

**NATIONWIDE ROLL-ON ROLL-OFF
TRANSPORT SYSTEM DEVELOPMENT STUDY
IN THE REPUBLIC OF THE PHILIPPINES**

EXECUTIVE SUMMARY

AUGUST 1992

FINAL REPORT

JAPAN INTERNATIONAL COOPERATION AGENCY

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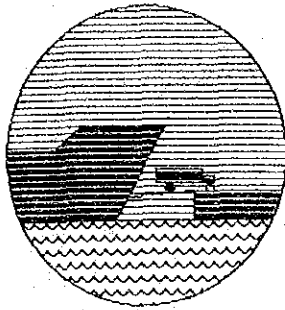
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PREFACE

In response to a request from the Government of the Republic of the Philippines, the Government of Japan decided to conduct the nationwide Roll-on Roll-off transport system development study and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Philippines a study team headed by Mr. Hideaki Sagara, Senior Executive Director of the Overseas Coastal Area Development Institute of Japan, five times between May 1991 and June 1992.

The team held discussions with the officials concerned of the Government of the Philippines, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

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

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

August 1992



Kensuke Yanagiya
President

Japan International Cooperation Agency

August 1992

Mr. Yanagiya Kensuke
President
Japan International Cooperation Agency
Tokyo, Japan

Sir,

It is my pleasure to inform you that I am submitting the Final Report of the Nationwide Roll-on Roll-off Transport System Development Study in the Republic of the Philippines. The Report consists of four volumes, ie., Nationwide Long-term Ro/Ro Transport Development Plan including an introductory section, Feasibility Study on the Iloilo-Bacolod Link (these two volumes comprise the main report), appendices to the main reports and the inventory of the study ports. The main report is accompanied by the summary and their Japanese versions.

While the first volume of the main report focuses upon the evaluation and prioritization of 42 routes which were selected beforehand by the government of the Philippines to be developed for the nationwide roll-on roll-off transport service, the second volume mainly concerns drafting of the short-term development plan for the Iloilo/Bacolod link which stands as one of the highest to be implemented and the assessment of the plan's feasibility.

The outcome of the study reveals that, with a view to encouraging the sustainable growth of the Philippine economy, a large number of the study routes should be cultivated, and Ro/Ro ferry service at the Iloilo/Bacolod link could be usefully and practicably brought in. The Philippine counterparts too, seem to be of the opinion that the coming report, along those lines which have already agreed upon between the study team and the counterparts, be utilized as a tool to formulate and foster the new five year infrastructure plan starting from 1993. With this in mind, it may be more appreciated if the report be transmitted to them in time for their preparation.

It may also be noteworthy that during the stay in the Philippines, the

Study team carried out three seminar/workshops together with several extraordinary workshop sessions, all of which were convened by the JICA sponsorship aiming at the transfer of technology with respect to Ro/Ro ferry development in the Philippines.

In conducting the study, the team has been extended valuable services from a number of personnel and institutions at the Philippines. The acknowledgement appears in the introductory section of the main report in detail. The team also wishes to take this opportunity to express its appreciation for all that your Agency has done.

Yours faithfully,

A handwritten signature in black ink, reading "Hideaki Sagara". The signature is written in a cursive style with a large, sweeping initial "H".

Hideaki Sagara
Leader, Study Team for Nationwide
Roll-on Roll-off Transport System
Development in the Republic of the
Philippines
(Senior Executive Director,
the Overseas Coastal Area
Development Institute)

Abbreviations and Glossary

I. Abbreviations of the Institutions

ADB	Asian Development Bank
APPOOP	Association of Private Port Owners and Operators of the Philippines
BOI	Board of Investments
CB	Central Bank
CISO	Conference of Inter-island Shipowners and Operators
DA	Department of Agriculture
DBM	Department of Budget and Management
DBP	Development Bank of Philippines
DND	Department of National Defense
DOLE	Department of Labor and Employment
DOTC	Department of Transportation and Communications
DPWH	Department of Public Works and Highways
DTI	Department of Trade and Industry
FPP PMO	Feeder Port Project Project Management Office
IATCTP	Inter-Agency Technical Committee on Transport Planning
IBRD	International Bank for Reconstruction and Development
LTFRB	Land Transportation Franchising and Regulatory Board
KfW	Kreditanstalt fuer Wiederaufbau (Germany)
MARINA	Maritime Industry Authority
MROs	MARINA Regional Offices
NAMRIA	National Mapping and Resources Information Authority
NSO	National Statistics Office
NEDA	National Economic and Development Authority
NHA	National Housing Authority
OECF	Overseas Economic Cooperation Fund
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PCCI	Philippine Chamber of Commerce and Industry
PCG	Philippine Coast Guard
PDOs	Port District Offices
PFDA	Philippine Fishery Development Authority

PISA	Philippine Inter-island Shipping Association
PMOs	Port Management Offices or Project Management Offices
PPA	Philippine Ports Authority
PRC	Professional Regulatory Commission
SEC	Security Exchange Commission
SMSA	Southwestern Mindanao Shipowners Association
USAID	United States Agency for International Development
VAFCSO	Visaya Association of Ferryboat and Coastwise Service Operators

II. Abbreviations, others

CI	Certificate of Inspection
CPC	Certificate of Public Convenience
dwt.	Deadweight Tonnage
EIRR	Economic Internal Rate of Return
EO	Executive Order
FIRR	Financial Internal Rate of Return
GDP	Gross Domestic Product
grt.	Gross Registered Tonnage
ICPC	International Commercial Port Complex (Iloilo)
IPP	Investment Priority Plan
LO/LO	Lift-on, Lift-off
MC	Memorandum Circular
MP	Municipal Port
MT	Metric Tons
MTPDP	Medium Term Philippine Development Plan
NFPDP	Nationwide Feeder Ports Development Project
NM	Nautical Mile
NRTSDS	Nationwide Roll-on Roll-off Transport System Development Study
OIC	Omnibus Investments Code
P	Philippine Peso
PA	Provisional Authority (vessel operation)
PCPR	Permit Certificate of Philippine Registry
PD	Presidential Decree

PIP	Public Investment Program
PMMRR	Philippine Merchant Marine Rules and Regulations
PSA	Public Service Act
RA	Republic Act
Ro/Ro	Roll-on, Roll-off
SOLAS	Safety of Life at Sea (Convention)
SP	Special Permit (vessel operation)
sq.m	square meter

III. Glossary

Arrastre	Longshoring
Banca	Small wooden boat with outriggers and no shelter
Barangay	Smallest administrative unit
Barangay Captain	Head of Barangay
Sangguniang Bayan	Town or Municipal Council

-- Currency Exchange Rate --

1 Philippine Peso = 5 Japanese Yen

1 US Dollar = 26 Philippine Pesos

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CONCLUSION AND RECOMMENDATIONS

I. Nationwide Long-Term Ro/Ro Transport Development Plan

Conclusion

1. In pursuit of sustainable economic growth and welfare promotion for the nation, the introduction and development of effective means of transportation is proposed in the Medium Term Development Plan. Ro/Ro operation is one of the transportation systems in this category, reducing cargo handling time at ports, which benefits both shippers and ship operators, and allows passengers and cargoes to reach their final destinations without interruption at sea/land terminal points. The Ro/Ro transportation system is especially effective for archipelagic nations like the Philippines.

2. To formulate a nationwide master plan of a Ro/Ro ferry transport system for the target year of 2010, field investigations of potential and existing Ro/Ro links, a list of which had been prepared by IATCTP, were jointly conducted by the JICA Study Team and IATCTP. The Team collected the latest information on shipping services, terminal facilities and socioeconomic activities in the hinterland regions. On-site traffic surveys were conducted on some of the study links to supplement the existing statistics. Aerial photographs were also taken to gain better understanding of the locational relationship between ports and towns and the land use pattern around the port.

3. Total 42 links shown in Figure 1 were selected as the study links. Based on a point mark system, the potential of each study link as the Ro/Ro transport mode was evaluated and prioritized. The criteria was composed of four major items; (i) mobility in the hinterland (ii) traffic demand (iii) cost for Ro/Ro terminal (iv) formation of transportation network, and each item consists of several variables. The variables, their link values and point total by study link are shown in Table 1.

4. The study links were categorized into three groups based on the point total of each link. The first group, consisting of twelve links, was evaluated as the most suitable links for Ro/Ro operations. Batangas-Calapan link is top ranked among them. The second group, consisting of fourteen links, was evaluated as moderate links for the Ro/Ro transportation. The rest of the study links were classified into the third group, which was evaluated as the least prosperous for Ro/Ro operations.

5. At present, the Pan-Philippine Highway with a total length of 2,100 Km is the single most important trunk line for the nation's unification and integration, containing two Ro/Ro links between the main islands of Luzon-Samar, and Leyte-Mindanao. After development or improvement of the first priority links for the Ro/Ro operations, main islands in the Visaya region are interconnected by Ro/Ro transportation, and a new national trunk line centering in Cebu is realized; Panay-Negros-Cebu-Leyte corridor and Cebu-Bohol link as shown in Figure 2.

6. Upon the completion of the links of the second priority group, social and economic ties between Visaya region and Mindanao region will be strengthened. Negros-Western Mindanao and Bohol-Central Mindanao links will play vital roles in fostering interisland transport. Remote islands with reasonable volumes of seaborne traffic are also linked by the Ro/Ro transport at this stage. Development of Ro/Ro links of the second priority group is also shown in Figure 2.

7. Total project cost for the development and improvement of Ro/Ro terminals of the first and second priority groups was estimated at about 2,700 million pesos. Project cost by link and by port were estimated individually, and a construction schedule was prepared so that the links of the first and second priority groups are in operation by the year 2010.

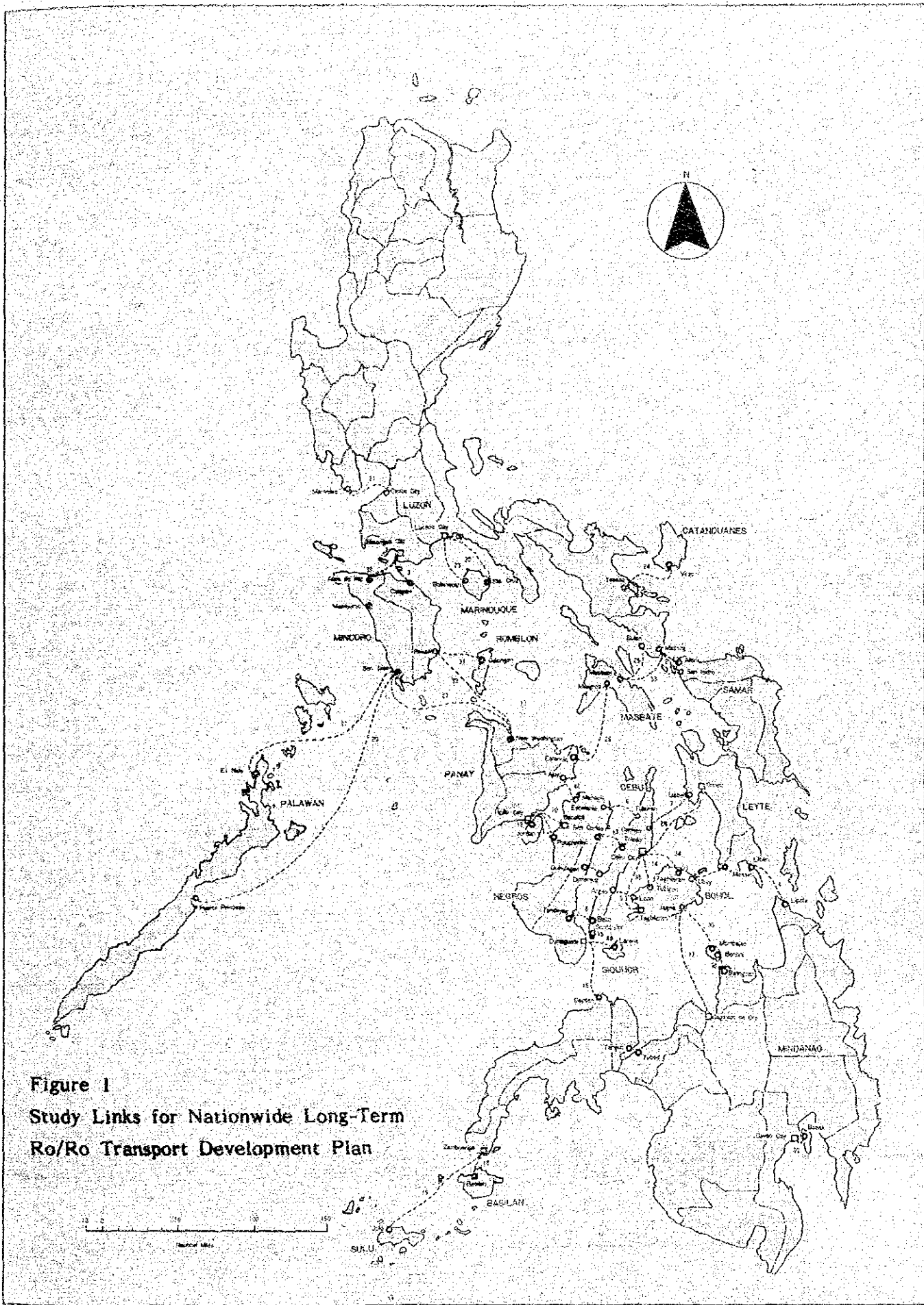


Figure 1
Study Links for Nationwide Long-Term
Ro/Ro Transport Development Plan



Figure 2. Ro/Ro Transportation Network Development Plan

Recommendations

(Maritime Policy)

It is necessary to adapt policies and rules so that an effective transportation means can be developed nationwide by introducing the Ro/Ro transportation system. The following are recommended as policy guidelines to be urgently required for promoting the Ro/Ro transportation system in the Philippines. It is suggested, however, that the recommendations should be understood in the context of the relevant facts and the analyses which appear in the main text (Vol. Chapter 2). For the reference, the paragraphs' number pertaining to each recommendations are indicated in brackets.

1. While it is the present arrangement in the Philippines for commencing domestic shipping business that any person or company must obtain a Certificate of Public Convenience (CPC), or a Provisional Authority (PA) from MARINA, it is the government policy to take steps toward deregulating liner services. However, most of the study links have a relatively limited volume of traffic, and may be served by operators whose financial positions are not strong. Therefore, the existing franchise scheme should be maintained for the routes where the demand is not sufficient for the more than two operators. (para.2.29).
2. Since the rate of maritime casualties and death toll thereof in the Philippines is high among other shipping nations, protection of life at sea should be given the highest priority in maritime policy alternatives. In this context, the government should maintain its function of controlling the passenger vessels' operation, until such time as the safety regulations which comply with the current international safety requirement are properly enforced by the administration, and the vessel operators are dedicated to the adherence of the regulations. Furthermore, the amending work of PMMRR should be expedited, and the Philippine Register of shipping should be utilized for certifying compliance of safety regulations with international endorsement (para.2.30 & 40).
3. Although some mitigating steps have been taken, rates of liner freight and passenger fare are basically still under strict control by the government. It is a consensus of those concerned that the existing scheme of freight pricing should be, in general, maintained. However, to encourage the expansion of

Ro/Ro service, it is recommended to introduce a specific Ro/Ro tariff scheme, in which rates are specified by type of vehicle so that collectors easily identify the charge to be levied. (para. 2.32 & 34)

4. As for institutional matters, it is suggested that DOTC should assume the role of planning coordinator in terms of Ro/Ro transport system; also local branches should be created to coordinate activities within the local circle for transport planning. Regarding construction of municipal ports, PPA should be more actively involved with its upgraded technological skills because characteristics of marine engineering which are essential for port works differ from those utilized for civil works on land. In order to sustain the policy implementation, reporting and notification systems between headquarters and local branches of the relevant agencies should be improved and a central filing system should be established.

Furthermore, for resolving the complicated problems concerning administrative structures and practices, an experienced consultant be hired to come up with effective and workable proposal (para. 2.38, 39, 43 & 44)

5. At present, fifteen agencies are requiring clearance formalities. December 31, 1991, EO No.493 was signed to cut red tape in the inter-island shipping business by reducing the number of clearance required to domestic vessels from 8 to 3, assuming PPA and PCG responsibility to coordinate vessel clearance procedures. Nevertheless, the implementing guideline has yet to be drafted. It is recommended that the work of the agencies should be expedited to formulate the adequate implementing guidelines of the EO No.493. (para.2.49)

6. Although MARINA has placed restrictions on the size of importing or bareboat chartering vessels for inter-island use to more than 500 grt, the restriction should be relaxed to under 300 grt for the benefit of operators of small vessels on secondary and/or tertiary Ro/Ro links. To implement the nationwide Ro/Ro ferry service project, specialized financing programs supported by government and other financial institutions are to be designed expeditiously for inter-island shipowners to acquire loans with favorable financing terms in the form of longer repayment periods and reasonable interest rates. (para. 2.60 & 62)

(Nationwide Long-Term Network Plan)

The demand for the introduction of the Ro/Ro transportation system on shipping links in the Philippines is on the increase, and this tendency will continue in the foreseeable future. The following recommendations are steps to be taken to foster the development of the effective transportation system throughout the Philippines as soon as possible.

1. Feasibility studies should be carried out for the first priority links if they are not yet done. If the feasibility study reveals both its technical soundness and economic/financial viability as a Ro/Ro transport link, construction work should commence. Among the ports of first priority links, ports which are not operating at present will be constructed earlier than those already under Ro/Ro operation.

2. A five-year-package development program is recommended. To the greatest extent possible, construction sequence of the ports should be established to formulate the nationwide Ro/Ro trunk corridors at each stage. After development of the ports of the first priority group, development works for the ports of the second priority group would follow.

3. Sequence of development of the links among the second priority group will be the same as that of the first priority group. It should be noted that some links of the second priority group will play very important roles in formulating the nationwide Ro/Ro trunk corridor such as Dumaguete-Dapitan link.

4. It is not advisable for the links of the third priority to be hastily developed as Ro/Ro transportation links because they are at pre-mature stage. Rather, it is advisable to improve the level of shipping services such as service frequency and to upgrade the level of safety.

5. Road improvement affects Ro/Ro transport; where there is no road traffic, there is no Ro/Ro traffic. It is recommended that planning and implementation work of Ro/Ro terminals and that of roads should be coordinated with each other to fully benefit from the advantages and characteristics of this type of transportation means.

6. It is recommended that a monitoring system on nationwide Ro/Ro traffic should be established to facilitate the preparation works for the ever-increasing demand of Ro/Ro traffic.

II. Feasibility Study on the Iloilo-Bacolod Link

Conclusion

1. Iloilo-Bacolod link is one of the first priority links for the Ro/Ro operation which the nationwide master plan in Volume I of this report has identified. Since the opening of Ro/Ro operation between Escalante Port (Negros Is.) and Tuburan Port (Cebu Is.) in 1983, there has been growing expectations to open a similar Ro/Ro service between Panay Is. and Negros Is., leading to the through traffic from Cebu City to Iloilo City. This link is one of the busiest shipping links connecting neighboring major islands in the Philippines with a one-way passenger traffic of more than 780 thousand passengers and 126 thousand tons of cargo in 1990. Two (2) passenger/cargo ferries and a pure passenger ferry are regularly plying on this link.

2. To evaluate the technological feasibility, topographical, hydrographical and geological conditions are surveyed at Ports of Iloilo and Bacolod. Maximum current velocity was observed in the range of 1.2 to 1.5 m/sec, and tidal variation is 2.3 to 3.0 m. Subsoil material in Iloilo consists mainly of sand, and that in Bacolod consists of fine sand and soft clay at sea bed. Bearing stratum are found about 15 m to 25 m below existing sea bed. From the natural conditions surveys, it can be said that construction of Ro/Ro terminal facilities at both ports are technologically feasible.

3. Future Ro/Ro vessel size on Iloilo-Bacolod link is forecast at 2000 grt from the estimation of capital and annual operation cost. The required water depth for the vessel operation is 5.5 m. Old Foreign Pier is selected for the Ro/Ro terminal site at Iloilo Port over River Wharf and ICPC based on the comparison of existing berth utilization, convenience for passenger/cargo and availability of berth expansion. Banago Pier, Reclamation Area and a new site were considered for the future Ro/Ro terminal site at Bacolod Port. The chosen site is Banago Pier based on the comparison of construction cost and clients' transportation cost.

4. Ro/Ro terminal plans at Iloilo Port and Bacolod Port are made to meet the passenger/cargo demand in the year 1997, which are shown in Figure-3 and Figure-4. Two (2) Ro/Ro vessels are each required to make

two (2) round trips a day to meet the demand. Environmental impact by the project is considered minimal because the project size is small and the project sites are already developed and utilized for port operations. The total cost for the construction of Ro/Ro terminals at the two ports is estimated at 299 million pesos, including a foreign exchange component equivalent to 110 million pesos.

5. The project will have significant economic benefits. The project will generate benefits in the form of reduced cargo handling costs, reduction in pilferage/damage of cargo, avoided truck operating cost and waiting time, and passenger time saving. The economic internal rate of return for the project is estimated at 18.4 per cent. The financial internal rate of return for the project is estimated at 6.2 per cent for Iloilo Port and 7.3 per cent for Bacolod Port under the condition of government subsidy to the portion of access trestle at Banago Pier. The project is feasible from the view point of the national economy and financially sound for port management bodies.

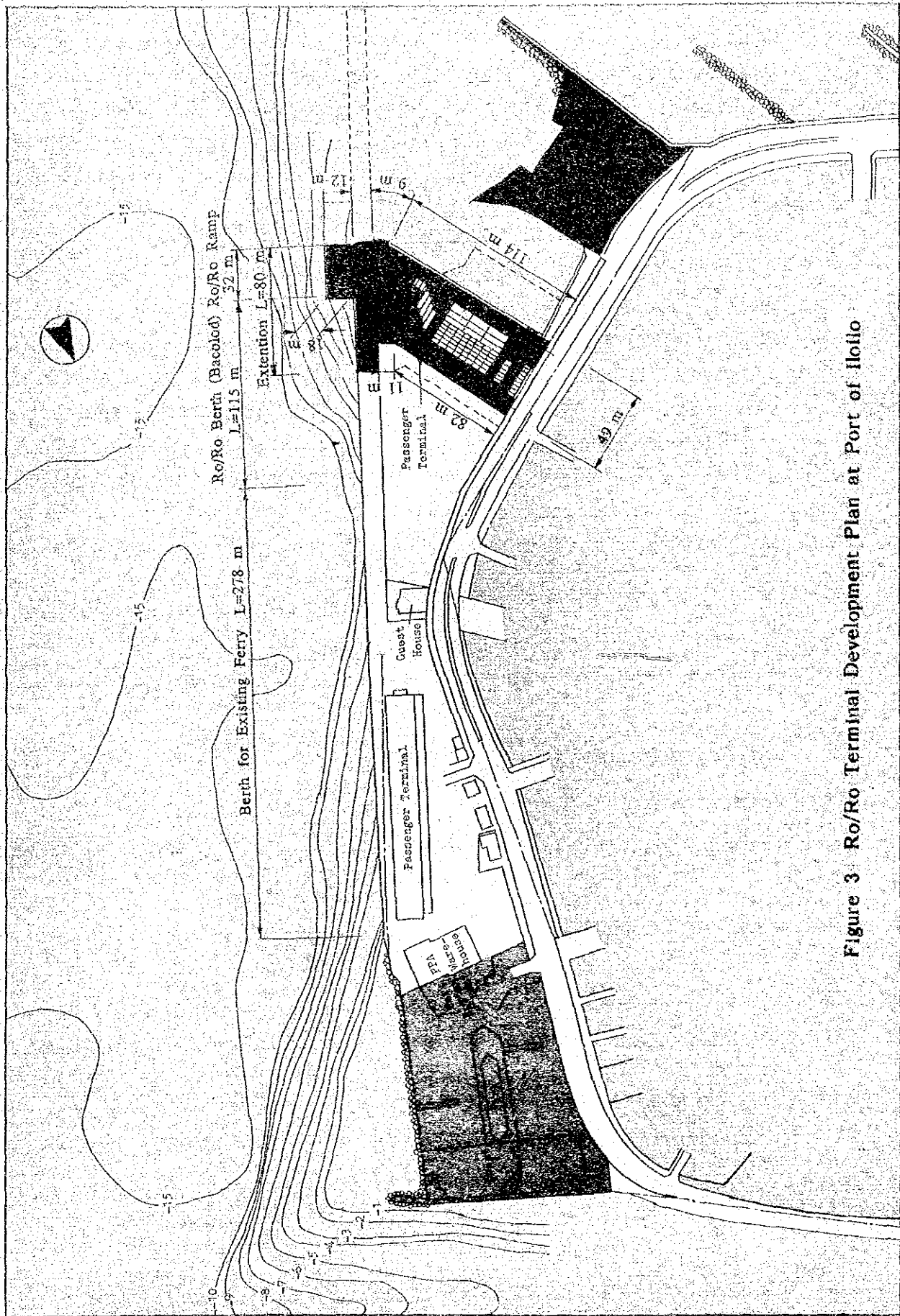


Figure 3 Ro/Ro Terminal Development Plan at Port of Iloilo

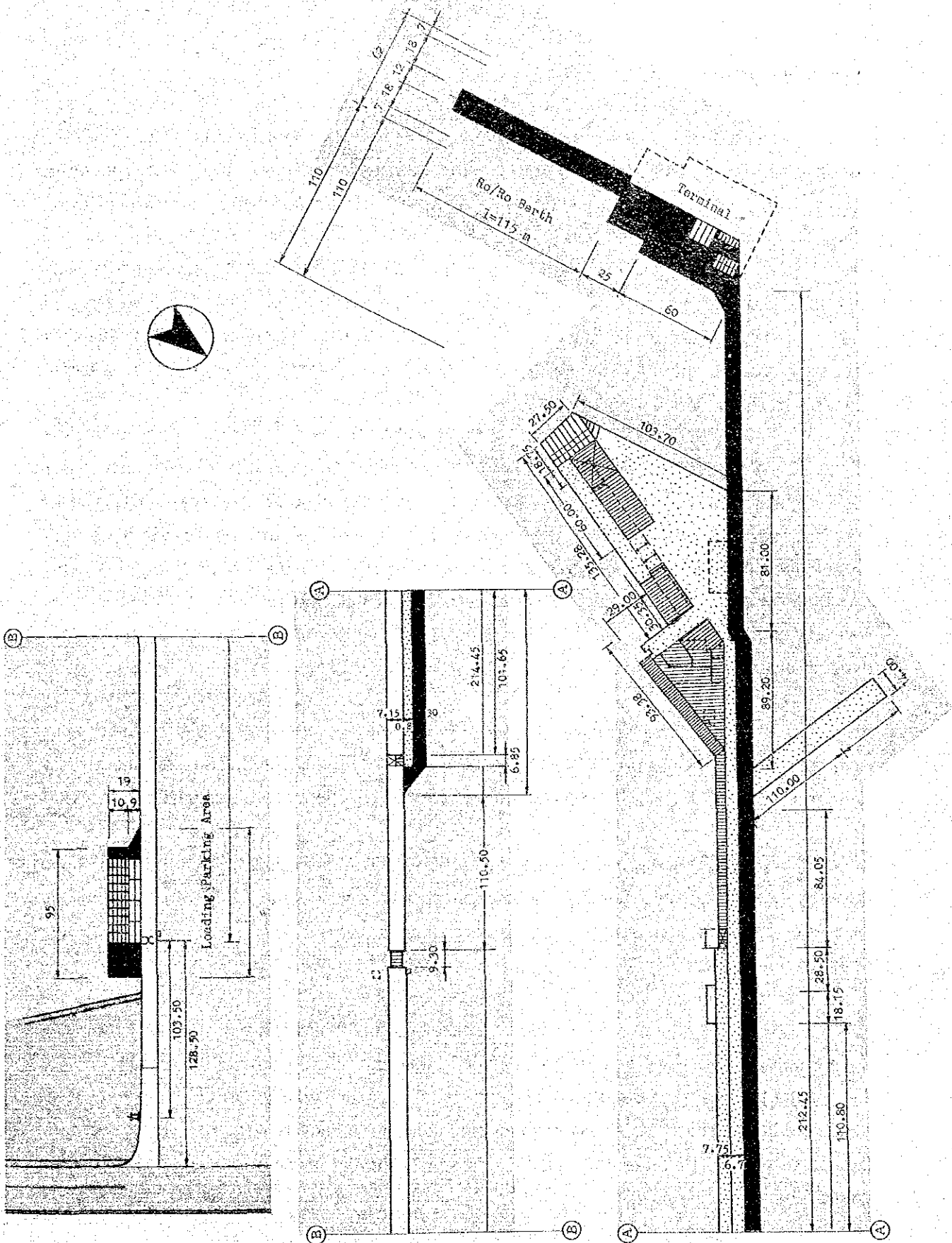


Figure 4 Ro/Ro Terminal Development Plan at Port of Bacolod

Recommendations

The Iloilo - Bacolod link is one of the links with the highest potentiality for introduction of the Ro/Ro transportation system. The following are summary recommendations for the successful implementation of the project.

1. To attain the financial viability of Bacolod Port, financial and/or technological support from the government will be required. As the causeway is mainly utilized as a road rather than a port facility, the public sector such as the government should compensate the port management body for the partial construction cost with a subsidy.

2. There is a possibility that a private firm might implement the development work of the Ro/Ro terminal. In general terms, private firms may not be qualified to obtain direct public loans. In view of the importance and magnitude of the social economic benefits of the Ro/Ro project on this link, the government should make arrangements for private firms to obtain loans from foreign or international public lending agencies like some projects actually conducted by private firms.

3. Prior to the actual development of the Ro/Ro ferry terminal at Bacolod, additional subsoil investigation at the construction site should be conducted to obtain supplementary subsoil data for the detailed design.

4. During development works of the Ro/Ro terminals at Iloilo Port and Bacolod Port, suitable safety measures should be taken to avoid unexpected incidents because construction works have to be carried out in the existing port operation area.

5. It is recommended that a meteorological observatory be set up as a permanent station in Bacolod to provide continual meteorological information for the project. As the Bacolod coastline is characterized by heavy siltation, it is also recommended that an additional function be added to the existing reference tide station at Bacolod to enable the periodical observation of the siltation caused by current.

INTRODUCTION

1. Background

Transportation in the Philippines is characterized by the dominance of road transport for intra-island movement and coastal shipping for interisland movement. The former accounts for about 65% of freight and 90% of passenger movement, while the latter handles about 35% of freight and 7% of passengers. These two modes generally complement rather than compete with each other.

About 55% of the total population of the Philippines (about 60.2 million in 1990) is concentrated in Luzon island where Metropolitan Manila is located, 23% in Visayas islands, and 22% in Mindanao island. Maritime transport, especially ferry transport, has been playing a significant role as the intraregional and interregional transport means. Regarding the ferry transport, Ro/Ro services are in operation on more than 20 links. It is requested, however, that safety and efficiency of maritime transport be increased because neither administrative rules and regulations nor related port facilities on the Ro/Ro transportation have been made.

Under these circumstances, the government of the Philippines requested the government of Japan to conduct the Nationwide Roll-on Roll-off Transport System Development Study.

2. Objectives

The objectives of the study are:

- (1) To formulate a master plan for a Ro/Ro ferry transport system including policy guidelines for an effective Ro/Ro ferry transport system
- (2) To identify and prioritize the potential Ro/Ro ferry routes and to conduct a feasibility study on the short-term development program

3. Particulars

In response to the request of the government of the Philippines, the government of Japan entrusted the study to JICA, which sent a contact mission to the Philippines from 26 October 1989 to 4 November 1989, followed by a preliminary study team from 24 January 1990 to 1 February 1990. Both of the teams were headed by Mr. Kobune.

The teams carried out a series of discussions and consultations with Philippine counterparts on the content of the study. On 31 January 1990, Implementing Arrangement for the study was formalized between Mr. Kobune and Mr. Romeo I. De Vera, Undersecretary, Department of Transportation and Communications, the government of the Philippines.

Based on the Implementing Arrangement, JICA sent to the Philippines a study team headed by Mr. Hideaki Sagara, Senior Executive Director of the Overseas Coastal Area Development Institute of Japan, five times between May 1991 and June 1992.

4. Scope of Work

To fulfill the objectives of the study mentioned earlier, the following were analyzed.

- 1) Review and analysis of available data and information
- 2) Field reconnaissance on study links and ports
- 3) Future demand forecast
- 4) Policy guidelines for effective Ro/Ro transport system
- 5) Master plan for nationwide Ro/Ro transport development
- 6) Feasibility study on the short-term development program
- 7) Workshops

5. Study Schedule

1) Preparation work in Japan	April 1991
2) 1st visit and Inception Report	May-June 1991
3) 2nd visit and Progress Report	July-August 1991
4) 3rd visit and Interim Report (I)	Oct.-Sept.1991
5) 4th visit and Interim Report (II)	March 1992
6) 5th visit and Draft Final Report	May-June 1992
7) Final Report	August 1992

6. Study Team

The Study Team is made up of 12 experts. Their names and responsibilities are listed below;

Name	Responsibility
Mr. Hideaki Sagara	Team Leader/Maritime Policy (I)
Mr. Hiroshi Kato	Acting Leader/Port Planning (I)
Mr. Toshihisa Inoue	Port Planning (II)
Mr. Akira Takahashi	Maritime Policy (II)
Mr. Shigeki Endo	Demand Forecast
Mr. Hikari Kanzawa/	Port Management/Financial Analysis
Mr. Norio Uemura	
Mr. Isamu Hotta	Design
Mr. Tomoo Iba	Natural Conditions (Topography/Oceanography)
Mr. Mitsuhiko Hasegawa	Natural Conditions (Soil)
Mr. Sadao Orishimo	Construction Schedule/Cost Estimation
Mr. Naoshi Okamura	Traffic Analysis/Economic Analysis
Mr. Venetial Lynn M. Martinez-Sison	Traffic Investigation

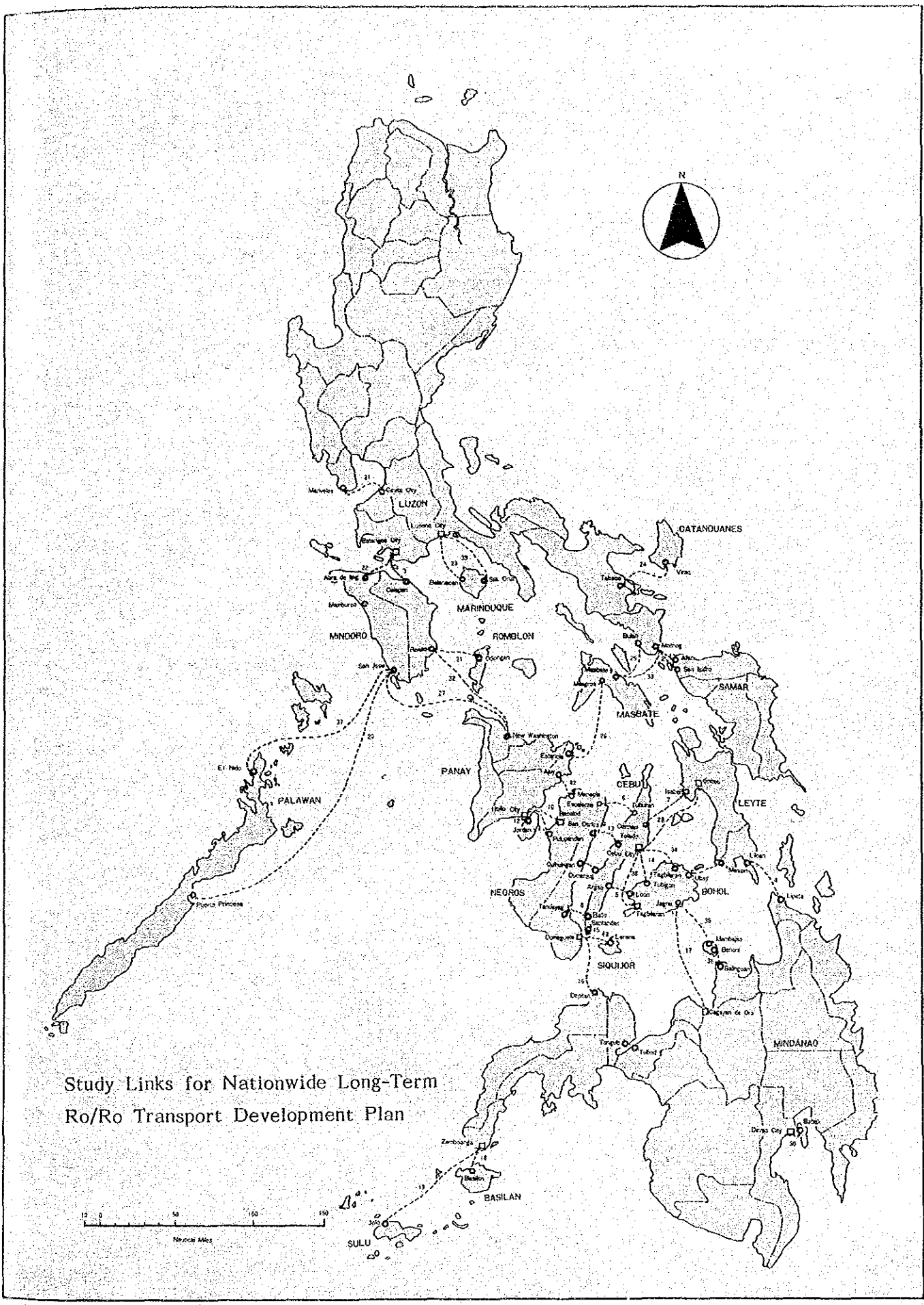
7. Counterparts of Philippine Side

Hon. Jose R. Valdecanas	Undersecretary, DOTC	
-Technical Advisors IATCTP		
Ms. Carolina S. Guina	Project Financing (up to May 1992)	NEDA
Mr. Augusto B. Santos	Management	NEDA
Mr. Manuel M. Bonoan	Road Development	DPWH
Ms. Ellen Delgado	Shipping	MARIAN
Mr. Ruben S. Reinoso	Transport Planning	NEDA
Mr. Thomas Quintos	Port Planning (up to October 1991)	PPA
Mr. Bert Catalan	-do- (from January 1992)	PPA
Mr. Jose P. Gloria	Project Monitoring	DPWH
-Key Technical Staff		
Mr. Cesar T. Valbuena	Project Coordinator	DOTC
Mr. Samuel C. Custodio	Project Manager	DOTC
Mr. Geronimo S. Alonzo	Deputy Project Manager	DPWH
Mr. Edgar Dona	Deputy Project Manager	NEDA
Mr. Eugene Goyena	Transport Planner	DOTC
Ms. Alma Porciuncula	Transport Economist	NEDA
Ms. Victoria A. Corpuz	Systems Analyst	DPWH
Mr. Roberto C. Aquino	Port Specialist/Economist	PPA
Ms. Helen Sarigumba	Shipping Specialist	MARINA
Mr. Ephraim D. Capucan	Sr. Structural Engineer	DPWH
Mr. Faustino Sta. Maria	Sr. Traffic Engineer	DPWH
-Technical Support Staff		
Ms. Rose C. Puse	Port Engineer	PPA
Mr. Cesario Vicente	Asst. Traffic Engineer	DPWH
Mr. Generoso Joves	Soil Engineer (up to March 1992)	DPWH
Ms. Lualhati B. Hizon	Research Engineer (up to November 1991)	DPWH
Mr. Carmelino Tizon	Research Engineer	DPWH
Ms. Elenita D. Asuncion	Asst. Transport Economist	DOTC

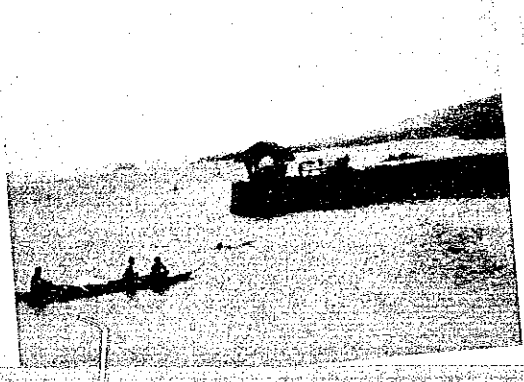
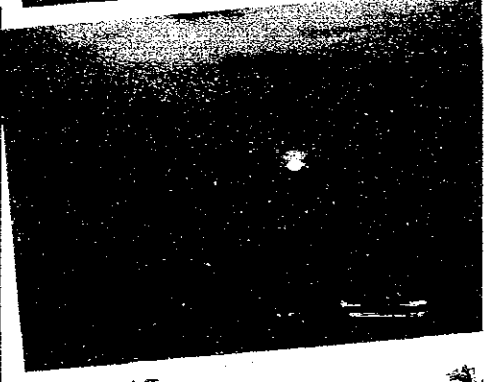
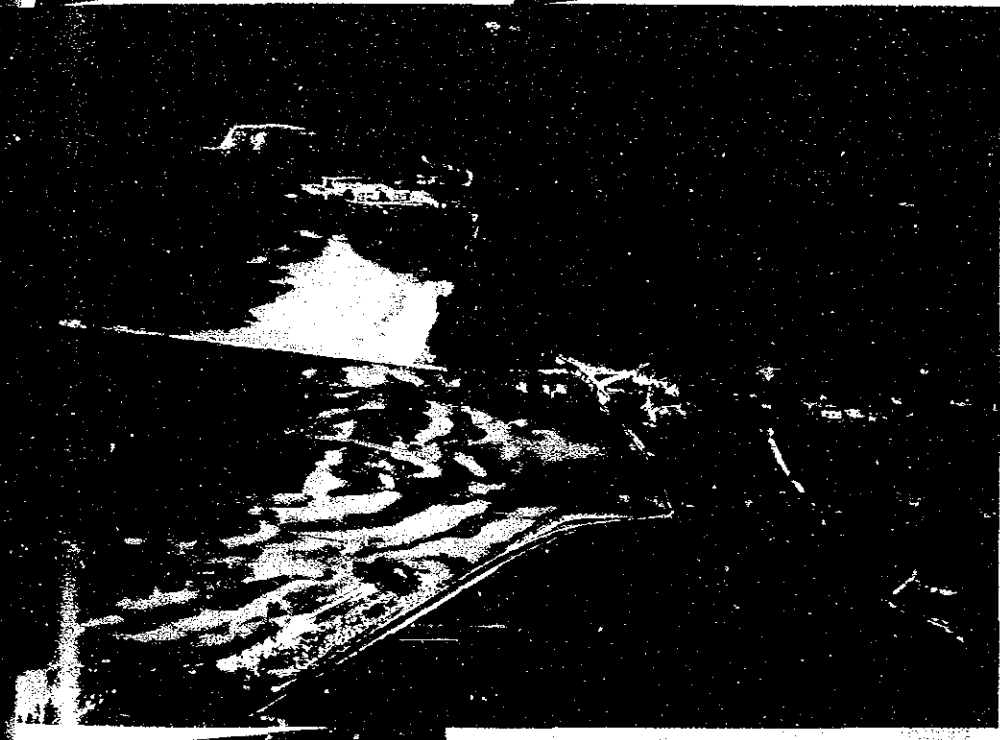
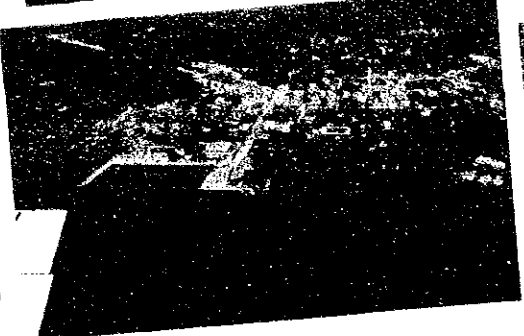
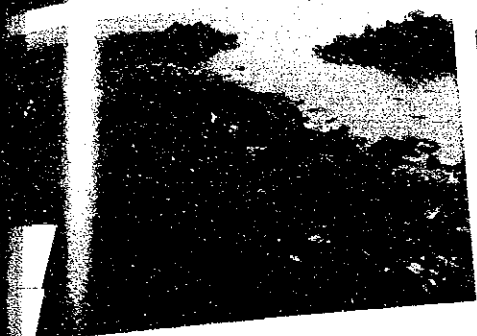
Ms. Louella D. Alonzo	Transport Devt. Researcher	DOTC
Mr. Arsenio F. Lingad II	Shipping Specialist	MARINA
Mr. Pablito Abellera	Civil Engineer	NEDA
Mr. Ariel Dimaano	Civil Engineer (up to December 1991)	DPWH
Mr. Antonio Yaptangco	Civil Engineer (up to March 1992)	DPWH
-Administrative Support		
Mr. Rogelio V. Jimenez	Accountant	NEDA
Ms. Zenaida N. Romero	Book Keeper	NEDA
Mr. Romeo O. Magumbol	Disbursing Officer	NEDA
Mr. Juanito Manzano	Dupl. Machine Operator	DPWH
Ms. Gloria C. Templo	Clark/Typist	DPWH
-Staff		
Mr. Marcel Adriatico	Economic Researcher	RO/RO
Mr. Friedrich Aguasa	Economic Researcher	RO/RO
Mr. Ildebrando Ibay	Economic Development Specialist I (-March 1992)	RO/RO
Mr. Philibert Jaramillo	Economic Researcher (up to June 1991)	RO/RO
Ms. Mary Berth A. Hussain	Secretary I	RO/RO
Mr. Jaime Lagos	Driver I	RO/RO
Mr. James Inzon	Utility Worker I	RO/RO

VOLUME I

NATIONWIDE LONG-TERM RO/RO TRANSPORT DEVELOPMENT PLAN



Study Links for Nationwide Long-Term
Ro/Ro Transport Development Plan



Chapter 1 Present Situation of Shipping and Port

A. Institutional Structure of Domestic Shipping

Following administrative institutions are concerned with the coastal shipping in the Philippines.

1. DOTC is the policy-drafting, planning, coordinating administrative entity of the executive branch of the government is promotion, development and regulation of network of transportation and communication system. In order to achieve the mandate, DOTC has, inter alia, the following objectives:

- To promote the development of a dependable and coordinated transportation network;
- To guide government and private investment in the development of the country's intermodal transportation system in a most practical, expeditious and orderly fashion for maximum safety, service and cost effectiveness; and
- To impose appropriate measures so that technical, economical and other conditions for the continuing economic viability of the transport industries is not jeopardized.

2. MARINA is one of the attached agencies of DOTC responsible i) to develop, formulate and implement policies, plans, rules etc. for the promotion and effective regulation of maritime industry, and ii) to implement safety regulatory functions pertaining to vessel construction and operation.

3. PPA – see next section

4. NEDA is responsible for coordinating the formulation and implementation of socioeconomic development plans and policies.

5. DPWH's function includes i) to provide technical services of planning, design, construction and maintenance of infrastructure, ii) to assist other agencies in determining the most suitable entity to undertake public work projects.

B. Port Management Bodies

6. Among some 1000 ports, which consists of 18 base ports, 75 secondary ports, 528 municipal ports and more than 300 private ports, base ports and secondary ports are managed by PPA.

7. PPA is one of the attached agencies of DOTC, and its prescribed function includes i) to formulate and implement a comprehensive and practicable port plan in coordination with NEDA, ii) to supervise, regulate, construct and operate such facilities and services as are necessary for ports, iii) to provide and assist in provision of training facilities for the employees. It has local branches, viz. 5 district offices (PDO) and 20 management offices (PMO).

8. PPA's account is conducted on a commercial basis and has a self-sustaining operation. The financial performance of PPA was sound until 1990. Debt service coverage ratio is well under the IRBD requirement since 1987, however, it is predicted to be soon beyond that line.

Chapter 2 Maritime Policy

A. Franchising and Pricing

1. These policies have long been enforced under the Public Service Act (1963). There exist many views to criticize the government regulating franchise of shipping and pricing of their services on the ground that the regulations impede the creation of an efficient water transport network, especially for liner services. Policy declared by the Philippine's government also reveals that domestic shipping operations should be more liberalized and less regulated. However, following two elements should be recognized when drafting new policy formula.

2. The first element is the "human factor". A policy, however logically or theoretically drafted, cannot be workable if the people concerned regard it disagreeable to their long accustomed practice. Therefore, from the outset of the study, the views of relevant persons should be carefully examined. In this respect, there are no calls for the immediate removal of all the regulations concerned, but partial and gradual liberalization is touched upon.

3. It should be noted that one policy may adversely affect persons directly and/or indirectly involved in the aftermath of the implementation. This point should particularly be carefully examined in developing countries with vulnerable economies and industries. With administration and community hampered by many issues, damage caused by the impact may be so great that it would take many years to recover even with an immediate policy revision. This issue can be called as the 'years after' problem.

4. With above points in mind, and following a famous Far-eastern proverb "Do not kill the ox by trying to correct his distorted horn", it can be said that it is more prudent for the development of an adequate Ro/Ro transport system to adopt a policy in which the government works closely with the relevant industries with the view to making and enforcing the guidelines for better operations rather than advancing a free market policy. While the study team acknowledges that competition in the maritime field is useful and that circumscription from the government should be limited to the minimum extent, in order to mitigate the possible adverse effect of liberalization/deregulation, a Fabian approach is recommended.

B. Institutional Matters

5. According to Sect.2.3 of the Inception Report of Nationwide Roll on Roll off Transport System Development Study (1989 IATCTP), the basic functions of relevant government agencies are divided into three phases, namely i) policy formulation, ii) infrastructure construction and administration and

implementation. Among the IATCTP agencies, DOTC is generally responsible for policy formulation and the planning of the Ro/Ro project (excl. roads and bridges which are under jurisdiction of DPWH) with coordination by NEDA. Implementation of the project and regulation of the industries are carried out by itself or through the attached agencies (PPA, MARINA and LAFTB) and their local branches. DPWH is responsible for the construction and maintenance of municipal ports. Present arrangement for the Ro/Ro development is discussed in the following paragraphs.

6. The IATCTP was established in 1989 to integrate the proposals by the different government agencies with the view to developing viable Ro/Ro transport systems focusing upon the effective utilization of existing and proposed transport facilities. Although IATCTP works well, this kind of combined team has an inherent disadvantage in that its efficiency and integrity is generally weaker than that of a strong single agency.

7. PPA is gradually moving toward dual/multi operators in one port, however, in ports under a certain size, one operator handles all the cargo in the port. While it is argued that a free and competitive market arrangement stimulates efficient cargo handling, for ports in remote areas where vessel service is limited, a license should not be extended to more than one operator. Recently, PPA has adopted a contract policy whereby the term is longer than one year which was the normal licensing term several years ago, and this position should be encouraged with the view to attracting investment.

8. The 'no work no pay' principle of port pricing is particularly important for promoting Ro/Ro transport since the mode of transport drastically reduces cargo maneuvering in the port. For Ro/Ro transport, ports are required to furnish such facilities as ramps and parking areas for car. With these points in mind, after a short transitional period, a restructuring of tariff including i.a. abolishing of cargo handled charges for cargo on vehicle and levying of the charge on the car should be implemented.

9. For implementing policy it is imperative to maintain reliable communication between the relevant department and the attached agencies, and between headquarters and the local branches. In this respect, the team observed some defects during the study.

10. For resolving many problems concerning administrative structures and practices, an experienced consultant be hired to come up with an effective and workable proposal.

11. Many government agencies request vessel clearance formality. These cumbersome proceedings directly affect the efficiency and cost of ship's operation. The Philippine government is aware of the problem and has issued EO No.493 on Dec.1991 to reduce the number of clearance requests. This should be urgently implemented with the consent of requesting agencies.

C. Vessel Acquisition

12. At present, import or bare-boat chartering vessels must be more than 500 grt. and 15 years old. Since the restrictions may cause some difficulty in view of encouraging development of Ro/Ro transport, MARINA's work to review the policy should be expeditiously implemented. For ship's acquisition, a bare charter is more favorable for the operator because he is able to evade huge import tax by payment of only 4.5% tax.

13. Recently, house bill 34234 was proposed to encourage the vigorous development of inter-island shipping. The bill provides that foreign currency for importing of vessels and spare parts be made available by CB. It also provides that more than 500 grt. and less than 12 year old vessels are qualified to be imported tax-free. Although tax-free import is an attractive incentive for investment, size restriction to minimum 500 grt. is questionable because many study routes may served by less than 500 grt. vessels.

14. The study team makes a number of recommendations in terms of franchising and pricing based upon the standpoints which are stated in previous paragraphs. These recommendations appear in the first part of this summary.

Chapter 3 Shipping Links in the Study

1. In 1988, the "Nationwide Ro/Ro Transport System Development Study" was created to integrate the proposals by the different agencies of the government to develop viable Ro/Ro systems focusing on the effective utilization of existing and proposed shipping services. Taking into account factors such as present traffic, population, economic benefits, future potential and geological suitability etc., 42 links including existing Ro/Ro links are selected and proposed by IATCTP as the nationwide Ro/Ro study links.

2. Currently, nationwide Ro/Ro ferry operations are at various stages of development and have different levels of services. In some cases, Ro/Ro services are available, but are not functioning well due to a lack of required facilities. According to the IATCTP Inception Report, there were nine service links where Ro/Ro vessels were operating as of October 1989.

3. Field reconnaissances on the study ports by JICA study team, however, have revealed that the level of current shipping services is lower than that in 1989. For example, no sailing services currently exist on Dumaguete-Dipolog link because a timber pier and the causeway of the Dipolog Port were destroyed by a typhoon in 1989. It is also observed that no ferry services have been offered on Batangas-Manburao link since Ro/Ro vessels were put into operation between Batangas and Abra de Ilog in 1990.

4. Although JICA study team highly regards the proposed 42 links, slight modification is needed in light of the changed shipping services. Modification of six(6) links is recommended. The modified study links in the Nationwide Long-Term Ro/Ro Transport Development Plan are shown in Figure I-3-1.

Chapter 4 Features of the Study Ports

1. A total of 67 ports are counted as study ports in this study. The names of the region, island and province for each of the study ports are listed in Table I-4-1. More than half of the study ports come from the Visaya region, which consists of about 6,000 islands.
2. As for management organizations, 50 per cent of the study ports are municipal ports, and 40 per cent are PPA base ports. Three (3) ports are privately owned and managed. The study ports contain several types of ports with varying degrees of port traffic. Some of them are as small as feeder ports and others function like international ports.
3. Information on existing port facilities, layout plans, port traffic and natural conditions at each port are vital for the implementation of this study. PPA Port Inventory is the major information source for many of the study ports.
4. Field investigations of the study ports were jointly conducted by the JICA Study Team and IATCTP. The Team collected the latest information on shipping services, terminal facilities and socioeconomic activities in the hinterland regions. On-site traffic surveys were conducted on some of the study links to supplement the existing statistics. Aerial photographs were also taken to gain better understanding of the locational relationship and the land use pattern around the port.
5. The outcome of the field reconnaissance is incorporated in the form of "Port Inventory For Ro/Ro Study". This inventory covers all of the Ro/Ro study ports, and contains information on socioeconomic conditions, port traffic, berthing facility, and Ro/Ro facility as well as aerial photograph and port layout plan.
6. The vital role of the major road links is to contribute to the most accessible, convenient, and economical transportation leading to the Ro/Ro ports, particularly to the commercial and business districts in the region. The present condition and future improvement plan of the Ro/Ro road links are investigated and summarized with assistance of DPWH.

Table 4-1 Classification of the Study Ports by Region

REGION	ISLAND	PROVINCE	Ferry Port	ROUTE NO.
III	Luzon	Bataan	1. Mariveles	21.
IV	Luzon	Cavite	2. Cavite City	21.
		Laguna	3. Lucena City	23.39.
		Batangas	4. Batangas City	3.22.
	Mindoro	Mindoro Oriental	5. Calapan	3.
		Mindoro Oriental	6. Roxas	31.32
		Mindoro Occidental	7. Abra de Ilog	22.
		Mindoro Occidental	8. San Jose	20.27.37.
	Marinduque	Marinduque	9. Balanacan	23.
		Marinduque	10. Sta. Cruz	39.
	Romblon	Romblon	11. Odiongan	31.
	Palawan	Palawan	12. El Nido	37.
		Palawan	13. Puerto Princesa	20.
V	Luzon	Albay	14. Tabaco	24.
		Sorsogon	15. Matnog	1.2.33.
		Sorsogon	16. Bulan	25.
	Catanduanes	Catanduanes	17. Virac	24.
	Masbate	Masbate	18. Masbate	25.33.
		Masbate	19. Milagros	26.
VI	Panay	Iloilo	20. Iloilo City	10.11.12.
		Iloilo	21. Estancia	26.
		Iloilo	22. Ajuy	42.
		Aklan	23. New Washington	27.32.
		Guimaras Sobu-Prov	24. Jordan	12.
	Negros	Negros Occidental	25. Bacolod	10.
		Negros Occidental	26. Pulupandan	11.
		Negros Occidental	27. San Carlos	13.
		Negros Occidental	28. Escalante	6.
		Negros Occidental	29. Manapla	42.
VII	Negros	Negros Oriental	30. Dumaguete	15.16.
		Negros Oriental	31. Tandayag	8.
		Negros Oriental	32. Guihulngan	41.
	Cebu	Cebu	33. Cebu City	14.28.34.38.
		Cebu	34. Carmen	7.
		Cebu	35. Tuburan	6.
		Cebu	36. Toledo	13.
		Cebu	37. Dumanjug	41.
		Cebu	38. Bato (Samboan)	8.
		Cebu	39. Santander	15.
		Cebu	40. Balaguete	40.
		Cebu	41. Argao	5.
	Bohol	Bohol	42. Talibon	34.
		Bohol	43. Tubigon	14.
		Bohol	44. Loon	5.
		Bohol	45. Tagbilaran	38.
		Bohol	46. Jagna	17.35.
		Bohol	47. Ubay	29.
	Siquijor	Siquijor	48. Larena	40.
VIII	Samar	Northern Samar	49. Allen	1.
		Northern Samar	50. San Isidro	2.
	Leyte	Leyte	51. Ormoc	28.
		Leyte	52. Isabel	7.
		Southern Leyte	53. Maasin	29.
		Southern Leyte	54. Liloan	4.
IX	Mindanao	Zamboanga Del Norte	55. Dapitan	16.
		Zamboanga Del Sur	56. Zamboanga	18.19.
	Sulu	Sulu (Tap. Group)	57. Basilan	18.
		Sulu (Joro Group)	58. Jolo	19.
X	Mindanao	Misamis Oriental	59. Cagayan de Oro	17.
		Misamis Oriental	60. Balingoan	36.
		Misamis Occ.	61. Tangub	9.
		Surigao Del Sur	62. Lipata	4.
		Camiguin	63. Mambajao	35.
		Camiguin	64. Benoni	36.
		Lanao Del Norte	65. Tubod	9.
XI	Mindanao	Davao City	66. Davao City	30.
		Samal I.	67. Babak	30.

Chapter 5 Natural Condition

Meteorology

1. In entire Philippines, average temperature is 26.6°C and relative humidity is 74 – 88 %. The wind have major components, Northeast air current and Southwest air current. The rainfall is mainly caused by monsoon (Northeast and Southwest) and tropical cyclone.

Oceanography

2. The main current which affect the Philippine is the North Equatorial current. The tide variation in the Philippines is classified by three(3) patterns which are semi-diurnal diurnal and middle pattern between semi-diurnal and diurnal. Wave in the Philippines is composed of the wind wave mainly caused by NE monsoon and SW monsoon and offshore swell coming from surrounding sea.

Geology

3. At the south end of the Philippines, the three tectonic plate those are Eurasian Plate, Pacific Plate and Indo-Australian Plate meet. The Philippines archipelago is affected by the active deformation of mobile belt characterized by the seismicity and volcanism.

Topography

4. The Philippines is characterized by three components from the geographical aspects. The first is the Luzon region with the area of 105,000 km², three narrow mountain ranges and two plains among the four largest plain in the Philippines. The second is the Mindanao region with the area of 95,000 km², three mountain ranges and two plains among the four largest plains. The third is the Visayas region with the area of 100,000 km² and composed of many islands.

Volcano and Volcanic Belt

5. There are three major volcanic belt defined by Quaternary Volcanoes and lay parallel to the trenches such as Manila Trench, Philippine Trench and Sulu Sea Trench. Hence, earthquake and volcanic activity are very prevalent in this country.

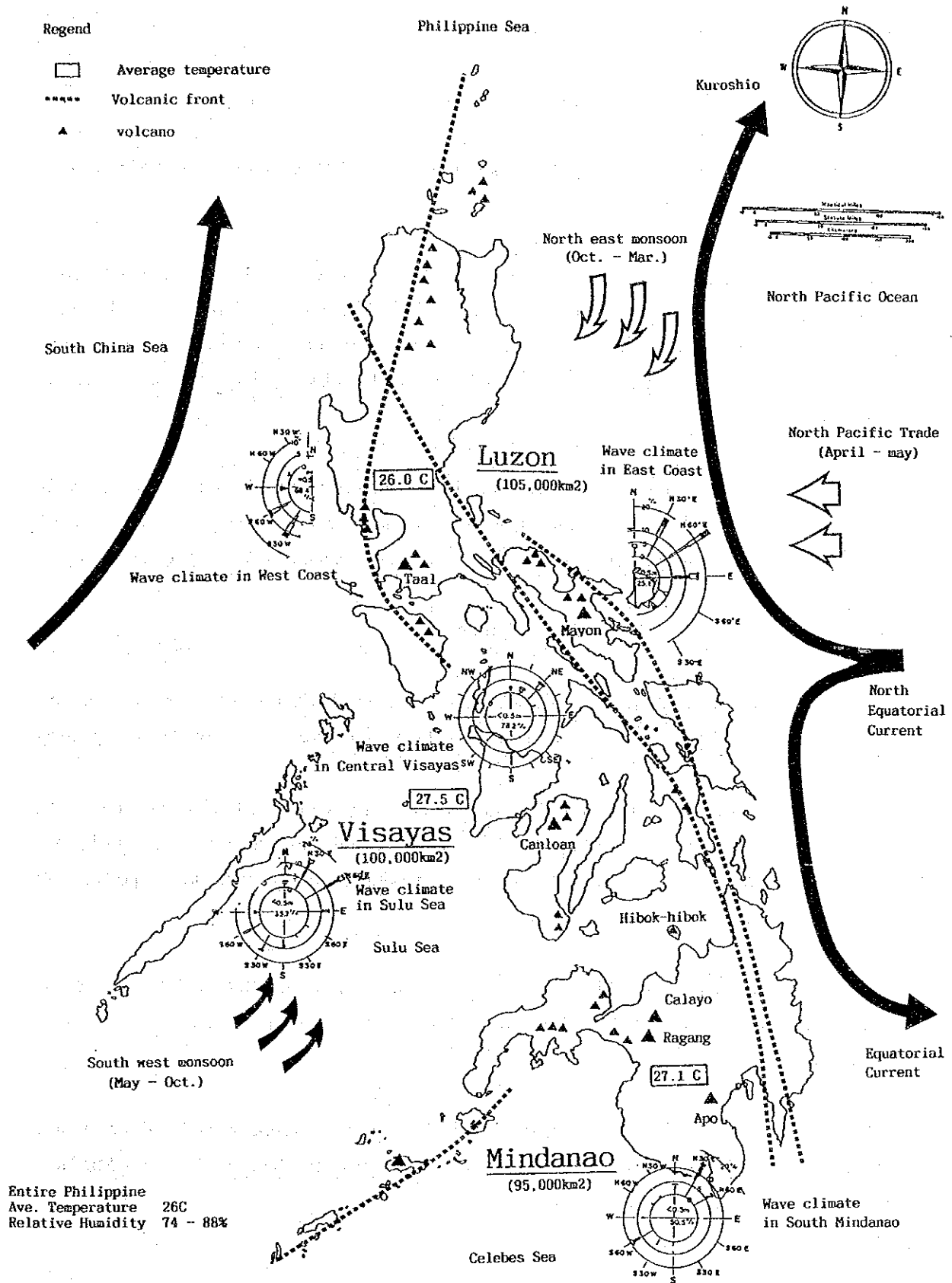


Figure I-5-1 Natural Condition of the Philippines

Chapter 6 Overview of the Port Traffic

A. Existing Port Statistics and its Nature

1. There are at present two (2) possible sources from which information on port traffic can be extracted: PPA statistics and NSO statistics.
2. The 1990 PPA Statistical Report, which is the first issue since PPA implemented the Revised Statistical System on 1 January 1991, is the summary result of operation of all ports nationwide during the one year period. It is a comprehensive collection and compilation of statistical figures on shipcalls, vessel particulars, cargo throughput, cargo statistics by commodity classification, container traffic and passenger traffic.
3. The NSO statistics are also based on the coastwise shipping manifest submitted to them monthly by PPA. Unlike the PPA statistics, the NSO statistics are available per commodity, per port of origin and destination. This information can be used as a basis for the commodity/passenger flow analysis.

B. General View on Port Traffic in the Philippines

4. Shipcalls reached 154,000 (domestic 146,000, foreign 8,000) in 1990, its highest level in this period. Port of Manila has a 12 per cent share of the national total, and a 42 per cent of the foreign total.
5. The nationwide port throughput reached 96.488 million MT (metric ton) in 1989, comprising 54.766 million MT of domestic and 41.722 million MT of foreign trade. In the domestic cargo, ports in Visayas occupy 34 per cent followed by Manila at 24 per cent. Regarding the type of port, private ports handle 56 per cent of the total cargo volume in the nation.
6. Break bulk has a portion of 49 per cent of the total cargo volume followed by bulk cargo. Containerized cargo reached 8.9 million MT, 17 per cent of the total. Containerization ratio of non-bulk cargo is 26 per cent in domestic trade.
7. In 1990 passenger traffic, both embarked and disembarked, reached 27.949 million persons nationwide. In regional aspects, Visayas has a large portion, 49 per cent, followed by North Mindanao (18 per cent) and South Mindanao (14 per cent).

8. According to the larger incremental gains from 1981 to 1989 in inter-regional commodity flow, all of the top 10 (except the 4th which is for intra-regional flow and out side the study area) are concerned with study areas; Regions VI, VII and VIII. Region VII have the largest, followed by Regions VI and VIII. For production, Regions VII and X rank highest, and for attraction, NCR and Region VII. That means large quantities of goods move from the producing districts to the consuming areas.

Table I-6-1 Top 10 Increment from 1981 to 1989

Origin	Destination	Origin	Destination
1. Region VI	NCR	6. Region X	Region VII
2. Region VII	Region X	7. Region XI	NCR
3. Region IV	Region IV	8. Region VII	Region VIII
4. Region XII	Region XII	9. NCR	Region VI
5. Region IV	Region VII	10. NCR	Region VII

Source: JICA Study Team based on NSO

C. Inter-island Passenger and Commodity Flow by Item in the Visayas Region

9. The nucleus of inter-island passenger flow in Visayas region is Cebu.

10. Similar to the inter-regional flow, the flow reveals that commodity moves basically amongst 3 large areas, that is, Luzon, Visayas inclusive of Panay, Negros, Cebu and Samar-Leyte islands and Mindanao.

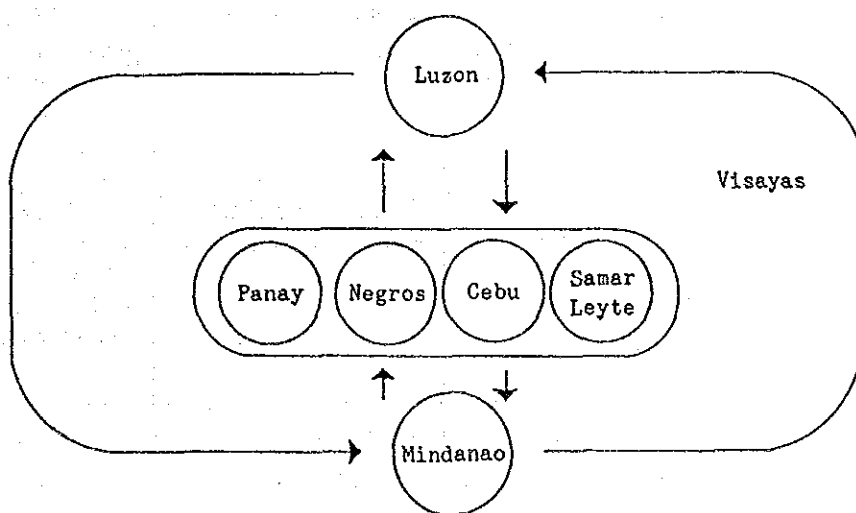


Figure I-6-1 Main Cargo Movement

Chapter 7 On-Site Traffic Surveys of the Existing Links

A. Outline of the Survey

1. Supplemental transport surveys were conducted to collect the necessary information for preparing a masterplan and conducting a feasibility study. Listed below are the surveys conducted and their corresponding objectives:

Table I-7-1 Supplemental Transport Surveys Conducted

Type of Survey	Objective	Methodology	Survey Items
Origin-Destination Survey	To provide an origin-destination pattern of passengers & related information	Interview of vessel passengers on subject routes.	Personal information, trip pattern, alternative travel means, private vehicle users, and assessment of service.
Consignor Survey	To determine the characteristics of major Ro/Ro or ferry cargo transport users & related information	Interview of consignors per route.	Frequency/schedule of use, type of cargo, destinations, problems and assessment of the service.
Operator Survey	To gather operational views & plans of Ro/Ro & ferry operators servicing the subject routes	Interview of Ro/Ro or ferry operators of routes.	Company ID, fleet info., development plans, problems and recommendations.
Traffic Count Survey	To determine the level of existing passenger traffic on subject routes.	Boarding/alighting count on pier.	Day, time, route, vessel name, type and no. of vehicles and passengers boarding/alighting.

B. Origin-Destination Survey

2. Following are found from the O/D traffic surveys. Generally, the passengers were displeased with facility, comfort, fare and speed respectively according to "bad" ratio. Detailed assessments by route reveal the following:

- a) Service Route: All routes were favorably assessed as good or reasonable.
- b) Facilities: Those assessed as bad are Zamboanga-Basilan, Zamboanga-Jolo and Benoni-Balingoan.
- c) Frequency: Those assessed with poor or bad frequency include Jagna-Cagayan de Oro.
- d) Fare & Speed: All routes have fairly assessed fare and speed level of good or reasonable.

3. Trip pattern of passengers basically categorizes the origin and destination of passengers as follows: inter-municipality, inter-province, inter-region, between municipality and province, between province and region, and others. The routes under "Others" have percentages of more than 30%. These routes actually connects mainland Luzon with some small islands or reflects the passenger traffic to/from Metro Manila.

C. Interview Survey of Major Consignors

4. The respondents' preference for their selected shipment modes are attributed to the following reasons. It seems that "accessability" is the major reason, "speed" is next for Ro/Ro and Ferry, and "cost" for the tramping mode.

5. The problems encountered by the companies using the Ro/Ro or Ferry transport are ranked. A scrutiny of the top 4 problem areas (Port Facilities, Arrastre/Stevedoring, Port Handling Charges, Freight Rates) reveals that the consignors have a number of dissatisfaction.

6. Especially, twelve (12) consignors would like to have a Ro/Ro service connecting their respective areas to Cebu while 8 consignors favor a Ro/Ro connection to Manila. The routes recommended for the introduction of Ro/Ro are spread over a wide area.

D. Interview Survey of Vessel Operators

7. The interview survey of vessel operators was undertaken for 32 routes. "Port Facilities" is the problem which received the highest score. The surveyed operators were asked to provide information as to their development/expansion thrusts. As it is, their plans are mostly focused on the improvement and development of their vessels and port/port facilities.

Chapter 8 Demand Forecast

1. In this study, a method for traffic projections will be generally applied for all the study links, and involves the following two steps:

- establishing a base year link traffic
- applying annual growth rates to obtain future traffic

2. Information on base year traffic is a key element in forecasting future traffic. For links which provide regular shipping services, base year traffic volumes were obtained using PPA statistics, NSO statistics or the team's head count survey. For unscheduled links, base year traffic volumes were estimated using gravity models or other models.

3. The formula for annual growth rate of traffic volume was taken from the Highway Planning Manual, and is expressed as follows:

$$T = \{(E \times I/100 + 1) \times (P/100 + 1) - 1\}$$

where, T = the traffic growth rate per annum

E = the transport demand-income elasticity

I = the growth rate for per capita income

P = the average population growth rate per annum

4. Elasticity has been taken equal to between 1.2 and 1.5 for passenger traffic in several port studies in the Philippines. After examining the past records of passenger traffic, 1.5 was taken as elasticity in this study. On the other hand, a lower elasticity has been used for commodity transport in many studies. In this study, 1.2 was used as an elasticity of consumption goods.

The future Ro/Ro traffic of each study link is shown in Table I-8-1.

Table I-8-1 Forecast Ro/Ro Traffic in 2010

No.	Link	Cargo (MT)	Passenger
1	Matnog - Allen	157,017	1,009,386
2	Matnog - San Isidro	97,740	1,178,004
3	Batangas City - Calapan	824,315	2,237,295
4	Liloan - Lipata	61,271	380,818
5	Argao - Loon	30,416	47,562
6	Escalante - Tuburan	46,990	355,023
7	Carmen - Isabel	6,947	28,623
8	Tandayag - Bato	20,226	457,077
9	Tubod - Tangub	128,522	105,793
10	Iloilo City - Bacolod	223,479	3,852,306
11	Iloilo City - Pulupandan	51,481	383,823
12	Iloilo City - Jordan	86,950	2,790,401
13	Toledo - San Carlos	160,732	1,028,960
14	Cebu City - Tubigon	99,446	836,952
15	Dumaguete - Santander	67,691	390,552
16	Dumaguete - Dapitan	22,246	257,198
17	Jagna - Cagayan de Oro	20,153	233,625
18	Zamboanga City - Basilan	46,847	1,259,686
19	Zamboanga City - Jolo	69,492	132,253
20	San Jose - Puerto Princesa	9,872	36,982
21	Cavite City - Mariveles	59,445	335,652
22	Batangas City - Abra de Ilog	28,209	142,975
23	Lucena - Balanacan	104,716	501,843
24	Tabaco - Virac	57,966	283,608
25	Bulan - Masbate	25,825	105,504
26	Milagros - Estancia	9,106	39,297
27	San Jose - New Washington	9,436	41,431
28	Cebu City - Ormoc	70,916	877,833
29	Ubay - Maasin	32,849	173,633
30	Davao City - Babak	29,135	99,367
31	Roxas - Odiongan	6,863	48,314
32	Roxas - New Washington	6,726	27,582
33	Matnog - Masbate	17,606	85,162
34	Cebu City - Talibon	48,433	229,529
35	Jagna - Mambajao	3,850	103,931
36	Benoni - Balingoan	9,926	573,095
37	San Jose - El Nido	5,190	19,914
38	Cebu City - Tagbilaran	176,818	663,363
39	Lucena - Sta. Cruz	47,080	255,523
40	Dumaguete - Larena	6,733	79,269
41	Guihulngan - Dumanjug	65,296	105,817
42	Ajuy - Manapla	43,289	239,820

Remark: Traffic volumes represent one way traffic only

Chapter 9 Development Policy for Ro/Ro Ferry Ports

1. The Ro/Ro ferry ports should facilitate an efficient and effective transport network through development of the western corridor route. At present, the Pan-Philippine Highway is the most important trunk line traversing the entire area of the archipelagoes. Through this highway, the eastern route has been greatly improved. What is presently needed is to develop another national trunk route which will interconnect several main islands such as Mindoro, Panay, Negros, Cebu and Mindanao.

2. The Ro/Ro ferry ports should contribute to the promotion of accelerated sustainable development and self-reliant regional economies. There remain several islands which are not interconnected by an efficient and effective transportation system although neighboring islands can be reached after a voyage of several hours. The development of Ro/Ro ferry ports should promote better inter-regional access, communication, and trade cooperation and socio-cultural understanding among all sectors in the country.

3. The Ro/Ro ferry ports should contribute to the promotion of urbanization. A city is a center of social and economic activity in the region. In the process of regional economic development, cities are expected to play vital roles in providing necessary social and economic services to the surrounding areas. In the selection of Ro/Ro ports, priority should be given to ports which have been promoting, and are expected to enhance, urbanization of the adjacent and hinterland areas.

4. In the development of Ro/Ro ferry ports, maximum utilization of the infrastructure facilities already in existence should be pursued, and priority shall be given to the use of simple and inexpensive vessels and infrastructure facilities.

Chapter 10 Ro/Ro Ferry Transport Network Plan

A. Preliminary Screening of the Candidate Links

1. Ro/Ro shipping links explained before are divided into the following two categories:

- (i) Long-distance Ro/Ro link
- (ii) Ferry-distance Ro/Ro link

A long-distance link is defined in this study as a shipping link with more than 100 n.m. link distance. It is quite difficult for a vessel plying on a long-distance link to make more than one (1) round trip a day under normal conditions of vessel operation. A ferry-distance link refers to those pairs of ports located at two continuous islands that are accessible to each other within a sailing time of two (2) to three (3) hours.

2. The Inception Report of IATCTP in October 1989 introduces four (4) previous Ro/Ro studies undertaken in the Philippines: the National Transportation Planning Project, the Road Feasibility Studies III, the Ro/Ro Facilities Development Study of PPA, and the Fourth UNDP Road Feasibility Study. All of the sea links studied above are ferry-distance links. The nationwide Ro/Ro transport system development study follows the stream of the preceding studies, and deals with ferry-distance links only.

Because long-distance Ro/Ro vessels are larger than ferry-distance Ro/Ro vessels and therefore, require a different design for a Ro/Ro facility.

3. Among the 42 study links, the following two (2) links

San Jose-Puerto Princesa (link distance of 233 n.m.)

San Jose-El Nido (link distance of 135 n.m.) fall into the category of long-distance links, and therefore should be examined separately from this study.

Table I-10-1 Prioritization Criteria

(1) Mobility in the Hinterland	(25 points)
1. Car ownership	(10 points)
More than 23 vehicles/thousand population	10
23 - 20 vehicles	8
20 - 15 vehicles	6
15 - 10 vehicles	4
less than 10 vehicles	2
2. Road condition in the hinterland	(5 points)
Good	5
Fair	3
Poor	1
3. Through-traffic rate	(5 points)
More than 80%	5
80 - 60 %	3
less than 60%	1
4. Development stage of shipping	(5 points)
Ro/Ro operation	5
Ferry	3
Banca	1
No regular services	0
(2) Traffic Demand	(35 points)
1. Cargo	(25 points)
More than 150,000 M.T.	25
150,000 - 80,000	20
80,000 - 50,000	15
50,000 - 20,000	10
less than 20,000	5
2. Passenger	(10 points)
More than 1,000,000	10
1,000,000 - 500,000	8
500,000 - 300,000	6
300,000 - 100,000	4
less than 100,000	2
(3) Cost	(20 points)
1. Passenger's Request	(5 points)
More than 20%	5
10% - 20%	3
Less than 10%	1
2. Links with Ro/Ro Ramps at Ports	(5 points)
Completed/on going	5
No plan	0
3. Preliminary Cost Estimate	(10 points)
Low	10
Medium	5
High	0
(4) Formation of Transport Network	(20 points)
1. Development Policy on Ro/Ro Ferry Network	(15 points)
National trunk link	15
Other inter-province link	10
Detached island link	5
Short-cut link	3
2. Promotion of Regional Center Development	(5 points)
Cities with population of 200,000 or more	5
Others	0

B. Prioritization Criteria

4. Based on a point mark system, the potential of each study link as the Ro/Ro transport mode was evaluated and prioritized. The criteria was composed of four major items; (i) mobility in the hinterland (ii) traffic demand (iii) cost for Ro/Ro terminal (iv) formation of transportation network, and each item consists of several variables. The prioritization criteria are shown in Table I-10-1.

(i) Mobility in the Hinterland

5. Car ownership in the hinterland region of the study ports is one of the most important factors to assess the potential of the candidate links. The car ownership of the link is determined by averaging the number of vehicles per one thousand people in the two provinces which are connected by the link.

6. Road condition also constitutes an essential part for evaluating the potential of the study links. If road condition is poor, vehicles cannot be fully utilized. Consequently, Ro/Ro transportation would show poor performance even if it is developed.

Present road condition was used to evaluate the potential of the candidate links.

7. Benefits of Ro/Ro operations are derived mainly from the "through" services made available by Ro/Ro vessels which connect the road systems of continuous islands. JICA study team conducted an origin-destination survey for existing ferryboat passengers. From the interview records, the "through traffic rate" can be derived as follows.

$$\text{Through Traffic Rate} = 1 - MM$$

Where, MM is percentage of inter-portcity trip.

8. It can be said that present form of shipping services itself reflects the potential of each candidate link. If there is no regular shipping service, the potential of this link as a Ro/Ro link may be poor. By contrast, if cargo/passenger ferryboats are plied regularly on a link, then this link can be said to have a high potential for Ro/Ro transportation service.

(ii) Traffic Demand

9. Future traffic demand is the single most important factor in prioritizing the candidate links. Ro/Ro transportation network should be basically developed in accordance with the magnitude of future demand of cargo and passenger traffic. It should be noted that future traffic demand is forecast using social and economic indicators, and therefore can be conceived as a combined factor which assesses

the potential of each link.

10. Among cargo and passenger traffic, the former is more important than the latter. The main benefit derived from the introduction of a Ro/Ro transportation system is the reduction of time and cost required for cargo handling at the quay side since ownership of passenger cars in 2010 is forecast to be still relatively low in the Philippines.

(iii) Cost for construction of Ro/Ro ferry terminals

11. Under conditions of limited resources, one method for allocation is to pay regard to public opinion. The JICA study team has conducted passenger interviews as a part of its on-site traffic survey to assess existing shipping services. Facilities, frequency, comfort, speed and punctuality of each existing link were evaluated and summarized. Priority should be given to links with unsatisfactory conditions.

No matter whether it is fixed or movable, a shore ramp is one of the core facilities at ports for Ro/Ro transportation.

12. If a shore ramp has been constructed at a port, this fact itself indicates that circumstances are ripe for the development of Ro/Ro transportation, at the said port. Priority should be given to such a port.

13. The development of Ro/Ro transport is expected to reap the most possible benefits while keeping investment at as low a level as possible. Therefore, preference is given to projects which require the least investment. A preliminary cost estimation was carried out based on the information on both required level and present state of port facilities.

(iv) Formatin of Transport Network

14. The main purpose of the Ro/Ro project is to spur regional development and promote national integration. In this sense, the highest priority should be given to the national truck links e.g., Luzon-Mindoro-Panay-Negros-Cebu-Mindanao. Other inter-provincial links such as Bohol-Leyte are also considered to be important links. Detached-island links and short-cut links are considered to be locally important.

15. One of the important goals in the national and regional development policy in the Philippines is to promote urbanization and assist growth of economic and social centers in the region. To facilitate the stated goal, a higher priority should be given to the links which connect municipalities with highly populated areas.

C. Prioritization of the Ro/Ro Ferry Links

16. Point totals by study link are shown in Table I-10-2. The study links were categorized into three groups based on the point total of each link. The first group, consisting of twelve links, was evaluated as the most suitable links for Ro/Ro operations. Batangas-Calapan link is top ranked among them. The second group, consisting of fourteen links, was evaluated as moderate links for the Ro/Ro transportation. The rest of the study links were classified into the third group, which was evaluated as the least prosperous for Ro/Ro operations.

17. At present, the Pan-Philippine Highway with a total length of 2,100 Km is the single most important trunk line for the nation's unification and integration, containing two Ro/Ro links between the main islands of Luzon-Samar, and Leyte-Mindanao. After development or improvement of the first priority links for the Ro/Ro operations, main islands in the Visaya region are interconnected by Ro/Ro transportation, and a new national trunk line centering in Cebu is realized; Panay-Negros-Cebu-Leyte corridor and Cebu-Bohol link.

18. Upon the completion of the links of the second priority group, social and economic ties between Visaya region and Mindanao region will be strengthened. Negros-Western Mindanao and Bohol-Central Mindanao links will play vital roles in fostering interisland transport. Remote islands with reasonable volumes of seaborne traffic are also linked by the Ro/Ro transport at this stage.

Table I-10-2 Prioritization of the Study Links

Study Links	Car				Passenger's				Sub		Regional		Total
	Ownership	Road Condition	Through Traffic	Shipping	Cargo	Passenger Request	Ro/Ro Ramps	Const. Cost	Total	Policy	Center	Points	
1st Priority Group													
3. Batangas City	4	4	5	5	25	10	1	5	5	64.0	15	0	79.0
13. Toledo	10	4	3	3	25	10	3	5	0	63.0	15	0	78.0
2. Matnog	2	5	5	5	20	10	1	5	10	63.0	15	0	78.0
1. Matnog	2	5	5	5	25	10	1	5	5	63.0	15	0	78.0
38. Cebu City	8	4	1	3	25	8	3	2.5	10	64.5	10	2.5	77.0
10. Iloilo City	6	5	1	3	25	10	1	0	0	51.0	15	5	71.0
4. Liloan	2	5	5	5	15	6	1	5	10	54.0	15	0	69.0
14. Cebu City	8	3	3	3	20	8	5	0	5	55.0	10	2.5	67.5
28. Cebu City	8	3	3	3	15	8	5	0	5	50.0	15	2.5	67.5
6. Escalante	10	3	5	5	10	6	3	3.5	5	50.5	15	0	65.5
8. Tandayag	10	3	3	3	10	6	1	2.5	10	50.5	15	0	65.5
41. Guihulngan	10	2	5	3	15	4	1	0	10	50.0	15	0	65.0
15. Davao City	10	3	3	0	15	6	3	2.5	5	47.5	15	0	62.5
12. Iloilo City	4	4	1	1	20	10	3	0	10	53.0	5	2.5	60.5
9. Tubod	6	3	3	5	20	4	1	5	10	57.0	3	0	60.0
16. Davao City	4	3	3	3	10	4	5	2.5	10	44.5	15	0	59.5
11. Iloilo City	6	5	3	0	15	6	1	0	5	41.0	15	2.5	58.5
22. Batangas City	6	3	3	0	10	4	5	5	5	41.0	15	0	56.0
17. Jagna	6	4	5	3	10	4	3	2.5	5	42.5	10	2.5	55.0
23. Lucena City	2	3	3	5	20	8	1	0	0	44.0	5	0	49.0
18. Zamboanga City	4	1	3	3	10	10	5	0	5	41.0	5	2.5	48.5
19. Zamboanga City	2	1	1	3	15	4	5	0	10	41.0	5	2.5	48.5
36. Benoni	6	3	5	3	5	8	3	0	10	43.0	5	0	48.0
24. Tabaco	4	3	5	3	15	4	3	0	5	42.0	5	0	47.0
25. Bulan	2	3	3	3	10	4	3	2.5	5	35.5	10	0	45.5
34. Cebu	8	3	3	3	10	4	3	1.0	0	33.0	10	2.5	45.5
2nd Priority Group													
42. Ajuy	6	3	1	1	10	4	3	0	0	28.0	15	0	43.0
21. Cavite City	10	6	3	0	15	6	1	0	0	40.0	3	0	43.0
33. Matnog	2	3	3	0	5	2	3	5	10	33.0	10	0	43.0
39. Savao	6	3	1	1	10	4	5	0	5	35.0	5	2.5	42.5
27. San Jose	4	2	3	0	5	2	1	2.5	6	24.5	15	0	39.5
32. Rotas	4	2	3	0	5	2	3	0	5	24.0	15	0	39.0
5. Arsan	6	3	3	0	10	2	3	0	0	29.0	10	0	39.0
7. Carmen	8	2	2	3	5	2	3	0	0	23.0	15	0	38.0
19. Lucena City	2	3	1	3	10	4	5	0	5	33.0	5	0	38.0
29. Ubay	4	1	3	3	10	4	3	0	0	26.0	10	0	36.0
40. Busuanga	6	2	1	1	1	2	3	2.5	10	32.5	5	0	37.5
31. Tausa	2	1	1	1	5	2	5	0	10	27.0	5	0	32.0
35. Jagna	4	2	3	0	5	4	3	0	5	26.0	5	0	31.0
26. Hilagros	2	1	3	3	5	2	5	0	0	21.0	10	0	31.0
3rd Priority Group													
43. Manila	6	3	1	1	10	4	3	0	0	28.0	15	0	43.0
21. Marikina	10	6	3	0	15	6	1	0	0	40.0	3	0	43.0
33. Masbate	2	3	3	0	5	2	3	5	10	33.0	10	0	43.0
39. Pabal	6	3	1	1	10	4	5	0	5	35.0	5	2.5	42.5
27. New Washington	4	2	3	0	5	2	1	2.5	6	24.5	15	0	39.5
32. New Washington	4	2	3	0	5	2	3	0	5	24.0	15	0	39.0
5. Loon	6	3	3	0	10	2	3	0	0	29.0	10	0	39.0
7. Ibahe	8	2	2	3	5	2	3	0	0	23.0	15	0	38.0
19. Sta. Cruz	2	3	1	3	10	4	5	0	5	33.0	5	0	38.0
29. Masina	4	1	3	3	10	4	3	0	0	26.0	10	0	36.0
40. Larena	6	2	1	1	1	2	3	2.5	10	32.5	5	0	37.5
31. Tausa	2	1	1	1	5	2	5	0	10	27.0	5	0	32.0
35. Masbate	4	2	3	0	5	4	3	0	5	26.0	5	0	31.0
26. Ixtaccia	2	1	3	3	5	2	5	0	0	21.0	10	0	31.0