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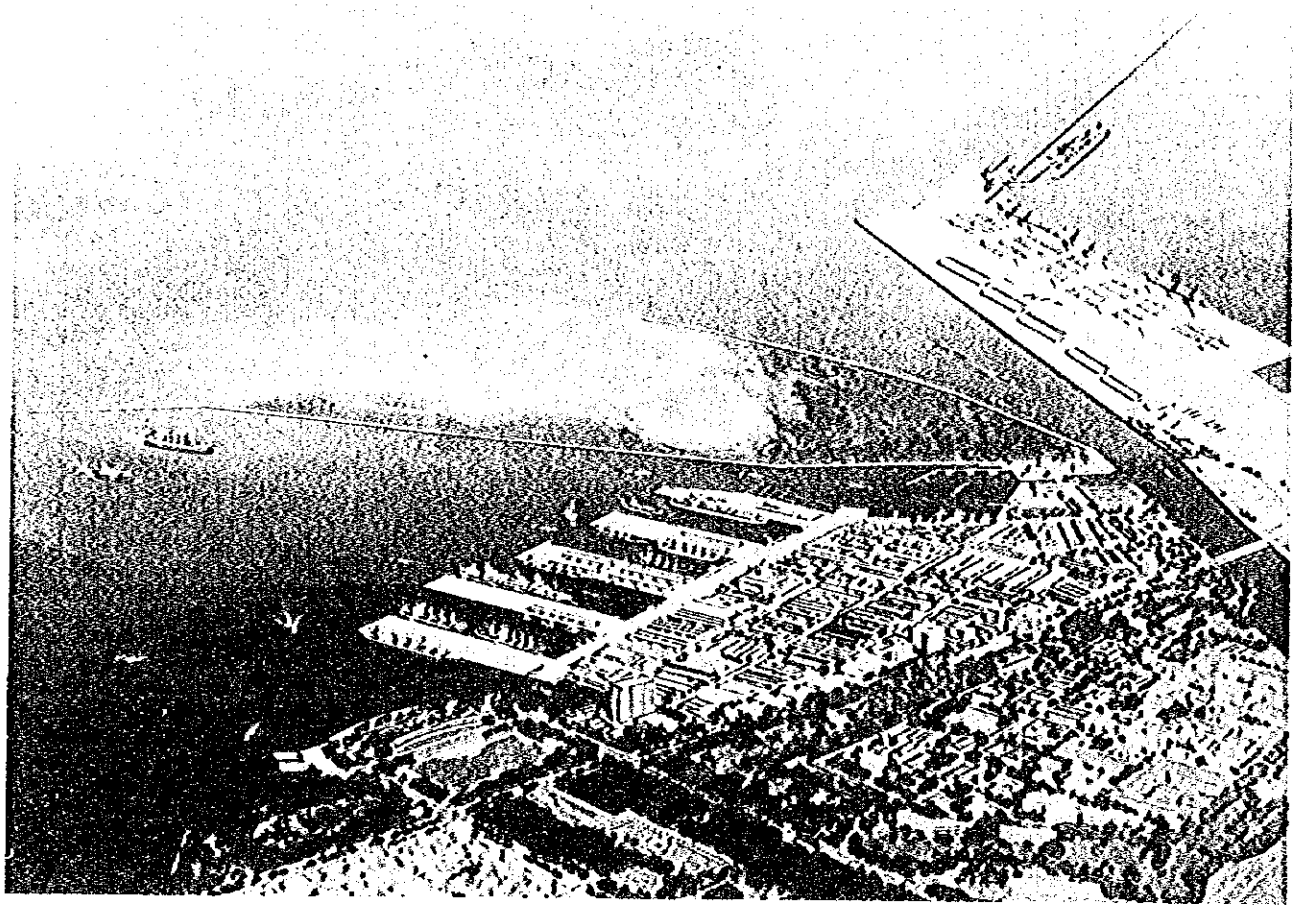
VOLUME 2 MAIN REPORT

MANILA SOUTH PORT REHABILITATION PROJECT

REPUBLIC OF THE PHILIPPINES



FEASIBILITY STUDY

FINAL REPORT

JUNE 1987

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request of the Government of the Republic of the Philippines, the Government of Japan has decided to conduct a feasibility study on the Manila South Port Rehabilitation Project, and entrusted the study to the Japan International Cooperation Agency (JICA).

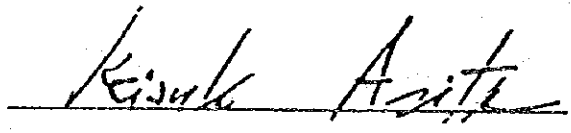
JICA sent to the Philippines a study team headed by Mr. Terumi Iijima, Executive Director, the Overseas Coastal Area Development Institute (OCDI), several times from April 1986 to March 1987.

The team exchanged views with the officials concerned of the Government of the Republic of the Philippines on the project, conducted field surveys and collected reference materials. After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the promotion of the Manila South Port Rehabilitation Project and contribute to the friendly relations between our two countries.

I wish to express my deep appreciation to all the officials concerned of the Government of the Republic of the Philippines for the close cooperation extended to the team.

June 1987



Keisuke Arita
President
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

June 1987

Mr. Keisuke Arita
President
Japan International Cooperation Agency

Dear Mr. Arita:

It is my great pleasure to submit herewith the Report for the Feasibility Study on the Manila South Port Rehabilitation Project in the Republic of the Philippines.

This report is the result of studies carried out by the Overseas Coastal Area Development Institute of Japan and Nikken Sekkei Ltd. at the request of the Japan International Cooperation Agency. Regarding this project, our study team conducted four series of field surveys, one of which took place for 75 days from June 16, 1986, to collect a variety of data including data concerning natural conditions.

The findings of these surveys were discussed to review the Master Plan and to study the feasibility of the Manila South Port Rehabilitation Project, and were then compiled into this report. The study shows that the Project is extremely important, so I hope the Project is executed promptly.

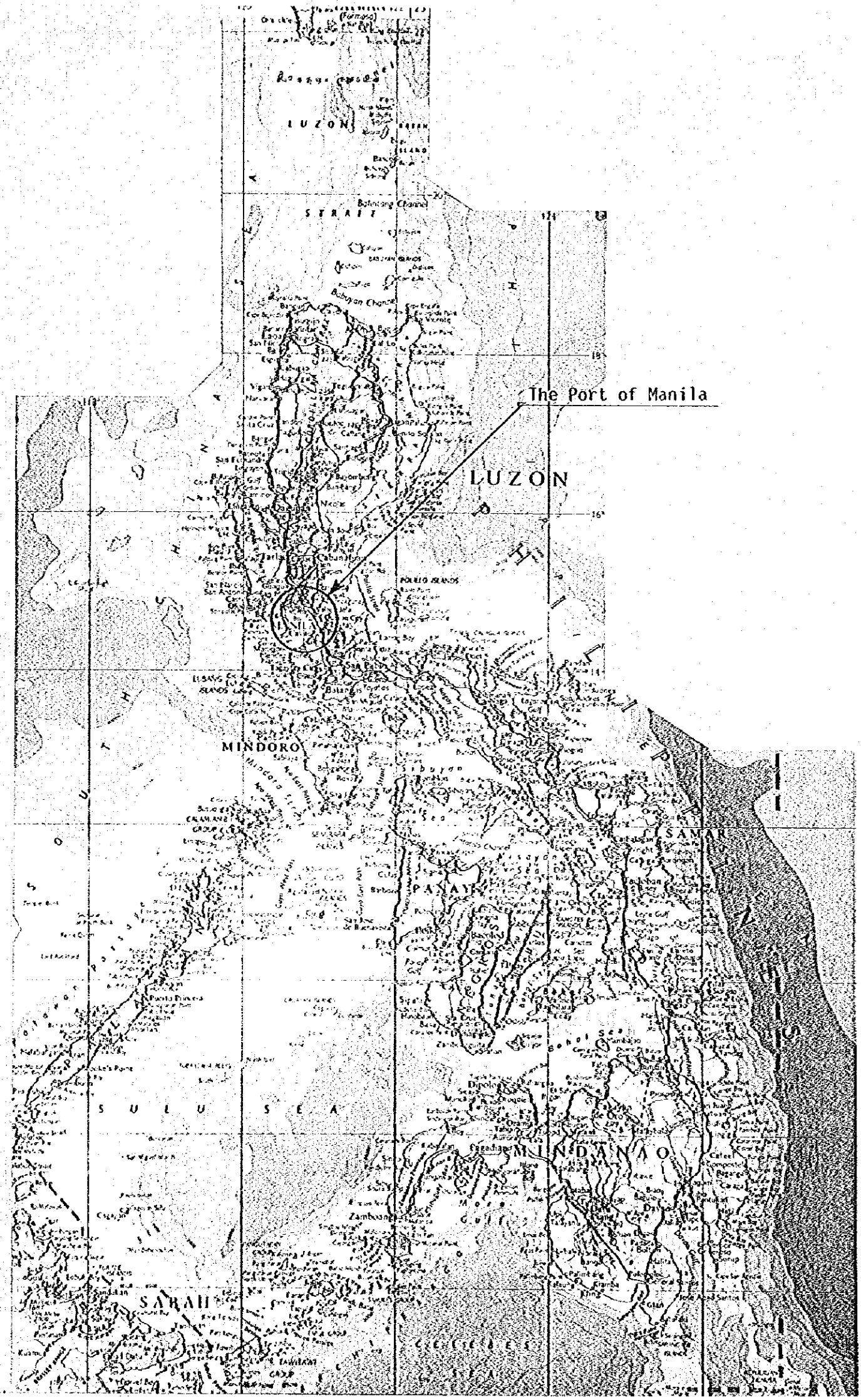
On behalf of the study team, let me express my heartfelt thanks to the Philippine Port Authority and to the other related agencies of the Philippine Government for the generous cooperation, assistance and warm hospitality which were extended to the study team during their stay in the Philippines.

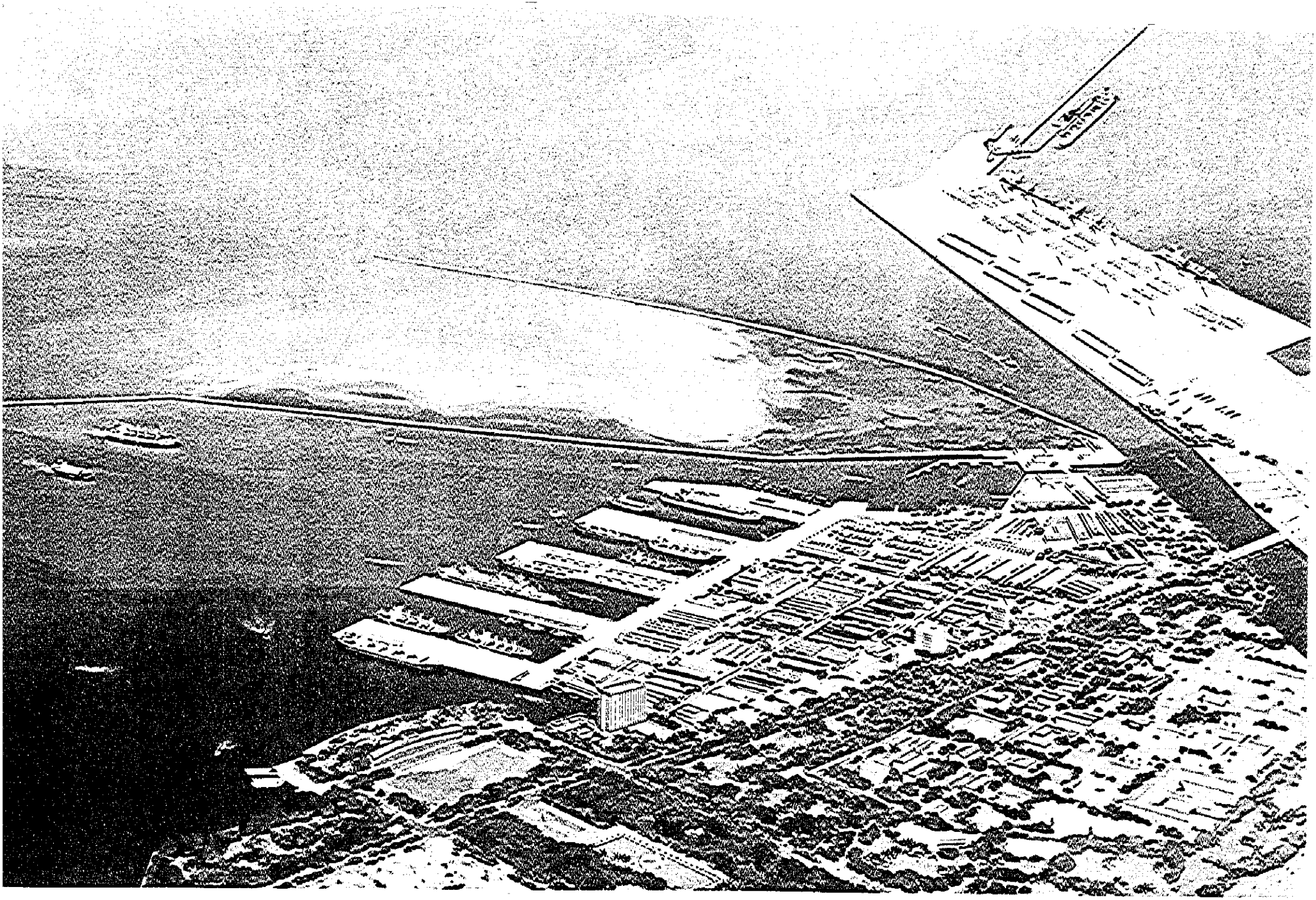
Our thanks are also due to the Japan International Cooperation Agency, the Ministry of Transport, the Ministry of Foreign Affairs and the Japanese Embassy in Manila for their valuable advice and support during the field surveys and the preparation of this report.

Yours faithfully,

T. Iijima

Terumi Iijima
Head
Japanese Study Team for the Manila South Port Rehabilitation Project
(Executive Director, the Overseas Coastal Area Development Institute of Japan)


The Port of Manila
LUZON
MINDORO
SAMAR
PANAY
MINDANAO
SULU SEA
SARAH
CELEBES SEA



EXCHANGE RATE

$ 1 = ₱ 20.5

$ 1 = ¥ 154

ABBREVIATIONS

ADB	Asian Development Bank
AG&P	Atlantic Gulf and Pacific Corp. Manila
BAECON	Bureau of Agricultural Economics
BAEX	Bureau of Agricultural Extension
BBTI	Batangas Bay Terminal Incorporated
BCGS	Bureau of Coast Geodetic Survey
BEU	Bureau of Energy Utilization
BFAR	Bureau of Fishery Aquatic Resources
BFD	Bureau of Forest Development
BM	Bench Mark
BMG	Bureau of Mining Group
BOC	Bureau of Customs
BOI	Board of Investments
BOM	Bureau of Mining
CB	Central Bank
DWT	Dead Weight Tonnage
EPZA	Export Processing Zone Authority
EIRR	Economic Internal Rate of Return
FPA	Fertilizer and Pesticide Authority
FAO	Food and Agricultural Organization of the United Nations
GDP	Gross Domestic Product
FRR	Financial Internal Rate of Return
GNDP	Gross National Domestic Product
GNP	Gross National Product
GRDP	Gross Regional Domestic Product
Gs	Specific Gravity of Soil Particles
GRT	Gross Registered Tonnage
GT	Gross ton(s)
IBRD	International Bank for Reconstruction and Development
JETRO	Japan Trade Center
JICA	Japan International Cooperation Agency
JIS	Japan Industrial Standards
MARINA	Maritime Industry Authority
MHS	Ministry of Human Settlement
MICT	Manila International Container Terminal
MIRDP	Mindoro Intergrated Rural Development Plan

MLLWL	Mean Lowest Low Water Level
MOA	Ministry of Agriculture
MOE	Ministry of Energy
MMA	Metropolitan Manila Area
MTI	Ministry of Trade and Industry
MOTC	Ministry of Transportation and Communications
MPWH	Ministry of Public Works and Highways
MT	Metric Ton(s)
NEDA	National Economic Development Authority
NCA	National Coal Authoriy
NCC	Northern Cemment Corporation
NCR	National Capital Region
NCSO	National Census and Statistics Office
NEPC	National Environmental Protection Council
NFA	National Food Authority
NIEP	Nationwide Industrial Estate Program
NSC	National Steel Corporation
NTPP	National Transportation Planning Project
OCDI	Overseas Coastal Area Development Institute of Japan
OECF	Overseas Economc Cooperation Fund
PAGASA	Philippine Atomospheric Geographical and Astronomical Service Administration
PASTORA	Planning Assistance Service to Rural Areas
PCA	Philippine Coconut Authority
PCIA	Philippine Cement Industry Authority
PFDA	Philippine Fishery Development Authority
PFM	Pacific Flour Mills
PHILSUCOM	Philippine Sugar Commission
PMU	Port Management Unit
PNCC	Philippine National Construction Company
PNOC	Philippine National Oil Company
PNR	Philippine National Railways
P	Peso(s)
PPA	Philippine Ports Authority
qu	Unconfined compressive strength
RT	Revenue Ton(s)
SPT	Standard Penetration Test
TEU	Twenty-foot Equivalent Units
UDS	Undisturbed Sample

UNICHEM	United Coconut Chemicals, Inc.
W	Water Content
$	United States Dollar(s)
¥	Japanese Yen
PMU Manila	Port Management Unit (Manila)

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SUMMARY

Chapter 1 INTRODUCTION

1.1 Background

The Port of Manila is the most important port in the nation, and plays a major role in the national economic development.

At present, the Government of the Philippines is steadily developing the Manila International Container Terminal in accordance with the master plan drawn up in 1978. At Manila Port, cargoes are also handled at the piers located in the South Harbor and the North Harbor.

These piers were constructed after World War II. The facilities have become deteriorated, and cargo handling activities at the South Harbor are being hindered by the outdated facilities.

Moreover, there are many related problems such as the lack of public areas and warehouses.

So, the Government of the Philippines has requested the Government of Japan to provide technical and economic cooperation in planning the rehabilitation of the South Harbor piers.

1.2 Objectives of the Study

The objectives of the study are to formulate a Master Plan for the development of the South Harbor of Manila Port for the period up to the year 2005 and to prepare a Short-term Rehabiitation Plan for this harbor including a feasibility study within the framework of the Master Plan.

The target year for the Short-term Rehabilitation Plan is the year 1995.

(Chapter 2 is omitted.)

Chapter 3 PRESENT SITUATION OF THE PORT

3.1 Geographic Features and Natural Conditions

The Port of Manila is situated at the east end of the Bay of Manila and the mouth of the Pasig River. The Bay of Manila is surrounded with low mountain ranges, which protect the Port of Manila from strong winds. Wave

heights are usually not so high within the Harbor area and the Harbor is very quiet.

The Port is situated at the estuary of the Pasig River and therefore, siltation is unavoidable.

In the vicinity of Manila, many earthquakes have been experienced. Therefore, the seismic load factor shall be taken into consideration for structural design.

3.2 Structural Survey

Table 3.2. is the overall assessment of the structural soundness/reliability of the individual piers based on the various investigations and inspections (refer to the "Main Report" Fig. 3.1 of Chapter 3).

Table 3.2 Overall Evaluation of the Piers

Pier	Evaluation
3	Aged but still usable with some partial minor repair works to slabs/beams and fenders.
5	The most sound pier, but full repair of fenders and minimum repair works to slabs/beams required.
9	Aged but still usable with some partial minor repair works to slabs/beams and fenders.
13	Most deteriorated pier, very dangerous and in almost critical condition for normal cargo handling operation without overall repair works to superstructure including fenders.
15	Second most deteriorated pier, but still usable with some repair works to slabs/beams and fenders.

The following are the results of the survey/inspection of the existing buildings.

1. The two transit sheds of Pier 5 are structurally damaged, but others are good and still usable.
2. With regard to warehouses and buildings, the following are structurally damaged.

   Warehouse ..... Block 141 (WH-2)

   Block 166

Buildings ..... Block 155 (MPWH's Equipment Service)
Machine Shop (in Container Yard-01)

3. Most of the warehouses and buildings near the engineering island basin are considerably damaged.

Most of the roads in the port zone are paved and no major rehabilitaion/renovation work will be required for the time being, though some parts of the pavement are partially uneven with cracks.

The drainage system does not necessary work effectively and shallow rainwater pools are observed here and there after rainfall.

North Harbor

The result of the underwater survey tells that very few sheet piles are damaged and they have no structural defects (refer to the "Main Report" Fig. 3.3 of Chpater 3). Some gaps between the sheet piles were observed but the total number of the gaps is very small while the total length of each of the Pies is quite long along their perimeters.

The backfilling behind the sheet piles is filled with firm and dense soil material and no leakage of the backfilling is expected through the gaps.

The trial excavation inspection shows that the tie-rods at Peir 8 are with partially corroded and the tie-beams at Pier 16 are broken and have no structural reliability (refer to the "Main Report" Fig. 3.4 and 3.5 of Chapter 3).

The Team studied the stability of the Piers based on the results of the trial excavation inspection and the geological investigation.

The conclusions of the structural study are as follows.

(1) No heavy load should be placed within 5 m from the end of piers.
(2) No deepending of water depth should be allowed without additional structural reinforcement works.

- 6 m below MLLW for Piers 8 through 14
- 5 m below MLLW for Pier 16

Pier 16 needs to be repaved. Because Pier 16 has a bad surface condition which is supposed to have been brought about by local settlement caused by heavy wheel loads, there is rutting and constant flow of backfilling material by rain water.

No further selltement of the backfilling of P16 is expected. The

following are the reasons for this:

(a) no leakage of the backfilling was observed during the underwater survey

(b) no partial settlement was perceived in the backfilling around the end of the relieving platform (if the backfilling went out through the gaps between the sheet piles, partial settlement would be induced in the backfilling.....)

(c) the settlement due to consolidation is finished.

Chpater 4 PRESENT SHIPPING AND CARGO THROUGHPUT

4.1 Ship Types and Characteristics

The number of oceangoing ships which called at the Port of Manila in 1985 is estimated by type of ship as follows:

	No. of Ships Calling	Percentage
Container Ships	882	43.0
Conventional Gen. Cargo Ships	459	22.4
Tankers	220	10.7
Bulk Carriers	202	9.8
Semi Container Ships	85	4.1
Others	205	10.0

About 60% of the container ships are berthed at South Harbor and the rest moored at MICT. On the other hand, tankers, other ships and bulk carriers are generally moored at Anchorage.

The average ship size and the average loading/unloading volume per ship by type of ship are shown in Table 4.1

The predominant size of conventional general cargo ships calling at South Harbor is in the range of 5,000 - 10,000 DWT. As for container vessels, about 60% of them are below the 10,000 DWT class; however, 17,500 - 20,000 DWT class ships account for 20% of the container ships. Most of the container ships that call at the Port of Manila are feeder vessels connecting with line haul vessels at Hong Kong and Taiwan.

Table 4.1 Characteristics of Oceangoing Ships which called at Manila in 1985 by Ship Type

Ship Type	Average DWT	Avg. Loading/ Unloading Volume per ship (tons)
Conventional Ships	9,951	3,145
Semi-container Ships	10,678	1,761
Container Ships	12,022	1,905
Bulk Carriers	17,575	6,298
Tankers	9,554	1,210

4.2 Cargo Movement

4.2.1 General

The Port of Minala, the major commercial port in the Philippines, handled about 11.4 million tons of cargo including 4,406 million tons of foreign trade in 1985.

With regards to foreign trade, the Port of Manila handles about eighty percent (80%) of all the import cargo and fifty percent (50%) of all the export cargo passing through Philippine government commercial ports. Thus, the hinterland of the Port of Manila is not limited to Metro Manila and its vicinity, but actually covers the entire nation.

The percentage of foreign trade cargo handled at the berths of South Harbor has been decreasing along with the increase at M.I.C.T. due to the advance of containerization. On the other hand, the percentage of foreign cargo handled at Anchorage has remained constant at over 30%. The major cargoes handled at Anchorage are bulk and homogeneous cargoes.

4.2.2 Foreign Trade Cargo by Commodity by Packing Type

As for imports, grains and chemicals including fertilizer are the most important commodities, while food products, timber and coconut products are the leading exports in 1985.

Loose cargo was mainly handled at Anchorage, Pier 9 and Pier 5. Other cereals (mainly rice) and bagged fertilizer were the main "loose" cargoes handled. About 33% of the imports were bulk cargo. However, the export

volume of bulk cargo was small. About 85% of all bulk cargo was handled at Anchorage.

The percentages of containerized cargo to the total general cargo are 56.0% for imports and 84.5% for exports in 1985. Around 43% of the total containerized cargoes are handled at MICT in 1985. 57% of the containerized cargo handled at South Harbor, mainly at Pier 3 and Pier 13.

4.3 Utilization of Port Facilities

The average berth occupancy rate of the whole South Harbor was 22% in 1985, and the average tonnage handled per meter run per year was estimated at 504 t/m. These values were relatively low compared with the figures for North Harbor.

Berths No. 3-3, 9-1, 13-1 and 15-2 are relatively well-used. However, the highest berth occupancy ratio is only 45.6%.

The berth occupancy of berths No. 5-4, 5-5, 13-6 and 13-7 are lower due to poor physical conditions such as the narrow apron width and the poor fender system, and also due to the existing operational conditions of the transit sheds behind the quaywall.

There are some sorting and storage facilities with a low utilization rate in the South Harbor area. Sheds C, K and L were not used at all in 1985 due to a lack of cargo to be stored and to their dilapidated condition.

Chpater 5 PORT MANAGEMENT

5.1 Existing Port Operations

The Port of Manila is operated under "common-use" policy. Therefore, there are no public port facilities for the exclusive use of any port user, but rather all the port facilities are assigned on a first-come first-served basis. However, berthing priority is granted to certain vessels having special arrangements with PPA. The following guodeline is used at present for berthing allotment at South Harbor:

① Container handling ships are berthed at Piers 3 and 13.
② Break bulk handling ships are berthed at Piers 5 and 9.
③ Passenger ships and foreign government vessels on official business are berthed at Pier 15.

The official working holidays of the Port are only two days a year, Good Friday and Christmas.

Cargo handling in South Harbor is carried out in two shifts: the day shift (from 7 a.m. to 7 p.m.) and the night shift (from 7 p.m. to 7 a.m).

The existing stevedoring work is ordinarily conducted using ship gear in South Harbor except for container handling at Pier 3 where a "tango" crane is used for loading and unloading.

5.2 Cargo Handling Productivity

The cargo handling work except container handling is executed by two different types of companies at South Harbor, stevedoring firms on board and arrastre firms at quay side. Sometimes the working speed of the two are differnt, so the overall productivity declines. Moreover, insufficient coordination among the firms related to the handling and tranport of cargoes causes a lot of lost time.

The percentage of standby/lost time to the total working time for bulk handling at Anchorage is estimated at 40%. One of the major causes is the delays caused by barges.

Chpater 6 DEMAND FORECAST

6.1 General Port Development Policy and Basic Assumptions

Considering the basic direction of national and regional development policy, basic assumptions concerning the roles and functions of the Port of Manila are set as follows:

① To reduce the burden of excessive concentration of traffic in MMA and to achieve more effective and economic transportation, certain cargoes such as iron and steel products and fertilizer will be imported via the Port of Batangas considering the spatial distribution of related industries.

② The basic functions and roles of the Port of Manila are the same as those specified in the Master Plan Study conduted by the Salzgittar Consult GMBH except for the above-mentioned relationship with the Port of Batangas.

③ Reflecting the status of MMA as the center of the Philippine economy, the Port of Manila will continue to play a central role as the main

gateway for imported goods.

④ The export commodities handled at the Port of Manila will not change remarkably during the planning period.

6.2 Cargo Traffic Forecasts

Two methods are used to forecast the cargo volume to be handled at the Port of Manila. One is a macro forecast which is a method to estimate the total cargo volume as a whole. The other is a micro forecast, which is a method to estimate the cargo volume of each commodity group individually.

Herein, the future cargo volumes to be handled at the Port of Manila for the target years are assumed equal to those forecast in the medium case of the forecast by commodity group, that is the micro forecast.

Summary of Foreign Trade Cargo Forecast

(thousand tons)

	(year) Commodity	1995	2005
Imports	Dairy Products	156	264
	Wheat	647	1,040
	Other Cereals	151	267
	Feed	514	956
	Paper and Pulp	253	353
	Fertilizer	410	460
	Chemicals	958	1,561
	Iron & Steel	290	320
	Machinery & Transport Equip.	437	764
	Others	1,192	1,914
Sub total		5,008	7,899
Exports	Fish & Fish Products	61	131
	Feed	66	85
	Other Food	317	483
	Forest Products	106	78
	Coconut Oil	80	80
	Other Coconut Products	85	85
	Others	885	1,600
Sub total		1,600	2,542
Grand total		6,608	10,441

Using the estimated percentages of each packing type by major commodity and the growth of containerization, the future cargo volume by packing type is estimated.

Chapter 7 REVISED MASTER PLAN

7.1 Fundamentals of the Master plan

Based on the role of South Harbor and the countermeasures to solve the major problems, the following basic strategies for the Master Plan, with a target year of 2005 are as follows.

In order to secure efficient port operations, South Harbor will continue to be used for the exclusive handling of foreign trade cargo except for some containerized cargoes which will be handled at M.I.C.T.

1) Effective Cargo handling
2) Rehabilitation of old port facilities
3) Container cargo handling at South Harbor
4) Preferential berthing
5) Safety

Based on these concepts, the future foreign trade cargo volume of South Harbor is forecasted as shown in Table 7.1.

Table 7.1 Estimated Foreign Trade Cargo Volume by Packing Type by Area

(1,000 tons)

Year / Area	Loose		Container		Bulk		Liquid		Total	
	Imp	Exp	Imp	Exp	Imp	Exp	Imp	Exp	Imp	Exp
1985										
S.H. Pier	530	138	669	447	214	7	22	5	1435	597
Anchorage	408	1	1	3	891	45	86	87	1386	136
MICT	3	2	526	321	-	-	-	-	529	323
Total	941	141	1196	771	1105	52	108	92	3350	1056
1995										
S.H. Pier	541	223	343	189	296	34	-	-	1180	446
Anch.	220	-	-	-	1404	-	262	80	1886	80
MICT	-	-	1942	1074	-	-	-	-	1942	1074
Total	761	223	2285	1263	1700	34	262	80	5008	1600
2005										
S.H. Pier	701	364	510	268	477	34	-	-	1688	666
Anch.	102	-	-	-	677	-	425	80	1204	80
Grain Terminal	-	-	-	-	1597	-	-	-	1597	-
MICT	-	-	3410	1796	-	-	-	-	3410	1796
Total	803	364	3920	2064	2751	34	425	80	7899	2542

7.2 Overall Evalution of Existing Facilities at South Harbor

(1) The repair of the slab at the end of pier 3 and at the back up area of berth No. 4 ar absolutely necessary.

(2) Pier 5 is in the best condition structurally of all the pier but the open storaage area at the pier is insufficient. Sheds K and L are in very poor condition.

7.3 Evaluation of the Alternative Plans

The alternative plans are evaluated based on the following criteria.

Table 7.3 Evaluation of the Alternative Plans

Item	Evaluation			
	Plan 1	Plan 2	Plan 3	Plan 4
Land Use	○	△	○	○
Operation of the facilities	○	○	◎	◎
Total Construction Cost	◎	◎	△	△
Investment Timing	○	○	△	△
Adaptability to Changing Conditions Potential for Future Development	△	△	◎	○
Future Development	○	○	○	○
Overall Evaluation	◎	○	△	△

Key ◎ Excellent
○ Ordinary
△ Some problems

In order to confirm the most appropriate plan, simulation tests are executed. Judging from the results of the simulation test. Plan 1 is selected as the most appropriate plan (refer to the "Main Report" Fig. 7.1 of Chapter 7).

7.4 Land Use Plan

The land use plan is designed to promote effective cargo movement and increased port related business activities. The main direction of the plan is outlined below.

1) The location of Government related building like B.O.C., M.P.W.H., P.P.A. will not change in the future.
2) The port related urban business area where the bank and the electronic power Co., Ltd. are located along Bonifacio drive will remain basically unchanged in the future.
3) A parking are for cargo vehicles and for vehicles with business inside

the port should be prepared.

4) Increase and rearrangement of storage facilities should be considered.
5) The main access roads to the piers are 25th st., 16th st. and 13th st., and the main lateral roads are San Francisco st., Chicago st. and Rail road st.
6) It might be preferable to reserve the area which is now sequestered by the Goernment for future development (refer to the "Main Report" Fig. 7.5 of Chapter 7 for the land use plan in 2005).

Chapter 8 THE SHORT-TERM REHABILITATION PLAN

The major short-term for the development of the Port of Manila by 1995 include rehabilitation of dilapidated facilities and improvement operations.

The major items of the Short-term Plan are as follows:

① To repair the damaged portions of existing facilities to maintain the existing capcity.
② To improve wharf facilities to raise the cargo handling productivity and improve the overall cargo flow at the piers. These works include the widening of aprons and the enlargement of open storage areas at the piers.
③ To improve the cargo handling productivity at anchorage, especially through the introduction of floating pneumatic unloaders and the reallocation of some cargoes to perside handling.

Based on these goals and the results of engineering inspections, the Short-term Rehabilitation Plan is proposed as shown in Fig. 8.1 of the "Main Report" Chapter 8.

Chapter 9 DESIGN, COST ESTIMATION AND CONSTRUCTION SCHEDULE

Design conditions for the rehabilitation plan are shown in Table 9.1. Soil conditions applied to the structural design are shown in Table 9.2.

Proposed structures for each Alternative plan were designed using these conditions as shown in Figs. 9.1.

Construction schedule and rough cost estimation are shown in Table 9.3 through 9.5.

Table 9.1 Design Conditions

1) Tide Level

M.H.H.W ..... M.L.L.W + 0.98 m

M.H.W ..... M.L.L.W + 0.838m

M.S.L ..... M.L.L.W + 0.462m

M.L.W ..... M.L.L.W + 0.101m

(M.L.L.W means Mean Lower Low Water)

2) Seismic Coefficient

for new structures ... Kh = 0.15*1

for existing ..... Earthquake-proof improvement

structures will not be conducted.

3) Maximum Berthing Ship Size for Structural Design*2

Type of Ship	Dead Weight Tonnage(tf)	Length Overall (m)	Molded Breadth (m)	Full Draft (m)
General Cargo Ship	25,000	184	24.9	10.6
Container Vessel	25,000	220	28.2	10.5

4) Berthing Velocity

v = 0.10 m/sec

5) Water Depth of the Berth

D = 10.5 m (M.L.L.W - 10.5 m)

6) Crown Height of the Quay Wall

H = M.L.L.W + 4.0 (approximately)

7) Surcharge Load on the Wharves

Distributed load

Ordinary ..... 2.0 tf/m^2

Extraordinary ..... 0.5 tf/m^2

Wheel load

Trailer for a 40 ft container

*1 Based on the National Structural Code of the Philippines, Vol. 1 (Third edition 1986). See Appendix 9.2.1.

*2 The maximum size of vessels/ships which can enter South Harbor during the high water period.

Table 9.2 Design Soil Conditions

Depth below Sea Bottom Level (m)	Symbol	Soil Characteristics	N-value/qu(Unconfined (SPT) compressive Strength;kgf/cm^2)	Unit Weight (tf/m^3)
0 to 20	Ac	Silty Clay	qu=0.05 qu=0.05 + 0.042x(z-4) (z; depth in meter)	1.45
20 to 30	As	Fine Sand	N = 10	1.80
30 to 40	Dg	Sandy Gravel Gravelly Sand	N = 30	1.80
40 over	Tsc	Tuff Sand Mud Stone	N = 50	1.80

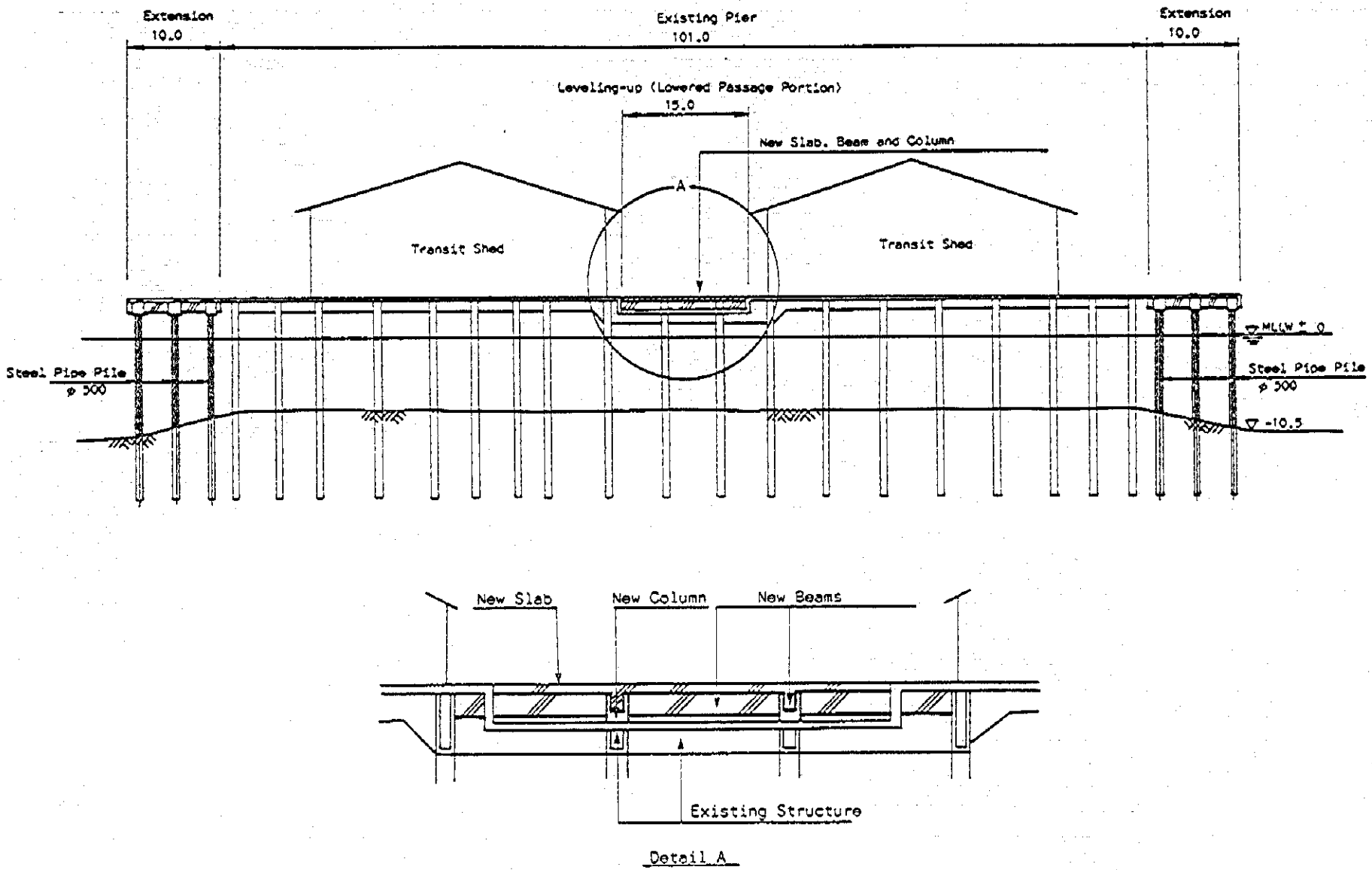

Fig. 9.1 Proposed Section for Pier 9

Table 9.3 Construction Schedule (Short-Term Rehabilitation Plan)

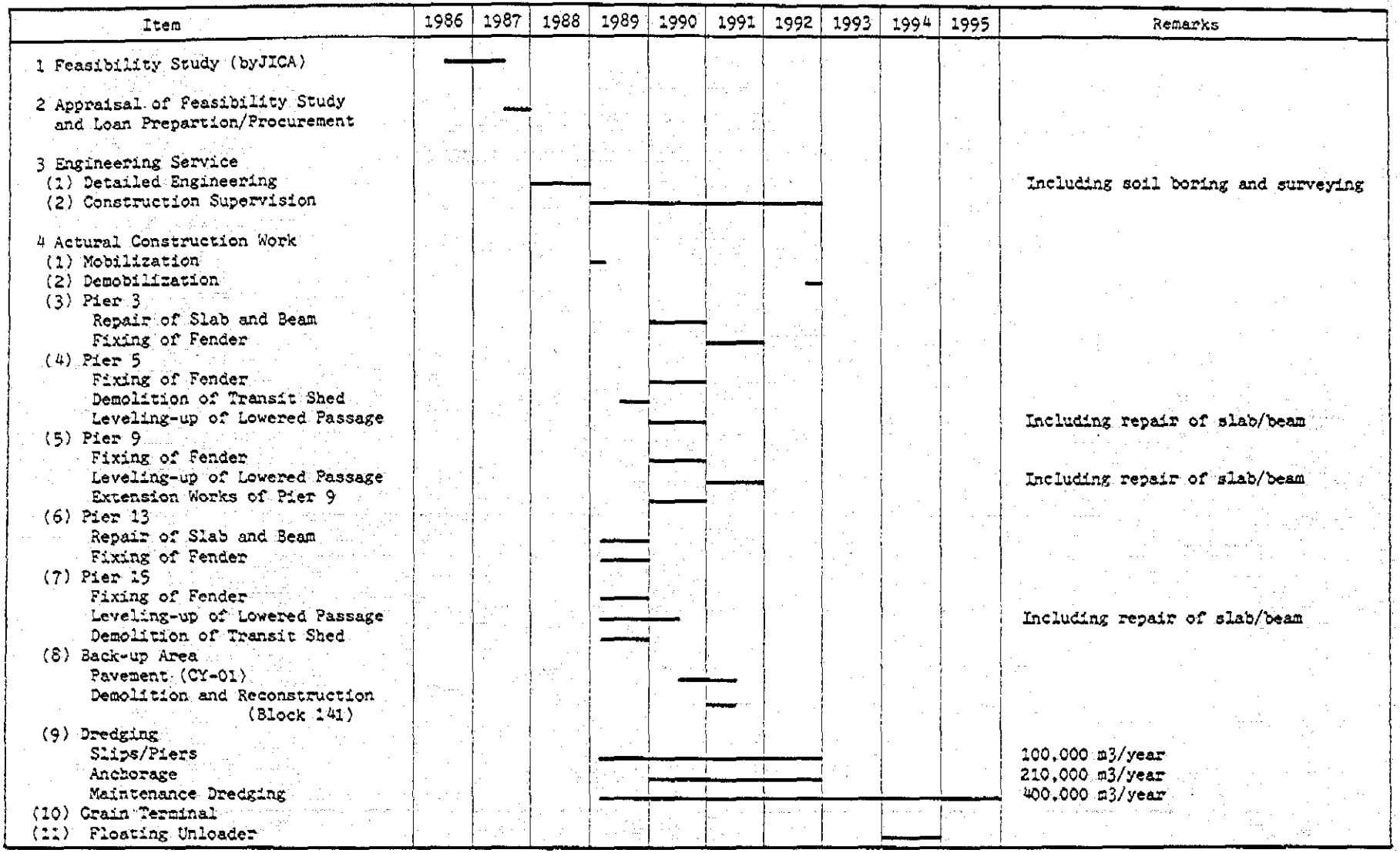

Table 9.4 Tentative Construction Schedule (Master Plan)
(1986 - 2005)

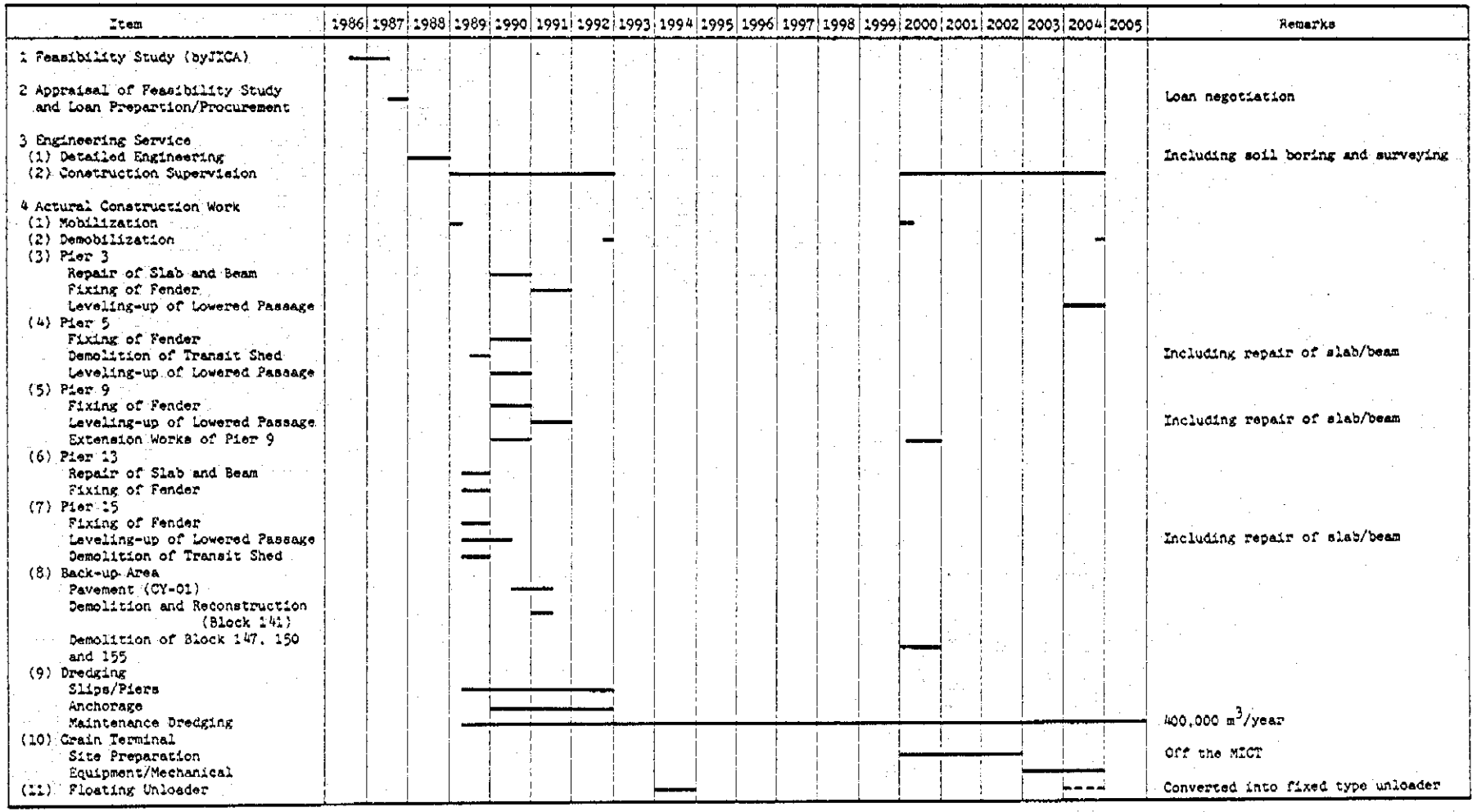

Table 9.5 Rough construction cost Estimate (Short-Term Development Plan) (1988 - 1994)

(in 1,000 Pesos, $1=P20.5=¥154)

Work Items	Unit	Quantity	Cost			Remarks
			Local Portion	Foreign Portion	Total	
1.Pier 3						
Slab and Beam	m^3	354	2,150	1,570	3,720	
Slab	m^3	680	2,803	2,047	4,850	
Fender (V-500)	p'ce	18	1,819	5,401	7,220	
Fender (V-300)	p'ce	19	1,287	3,823	5,110	
Leviling-up (Center)	m^3	2,700				Constructed in 2004
Sub-total			8,059	12,841	20,900	
2.Pier 5						
Fender (V-500)	p'ce	36	3,641	10,809	14,450	
Fender (V-300)	p'ce	6	405	1,205	1,610	
Leveling-up (Center)	m^3	5,250	30,422	17,488	47,910	
Domolition of Transit Shed	block	2	6,920	1,080	8,000	$2,930m^2x2$
Sub-total			41,388	30,582	71,970	
3.Pier 9						
Fender (V-500)	p'ce	18	1,819	5,401	7,220	
Fender (V-300)	p'ce	6	405	1,205	1,610	
Leveling-up (Center)	m^3	3,850	22,307	12,823	35,130	
Extension Works	m	380	24,987	42,183	67,170	
Sub-total			49,518	61,612	111,130	
4.Pire 13						
Slab and Beam	m^3	345	2,098	1,532	3,630	
Fender (V-500)	p'ce	38	3,843	11,407	15,250	
Fender (V-300)	p'ce	5	337	1,003	1,340	
Sub-total			6,278	13,942	20,220	
5.Pier 15						
Slab and Beam	m^3	620	3,768	2,752	6,520	
Fender (V-500)	p'ce	36	3,641	10,809	14,450	
Fender (V-300)	p'ce	6	405	1,205	1,610	
Leveling-up (Center)	m^3	4,530	26,250	15,090	41,340	
Demolition of Transit Shed	block	1	3,468	542	4,010	$2,900m^2$
Sub-total			37,532	30,398	67,930	
6.Back-up Area						
Pavement (CY-01)	m^2	55,000	16,186	21,634	37,820	
Demolition and Reconstruction (Block-141)	block	1	22,728	6,152	28,880	$3,500m^2$
Demolition (Block 147, 150 and 155)	block	3				Demolished in 2000
Sub-total			38,914	27,786	66,700	

Rough construction cost Estimate (Short-Term Development Plan)
(1988 - 1994)

(In 1,000 Pesos, $1=P20.5=¥154)

Work Items	Unit	Quantity	Cost			Remarks
			Local Portion	Foreign Portion	Total	
7.Dredging						
Slips/Piers	m^3	400,000	2,200	17,800	20,000	
Anchorage	m^3	620,000	3,410	27,590	31,000	
Sub-total			5,610	45,390	51,000	
8.Grain Terminal						
Floating Unloader	set	2		(220,000)	(220,000)	Introduced in 1994
Site Preparation	L.S.	1				Constructed in 2000 through 2002
Civil Work and Equipment/Mechanical	L.S.	1				Construction in 2003 and 2004
9.Engineering Fee						
Detail Engineering			4,927	27,923	32,850	Except Item 8
10.Total A			192,226	250,474	442,700	Items 1 - 7,9
11.Contingency A			19,222	25,078	44,300	10% of Item 10
12.Grand Total A			211,448 (43%)	275,552 (57%)	487,000	in 1,000 Pesos

N.B. In case of introduction of Floating Pneumatic Unloader, the following cost shall be added to the above Grand Total A

13.Floating Unloader			-	220,000	220,000	Refer to Item 9
Engineering Fee			-	18,000	18,000	
Total B			-	238,000	238,000	
14.Grand Total			211,448 (29%)	513,552 (71%)	725,000	Grand Toatl A+Total B

Note: 1. Above cost estimate is based on the survey as of Aug.'86
2. The following costs/fees are not included (Refer to App. 9.6.2)
1) repair/improvement cost for West and South Breakwaters
2) maintenance dredging cost (400,000m^3/year)
3) price escalation from Aug.'86 through Jun. '87
4) withholding and contractor's taxes (5% of the total contract ammount)
5) supervising fee
6) repair/improvement of navigation aids
3. Dredging areas are shown in App. 9.6.3.

Chapter 10 ADMINISTRATRION AND OPERATIONS

10.1 Administrative Recommendations

Based on the analyses of the present situation of the port, the following items are recommended for improvement of the port administration.

1) Basic structure and responsibility for the port administration
2) Appropriate coordination of port services
3) Improvement of human resources
4) Improvement of port statistics
5) Simplification of formalities and administrative procedures
6) Improvement of maintenance work

10.2 Proposed Operation System

Based on the analyses of the present operational problems, the following basic maesures are proposed to improve the efficiency of the cargo handling opearations and the traffic flow:

① Some of the cargoes which are presently handled at anchorage should be transferred to pier side handling.

② A preferential berthing system is being adopted for berth allotoment at the Port of Manila.

③ The improvement of cargo handling machines and the rearrangement of physical facilities at the wharf are proposed to raise the efficiency of cargo handling.

To achieve significantly raising cargo hanling efficiency for grain, the introduction of floating unloaders at anchorage is recommended in the Short-term. Considering the average discharging volume of grain per ship, two floating pneumatic unloaders with a capacity of 400t/hrs each should be provided.

Chapter 11 Economic Analysis

The Short-term Rehabilitation Plan is evaluated using the Internal Rate of returan (IRR) which is calculated based on cost-benefit analysis from the viewpoint of the national economy. Banefits considered are the savings in ships' staying costs, cargo handling costs and time costs, while costs are the construction and maintenance costs. the internal rate of return, using 30 years as the period of economic calculation, is 18.61%.

Chapter 12 Financial Analysis

PPA maintains its financial viability throughout the entire project life including the construction period. It will be able to pay all expenditures and have some surplus even after appropriating funds for the repayment of foreign loans including interest.

As for the profitability of the project itself, the FIRR is estimated to be 7.69% for the base case, which exceeds the weighted average cost of capital (3.1%).

Judging from the above, we conclude that the Short-term Rehabilitation Plan with the target year of 1995 is feasible both economically and financially.

CHAPTER 1
INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Background

The Republic of the Philippines has established a long-term economic development plan (1978-1987). The main thrust of the economic policy has been shifted to promoting export-oriented industry.

The Government is now implementing a modified national development plan (1984-1987) in accordance with the basic policy. Although the Government is trying to promote exports, along with the increase of domestic demand imports have been increasing resulting in a worsening international balance of payments.

The Republic of the Philippines is an island nation with 870 ports. Thus, the development and operation of these ports and of maritime transportation as a whole comprise the most important facet of the national transportation infrastructure.

The port of Manila is the most important port in the nation, and plays a major role in the national economic development.

At present, the Government is steadily developing the Manila International Container Terminal in accordance with the master plan drawn up in 1978. At Manila, cargoes are also handled at the piers located at South Harbor and North Harbor.

These piers were constructed after World War II. The facilities have become superannuated, and cargo handling activities at South Harbor are being hindered by the outdated facilities.

Moreover, there are many related problems such as the lack of public areas and warehouses.

So, the Government of the Philippines has requested the Government of Japan to provide technical and economic cooperation in planning the rehabilitation of the South Harbor piers.

1.2 Objectives of the Study

The objectives of the study are to formulate a Master Plan for the development of the South Harbor of Manila Port for the period up to the year 2005 and to prepare a Short-term Rehabilitation Plan for this harbor including a feasibility study within the framework of the Master Plan.

The target year for the Short-term Rehabilitation Plan is the year 1995.

1.3 Circumstances

The Government of the Republic of the Philippines requested the Government of Japan to carry out a feasibility study on the MANILA SOUTH PORT REHABILITATION PROJECT.

In response to the request, the Government of Japan decided to undertake the study and dispatched the Japanese Preliminary Study Team headed by Mr. Koji Kobune, JICA to the Philippines from November 27 to December 7, 1985. The team had a series of discussions about the project with the Philippine Ports Authority. The Scope of Work for the study was agreed upon on 3 December 1985 by Mr. Koji Kobune, leader of the Japanese Preliminary Study Team, and Mr. Maximo S. Dumlao, JR., Officer-In-Charge, Philippine Ports Authority.

Based on the Scope of Work, JICA organized a study team headed by Mr. Terumi Iijima, Executive Director, OCDI. The study team executed the study, including two field surveys, from April of 1986 to May of 1987.

1.4 Scope of the Study

In order to achieve the objectives, the Study covers the following items.

1. Field Survey
   a. Natural Conditions
      - a review of existing data on the following items
        - o soil
        - o climate
        - o topography
        - o hydrography
        - o hydrology
        - o siltation
      - additional investigations as follows:
        - o soil investigation
        - o topographic survey
        - o wave hindcasting (as necessary)
   b. Present situation of cargo flow within the area of Manila Port
   c. Inspection and functional evaluation of existing pier structures

2. Review of Master Plan

a. a review of completed and on-going studies and plans, in particular, the Master Plan for the Port of Manila carried out in 1977-1978, in view of the following:
   - hinterland of the port
   - volume of traffic
   - functions of each section of the port
   - land-use nearby the port
   - alignment of access roads

b. alternative operational layout plans for South Harbour

3. Feasibility Study on the Rehabilitation Plan for South Harbour:

a. to determine the structures which require rehabilitation or demolition;

b. to project the traffic volume for South Harbour;

c. to define the detailed scope of the plan including the construction schedule;

d. to carry out preliminary designs and cost estimation;

e. to recommend management and operational systems;

f. to carry out economic analysis;

g. to carry out financial analysis.

1.5 Study Schedule

The study was conducted as follows.

1)	First field survey, presentation of the Inception Report	: April - May, 1986
2)	Second field survey, submission of the Progress Report	: June - Sept., 1986
3)	Preparation of the Interim Report	: Sept.- Nov., 1986
4)	Presentation of the Interim Report	: Dec., 1986
5)	Preparation of the Draft Final Report	: Jan. - March, 1987
6)	Presentation of the Draft Final Report	: March, 1987
7)	Preparation of the Final Report	: April - May, 1987
8)	Submission of the Final Report	: June, 1987

1.6 Organization of the Study Team

The Japanese study team was comprised of ten specialists from OCDI and NIKKEN SEKKEI, and a JICA representative. Their names, duties and present positions are as follows.

Duty	Name	Present Position
1) Leader, Overall Study	Terumi Iijima	Executive Director, OCDI
2) Port Planning	Kunihiko Iwata	OCDI
3) Demand Forecast, Port Management, and Port Operations	Keiki Yasutake	OCDI
4) Financial Analysis	Kenji Hattori	OCDI
5) Economic Analysis	Toshio Yashikawa	OCDI
6) Natural Conditions, Stractural Design	Shinsuke Kubo	NIKKEN SEKKEI
7) Structural Design, Construction Planning, and Cost Estimetion	Yoshiyuki Kojitani	NIKKEN SEKKEI
8) Structural Soundness Investigation	Takaharu Ikuta	NIKKEN SEKKEI
9) Natural Conditions	Toshihiro Takahashi	NIKKEN SEKKEI
10) Structural Soudness Investigation, Structural Design	Susumu Sunami	NIKKEN SEKKEI
11) Coordinator	Chisa Hara	JICA

1.7 List of PPA Counterparts

PPA counterparts are listed below.

HEAD OFFICE

1.	Mr. Prudencio Mercado, Jr.	Project Manager
2.	Mr. Rodolfo Aquino	Asst. Project Manager Economic Analysis
3.	Mr. Rolando Aquino	Demand Forecast
4.	Mrs. Bernardita Samia	Financial Analysis
5.	Mr. Eugenio Macuha, Jr.	Engineering
6.	Mr. Teresita de Guzman	Port Planning

7.	Mr. Orlando B. Ancheta	Statistic Work Assistance

PMU MANILA

1.	Mr. Domiciano Flores	Sectin Chief Planning and Design Section
2.	Mr. Maximo Quijano	Port Operation
3.	Mr. Evelindo Escuterio	Civil Engineering Assistant 1
4.	Mr. Renato Yumang	Civil Engineering Assistant

CHAPTER 2
SOCIO-ECONOMIC BACKGROUND

CHAPTER 2 SOCIO-ECONOMIC BACKGROUND

2.1 General Introduction

The total land area of the Philippines is approximately 300,000 square kilometers.

As of January 1986, there are thirteen administrative regions in the Philippines including Metropolitan Manila (See Figure 2.1.1). Metropolitan Manila has been designated the National Capital Region, and includes four cities (Manila, Pasay, Quezon and Caloocan City) and thirteen other municipalities.

Manila was proclaimed the capital of the Philippines on June 24, 1571. Manila remained so until Quezon City was made the capital on July 17, 1948. With Presidential Decree No. 940, Manila was again made the capital and the permanent seat of the national government on June 14, 1976.

2.2 Population and Employment

2.2.1 Population At Present

The 1980 Philippine population census placed the total population of the country at 48,098,460 as of May 1, 1980. Among the thirteen regions, the bulk of the population was concentrated in MMA and Southern Tagalog (Region IV) located south of MMA. MMA and Region IV are the most urbanized and most economically developed regions in the Philippines.

The tendency towards further concentration of population in MMA and Region IV can also be seen in the preliminary 1985 statistics (See Table 2.2.1).

High annual growth rates were recorded in the 1960's: the average annual growth rate during the decade was 3.1 percent. Due to the rapidly increasing population, the Population Commission was created in 1969 to formulate policy and program recommendations on population and socio-economic development. As a result, population growth slowed down to an annual growth rate of 2.8 percent from 1975 to 1980, and 2.6 percent from 1980 to 1985.

The annual population growth rate of MMA also slowed down from 1960 to 1985, though the population share of MMA increased during 1960-1985 due to a sustained inter-regional migration of people from Bicol and Visayas as well as from some areas in the northern part of Luzon into MMA.

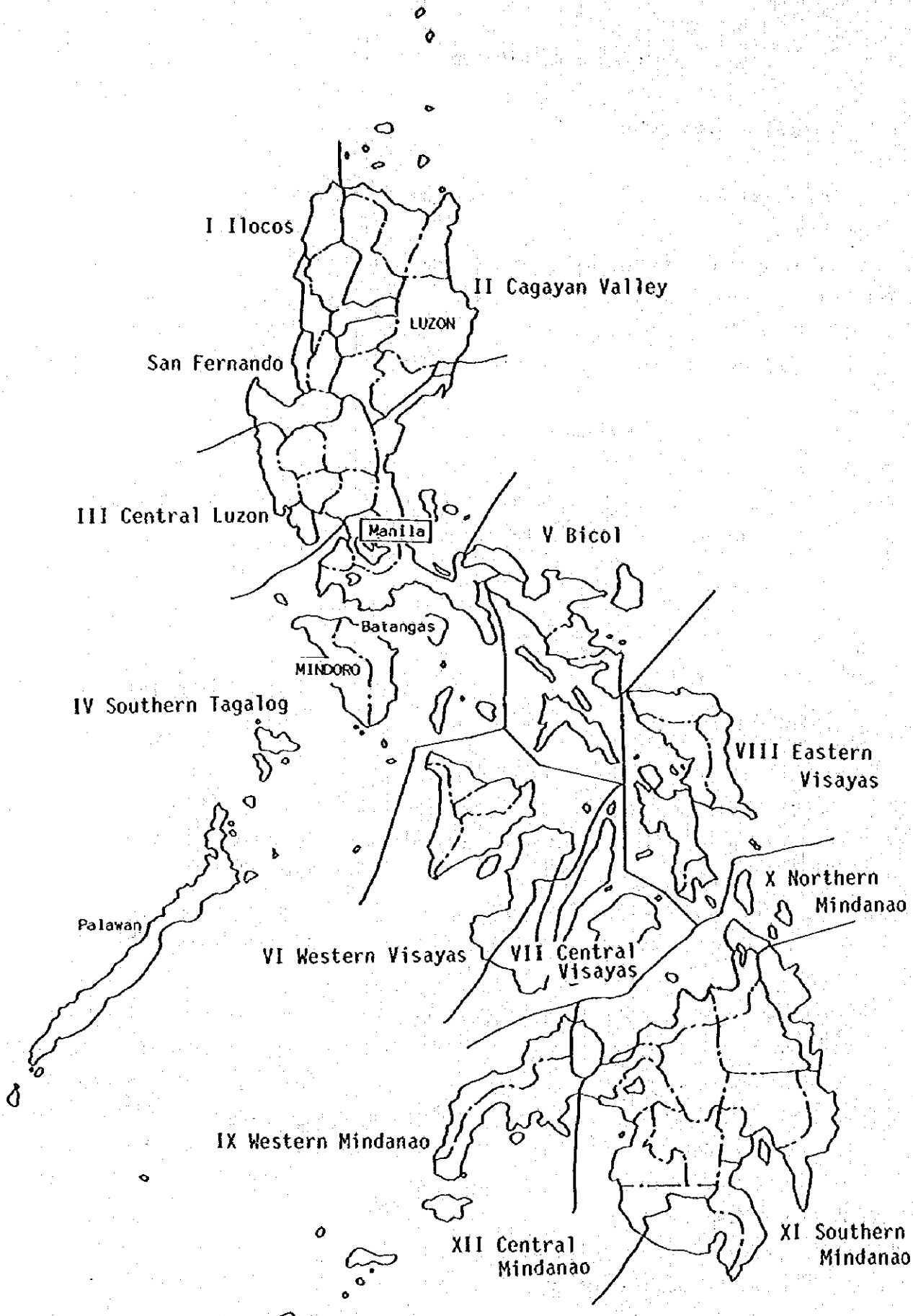

Fig. 2.1.1 Regional Map of the Philippines

Table 2.2.1 Population and Growth Rate by Region for Census Years

	POPULATION (THOUSANDS)										GROWTH RATE (%)			
	1960		1970		1975		1980		1985 (Estimate)		'70 /'60	'75 /'70	'80 /'75	'85 /'80
Philippines	27,088	100.0	36,684	100.0	42,071	100.0	48,098	100.0	54,688	100.0	3.1	2.8	2.6	2.6
Metropolitan Manila Area (National Capital Region)	2,462	9.1	3,697	10.8	4,970	11.8	5,296	12.3	6,942	12.7	4.9	4.6	3.6	3.2
Region														
1. Ilocos	2,428	9.0	2,991	8.1	3,269	7.8	3,541	7.4	3,903	7.1	2.1	1.8	1.6	2.0
2. Cagayan Valley	1,202	4.4	1,691	4.6	1,933	4.6	2,215	4.6	2,521	4.6	3.5	2.7	2.8	2.6
3. Central Luzon	2,525	9.3	3,615	9.9	4,210	10.0	4,803	10.0	5,456	10.0	3.7	3.1	2.7	2.6
4. Soutern Tagalog	3,081	11.4	4,457	12.1	5,214	12.4	6,119	12.7	7,089	13.0	3.8	3.2	3.3	3.0
5. Bicol	2,363	8.7	2,967	8.1	3,194	7.6	3,477	7.2	3,922	7.2	2.3	1.5	1.7	2.4
6. Western Visayas	3,078	11.4	3,618	9.9	4,146	9.8	4,526	9.4	5,092	9.3	1.6	2.8	1.8	2.4
7. Central Visayas	2,523	9.3	3,033	8.3	3,387	7.9	3,787	7.9	4,195	7.7	1.9	2.2	2.3	2.1
8. Eastern Visayas	2,041	7.5	2,381	6.5	2,600	6.2	2,799	5.8	2,073	5.6	1.6	1.8	1.5	1.9
9. Western Mindanao	1,351	5.0	1,869	5.1	2,048	4.9	2,528	5.3	2,863	5.2	3.3	1.8	4.3	2.1
10. Nortern Mindanao	1,297	4.8	1,953	5.3	2,314	5.5	2,759	5.7	3,718	5.8	4.2	3.5	3.6	2.9
11. Southern Mindanao	1,353	5.0	2,201	6.0	2,715	6.5	3,347	7.0	3,836	7.0	5.0	4.3	4.3	2.8
12. Central Mindanao	1,383	5.1	1,941	5.3	2,070	4.9	2,271	4.7	2,598	4.8	3.4	1.3	1.9	2.7

Source : 1960 - 1980 Philippine Statistical Yearbook 1985 (NEDA)
1985 Philippine Yearbook 1985 (NEDA National Census Statistics Office)

2.2.2 Future Population

According to the Philippine population projections, the Philippine population will increase to 68,424 thousand people in 1995 and 81,591 thousand people in 2005 (middle estimate), and the annual growth rate will continue to decrease gradually. The forecast annual growth rate of MMA is higher than that of the nation. This shows that the concentration of population into MMA will continue during the projection period (See Appendix 2.2.1).

Table 2.2.2 Population Projections for the Philippines by Region: 1980-2005

(Unit: 1000 Persons)

	Alternative	1980	1985	1990	1995	2000	2005	Annual Growth Rate				
								1985/1980	1990/1985	1995/1990	2000/1995	2005/2000
Philippines	L.	48,098	54,488	60,671	66,416	71,320	75,859	2.5	2.2	1.8	1.4	1.2
	M.	48,098	54,668	61,480	68,424	75,224	81,591	2.6	2.4	2.2	1.9	1.6
	H.	48,098	54,762	61,894	69,447	77,209	84,971	2.6	2.5	2.3	2.1	1.9
Metropolitan Manila Area	L.	5,926	6,924	7,891	8,770	9,520	10,201	3.2	2.6	2.1	1.7	1.4
	M.	5,926	6,942	7,974	8,971	9,895	10,737	3.2	2.8	2.4	2.0	1.6
	H.	5,926	6,952	8,016	9,072	10,083	11,045	3.2	2.9	2.5	2.1	1.8
Region 1	L.	3,541	3,890	4,236	4,551	4,805	5,031	1.9	1.7	1.4	1.1	0.9
	M.	3,541	3,903	4,292	4,690	5,073	5,422	2.0	1.9	1.8	1.6	1.3
	H.	3,541	3,909	4,321	4,761	5,210	5,652	2.0	2.0	2.0	1.8	1.6
Region 2	L.	2,215	2,512	2,806	3,085	3,327	3,552	2.5	2.2	1.9	1.5	1.3
	M.	2,215	2,521	2,845	3,182	3,518	3,835	2.6	2.4	2.3	2.0	1.7
	H.	2,215	2,525	2,864	3,232	3,615	4,000	2.7	2.5	2.4	2.3	2.0
Region 3	L.	4,803	5,439	6,065	6,654	7,159	7,620	2.5	2.2	1.9	1.5	1.3
	M.	4,803	5,456	6,142	6,844	7,529	8,162	2.6	2.4	2.2	1.9	1.6
	H.	4,803	5,465	6,181	6,942	7,718	8,481	2.6	2.5	2.3	2.1	1.9
Region 4	L.	6,119	7,065	7,992	8,869	9,630	10,341	2.9	2.5	2.1	1.7	1.4
	M.	6,119	7,089	8,105	9,152	10,188	11,166	3.0	2.7	2.6	2.1	1.9
	H.	6,119	7,102	8,162	9,296	10,472	11,654	3.0	2.8	2.6	2.4	2.2
Region 5	L.	3,477	3,907	4,323	4,710	5,035	5,341	2.4	2.0	1.7	1.3	1.2
	M.	3,477	3,922	4,388	4,710	5,035	5,341	2.4	2.0	1.7	1.3	1.2
	H.	3,477	3,929	4,422	4,956	5,518	6,091	2.5	2.4	2.3	2.2	2.0

(Unit: 1000 Persons)

	Alternative	1980	1985	1990	1995	2000	2005	Annual Growth Rate				
								1985/1980	1990/1985	1995/1990	2000/1995	2005/2000
Region 6	L.	4,526	5,073	5,588	6,042	6,398	6,713	2.3	2.0	1.6	1.2	1.0
	M.	4,526	5,092	5,672	6,520	6,800	7,301	2.4	2.2	2.0	1.7	1.4
	H.	4,526	5,102	5,715	6,355	7,002	7,645	2.4	2.3	2.1	2.0	1.8
Region 7	L.	3,787	4,182	4,559	4,896	5,171	5,420	2.0	1.7	1.4	1.1	0.9
	M.	3,787	4,195	4,616	5,037	5,441	5,811	2.1	1.9	1.8	1.6	1.3
	H.	3,787	4,202	4,645	5,109	5,578	6,041	2.1	2.0	1.9	1.8	1.6
Region 8	L.	2,799	3,063	3,317	3,558	3,764	3,960	1.8	1.6	1.4	1.1	1.0
	M.	2,799	3,073	3,360	3,665	3,973	4,263	1.9	1.8	1.8	1.6	1.4
	H.	2,799	3,078	3,383	3,720	4,080	4,445	1.9	1.9	1.9	1.9	1.7
Region 9	L.	2,582	2,853	3,150	3,424	3,658	3,875	2.0	2.0	1.7	1.3	1.2
	M.	2,582	2,863	3,195	3,534	3,874	4,195	2.1	2.2	2.0	1.9	1.6
	H.	2,582	2,868	3,218	3,591	3,984	4,384	2.1	2.3	2.2	2.1	1.9
Region 10	L.	2,759	3,168	3,567	3,953	4,301	4,633	2.8	2.4	2.1	1.7	1.5
	M.	2,759	3,178	3,616	4,074	4,540	4,993	2.9	2.6	2.4	2.2	1.9
	H.	2,759	3,184	3,640	4,135	4,661	5,203	2.9	2.7	2.6	2.4	2.2
Region 11	L.	3,347	3,823	4,275	4,701	5,074	5,429	2.7	2.3	1.9	1.5	1.4
	M.	3,347	3,836	4,334	4,848	5,364	5,858	2.8	2.5	2.3	2.0	1.8
	H.	3,347	3,843	4,364	4,924	5,513	6,116	2.8	2.6	2.4	2.3	2.1
Region 12	L.	2,271	2,589	2,902	3,205	3,478	3,745	2.7	2.3	2.0	1.6	1.5
	M.	2,271	2,598	2,942	3,304	3,675	4,037	2.7	2.5	2.3	2.2	1.9
	H.	2,271	2,602	2,963	3,356	3,776	4,212	2.8	2.6	2.5	2.4	2.2

Source: Philippine Population Projections 1980-2030 (NEDA)

2.2.3 Employment

The Philippine labor force was reported to be twenty-one million persons or 39.3 percent of the population in 1984. "Labor force" means the economically active population which comprises the population 15 years old and over who are either employed or officially unemployed during the reference quarter.

In spite of a 4.9 percent increase of the labor force, the number of employed persons increased by only 4.6 percent from 1980 to 1984. This contributed to an increase in the unemployment rate from 5.0 percent in 1980 to 6.2 percent in 1984. Though there are several major causes of unemployment in the Philippines, foremost among them is the rapid population growth, causing a regular increase in the labor force. Employment opportunities have not increased along with the growth of the population (See Table 2.2.3).

The majority of the employed persons work in the agricultural sector, though the share of this sector has gradually decreased since 1965. The employment share of the industrial sector is stable at around 15 percent. The service sector is increasing its employment share.

As for MMA, the labor force participation ratio is 38.6 percent and the unemployment ratio is 16.3 percent as of 1984. The unemployment ratio in MMA is much higher than in the Philippines as a whole. MMA cannot sufficiently absorb those people who want to work there because of the rapid increase of population (See Table 2.2.5).

Table 2.2.3 Labor Force Participation Rate and Employment Status

(Unit: 1000 persons)

	1971	1975	1980	1984	Annual Growth Rate (%)		
					'75/'71	'80/'75	'84/'80
Population (A)	37,862	42,071	48,098	53,351	2.7	2.8	2.6
Labor Force (B)	13,241	15,161	17,308	20,969	3.4	2.7	4.9
Employed (C)	12,542	14,518	16,434	19,673	3.7	2.5	4.6
Unemployed (D)	699	643	874	1,296	(2.1)	6.3	10.4
Labor Force Participation (%) (B/A)	35.0	36.0	36.0	39.3			
Unemployment Rate (%) (D/B)	5.3	4.2	5.0	6.2			

Source: Philippine Statistical Yearbook 1985 (NEDA)

Table 2.2.4 Employed Persons by Major Industry Group

(Unit: Thousands, %)

	1965		1970		1975		1980		1984		Annual Growth Rate			
		Share		Share		Share		Share		Share	'70/'65	'75/'70	'80/'75	'84/'80
Philippines	10,101	100.0	11,358	100.0	14,517	100.0	16,434	100.0	19,673	100.0	2.4	5.0	2.5	4.6
Agricultural Sector	5,725	56.7	6,100	53.7	7,768	53.5	8,453	51.4	9,733	49.5	1.3	5.0	1.7	3.6
Industrial Sector	1,420	14.0	1,843	16.2	2,161	14.9	2,496	15.2	2,824	14.4	5.4	3.2	2.9	2.5
Service Sector	2,956	29.3	3,415	30.1	4,588	31.6	5,485	33.4	7,116	36.1	2.9	6.1	3.6	5.3

Source: Philippine Statistical Yearbook 1985 (NEDA)

Table 2.2.5 Employment in MMA

('000 persons)

		1984
Population	(A)	6,739
Labor Force	(B)	2,599
Employed	(C)	2,175
Unemployed	(D)	424
Labor Force Participation (%)	(B/A)	38.6
Unemployment Rate (%)	(D/B)	16.3

Source: Philippine Yearbook 1985 (NEDA)

2.3 National Economy

2.3.1 Overall Development

In the 1970's the Philippine economy (GDP) maintained steady growth averaging just over 6 percent per annum. But in 1980 this growth rate started to decline and by 1984 it had become negative because of (a) the world-wide economic recession of 1980, following the second round of oil price increases, (b) the collapse of the world markets for copra and sugar, which are among the main export products of the Philippines, and (c) the crisis of confidence and the flight of capital following the assassination of Senator Aquino in 1983.

Mainly due to item (c), investment in the Philippines drastically declined after 1983. Investment in the short-term is unlikely to bring about a full-fledged economic recovery. Investors are taking a "wait-and-see" attitude toward the stability of the new government.

So, it is presently personal consumption that supports the Philippine economy.

2.3.2 Sectional Distribution of Activities

The GDP in 1985 was 90,469 million pesos of which 39.3% was in the service sector, 31.9% in the industrial sector and 28.8% in the agricultural sector.

In the Philippines, agriculture still plays the pivotal role in socio-economic development. Agriculture is the main source of livelihood of 70 percent of the population. Agriculture employs about 50 percent of the labor force and produces about half of the total export revenues. The main crops are palay (rice), corn, fruits, nuts and root crops as food crops, and coconut and sugar cane as commercial crops. The industrial sector constitutes a major part of the Philippine's total economic activities. Major manufacturing industries are light manufacturing industries such as food, beverages, tobacco, textiles and apparel. The heavy industries, on the other hand, are paper and paper products, industrial chemicals, other chemical products, petroleum refineries and so on.

The main activities of the service sector are trade and services such as education, medicine and recreation.

After 1980 the growth rate of the industrial sector drastically declined to a negative growth from the high growth rate in the 1970's. But

Table 2.3.1 Gross Domestic Product by Expenditure at Constant 1972 Prices

(Unit: Million Pesos, %)

	1970		1975		1980		1981		1982		1983		1984		1985		Annual Growth Rate '75/'70	Annual Growth Rate '80/'75	Annual Growth Rate '85/'80
Expenditure on GDP	51,014	100.0	68,361	100.0	92,706	100.0	96,207	100.0	98,999	100.0	99,920	100.0	94,214	100.0	90,469	100.0	6.0	6.3	(0.5)
Personal Consumption	37,088	72.7	46,160	67.5	59,270	63.9	61,617	64.0	63,535	64.2	65,378	65.4	66,033	70.1	66,162	73.1	4.5	5.1	2.2
Government Consumption	4,228	8.3	7,031	10.3	8,266	8.9	8,598	8.9	9,145	9.2	8,689	8.7	8,255	8.8	8,205	9.1	10.7	3.3	(0.1)
Investments	10,835	21.3	18,984	27.8	26,609	28.7	27,220	28.3	26,267	26.5	24,924	24.9	15,851	16.8	12,616	14.0	11.9	7.0	(13.9)
Fixed Capital Formation	7,919	15.6	15,037	22.0	22,737	24.5	23,542	24.5	23,687	23.9			16,541	17.5	12,714	14.1	13.7	8.6	(11.0)
Stocks	2,916	5.7	3,949	5.8	3,872	4.2	3,678	3.8	2,580	2.6			(690)	0.7	(98)	(0.1)	6.2	(0.4)	(52.3)
Net Exports	(1,246)	(2.5)	(3,554)	(5.2)	(1,302)	(1.4)	(907)	(0.9)	(1,837)	(1.8)	1,571		2,671	2.8	5,356	5.9	-	-	-
Statistical Discrepancy	109	0.2	(260)	(0.4)	(137)	(0.1)	(321)	(0.3)	1,889	1.9			1,404	1.5	(1,870)	(2.1)	-	-	-

Source: Philippine Statistical Yearbook 1985 (NEDA)

Table 2.3.2 Gross Domestic Product At Constant 1972 Prices

(Unit: Million Pesos, %)

	1970		1975		1980		1981		1982		1983		1984		1985		Annual Growth Rate '75/'70	Annual Growth Rate '80/'75	Annual Growth Rate '85/'80
Philippines	51,014	100.0	68,361	100.0	92,706	100.0	96,207	100.0	98,999	100.0	99,920	100.0	94,214	100.0	90,469	100.0	6.0	6.3	0.5
Agriculture Sector	14,734	28.9	18,218	26.6	23,732	25.6	24,608	25.6	25,378	25.6	24,845	24.9	25,439	27.0	26,010	28.8	4.3	5.4	1.9
Industry Sector	15,048	29.5	22,690	33.2	33,471	36.1	34,963	36.3	35,714	36.1	35,955	36.0	32,159	34.1	28,880	31.9	8.6	8.1	2.9
Service Sector	21,232	41.6	27,453	40.2	35,503	38.3	36,636	38.1	37,907	38.3	39,120	39.1	36,616	38.9	35,579	39.3	5.3	5.3	0.0

Source: Philippine Statistical Yearbook 1985 (NEDA)

the agricultural sector maintained an annual growth rate of around 2 percent.

2.3.3 Regional Development

The Philippine economy is concentrated in MMA and Southern Tagalog (Region IV). The GDP shares of the MMA and Region IV are 31.6 percent and 14.0 percent respectively in 1984. The tendency of economic concentration in these two regions has continued for many years. Government efforts in recent years to promote the decentralization of industry have not yet changed the uneven pattern of regional development.

The Philippines' GDP per capita is 1,790 pesos in 1984. GDP per capita in MMA is 4,476 pesos which is 2.5 times the national average. However, the GDP per capita in MMA has been gradually decreasing since 1981 despite the increased GDP of MMA from 1981 to 1983. This is because of the rapid increase of the local population.

The GDP in MMA decreased by 6.8 percent which was greater than the drop of the (national) GDP in 1984. This is because the GDP of MMA is mostly produced by the industrial sector which suffered the greatest setback in the 1984 recession.

Table 2.3.3 Gross Domestic Product by Region

	IN MILLION PESOS AT CONSTANT 1972 PRICES														GROWTH RATE	
	1978		1979		1980		1981		1982		1983		1984		'80/'78	'84/'80
Philippines	82,784	100	87,963	100	92,637	100	96,210	100	99,003	100	100,067	100	95,498	100	5.8	0.8
NCR Metro Manila	25,729	31.1	27,476	31.2	29,224	31.5	30,521	31.7	31,511	31.8	32,359	32.3	30,164	31.6	6.6	0.8
Ilocos Region	3,021	3.6	3,257	3.7	3,433	3.7	3,646	3.8	3,760	3.8	3,787	3.8	3,729	3.9	6.6	2.1
Cagayan Valley	2,332	2.8	2,589	2.9	2,615	2.8	2,697	2.8	2,640	2.7	2,585	2.6	2,360	2.5	5.9	(2.5)
Central Luzon	6,943	8.4	7,355	8.4	7,783	8.4	8,518	8.8	8,795	8.9	8,731	8.7	8,310	8.7	5.9	1.7
Southern Tagalog	11,886	14.4	12,265	13.9	12,951	14.0	13,239	13.7	13,521	13.7	13,868	13.9	13,421	14.0	4.4	0.9
Bicol Region	2,773	3.4	2,901	3.3	3,161	3.4	3,258	3.4	3,045	3.1	3,087	3.1	2,993	3.1	6.8	(1.4)
Western Visayas	7,066	8.5	7,465	8.5	7,462	8.2	7,971	8.3	8,410	8.5	8,288	8.3	7,944	8.3	4.0	1.0
Central Visayas	5,921	7.2	6,214	7.1	6,727	7.3	6,990	7.3	6,999	7.1	7,098	7.1	6,847	7.2	6.6	0.4
Eastern Visayas	2,097	2.5	2,181	2.5	2,309	2.5	2,391	2.5	2,420	2.4	2,328	2.3	2,211	2.3	4.9	(1.1)
Western Mindanao	2,584	3.1	2,862	3.3	3,124	3.4	3,261	3.4	3,294	3.3	3,324	3.3	3,110	3.3	10.0	(0.1)
Northern Mindanao	3,903	4.7	4,321	4.9	4,416	4.8	4,382	4.6	4,707	4.7	4,494	4.5	4,380	4.6	6.4	(0.2)
Southern Mindanao	5,813	7.0	6,184	7.0	6,279	6.8	6,358	6.6	6,336	6.4	6,564	6.5	6,458	6.8	3.9	0.7
Central Mindanao	2,716	3.3	2,893	3.3	2,973	3.2	2,978	3.1	3,563	3.6	3,555	3.6	3,571	3.7	4.6	4.7

Source: Philippine Statistical Yearbook 1985 NEDA

Table 2.3.4 Per Capita Gross Domestic Product by Region

	PESOS AT CONSTANT 1972 PRICES						GROWTH RATE
	1979	1980	1981	1982	1983	1984	'84/'79
Philippines	1,870	1,917	1,943	1,950	1,922	1,790	(0.9)
NCR Metro Manila	4,774	4,912	4,971	4,966	4,948	4,476	(1.3)
Ilocos Region	932	967	1,010	1,021	1,009	974	0.9
Cagayan Valley	1,195	1,175	1,193	1,128	1,078	960	(4.3)
Central Luzon	1,565	1,615	1,718	1,735	1,680	1,561	(0.1)
Southern Tagalog	2,059	2,100	2,082	2,075	2,069	1,947	(1.1)
Bicol Region	846	907	909	833	825	781	(1.6)
Western Visayas	1,674	1,684	1,707	1,769	1,703	1,596	(0.9)
Central Visayas	1,671	1,769	1,798	1,771	1,761	1,665	(0.1)
Eastern Visayas	789	823	849	832	785	733	(1.5)
Western Mindanao	1,172	1,227	1,258	1,233	1,216	1,111	(1.1)
Northern Mindanao	1,613	1,591	1,546	1,606	1,492	1,416	(2.6)
Southern Mindanao	1,913	1,863	1,819	1,784	1,801	1,727	(2.0)
Central Mindanao	1,294	1,305	1,301	1,483	1,441	1,411	1.7

Source: Philippine Statistical Yearbook 1985 (NEDA)

2.3.4 Foreign Trade

The Philippines has had a persistent balance of trade deficit for more than ten years. This is because industry largely depends on imported materials such as petroleum and petroleum products, and exports are dominated by four "traditiional" products - coconut products, logs/forest products, sugar and copper concentrates.

In recent years the balance of trade improved slightly because the government took various measures including a 27.3 percent depreciation of the peso against the United States dollar on October 5, 1983 and severe government restrictions on imports.

Until 1980 traditional products accounted for over 50% of export revenues. But due to the government's aggressive development of non-traditional exports which are less susceptible to the vagaries of the international pricing mechanism, the share of non-traditional exports such as electronic goods and garments is gradually increasing.

These non-traditional exports were able to cushion the impact of the low prices of the traditional commodity exports on the world market (See Table 2.3.6 and Table 2.3.7).

The Philippines' major trading partners are the United States and Japan, together accounting for 57.3 percent of exports and for 40.3 percent of imports in 1984. The United States and Japan gave the Philippines a positive trade balance of $373.2 million and $228.2 million, respectively, in 1984. The value of imports from the Middle East has been decreasing due to the government's move to tap non-oil products as sources of energy.

Table 2.3.5 Balance of Trade

	In Million U.S Dollars							Annual Growth Rate	
	1975	1980	1981	1982	1983	1984	1985	'80/'75	'85/'80
Balance of Trade	(1,165)	(1,939)	(2,224)	(2,646)	(2,482)	(679)	(482)	10.7	(24.2)
Exports	2,294	5,788	5,722	5,021	5,005	5,391	4,629	20.3	(4.4)
Imports	3,459	7,727	7,946	7,667	7,487	6,070	5,111	17.4	(7.9)

Source: Philippine Statistical Yearbook 1985 (NEDA)

Table 2.3.6 Exports (Traditional and Non-traditional)

	F.O.B. Value in Million U.S. Dollars														Annual Growth Rate	
	1975		1980		1981		1982		1983		1984		1985		'80/'75	'85/'8
Exports	2,294	100.0	5,788	100.0	5,722	100.0	5,021	100.0	5,005	100.0	5,391	100.0	4,629	100.0	20.3	(4.4)
Traditional Exports	1,767	77.0	3,068	53.0	2,742	47.9	2,116	42.1	2,068	41.3	1,828	33.9	1,302	28.1	11.7	(15.8)
Non-tradition Exports	504	22.0	2,650	45.8	2,920	51.0	2,851	56.8	2,846	56.9	3,430	63.6	3,275	70.8	39.4	4.3
Others	23	1.0	70	1.2	60	1.1	54	1.1	91	1.8	133	2.5	52	1.1	24.9	(5.8)

Source: Philippine Statistical Yearbook 1985 (NEDA)

Table 2.3.7 Imports by Commodity Group

	In Million US Dollars														Annual Growth Rate (%)	
	1975		1980		1981		1982		1983		1984		1985		'80/'75	'85/'80
Imports	3,459	100.0	7,727	100.0	7,946	100.0	7,667	100.0	7,487	100.0	6,070	100.0	5,111	100.0	17.4	(7.9)
Capital Goods	1,149	33.2	1,986	25.7	1,925	24.2	1,786	23.3	1,698	22.7	1,150	18.9	788	15.4	11.6	(16.9)
Raw Materials & Int. Goods	1,166	33.7	2,855	37.0	2,886	36.3	3,042	39.7	3,017	40.3	2,636	43.4	2,198	43.0	19.6	(5.1)
Mineral Fuels & Lubricants	770	22.3	2,248	29.1	2,458	30.9	2,105	27.4	2,123	28.3	1,649	27.2	1,452	28.4	23.9	(8.4)
Consumer Goods	289	8.4	466	6.0	537	6.8	635	8.3	538	7.2	367	6.1	441	8.6	10.0	(1.1)
Others	85	2.4	172	2.2	140	1.8	99	1.3	111	1.5	268	4.4	232	4.6	15.1	6.2

Source: Philippine Statistical Yearbook 1985 (NEDA)

Table 2.3.8 Imports by Area

	F.O.B Value in Million U.S. Dollars												Annual Growth Rate
	1975		1980		1981		1982		1983		1984		1985	'80/'75
Imports	3,459	100.0	7,727	100.0	7,946	100.0	7,667	100.0	7,487	100.0	6,070	100.0	5,111	17.4
United States	754	21.8	1,786	23.1	1,787	22.5	1,703	22.2	1,739	23.2	1,630	26.9		18.8
Japan	966	27.9	1,531	19.8	1,494	18.8	1,532	20.0	1,266	16.9	815	13.4		9.6
EEC	429	12.4	828	10.7	819	10.3	814	10.6	880	11.7	674	11.1		14.1
Middle East	604	17.5	1,975	25.6	1,694	21.3	1,455	19.0	1,452	19.4	977	16.1		26.7
ASEAN	173	5.0	483	6.2	539	6.8	510	6.7	671	9.0	834	13.7		22.8
Socialist Countries	63	1.8	245	3.2	212	2.7	232	3.0	155	2.1	232	3.8		31.2
Other Countries	470	13.6	879	11.4	1,401	17.6	1,421	18.5	1,324	17.7	908	15.0		13.3

Table 2.3.9 Exports by Area

	F.O.B Value In Million U.S. Dollars												Annual Growth Rate
	1975		1980		1981		1982		1983		1984		1985	'80/'75
Exports	2,294	100.0	5,788	100.0	5,722	100.0	5,021	100.0	5,005	100.0	5,391	100.0	4,629	20.3
United States	664	28.9	1,588	27.4	1,766	30.9	1,586	31.6	1,800	36.0	2,050	38.0		19.1
Japan	865	37.7	1,533	26.5	1,251	21.9	1,146	22.8	1,015	20.3	1,043	19.3		12.1
EEC	372	16.2	981	17.0	924	16.1	726	14.5	816	16.3	680	12.6		21.4
Middle East	50	2.2	115	2.0	99	1.7	90	1.8	78	1.5	67	1.3		18.1
ASEAN	61	2.7	377	6.5	412	7.2	359	7.0	353	7.0	517	9.6		43.9
Specialist Countries	36	1.6	256	4.4	257	4.5	231	4.6	123	2.5	118	2.2		48.0
Other Countries	246	10.7	937	16.2	1,011	17.7	883	17.6	820	16.4	916	17.0		30.7

2.4 Transportation

2.4.1 General Outline

There are four main transport system in the Philippines.

1) Road transport: This is the principal transport system of the country and accounts for sixty-five percent (65%) of the total domestic freight traffic and ninety percent (90%) of the total domestic passenger traffic.

2) Sea transport: This is the complementary system for the road transport, and carries the majority of inter-island traffic. Sea transport handles thirty-five percent (35%) of the total freight and seven percent (7%) of the passenger traffic.

3) Railway transport: The railway services in Luzon have been losing share to the road system. The condition of the north line is poor, but the south line is being refurnished.

4) Air transport: The air sector handles some inter-island and virtually all the international passenger traffic.

Along with the progress of economic development, regional development and industrialization, the capacity of the transport network will have to be expanded systematically in the future.

2.4.2 Roads

The Ministry of Public Works and Highways (MPWH) is responsible for the construction and maintenance of roads and bridges in this country. As of 1984, the road network totalled 157,140 kilometers, 87.3 percent of which was unpaved. National roads measured 25,117 kilometers or 16.0 percent of the total (See Appendix 2.4.1).

Trunk roads connecting the major cities have been developed. However, roads in rural areas are not yet well developed.

2.4.3 Railways

There are two (2) railway systems in the Philippines: The Philippine National Railways (PNR) and the Philippine Railway Company. At present, the PNR owns two main railway lines (See Fig. 2.4.1). One is the North Line that runs from Metro Manila to San Fernando, La Union in the North. The other is the South Line that runs from Metro Manila to Legaspi, Albay in the South. The North Line measures 266 kilometers and the South Line 474 kilometers. (The rolling stock inventory for 1983 is shown in Appendix 2.4.2).

The number of railways passengers decreased by 7.7 percent in 1984, but there was a considerable gain of 34.5 percent in revenue. The volume of railway freight has been decreasing for twenty-five years since 1960. (Traffic volume and revenue for railways (PNR) are shown in Appendix 2.4.3).

2.4.4 Ports and Shipping

In the Philippines there are at present nineteen (19) base ports, sixty-eight (68) sub-ports, five hundred and four (504) municipal ports and numerous private ports under the supervision of 19 port management units (See Table 2.4.1). The Philippine domestic operating fleet by type of vessel is shown in Table 2.4.2. The number of vessels engaged in foreign shipping is shown in Table 2.4.3. Table 2.4.4 presents the number of passengers transported at the major ports all over the country. A total of 8.2 million passengers passed through the ports in 1983, 24.56 percent of which either embarked or disembarked in Cebu. Table 2.4.5 shows the cargo movement in the different ports. There was a total throughput of 17.3 million metric tons of cargo for both domestic and foreign trade in 1983. The leading ports with the greatest volume of cargo were the ports of Manila, Cebu and Zamboanga.

The ports in San Fernando, La Union and Aparri, Cagayan are used mainly as cargo ports. Table 2.4.6 shows the number and tonnage of vessels engaged in domestic trade which entered and were cleared at the major ports.

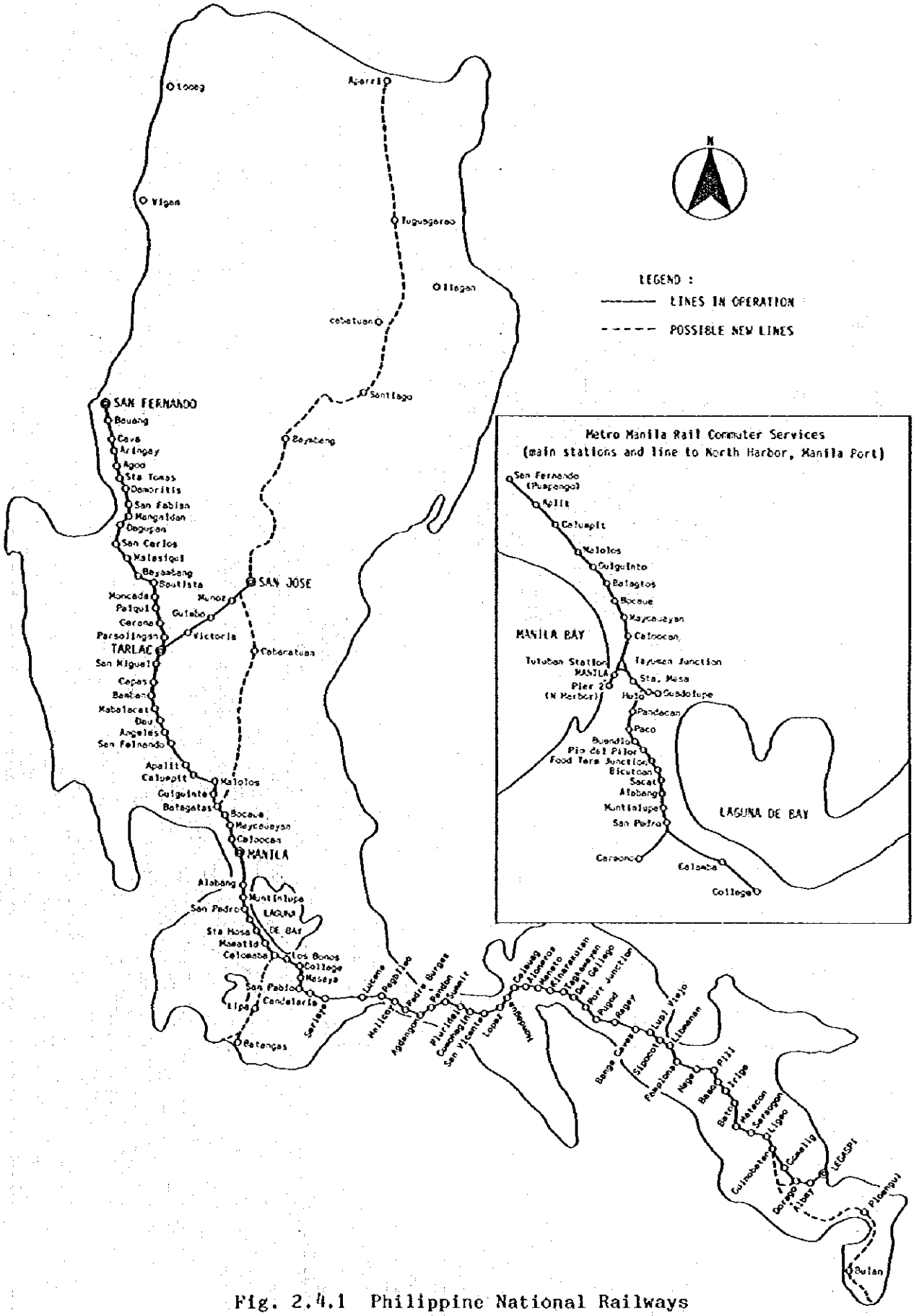

Fig. 2.4.1 Philippine National Railways

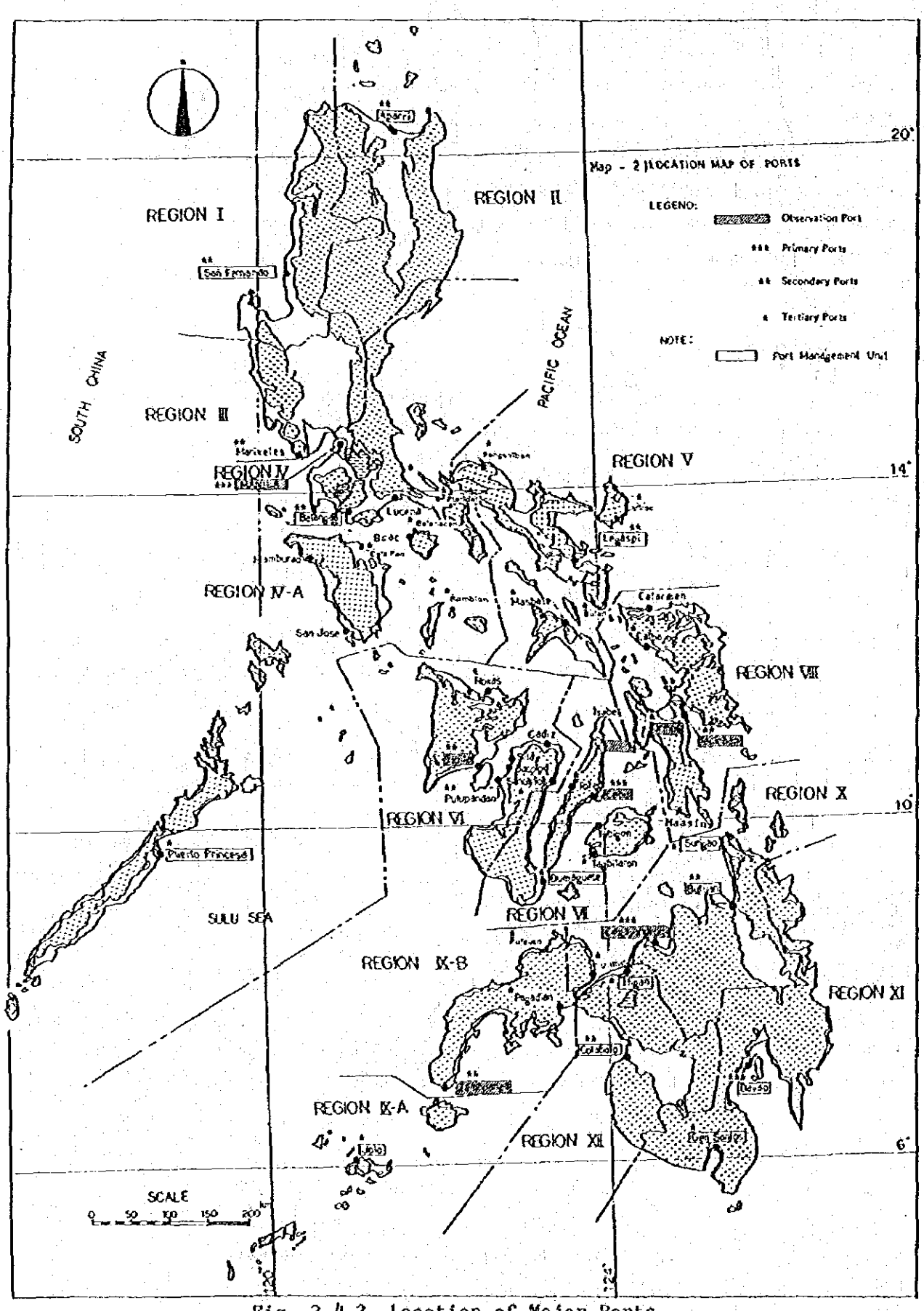

Fig. 2.4.2 Location of Major Ports

Table 2.4.1 Philippine Port System by Port Management Unit: 1986

Port Management Unit	Total	PPA Base Ports	PPA Sub-Ports	Other National/ Municipal Ports	Private Ports/ Loading Ports
Total	905	19	68	504	314
BATANGAS	83	1	7	49	26
CAGAYAN DE ORO	32	1	2	12	17
CEBU	87	1	9	51	26
DAVAO	27	1 (2 operating units)	1	9	16
DUMAGUETE	16	1	5	2	8
GENERAL SANTOS	9	1	-	3	5
ILIGAN	59	1	1	41	16
ILOILO	64	1	8	16	39
IRENE	15	1	2	7	5
JOLO	33	1	3	28	1
LEGASPI	55	1	6	35	13
MANILA	72	1 (4 operating units)	4	28	39
MASAO	31	1	2	3	25
POLLOC	16	1	2	3	10
PUERTO PRINCESA	28	1	1	13	13
SAN FERNANDO (L.U.)	35	1	1	26	7
SURICAO	70	1	1	59	9
TACLOBAN	133	1	9	97	26
ZAMBOANGA	40	1	4	22	13

Source: PPA

Table 2.4.2 Philippine Domestic Operating Fleet by Type of Vessel: 1982 and 1983

Type of Vessel	1983		1982	
	Number	Gross Tonnage	Number	Gross Tonnage
Total	4,479	-	3,631	-
PASSENGER FERRY	119	11,822	101	11,777.10
PASSENGER CARGO	559	177,699	344	183,156.00
GENERAL CARGO	1,008	441,996	986	444,780.00
SEMI-CONTAINER	-	-	-	-
CONTAINER	28	51,841	30	55,790.80
RORO (roll on roll of)	-	-	-	-
BULK CARRIER	-	-	-	-
LIGHTER	17	2,803	17	2,804.56
BARGE	793	333,280	815	339,938.00
OIL TANKER	72	139,730	75	141,580.00
PARCEL TANKER	-	-	-	-
TUG BOAT	345	38,029	332	37,213.30
FISHING BOAT	662	32,064	267	23,087.30
PLEASURE BOAT	32	6,330	31	6,368.62
PILOT BOAT	5	67	-	-
SALVAGE VESSEL	2	104	2	105.38
PASSENGER/CONTAINER	24	24,530	12	26,086.30
OTHERS	14	920	-	-
NO INFORMATION	799	93,892	619	95,879.70

Source: Philippine Yearbook 1985

Table 2.4.3 Philippine Registered Overseas Fleet by Type of Vessel: 1982 and 1983

Type of Vessel	1983		1982	
	Number	Gross Tonnage	Number	Gross Tonnage
Total	257	-	203	-
GENERAL CARGO	76	433,105.84	68	388,134.00
BULK CARRIER	78	1,300,065.97	59	925,443.00
TANKER	10	485,919.89	9	484,385.00
RORO	2	9,412.07	3	30,745.90
MULTI-PURPOSE	2	19,502.04	10	124,880.00
LOG CARRIER	12	62,419.45	2	10,399.50
REEFER	10	83,125.46	10	72,648.60
CONTAINER	-	-	4	8,047.62
CAR CARRIER	8	102,887.98	6	86,509.30
FEELER	-	-	1	1,226.00
LIVESTOCK CARRIER	10	27,923.35	3	4,220.13
GENERAL CARGO/CONTAINER	32	241,770.42	11	42,887.90
TUGBOAT	10	2,986.95	15	4,054.23
PASSENGER/CARGO	1	18,832.00	1	18,832.00
ORE/BULK CARRIER	4	147,265.00	1	53,504.00
REFRIGERATED CARGO	1	4,966.12	-	-
FISHING VESSEL	1	1,581.00	-	-

Source: Philippine Yearbook 1985

Table 2.4.4 Domestic Passenger Traffic by Major Ports: 1982 and 1983

Base Ports	1983 [a]			1982		
	Total	Embarked	Disembarked	Total	Embarked	Disembarked
Total	8,235,625	4,074,560	4,161,065	11,318,972	5,569,986	5,748,335
MANILA 1	1,566,828	779,132	787,696	2,529,062	1,244,322	1,284,740
South Harbor	18,058	8,818	9,240	22,883	10,893	11,990
North Harbor	1,548,678	770,286	778,392	2,503,790	1,232,398	1,271,392
Pasig River	92	28	64	2,389	1,031	1,358
CEBU	2,022,989	1,022,558	1,000,431	3,388,225	1,722,516	1,665,709
ILOILO	786,514	405,397	381,117	1,273,538	607,112	666,426
CAGAYAN DE ORO	499,391	276,830	222,561	625,304	334,185	291,119
DAVAO	112,528	61,906	50,622	204,702	109,378	94,673
Sasa	28,906	14,145	14,761	67,338	36,148	30,539
Sta. Ana	83,622	47,761	35,861	137,364	73,230	64,134
GENERAL SANTOS	80,449	44,179	36,270	137,218	72,663	64,555
ZAMBOANGA	1,794,185	842,269	951,916	894,954	406,914	488,040
BATANGAS	403,071	159,885	243,186	635,621	286,163	349,458
SAN FERNANDO	-	-	-	-	-	-
TACLOBAN	239,811	121,385	118,426	438,824	229,206	209,618
DUMAGUETE	209,296	97,095	112,201	312,867	145,563	167,304
POLLOC	24,556	15,919	8,637	-	-	-
ILIGAN	104,337	58,966	45,371	208,354	110,411	97,943
SURIGAO	149,553	73,924	75,629	275,477	127,364	148,113
LEGASPI	6,677	3,438	3,239	15,108	7,556	7,552
APPARI	-	-	-	-	-	-
JOLO	116,939	48,348	68,591	204,203	68,794	135,409
PUERTO PRINCESA	31,019	17,758	13,261	49,250	27,127	22,123
BUTUAN	87,482	45,571	41,911	126,265	70,712	55,553

a: January to June

Source: Philippine Yearbook 1985

Table 2.4.5 Cargo Movement by Major Ports at Berth and Anchorage: 1983

BASE PORTS	TOTAL CARGO	DOMESTIC TRADE			FOREIGN TRADE		
		TOTAL	INWARD	OUTWARD	TOTAL	IMPORT	EXPORT
1983 Total	17,341,268	9,017,556	5,467,877	3,549,680	8,323,712	1,822,482	6,601,229
MANILA	11,740,763	4,107,814	2,370,037	1,737,777	7,632,949	1,518,893	6,114,055
North Harbor	3,512,024	3,512,024	1,808,030	1,703,994	-	-	-
South Harbor	7,142,020	-	-	-	7,142,020	1,135,586	6,006,434
Pasig River	595,790	595,790	562,007	33,783	-	-	-
Internat'l Port	490,929	-	-	-	490,929	383,307	107,622
CEBU	1,285,387	1,198,809	759,267	439,542	86,578	58,929	27,649
ILOILO	509,270	458,606	220,954	237,652	50,664	43,664	7,000
CAGAYAN DE ORO	429,575	314,803	154,139	160,664	114,772	8,695	106,077
ZAMBOANGA	888,486	881,196	636,873	244,323	7,290	5,635	1,655
DAVAO	433,783	357,744	207,707	150,037	76,039	27,588	48,451
Sasa	378,502	302,463	175,458	127,005	76,039	27,588	48,451
Sta. Ana	55,281	55,281	32,249	23,032	-	-	-
GENERAL SANTOS	317,336	292,230	77,119	215,111	25,107	13,535	11,571
SAN FERNANDO	388,260	184,750	171,742	13,008	203,510	96,543	106,967
BATANGAS	201,712	165,516	104,668	60,847	36,197	997	35,200
TACLOBAN	168,001	160,559	91,869	68,691	7,441	2,628	4,813
DUMAGUETE	179,974	179,974	125,034	54,940	-	-	-
ILIGAN	150,677	88,089	48,115	39,974	62,588	39,925	22,663
SURIGAO	122,574	117,124	80,072	37,053	5,450	5,450	-
POLIOC	82,560	67,432	29,610	37,822	15,128	-	15,128
LEGASPI	51,728	51,728	43,009	8,719	-	-	-
JOLO	64,521	64,521	31,434	33,087	-	-	-
PUERTO PRINCESA	31,331	31,331	23,368	7,963	-	-	-
BUTUAN	4,116	4,116	1,646	2,470	-	-	-
APARRI	291,215	219,215	291,215	-	-	-	-

Source: Philippine Yearbook 1985

Table 2.4.6 Number and Tonnage of Vessels Entered and Cleared in Selected ports, Domestic and International: 1979-1984

(Tonnage in Thousands)

YEAR VESSELS & TONNAGE	DOMESTIC TRADE						FOREIGN TRADE					
	TOTAL	MANILA	CEBU	ILOILO	ZAMBOANGA	OTHERS	TOTAL	MANILA	CEBU	ILOILO	ZAMBOANGA	OTHERS
1979												
No. of Vessels	162,497	23,080	32,629	15,566	16,218	75,004	14,690	5,702	1,002	601	288	7,097
Gross Tonnage	82,245	18,482	11,433	8,038	5,859	38,433	37,595	-	-	-	-	-
Net Tonnage	51,700	10,886	8,577	7,735	3,318	21,184	77,310	23,804	3,754	2,122	1,865	45,765
1980												
No. of Vessels	152,798	23,271	29,935	16,959	15,461	67,172	13,561	5,340	848	600	254	6,519
Gross Tonnage	82,519	18,984	11,770	8,411	5,759	37,595	-	-	-	-	-	-
Net Tonnage	52,137	10,920	9,054	8,130	3,215	20,818	73,582	23,254	3,440	2,577	1,245	43,066
1981												
No. of Vessels	143,583	21,886	26,654	14,429	15,429	65,185	13,193	4,880	849	456	236	6,772
Gross Tonnage	73,886	16,230	10,928	7,402	5,551	33,775	-	-	-	-	-	-
Net Tonnage	48,443	10,381	8,572	7,122	3,135	19,233	74,331	23,192	3,390	1,923	1,366	44,460
1982												
No. of Vessels	139,433	21,330	25,219	14,008	15,349	63,527	13,478	4,105	806	360	230	7,977
Gross Tonnage	79,948	19,074	12,764	7,290	5,797	35,023	-	-	-	-	-	-
Net Tonnage	51,669	11,310	10,797	7,090	3,316	19,156	79,089	19,054	3,525	1,535	1,688	53,287
1983												
No. of Vessels	140,307	22,801	24,935	13,609	14,370	64,592	13,279	4,019	760	337	283	7,880
Gross Tonnage	89,446	21,508	14,661	7,437	6,437	39,403	-	-	-	-	-	-
Net Tonnage	56,614	12,976	10,315	7,237	3,694	22,392	82,551	19,932	3,316	1,358	2,058	55,887
1984												
No. of Vessels	126,901	22,178	22,235	12,595	13,345	56,548	11,418	3,592	608	334	317	6,557
Gross Tonnage	85,487	20,268	16,676	8,472	6,473	33,597	-	-	-	-	-	-
Net Tonnage	51,407	11,030	8,143	8,047	3,586	20,601	72,492	19,276	2,814	1,511	2,037	46,854

Source: Philippine Statistical Yearbook 1985