao	1998	128,722	10,969	139,691	121,636	5,562	127,198	266,889
	1999	175,178	8,801	183,979	150,135	9,082	159,217	343,196
Santa Fe	1998	365,718	0	365,718	348,757	0	348,757	714,475
	1999	356,305	0	356,305	354,764	0	354,764	711,069
Toledo	1998	241,545	0	241,545	237,671	0	237,671	479,216
	1999	253,916	0	253,916	235,712	0	235,712	489,628
Argao	1998	0	6,889	6,889	0	8,359	8,359	15,248
	1999	0	7,316	7,316	0	9,565	9,565	16,881
Total	1998	735,985	17,858	753,843	708,064	13,921	721,985	1,475,828
	1999	785,399	16,117	801,516	740,611	18,647	759,258	1,560,774

Source: Cebu Port Authority

Table 3.1.9 shows passenger traffic through Outports in 1999.

Table 3.1.9 Disembarkation and Embarkation of Passenger at Outport in 1999

a. Danao Management Office				
	Name of Port	Ownership	Passenger	%
1	Danao	P. Government	195,576	57%
2	Dunguan	Private	38,525	11%
3	Carmen	P. Government	Stop Operation	
4	Camotes (Poro)	P. Government	109,095	32%
Total			343,196	100%
b. Santa. Fe Management Office				
	Name of Port	Ownership	Passenger	%
1	Sta. Fe	P. Government	366,818	52%
2	Bantayan	P. Government	64,630	9%
3	P. Hagnaya	Government	276,618	39%
4	Baigad	Private	3,004	0%
Total			711,070	100%
c. Toledo Management Office				
	Name of Port	Ownership	Passenger	%
1	Toledo	P. Government	286,426	59%
2	P.T.C	Private	49,313	10%
3	Tuburan	P. Government	153,889	31%
Total			489,628	100%
d. Argao Management Office				
	Name of Port	Ownership	Passenger	%
1	Argao	Government	Operation Stopped	
2	Trigon	Private	Operation Stopped	
3	Dumamgug	Private	Operation Stopped	
4	Santander	Private	Operation Stopped	
5	Taloot	Private	16,881	100%
Total			16,881	100%

Source: Based on the Hearing and Data from CPA, December, 2000

3.1.3 Calling Vessels

(1) Cebu Baseport

1) Foreign Vessels

The foreign vessels are classified into Container Vessel and Conventional Vessel (mainly bulk carrier). Based on the analysis of the statistics, the vessel calls and vessel sizes of foreign vessels are estimated as shown in Table 3.1.10.

Table 3.1.10 Statistics of Foreign Container Cargo Vessel

Year	Container Cargo Vessel				Conventional Cargo Vessel			
	Throughput TEU	Vessel calls	Vessel Size (DWT)		Throughput ton	Vessel calls	Vessel Size (DWT)	
			Average	Max			Average	Max
1996	70,000	263	10,412	27,468	375,694	222	9,832	41,820
1997	63,000	270	9,983	14,310	248,711	236	10,056	60,552
1998	62,000	231	12,354	23,508	416,000	165	8,735	26,605
1999	79,000	219	11,144	29,213	314,000	167	7,060	18,693
2000	104,000	287	12,516	29,213	459,000	155	8,423	45,222

Currently the average vessel sizes are about 12,000 DWT for container cargoes and 9,000 DWT for conventional cargoes. Average load, vessel size and productivity of container vessel/handling are increasing. Therefore in last 5 years despite that the container throughput increased by about 50 %, number of vesselcall remained almost the same, which means that the average service time has decreased greatly. As for conventional vessels, the average size slightly decreased, however, the average load per vessel increased, and as a result, the number of vessel calls decreased.

2) Domestic Vessels

Based on the field observations, the study team classified the vessels into 7 types as shown in Table 3.1.11, which is different from the classification of the CPA's statistics. The vessel calls and vessel sizes estimated from the statistics are shown in Table 3.1.12 and 13.

Table 3.1.11 Classifications of Domestic Vessels

Type of Vessel	Descriptions	Type of Cargo
Large RORO	RORO ferries larger than 7,000 GRT such as "Superferry" of WGA and "Princess of Paradise" of Sulpicio Lines. Mostly berth at MOI (Cebu International Port), Side-ramp.	Container Cargoes and Passengers
Middle RORO	RORO ferries smaller than 7,000 GRT. Mostly stern-ramp	Container, Conventional Cargoes and Passengers
Container	Container vessels mostly with shipgears	Container
Conventional	Breakbulk and bulk cargo vessels (cargo only)	Conventional Cargo
Passenger/Cargo	Vessels carrying passengers (mainly) and cargoes	Conventional Cargo and Passengers
Fast Craft	Fast catamaran passenger vessels such as "Oceanjet" and "Supercat"	Passengers
Metro Bus Ferry	The small boats connecting Lapu-Lapu City and Cebu City	Passengers

Table 3.1.12 Statistics of Domestic Vessels (1)

Year	Large RORO Vessels			Middle RORO Vessels			Container Cargo Vessels		
	Vessel calls	Vessel Size (GRT)		Vessel calls	Vessel Size (GRT)		Vessel calls	Vessel Size (DWT)	
		Average	Max		Average	Max		Average	Max
1998	766			6,004			328		
1999	841			5,681			480		
2000	816	11,210	15,223	3,553	2,022	6,090	344	4,683	7,276

Table 3.1.13 Statistics of Domestic Vessels (2)

Year	Conventional Cargo Vessels			Passenger/Cargo Vessels			Fast Craft	Metro Bus
	Vessel calls	Vessel Size (DWT)		Vessel calls	Vessel Size (GRT)		Vessel calls	Vessel calls
		Average	Max		Average	Max		
1998	1,286			12,423			9,704	20,667
1999	1,455			14,020			7,448	26,269
2000	1,492	847	6,745	14,559	314	4,000	6,099	17,122

(2) Toledo Port

Currently, 4 RORO and 8 fast crafts are operating daily between Toledo and San Carlos and tramper vessels are calling at the port only few times a month to transport outgoing bagged fertilizers. The vessel particulars are as shown in Table 3.1.14.

Table 3.1.14 Particulars of Regular Vessels at Toledo Port

	Type of Vessel	GRT	DWT	Breadth	LOA
				m	m
MV Danilo I	RORO	480.0	652.3	11.6	44.0
MV Danilo II	RORO	489.6	671.7	11.0	45.2

Particulars of fast craft are unknown. Approximately 150 GRT

(3) Hagnaya Port (The New San Remigio Port)

There are 2 or 3 passenger vessels traveling between Hagnaya port and Santa Fe port, 4 to 5 times a day, transporting passengers and very small amount of cargoes. The vessel particulars are as shown in Table 3.1.15.

Table 3.1.15 Particulars of Regular Vessels at Hagnaya Port

	Type of Vessel	GRT	DWT	Breadth	LOA
				m	m
Island Express 1	Passenger	91.5	114.0	6.0	24.5
Island Express 3	Passenger	192.43	240.5	7.0	28.8
Island Express 5	Passenger	219.39	275.0	7.2	26.1

3.1.4 Container User Survey

1) Data Collection, Validation, and Processing

In order to identify the hinterland of foreign container cargoes at Cebu Baseport, container user survey was conducted based on the data of foreign manifests of October 2000. The number of container boxes was 1,061 for export and 1,349 for import.

The result shows that 79 % of export containers were produced in Mandaue city, Cebu city, and Mactan Island, while 88 % of import containers were delivered to the same area.

Table 3.1.16 Number and Percentage of Container per Zone/Area and Kind of Container (Export)

Zone/Area	20'	40'	45'	40H	TOTAL	%
Mandaue City	63	282	13	20	378	35.63%
Cebu City	62	55	1	0	118	11.12%
Mactan Island **Lapu-lapu City and Cordova	66	227	6	42	341	32.14%
Northern Cebu **Consolacion, Liloan, Compostela	7	46	0	0	53	5.00%
Southern Cebu **Talisay, Minglanilla, Naga	3	57	0	1	61	5.75%
Northern Island **Danao City	8	17	0	0	25	2.36%
Southern Island **Southern Cebu provincial area	0	0	0	0	0	0.00%
Western Island **Balamban	0	0	0	0	0	0.00%
UNKNOWN	42	41	2	0	85	8.01%
NA	0	0	0	0	0	0.00%
TOTAL	251	725	22	63	1061	100.00%
PERCENTAGE	23.66%	68.33%	2.07%	5.94%	100.00%	

Table 3.1.17 Number and Percentage of Container per Zone/Area and Kind of Container (Import)

Zone/Area	40'	20'	45'	20FR (FlatRack)	40HREE F	TOTAL	%
Mandaue City	159	203	0	0	4	366	27.13%
Cebu City	337	285	0	2	4	628	46.55%
Mactan Island **Lapu-lapu City and Cordova	142	54	1	1	1	199	14.75%
Southern Cebu **Talisay, Minglanilla, Naga	5	11	0	0	0	16	1.19%
Northern Cebu **Consolacion, Liloan, Compostela	5	0	0	0	0	5	0.37%
Northern Island **Danao City	10	10	0	0	0	20	1.48%
Southern Island **Southern Cebu Provincial Areas	0	2	0	0	0	2	0.15%
Western Island **Balamban	6	30	0	0	0	36	2.67%
Bohol	5	2	0	0	0	7	0.52%
Bukidnon	0	1	0	0	0	1	0.07%
Tagoloan, Misamis	0	0	0	0	0	0	0.00%
Cagayan de Oro City	4	20	0	0	0	24	1.78%
Metro Manila Areas	11	8	1	0	1	21	1.56%
Malinta, Masbate	0	1	0	0	0	1	0.07%
Kabankalan City, Negros	0	0	0	0	0	0	0.00%
UNKNOWN	2	21	0	0	0	23	1.70%
TOTAL	686	648	2	3	10	1349	100.00%
PERCENTAGE	50.85%	48.04%	0.15%	0.22%	0.74%	100.00%	

3.2 Port Facilities

3.2.1 Port Facilities and Layout

(1) Cebu Baseport

1) Approach Channels

Cebu Baseport is located along the sea-lane between Cebu City and the Mactan Island. It is well protected and easily accessible to ocean-going vessels. There are two approach channels, the north channel and the south channel. But due to the clearance of the second Mactan bridge (22.82 m above mean water level) over the north channel, large vessels can use only the south channel. The maximum draft of the vessel of the south channel is only 8.5 m.

2) Port Facilities

The port area, owned and managed by CPA, is the only waterfront area of about 40 ha. The port zone consists of this CPA-owned port area and adjacent private area. Within the port zone, the land use including private area is restricted only for port related purposes. The port area is divided into five areas and each area is managed by port management office (PMO) from 1 to 5. Cebu Baseport has 33 berths and the jurisdiction of each PMO is as follows;

PMO 1	:	Berth No. 1	- 7
PMO 2	:	Berth No. 8	- 17
PMO 3	:	Berth No. 18	- 23north
PMO 4	:	Berth No. 23tip	- 27
PMO 5	:	Berth No. 28	- 33

Length and water depth of each berth are shown in Table 3.2.1.

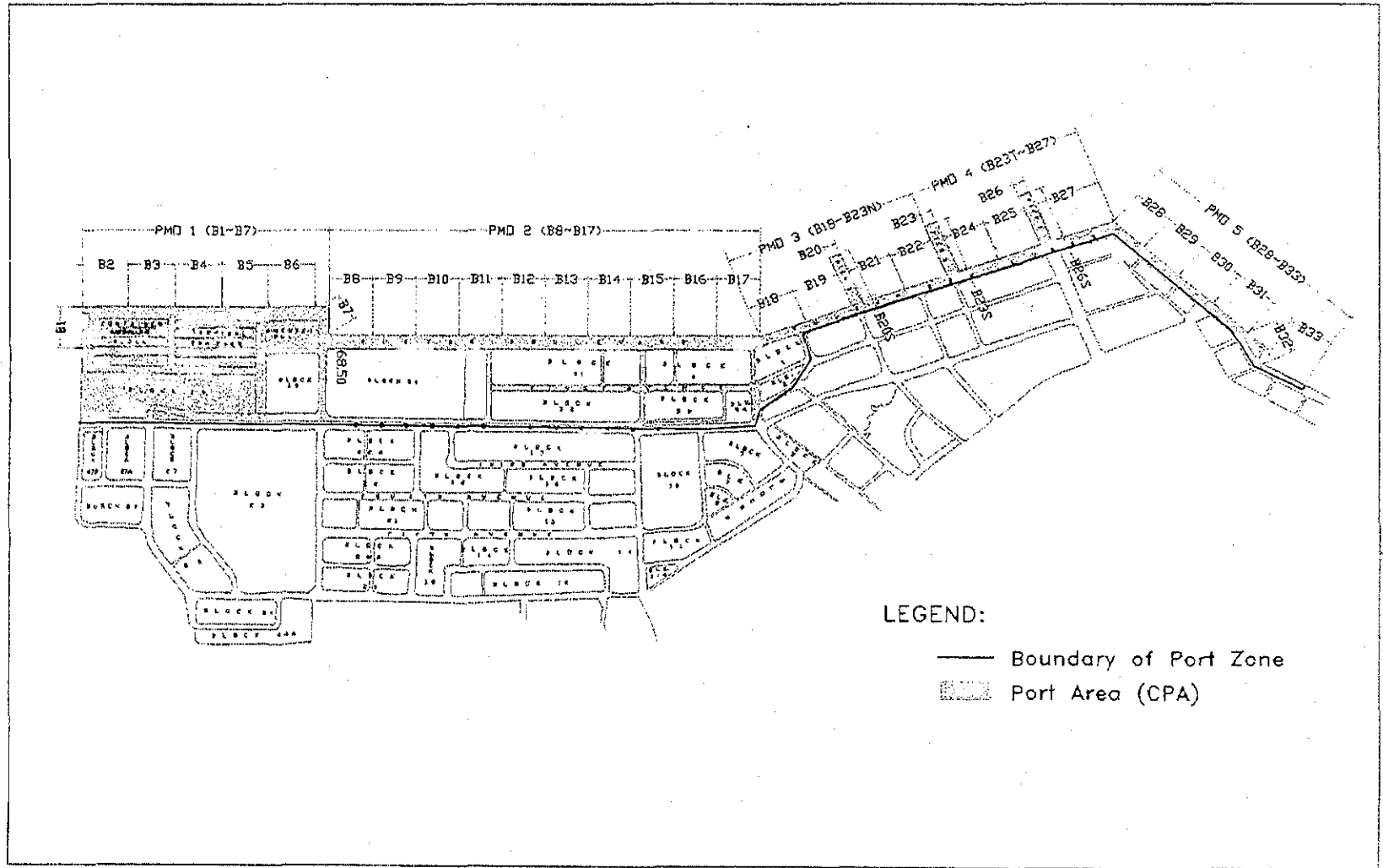


Fig. 3.2.1 Port Zone and Port Area of Cebu Baseport

Table 3.2.1 List of the Berths of Cebu Baseport

Management Office	Berth Number	Length of Berth (m)	Depth of Berth (m)	Major Function
PMO 1	B-1	125.0	-	Not Operational
	B-2	130.5	8.5	Bulk/Break Bulk
	B-3	128.0	8.5	Container
	B-4	128.0	8.5	Container/Passenger (RORO Ferry)
	B-5	128.0	8.5	Container/Passenger (RORO Ferry)
	B-6	128.0	8.5	Container/Passenger (RORO Ferry)
	B-7	119.3	8.5	Container/Passenger (RORO Ferry) (available length is 50.8m)
PMO 2	B-8	140.0	3.0-4.0	Under Rehabilitation (future water depth 7-8m)
	B-9	125.0	3.0-4.0	Under Rehabilitation (future water depth 7-8m)
	B-10	125.0	3.0-4.0	Under Rehabilitation (future water depth 7-8m)
	B-11	125.0	6.0-7.0	Bulk/Break Bulk
	B-12	125.0	4.0	Bulk/Break Bulk
	B-13	125.0	7.0	Container
	B-14	125.0	5.0	Passenger (Fast Craft)
	B-15	125.0	6.0-7.0	Break Bulk/Container/RORO
	B-16	125.0	6.0-7.0	Break Bulk/Container/RORO
B-17	125.0	6.0-7.0	Break Bulk/Container/RORO	
PMO 3	B-18	125.0	5.1	Container/ Break Bulk /Passenger
	B-19	125.0	3.8	Break Bulk/Passenger
	B-20N	155.0	5.6	Break Bulk/Passenger
	B-20T	32.8	6.8	Break Bulk/Passenger
	B-20S	155.0	5.1	Break Bulk/Passenger
	B-21	130.0	3.2	Break Bulk/Passenger
	B-22	130.0	3.4	Under Rehabilitation (available length for conventional cargo 40m)
	B-23N	155.0	7.6	Break Bulk/Passenger
PMO 4	B-23T	32.8	5.0-7.0	Break Bulk
	B-23S	155.0	5.0-7.0	Break Bulk/RORO
	B-24	125.0	5.0-7.0	Break Bulk/RORO
	B-25	125.0	5.0-7.0	Break Bulk/RORO
	B-26N	155.0	5.0-7.0	Passenger (Fast Craft)
	B-26T	32.8	5.0-7.0	Break Bulk/Passenger
	B-26S	155.0	5.0-7.0	Break Bulk/Passenger
	B-27	190.0	6.0-7.0	RORO
PMO 5	B-28	101.0	5.0-7.0	Break Bulk
	B-29	135.0	5.0-7.0	Break Bulk
	B-30	135.0	5.0-7.0	RORO
	B-31	135.0	5.0-7.0	Break Bulk
	B-32	135.0	5.0-7.0	Bulk/Break Bulk/RORO
	B-33	135.0	5.0-7.0	Break Bulk/Passenger

Source: CPA

Note : March 2001

(2) Major Outports in the Cities and Province of Cebu

Table. 3.2.2 List of Major Ports in the Cities and Province of Cebu

Name of Port	Major facilities			Other facilities
	Type	Dimension(m)	Depth(m)	
Toledo	Pier	228	-4	None
	RORO ramp	11 x 18		
Balamban	Causeway	100	-4	None
San Remegio (Hagnaya)	Wharf	18 x 18	-3	None
	RORO ramp	1 unit		
Sta. Fe	Pier	35	-3 to -4.5	Passenger shed
	RORO ramp	9 x 60		
Argao	Causeway	93	-3	None
	R.C. Deck	10 x 10		
	RORO ramp	10 x 12		
Oslob	Causeway	53.5	-3	Passenger shed
	RORO ramp	15 x 12.5		
Carmen	Causeway	126.75	-3	None
	R.C. Deck	30 x 17		
Danao	Causeway	100	-2	None
	RORO ramp	1 unit		
Bantayan	Causeway	314	-4	Passenger shed
	R.C. Deck	20 x 7		

3.2.2 Conditions of Ports Facilities

(1) Cebu Baseport

1) Container Terminal

The Container terminal with length of 690 m and a water depth along side wharf of - 6 to 8.5 m were constructed in 1985 by the IBRD World Bank finance, 3rd IBRD project.

The quay wall is not damaged, and the concrete pavement in the container stockyard are still in good condition. It is observed that some upheavals of concrete block pavement in the stockyard were considered to be caused by the excessive wheel loads of trucks and container handling operation by folk lift trucks. The north corner of the terminal is situated at the mouth of the river and becomes shallow depth with the sedimentary material from the river.

2) General Purpose Berth

At the RORO ferry ships berthing area of 350 m long as parts of the 1,265 m long of general purpose berth, the construction works of widening the apron for 30 m from the existing apron are carried out as first phase from 2000 - 2001. CPA plans to continue subsequent widening works as Phase 2 and 3 to complete the entire length of this berth. The existing sea bed depth

is -6 m. There are three steel pontoons extended from the berthing alignment and passenger waiting hall with parking area as fast craft berthing facilities.

3) Pier 1, 2 and 3 Area

There are three piers in length of 165 m and 32.8 m width each at the south end of the Baseport area. They were constructed in 1930s with support of concrete square piles. The large parts of upper structures from the pile head connection with beam and slabs in all three piers are heavily deteriorated and damaged substantially along the quay wall area. One unit of the warehouse is constructed on each pier and used for storage of cargoes. These piers are used for cargo handling and for passenger terminal to embark/disembark of short distance passenger traffic.

The cargo berthing facilities which was previously planned for waterfront development area are heavily damaged. CPA constructed 5 dolphins with used rubber fenders in front of the berth for protection of the existing damaged structures.

The damaged conditions survey of the pier No.1, 2 and 3 were carried out. The findings by the investigation of each pier are as follows. The degree of deterioration is substantial throughout. Most of this concrete is spilling off, exposing heavily corroded reinforcement bars on beams, deck slabs, piles and pile heads.

Beams along the periphery of the pier are particularly badly damaged. Additionally there are a number of badly damaged/deteriorated piles on the perimeter of the pier. A large amount of repair/reconstruction and reinforcement is necessary to rectify the damaged conditions.

(2) Outports of Cebu Province

The observations of port facilities of the 13 out ports from the site reconnaissance survey are summarized as follows;

- The berthing facilities of the major outports are pier type of structure constructed with reinforced concrete slab supported by concrete square piles and generally its fenders of the pier are mainly damaged due to roughly ship berthing operation,
- The access road, berthing facilities are worn out for long time service without periodical rehabilitation and maintenance,
- The berthing facility are constructed at the shallower water depth area which can only accommodate limited size of ships and required a long distance of access by causeway.

Due to strong demands from the regions particularly in the southern parts of the Cebu Island, RORO service and fast ferry for passengers had operated services without berthing facilities but by using the sand beach for ship ramp placement.

The existing port facilities of the major out ports shall be improved and upgraded for efficient of RORO ferry services for transporting vehicles with cargo to meet the minimum required function for regional economy and direct communications and delivery of goods and passengers.

3.3 Port Administration, Management, and Operation

3.3.1 Port Administration, Management, and Operation

(1) Out line of Port Administration

Main duties of CPA are planning and development, maintenance of port facilities and management of operation. CPA owns Cebu international port, other quay side area and some handling equipment. Cargo handling activity and tugboat operations are done by private companies. Pilotage is done by a single private company. Other agencies concerned in port activities include Customs, and Quarantine.

(2) Port Management Body

1) Role and Objectives of CPA

CPA's role and objectives are stated in the CPA Charter as follows. ① To integrate and coordinate the planning, development, construction and operation. ② To enhance the flow of international and domestic commerce. ③ To promote regional development by providing support services.

2) Territorial Jurisdiction of CPA

CPA's territorial jurisdiction includes all government and private ports and all seas, lakes, rivers and all other navigable inland waterways within the Province of Cebu, including the City of Cebu and all other cities which may be created after R.A.7621 was signed in 1992.

3) Power and responsibility of CPA

The Authority shall have the power and responsibility to, ① Have perpetual succession under its corporate name otherwise provided by law. ② Prescribe its bylaws and such rules and regulations.

4) Organization of CPA

The powers and functions of the CPA are vested in and exercised by a Cebu Port Commission

of 7 members, which is CPA's governing and policy-making body. The daily business and operational management of CPA is directed and controlled by the General Manager. CPA has its head office and four terminal offices, Toledo, Danao, Argao, and Santa Fe. Total number of employees is 176.

(3) Financial Condition

1) Revenue

Revenue of the CPA mainly comes from Port Tariff and Share of Arrastre / Stevedoring. Share of Arrastre / Stevedoring come from cargo handling charge of private cargo handling company. Wharfage dues and Share of Arrastre / Stevedoring represented 61 % of all revenue in 2000, and this figure has not changed significantly over the last 5 years.

2) Expenditure

Expenditure in 2000 of CPA is well balanced. Personnel cost is relatively low. CPA pays BTR dividend to the national government every year, which is 50 % of net income after income tax.

3) Financial Soundness of CPA

Rate of return on net fixed assets is low compared to the interest rate in the city. This means CPA needs to make more efficient use its assets.

Debt Service Coverage ratio is relatively low, but this does not pose a problem at the moment.

3.3.2 Port Operation

(1) Port Management and Operation

This proposed project targeting principally the enhancement of operational efficiency and safety of Cebu Baseport will lead to overall long term environmental improvement of the port.

Still, the most crucial constraint to these multiple benefits, assuming the required financial resources can be found, is the effective enhancement of the port operational management, including the human resources development. This would ensure proper operational management of the facilities provided by the project plan and hence the realization of multiple benefits including effective port environment improvement.

(2) Port Management by Computerization

Recently, container transport has not been limited to transport by sea but has spread to transport by land, i.e. by truck or by rail, all over the world, to build up and expand the container transport networks. And thanks to the growth of communication networks, the

introduction of advanced technology and the jumbo-sized of container vessels, what we call "mass transportation", is now possible and will become more and more the mainstream. As vessel berthing schedule are now mostly on a fixed-day-of the weekly basis, it will be essential for port authority to make the maximum use of port facilities by controlling all the information ranging from vessel 's arriving and departure.

For vessels' safe navigation and shortening the time of vessels' port stay within the harbor, it is also compulsory to maximize the accuracy and efficiency in container discharging/loading operations of vessels calling the port. It is very important, therefore, for port administrators to obtain all the information required for vessels' operators from shipping companies or their agents at the earliest possible moment and to utilize it for accurate and efficient operation.

Data processing by computer is indispensable in this regard, too.

4. Port Development Policy in Cebu Province

4.1 Roles and Functions of Cebu Baseport and Outports

4.1.1 Cebu Baseport

Cebu Baseport is located at the center of the southern part of the Philippines. It should play a leading role as a regional hub in Visayas and Mindanao. In particular, strengthening the international container terminal function is strongly required in order to cater for the progress of containerization and enlargement of the vessel size.

Cebu Baseport should have various port functions as an integrated port. The followings are major functions required for Cebu Baseport.

- International container vessel terminal
- RoRo vessel terminal
- Fast craft terminal
- Passenger/cargo vessel terminal
- Cargo vessel terminal

4.1.2 Outports

The outports numbered 107 consisting of 41 public ports and 66 private ones. Basically, main function of outports is as a gate port to the neighboring islands. Outports serve a supplemental function to Cebu Baseport for medium distance transport and also functions as the local transport system for short distance transport. Some ports are industrial ports to support hinterland industries. Through these functions, outports contribute to the regional development.

4.2 Port Development Policy in Cebu Baseport

4.2.1 Cebu Baseport

(1) Constraints

1) Limitation of Maximum Draft

The maximum draft of the vessels entering Cebu Baseport is limited below 8.5 meters.

2) Lack of Space for Land Area Expansion

The back yard area for cargo handling is very narrow. However, it is difficult to expand its backyard area.

3) Limitation of Waterfront Expansion

Adjacent waterfront area of Cebu Baseport is utilized.

4) Limitation of the Offshore Expansion

Since Cebu Baseport faces navigation area of Mactan Channel, offshore expansion of port facilities is limited.

5) Deterioration of the Facilities

In particular, pier 1-3 are seriously damaged.

6) Low Productivity of the Cargo Handling

Cargo handling productivity is low as a result of the lack of backyard area and RORO ramps.

7) Lack of Passenger Facilities

Although Cebu Baseport handles more than 10 million passengers per year, it has neither sufficient passenger terminal facilities nor amenity facilities.

(2) Development of the New Cebu Port

In order to solve the above mentioned problems and to develop Cebu Baseport as the regional hub for both international/domestic cargo and passenger transportation in Visayas and Mindanao region, the development of the New Cebu Port out of the existing port area is required.

(3) Development Policy for the New Cebu Port

1) International Container Terminal

Since this port can be developed with deep berths, its main function is an international container terminal. The New Cebu Port should have adequate port facilities to cater to the maximum container vessels operated in the inter-Asia container route in the future. High cargo handling efficiency is also needed for the competition with other ports.

2) Foreign Cargo Terminal

Foreign cargo vessels also need deep berths and should use the New Cebu Port. As a result, all foreign cargoes will be handled at the New Cebu Port.

3) Feeder domestic container vessels

The feeder domestic container vessels should be handled at the New Cebu Port for an efficient container transport network.

4) Land Transportation

In order to establish the linkage between international container routes at the New Cebu Port and domestic container routes at Cebu Baseport, the effective land route between the two ports

should be developed.

(4) Development Policy for Cebu Baseport

Location of Cebu Baseport, which is close to the city center, is advantageous for passengers. The primary function of this port is the transportation of passengers.

Moreover, Cebu Baseport should use its port facilities up to the maximum capacity by renovating and providing suitable facilities. RORO ramps are urgently required for efficient cargo handling.

For the renovation of this port, shifting plan of the vessels using the renovated berth should be considered carefully.

The efficient utilization of port zone should be considered in the future development plan.

1) Proper Maintenance and Rehabilitation

It is necessary to maintain all the facilities in available condition except when under construction. Proper maintenance and rehabilitation work should be conducted timely.

2) Expansion of Backyard Area

All backyard areas except CIP are very narrow. For efficient cargo handling, smooth vehicle transport and passenger safety, the expansion of backyard area should be promoted.

3) Improvement of Passenger Facilities

The passenger transport is the main function of this port and more than 10 million passengers use this port annually. But at present, Cebu Baseport has the passenger terminal buildings and cat walks only for the passengers of large RORO ferries and fast crafts. The construction of passenger facilities should be promoted for convenience and safety.

4) Efficient Land Use of Port Zone

Efficient use of Port Zone, including private land, should be promoted based on the appropriate land use plan.

5) Improvement of access road network in Cebu province

The improvement of access road network is necessary to encourage use of Cebu Baseport.

4.2.2 Port Development Policy for Outports

(1) Basic Policy

To play a role and function of Outports, well balanced development policy should be

authorized.

Port development policy of Outports shall be established from overall points of views such as safety, comfort, cost, time, service, accessibility, etc.

- 1) Establishment of the Trans Visayas Intermodal Transport Network is the priority target of the Region VII.
- 2) Competition between Baseport and Outports shall be encouraged to lead port and shipping industry to sustainable development
- 3) Urgent rehabilitation shall be implemented for damaged ports such as Carmen, Santa Fe, Tuburan, etc.
- 4) Construction of passenger terminal for Outports such as Toledo, Danao, Tuburan, Carmen, etc. shall be proceeded.
- 5) New San Remigio Port shall be developed in place of Hagnaya Port
- 6) Access road to the port from national road shall be widened and paved for poor access such as Argao, etc.
- 7) Port development plan of Cebu province shall be implemented on schedule together with road development plan for time-saving to reach Outports.
- 8) Master plan of each Outport shall be implemented to accommodate upgraded vessels on various points such as enlargement, fast, luxury, etc..
- 9) Safety facilities such as lighting, fender, navigation buoy, etc. shall be installed depend on necessary.
- 10) Passenger path shall be kept in safety from cargo handling operation.

(2) Recommendation on the Selected Two Major Outports for the Master Plan Study

Seven ports are recommended by CPA as candidate ports for conducting the master plan study. Those are Santa Fe, San Remigio, Carmen, Balamban, Toledo, Argao and Oslob. Potential, publicity, urgency of expansion/construction, and future demand of these ports are evaluated by three point method. Toledo and San Remigio have the priority in port development.

Table 4.2.1 Evaluation on Seven Candidate Outports

Port	Potential	Publicity	Urgency	Future Demand	Total
Santa Fe	2	3	1	3	9
San Remigio	2	3	3	3	11
Carmen	1	1	1	1	4
Balamban	1	1	1	1	4
Toledo	3	3	2	3	11
Argao (Taloot)	1	2	2	1	6
Oslob	1	1	2	1	5

5. Site Selection for the New Cebu Port

5.1 Preliminary Evaluation of Candidate Sites for the New Cebu Port

5.1.1 Evaluation Policy

(1) The Study on the Cebu Integrated Area Development Master Plan

The Study on the Cebu Integrated Area Development Master Plan was conducted from 1993 to 1994 by the JICA Study Team. This study nominated five conceivable candidate sites for the Cebu International Port along the Mactan Channel in Metro Cebu area on the east side of the Cebu island and recommends the detail study for these candidate sites to select the most appropriate site for the new Cebu Port.

(2) Toledo and Balamban

Toledo port is a main port to accommodate cargo and passenger traffic demand connecting Cebu island and Negros Occidental (San Carlos) which forms nationwide Ro-Ro routes.

In Balamban there is a large industrial estate, which is Export Oriented Economic Zone. This is planned for medium and heavy industries, especially for shipbuilding and allied activities. Besides private port facilities in this industrial park, Balamban has only small rock mound causeway operated by private company.

(3) Evaluation sites for the Cebu Port

To seek the most economically, technically and functionally suitable site, several factors such as 1) potential of the hinterland, 2) land transportation network, 3) natural conditions should be taken into account for selection of the site.

Metro Cebu area has large potential for container cargoes. Most export container cargoes are produced in Metro Cebu area. Cebu Baseport and surrounding areas have large potential for port activities and sea transport demand. The Cebu Baseport area also has many functions related to the port activities. In addition to these factors, another important factor is functional linkage with the existing Cebu Baseport.

The basic industrial development policy of Cebu province is that heavily industries should be developed in the west side of the island while light industries should be promoted in the east side of the island. Therefore, compared to Metro Cebu area, the container cargo potential in the west is small. This area also has difficulty in terms of the linkage with the existing Cebu Baseport.

Therefore, the evaluation sites for the Cebu Port are selected as follows;

Alternative 1 : Consolacion/Liloan

Alternative 2 : Mactan-North

Alternative 3 : Mactan-South

Alternative 4 : Cebu-South

Alternative 5 : Minglanilla

5.1.2 Results of Alternative Evaluation

Alternative 4 ranks first following by Alternative 1. The scores of these alternatives are 6 points higher than the other alternatives in the case of the Standard Type section. In case of the Weighted Environmental Aspects, Alternative 4 rank, is the first and Alternative 1 second—each obtained a score of 3 points higher than the others. For Weighted Construction Cost, Alternative 1 is the first while Alternative 4 is the second—the scores are 5 points higher than the others.

5.1.3 Proposal for Selection of Two Prioritized Development Sites

Based on the evaluation, Alternative 1 and Alternative 4 are identified as reasonable sites for long-term international container port among the five alternatives.

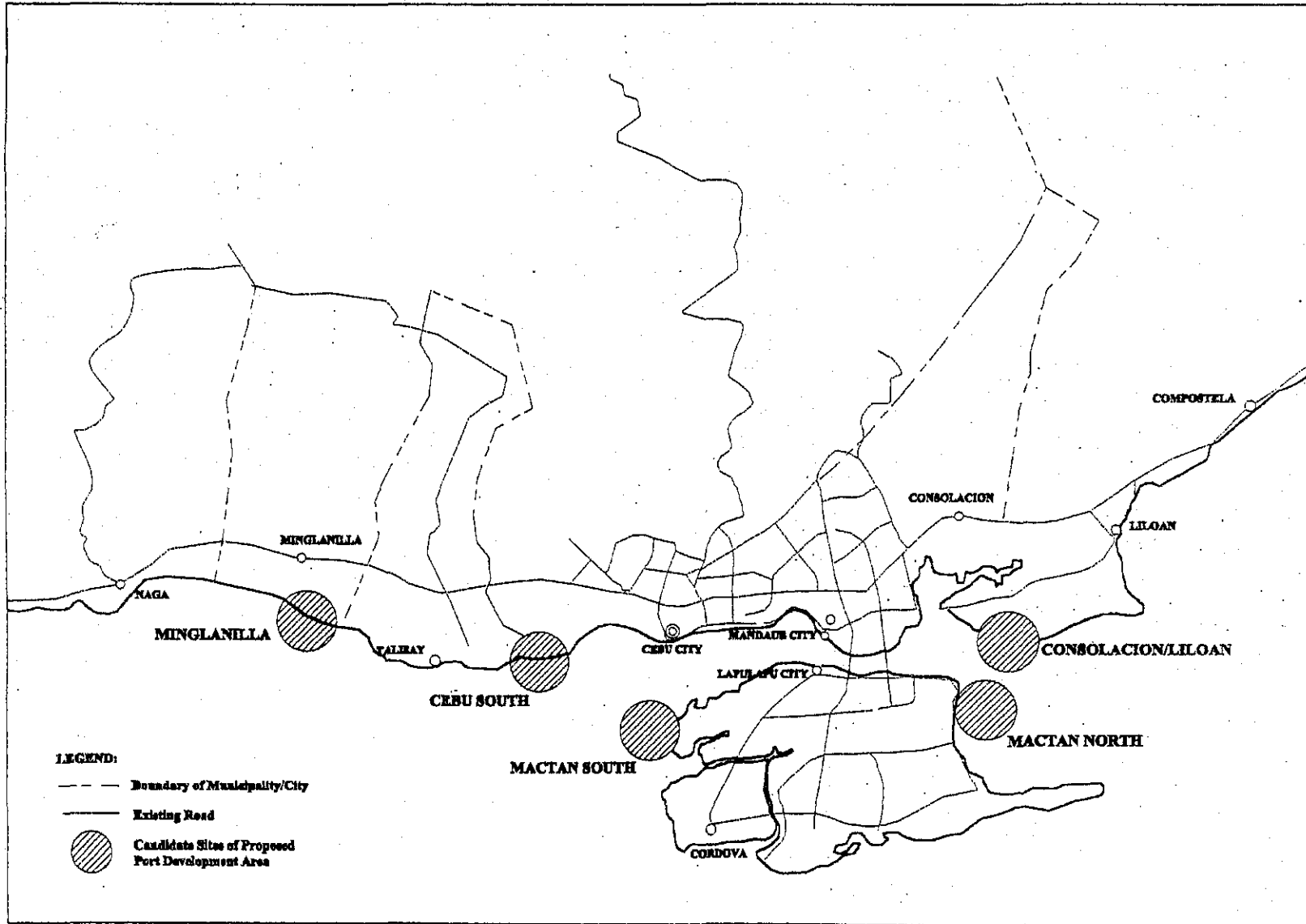


Fig. 5.1.1 The Candidate Sites for the New Cebu Port

Table 5.1.1 Evaluation Sheet on Selection of New Port Area from 5 candidates

	Standard Type										Weighted on Environmental Aspects										Weighted on Construction Cost												
	Alternative 1 Consolacion /Liloan		Alternative 2 Mactan- North		Alternative 3 Mactan- South		Alternative 4 Cebu-South		Alternative 5 Minglanilla		Alternative 1 Consolacion /Liloan		Alternative 2 Mactan- North		Alternative 3 Mactan- South		Alternative 4 Cebu-South		Alternative 5 Minglanilla		Alternative 1 Consolacion /Liloan		Alternative 2 Mactan- North		Alternative 3 Mactan- South		Alternative 4 Cebu-South		Alternative 5 Minglanilla				
	weig ht	origi nal	weig hted	origi nal	weig hted	origi nal	weig hted	origi nal	weig hted	origi nal	weig ht	weig even	weig hted	weig even	weig hted	weig even	weig hted	weig even	weig hted	weig even	weig hted	weig even	weig hted	weig even	weig hted	weig even	weig hted	weig even	weig hted				
101 Availability of Water Depth at Berth	1	4	4	4	4	3	3	4	4	1	1	1	4	4	4	4	3	3	4	4	1	1	1	4	4	4	4	3	3	4	4	1	1
102 Availability of Water Depth at Access Channel	1	5	5	5	5	5	5	5	5	5	1	5	5	5	5	5	5	5	5	5	5	1	5	5	5	5	5	5	5	5	5	5	
103 Oceanographic Conditions	3	3	9	3	9	2	6	2	6	1	3	2	3	6	3	6	2	4	2	4	1	3	2	3	6	3	6	2	4	2	4	1	2
104 Soil Condition	1	4	4	3	3	3	3	2	2	2	2	1	4	4	3	3	3	3	2	2	2	2	3	4	12	3	9	3	9	2	6	2	6
105 Land Availability of Port Area and Future Expansion	1	3	3	3	3	4	4	3	3	3	3	1	3	3	3	3	4	4	3	3	3	3	1	3	3	3	3	4	4	3	3	3	3
106 Natural Environmental Aspects	2	4	8	4	8	4	8	5	10	4	8	3	4	12	4	12	4	12	5	15	4	8	1	4	4	4	4	4	4	5	5	4	4
107 Accessibility from Existing Road	1	4	4	4	4	3	3	4	4	5	5	1	4	4	4	4	3	3	4	4	5	5	1	4	4	4	4	3	3	4	4	5	5
Total of Evaluated Score on Natural Conditions	10										10											10											
Ranking from Higher Weighted Scores on Natural Conditions			27	37	26	36	24	32	25	34	21	27	27	38	26	37	24	34	25	37	21	27	27	38	26	35	24	32	25	31	21	26	
				1		2		4		3		5		1		2		4		2		5		1		2		3		4		5	
201 Accessibility from Existing Port	3	4	12	3	9	3	9	4	12	2	6	2	4	8	3	6	3	6	4	8	2	4	3	4	12	3	9	3	9	4	12	2	6
202 Navigation Safety for Ship	2	4	8	3	6	3	6	4	8	5	10	2	4	8	3	6	3	6	4	8	5	10	2	4	8	3	6	3	6	4	8	5	10
203 Navigation Safety for Aircraft	1	3	3	2	2	5	5	5	5	5	5	1	3	3	2	2	5	5	5	5	5	5	1	3	3	2	2	5	5	5	5	5	5
204 Necessity of Port Function to Industrial Development	1	3	3	3	3	4	4	3	3	3	3	1	3	3	3	3	4	4	3	3	3	3	1	3	3	3	3	4	4	3	3	3	3
205 Easiness of Land Acquisition	1	4	4	3	3	3	3	3	3	4	4	1	4	4	3	3	3	3	3	3	4	4	1	4	4	3	3	3	3	3	4	4	4
206 Social Environmental Aspects	2	3	6	3	6	4	8	5	10	3	6	3	3	9	3	9	4	12	5	15	3	9	2	3	6	3	6	4	8	5	10	3	6
Total of Evaluated Score on Social-Economic Conditions	10		0		0		0		0		0	10		0		0		0		0		0	10		0		0		0		0		0
Ranking from Higher Weighted Score on Social-Economic Conditions			21	36	17	29	22	35	24	41	22	34	21	35	17	29	22	36	24	42	22	35	21	36	17	29	22	35	24	41	22	34	
				2		5		3		1		4		2		5		2		1		4		2		5		3		1		4	
Grand Total of Evaluated Scores	48	73	43	65	46	67	49	75	43	61	48	73	43	66	46	70	49	79	43	62	48	73	43	64	46	67	49	72	43	60	48		
Ranking from Higher Weighted Score on Total Conditions			2		4		3		1		5		2		4		3		1		5		1		4		3		2		5		

5.2 Evaluation of two Priorized Sites for a New Port

5.2.1 Soil Boring Surveys and Wave Conditions

(1) Soil Boring Survey

9 borings in total have been drilled 6 in Consolacion and 3 in Cebu South, accompanied by Standard Penetration test. The result is summarized as follows

Consolacion Site

• Composition of Soil Layer	0 m (sea bed) to 10 m deep: Loose and Soft sandy Clay with coral fragments, Highly compressive, $N_{ave} = 3$
	10 m to 25 m deep: Medium hard sandy Clay with coral boulder, $N_{ave} = 12$
	Below 25 m: Hard sandy Clay , $N_{ave} > 30$

Cebu South Site

• Composition of Soil Layer	0 m (sea bed) to 18 m: Very soft Clay , $N_{ave} = 0$ to 2, Highly compressive
	18 m to 27 m Sand with clay including coral fragments, Medium dense, $N_{ave} = 15$ to 20..
	27m below Highly dense Sand , $N_{ave} > 40$

(2) Wave Conditions

The equivalent deepwater wave height under the normal rough weather conditions (return period of 1 year) and the wave height in 50 years at the two sites are estimated. Those are summarized in Table 5.2.1.

Table 5.2.1 Equivalent Deepwater Wave Height at 2 Sites

Area	Consolacion			Cebu South		
	1 year	50 years		1 year	50 years	
H 1/3 (m)	0.8-0.84	1.64 - 2.03	1.20 - 1.50	1.18-1.20	4.02 - 4.10	3.20 - 3.43
Direction	-	NE	NNE	-	S	SW

For the selection of a new port site, the above table indicates that in terms of wave conditions, Consolacion is preferable because it will probably not require a protection against incoming waves.

5.2.2 Recommendation on the Site of a New Cebu Port

Based on the detailed survey, including soil borings and wave assessment, the Study Team re-evaluated the two candidate sites. Re-evaluated scores of both sites are almost same as the preliminary evaluation scores. (See section 5.1) The final candidate sites, Consolacion-Liloan area and Cebu South area, have both advantages and disadvantages. Generally, Cebu South area has advantage in natural/social environmental aspects, while Consolacion-Liloan area has advantage in natural condition (oceanographic and soil condition).

Considering the integrated feasibility of the project from various aspects, including engineering and social aspects, Consolacion-Liloan area is recommended for the site of a new Cebu Port, and it is suggested to start the initial development for a new port at Consolacion area.

In order to develop a New Cebu Port in Consolacion-Liloan area, Cebu North Coastal Road project, including a new bridge over Cansaga Bay, must be promoted together with a new port development. This road is essential for a new port development as a main access route.