社会開発協力部報告書

No. 9

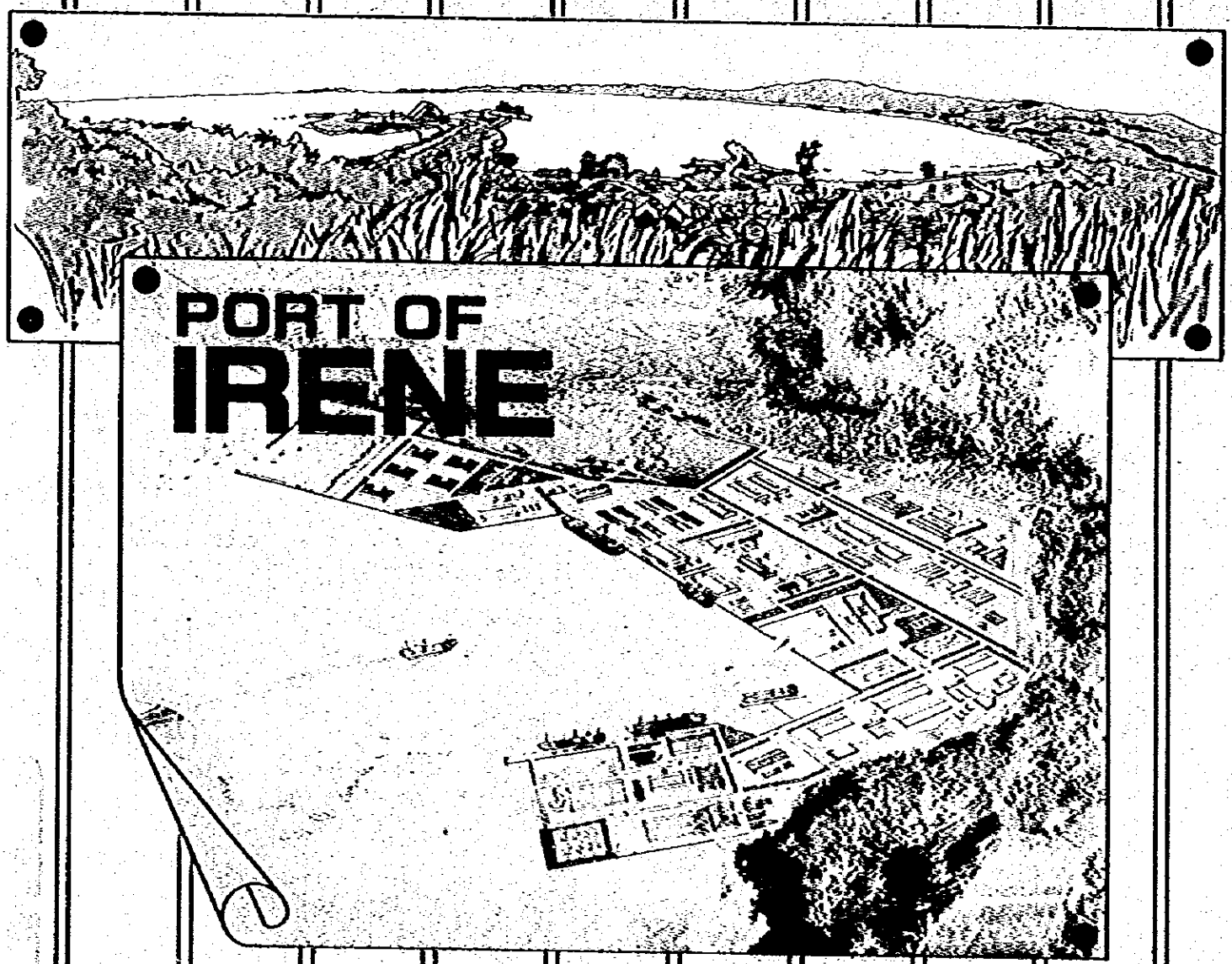
REPUBLIC OF THE PHILIPPINES

PHILIPPINE PORTS AUTHORITY

THE STUDY ON THE DEVELOPMENT PROJECT OF THE PORT OF IRENE

FINAL REPORT

MARCH 1982



JAPAN INTERNATIONAL COOPERATION AGENCY

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REPUBLIC OF THE PHILIPPINES

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PREFACE

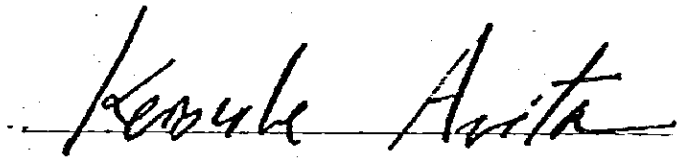
In response to the request of the Government of Republic of the Philippines, the Government of Japan decided to conduct a study on the Development Project of the Port of Irene and entrusted it to the Japan International Cooperation Agency (JICA). The JICA sent to the Philippines a survey team headed by Mr. Ikuhiko Yamashita, Director of the Overseas Coastal Area Development Institute of Japan in May, 1981.

The team had discussions with the officials concerned of the Government of the Philippines over the Project, and conducted a field survey. 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 development of the Project and contribute to the promotion of friendly relations between our two countries.

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

March, 1982



Keisuke Arita
President
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

Mr. Keisuke Arita
President
Japan International Cooperation Agency

Dear Sir:

It is my great pleasure to submit herewith a report for the Study on the Development Project of the Port of Irene of Republic of the Philippines.

In order to make the master plan and examine the feasibility of the development project, the Japanese study team conducted a principal survey for 52 days from May 10, 1981, at the request of the Japan International Cooperation Agency. The findings of this survey were discussed to make the master plan and study the feasibility of the Development Project of the Port of Iren, and compiled into this report.

During the field survey and the preparation of this report, the Japanese study team could acquire the valuable information pertaining to the project through discussions with the Philippines' officials concerned.

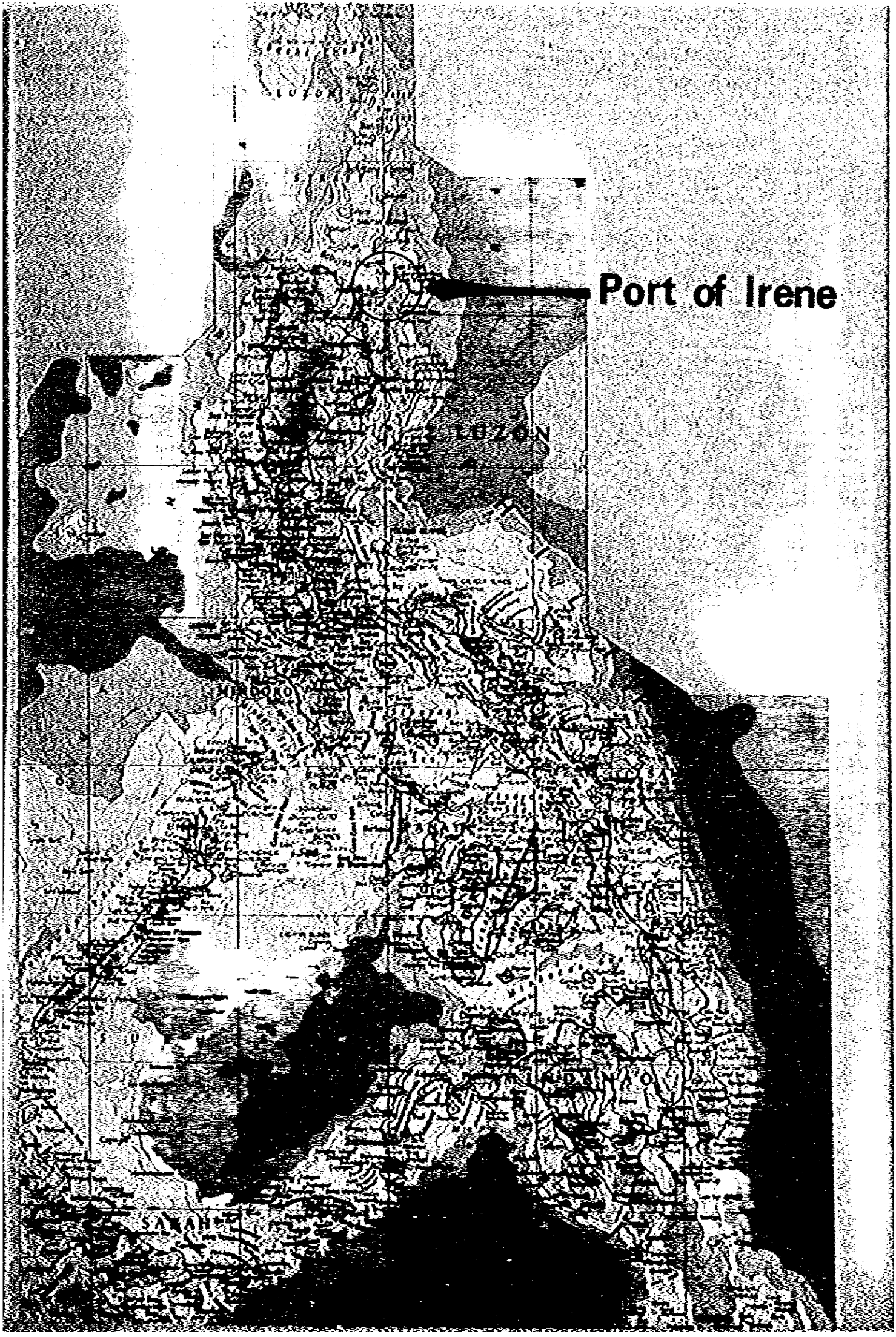
On behalf of the Japanese study team and myself I would like to express my deepest appreciation to the Government of Republic of the Philippines, for their generous cooperation and assistance and warm hospitality extended to the team through the study.

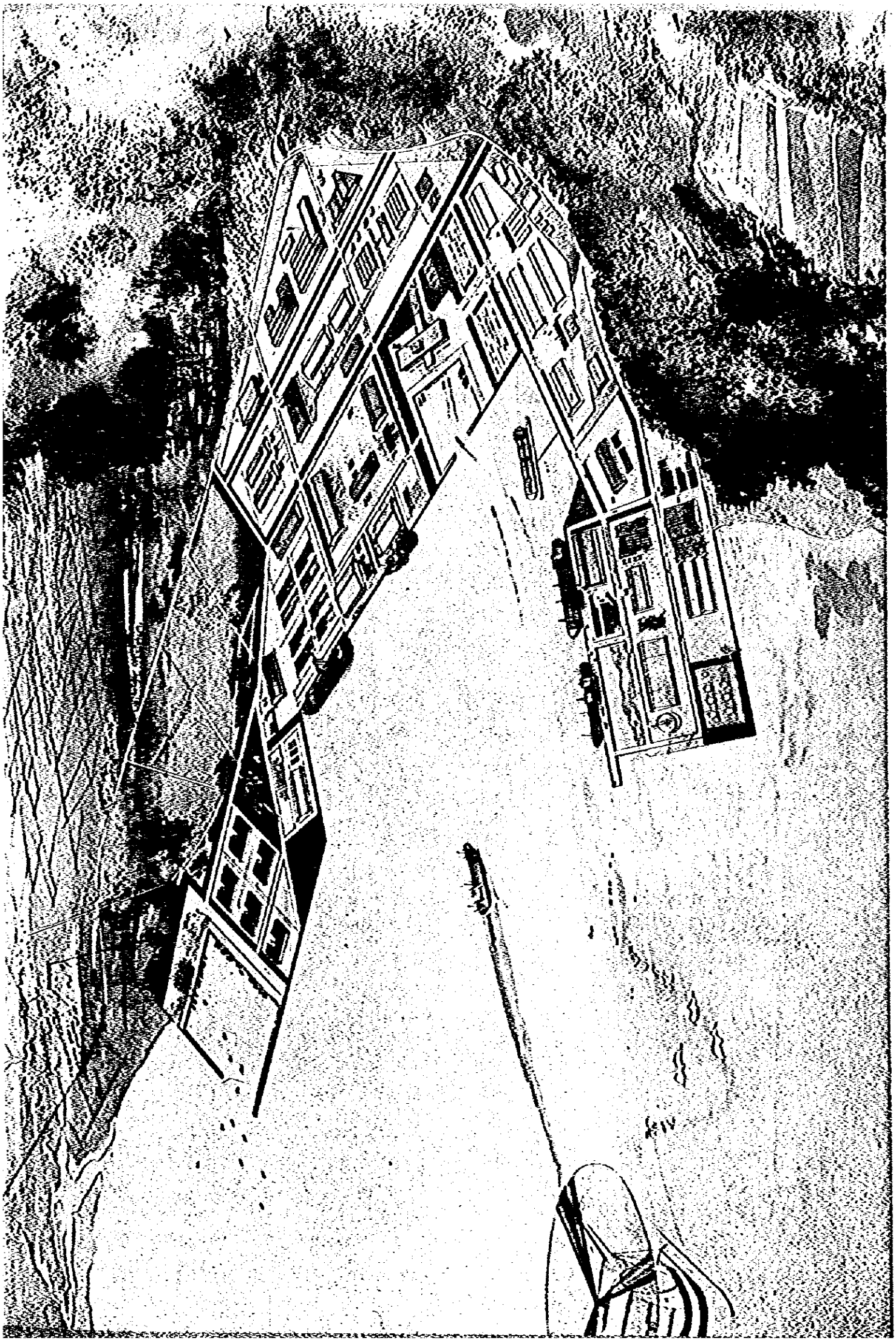
My indebtness is also great to the Japan International Cooperation Agency, the Ministry of Transport, the Ministry of Foreign Affairs, and the Japanese Embassy in Republic of the Philippines, who have given us valuable suggestions and assistance in the field survey and in the preparation of this report.

March, 1982

Sincerely yours,

Ikuhiko YAMASHITA
Team Leader
Japanese Study Team for the
Development Project of the Port of Irene
Director Planning, The Overseas
Coastal Area Development Institute of
Japan


Port of Irene
LUZON
MINDORO
SABAH



ABBREVIATIONS and ACRONYMS

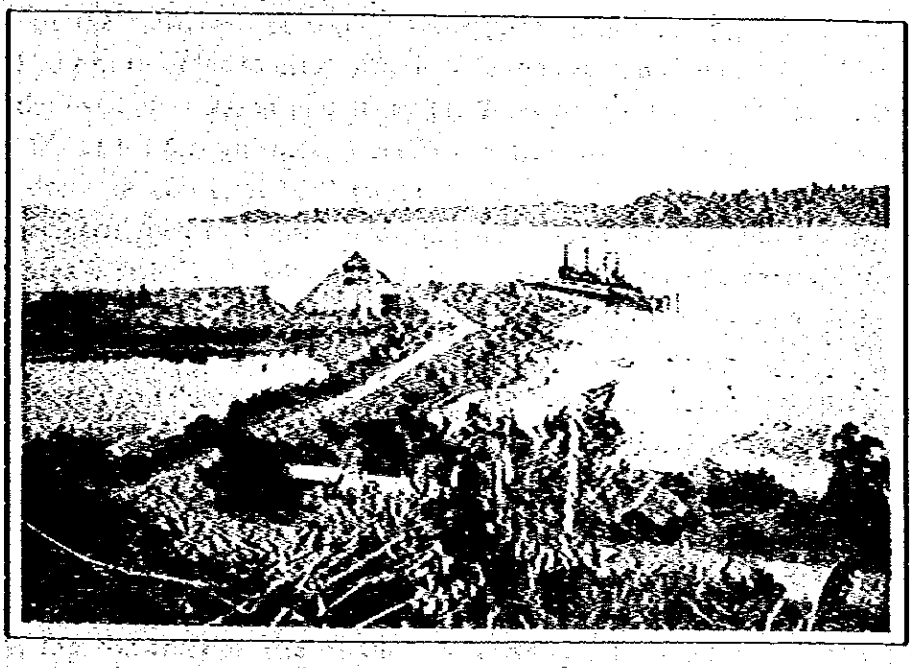
BAECON	Bureau of Agricultural Economics
BFD	Bureau of Forest Development
CASUCO	Cagayan Sugar Corporation
CIADP	Cagayan Intergrated Agricultural Development Project
CRIP	Chico River Irrigation Project
EPZA	Export Processing Zone Authority
IECA	International Engineering Consultants Association
JICA	Japan International Cooperation Agency
MPW	Ministry of Public Works and Highway
MRMP	Magat River Multi-Purpose Project
NASUTRA	National Sugar Trading Corporation
NEDA	National Economic and Development Authority
NFA	National Food Authority
NGA	National Grains Authority
NTPP	National Transport Planning Project
OCDI	The Oversea Coastal Area Development Institute of Japan
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PMU	Port Management Units
PPA	Philippine Ports Authority
BBLS	Barrels
DWT	Dead Weight Tonnage
FIRR	Financial Internal Rate of Return
FOB	Free on Board
GDP	Gross Domestic Product
GGH	Gross Gang Hour
GNP	Gross National Product
GRDP	Gross Regional Domestic Product
GRT	Gross Registered Tonnage
GVA	Gross Value Added
IRR	Internal Rate of Return
MLLW	Mean Lower Low Water

CONTENTS

LIST OF TABLES

LIST OF FIGURE

CONCLUSION AND RECOMMENDATIONS



CONCLUSION AND RECOMMENDATIONS

1. CONCLUSION

(1) The functions required for the port, i.e., the role to be played by the port are various and variable in each era, region and economic structure. However, in all ages and regions, the port has stimulated region's development, and regional development has, in turn, accelerated the proliferation of functions of the port. Port may be viewed simply as a passing point in the course of transport process. Port may also be regarded as a management body.

However, if seen simply from these viewpoints, the significance of the Port of Irene development is only partially understood. The Port of Irene development should be evaluated not only in measurable terms, but in the degree of its contribution to the betterment of the life of local residents.

The immediate effects of the Port of Irene construction will be the development of agricultural and forestry potentials, expansion of employment opportunities and the increase of income of local residents. In the long run, the Port of Irene development will strengthen the infrastructure of the industries and help form the Philippines' maritime transport system.

(2) The Master Plan with the target year of 2000 will be implemented in the southwest part of Casambarangan Bay. In the year 2000, the hinterland of Port of Irene will be the entire northeast district of Luzon Island (Region II), and the estimated cargo volume will be 850,000 tons. A half of the cargo will be foreign trade goods which comprise palay, timber products, fertilizer and so on. In order to efficiently handle the cargo, 6 new berths will be constructed in addition to the existing – 9.0 m pier. They are 2 berthes (water depth –10 m, maximum vessel size: 15,000 DWT) for foreign trade, 3 berthes (water depths: –7.5 m and –5.5 m) for domestic trade, and 1 domestic container berth (water depth: –7.5 m, maximum vessel size: 5,000 DWT).

Storage facilities such as transit sheds and warehouses will be built behind the berthes. A fishing port area will be built adjacent to the commercial port to encourage the fisheries. The peripheral areas of the port will be secured as the site for distribution centers and factories.

(3) The Short-Term Port Development Plan with the target year of 1987 presupposes that the main hinterland of Port of Irene will be the Cagayan Province. The cargo volume in the target year is estimated to be 248,000 tons, of which over 60 percent is export goods such as timber products and palay. In the Short-Term Port Development Plan, a –10 m water-depth berth will be built. The new berth will be linked to the existing pier in such a way that the face line of the former will be the extension of that of the latter in order to facilitate ship operation. Geologically, the construction site of the new berth is not necessarily suited for that purpose. However, it has been chosen to take advantage of the integrated use of the existent pier and the new berth. The area behind the berth will be reclaimed to achieve higher efficiency in cargo handling. The apron will be 25 m wide; a transit shed and an open storage yard are to be built behind it. The berth will be connected with the National Road No. 3 by the port road, which is planned to be upgraded and paved.

(4) The construction cost of the Short-Term Port Development Plan is approximately 103 million pesos (foreign currency: approximately 68 percent). 4 years is required to complete all the processes, including detailed designing, bidding and other preparations before the berth is put to service.

(5) When the major benefit of the project is taken to be the reduction in the transportation cost, which is achieved by the conversion from land to sea transport, the Internal Rate of Return (IRR) is 25.2 percent.

This fact indicates that the project is quite feasible in view of the nation's economy.

(6) The financial analysis shows that the soundness and the profitability of this project can be ensured by raising current tariff rates.

If the current tariff is doubled, FRR of this project is estimated to be 5.2 percent. The revised tariff rates are acceptable since all the dues and charges collected by this tariff rate raise are well within the entire benefit of this project. This raise can also be said reasonable compared to those in neighbouring countries.

And introduction of public funds to secure the financial self-supporting seems to be a recommendable alternative, since this project contributes greatly to the regional development and is expected to yield great benefit to the national economy.

2. RECOMMENDATIONS

(1) After careful assessment of the area's social and economic conditions in the future, and study of the past economic activities and various development plans, the proposed plan for the Port of Irene development has been formulated. However, economy is subject to constant flux, a nation's economy, and even a smaller region's economy is substantially affected by the trends of the world's economy. Therefore, it is important to keep informed of the economic conditions in general, and revise the Port Development Plan where necessary, so that the development of Port of Irene will appropriately stimulate the development of the region.

(2) The functions of the port may not be properly performed even with the upgrading of physical facilities such as berths and storage areas. Improvement of various supportive functions sustains smooth activities of the port. For the steady growth of Port of Irene, it is vital to upgrade the road which connects the port with its hinterland, establish and/or expand governmental offices concerned, and provide ships with better services in cargo handling, water supply and so on. The fulfillment of these requirements takes time. It is urgently requested, therefore, that comprehensive plans be implemented for this purpose prior to the construction of terminal facilities.

(3) It will take at least a few years before the Short-Term Port Development Plan is completed. During this period, Port of Irene could better serve the development of the region if equipped with substantial storage capacity. Fortunately, Port of Irene has a privately owned transit shed for sugar, which is currently unused. It would be beneficial to examine the possibility of its utilization to accommodate transit cargo.

SUMMARY

SUMMARY

1. Significance of Port of Irene Development

(1) Significance of Short Term Development

The hinterland of Port of Irene comprises the Cagayan Province and its neighboring areas in Region II. Although the area's potential productivity in agriculture and forestry is high, the region is economically underdeveloped due to the lack of efficient transportation means.

As far as Port of Irene is concerned, port facilities such as berthes and transit sheds are insufficient, and commercial distribution mechanisms are underdeveloped. Furthermore, poor conditions of the road network within the region suppress the productive activities in the region. Products of the hinterland are transported by land to the Manila Metropolitan Area for consumption or for shipment to other domestic and/or foreign markets via port of Manila. The cost of land transportation to the Manila Metropolitan Area is a negative factor in the market competitiveness of the products of Region II; the producers in the hinterland are at a disadvantage.

With the development of Port of Irene, it will become possible to directly ship out export goods from Port of Irene, and competitiveness of the products of Region II in the export market will be strengthened. This will lead to the increase of production and expansion of employment opportunities. These are the merits to be gained in the Short-Term Port Development Plan.

(2) Significance of Long Term Development

Various policies are implemented to develop resources and to invite new industries in Region II. Along with electricity supply, road improvement and irrigation works, the Port of Irene Development Plan may be regarded as one of the important approaches to regional development. As the Port of Irene construction will realize inexpensive mass transportation, the development of resources will be promoted, at the same time, the value of its vicinity as a potential industrial site will be enhanced. For industries which depend on maritime transportation for the procurement of raw materials and/or the shipment of finished products, the port is an absolute requisite in selecting a factory site. The development of Port of Irene is expected to play no small role in promoting Irene EPZ, and in starting the heavy chemical industry in the region.

In the long run, the Port of Irene development is expected to give rise to the formation of a port city around Port of Irene. As the Philippines is made up of numerous islands, the importance of the maritime transportation is expected to further increase in the course of the nation's modernization process. The development of Port of Irene will greatly contribute to the formation of the Philippines' domestic maritime transport system.

2. Future of the Region and Port Activities

(1) Economic Activities of the Region

The future of Region II, the hinterland of Port of Irene, is forecasted on the basis of the analysis of the region's present conditions, the Cagayan Valley Five-Year Development Plan and

the Long Term Philippine Development Plan.

In the beginning, the region's economic growth is assumed to be achieved mainly in the primary industry. Then, as the industrial foundation solidifies and the capital accumulate the share of the secondary industry increases, lowering the ratio of the primary industry in due proportion. The Gross Regional Development Product for the 1979–1987 period is assumed to be 10.0 percent, and that from 1987 to 2000, 8.8 percent.

As a result, the ratio of per capita income in Region II to that of the national average is expected to improve from 65.2 percent in 1979 to 76.1 percent in 2000.

(2) Cargo Volume in 1987

The cargo volume in the target year must be calculated to formulate the port improvement plan. To achieve the utmost accuracy, both macro estimation and product-by-product estimation are separately conducted and compares. The cargo volume in 1987 (the target year of the Short-Term Port Development Plan) is calculated as in the following. For the macro estimation, the PMU Irene's cargo volume in 1987 is determined on the assumption that the PMU Irene's cargo in 1979 will increase at the same rate as the GRDP growth of the hinterland. Supposing that the scale (capacity) of PMU Irene ports excluding Port of Irene will remain at the 1979 level, the cargo volume of Port of Irene in 1987 is obtained.

For the product-by-product estimation, the first step is to list major items which will be produced in the hinterland. Judging from the major items in nation's other ports, National Transportation System Study in 1975, and social and economic trends of the hinterland, 11 products, e.g., sawn timber, palay, sugar, etc. are selected as the major handling items of Port of Irene. The cargo volume of each of these products is estimated from the analysis of the past production and transport volumes, production plan, location of producing areas, national trend of export and import, and the competitiveness of Port of Irene with other ports.

The macro estimate for 1987 on the basis of GRDP is 271,000 tons.

The sum total of cargoes separately calculated for each product is 248,000 tons. Thus, 248,000 is adopted as the cargo volume of Port of Irene in 1987.

(3) Cargo Volume in 2000

The cargo volume in 2000 (the target year of the Master Plan) is estimated in the same manner. However, it is foreseeable that the hinterland will have been industrialized by 2000, causing changes in social, industrial and transportation structures. These changes should be taken into account as much as possible. The macro estimation for 2000 is 750,000 tons, and the sum total of product-by-product estimation is 850,000 tons (excluding petroleum products). Therefore, the cargo volume of Port of Irene in 2000 is determined to be 850,000 tons.

The capacity and functions of PMU Irene ports (excluding Port of Irene) in 2000 are assumed to remain more or less the same as the present level, the scale of improvement would be minimum, if any.

Table 1 Cargo Volume at Port of Irene

(.000 ton)

Item \ Year	1979		1987		2000		Remarks
	F	D	F	D	F	D	
Lumber	3		17	33	46	84	
Plywood/Veneer			29	32	64	66	
Cement				5			
Fertilizer			20		46		
Sugar			22		38		
Palay			40		120	70	
Corn					50		
Petroleum						(250)	
Molasses	3		8		12		
Logs	11	3	10	20	60	30	
Others			7	5	14	150	
Total	17	3	153	95	450	400 (250)	

F: Foreign Trade D: Domestic Trade

3. Port Planning

(1) Selection of the Site of Port Development

The site of the Port of Irene construction will be chosen within Casambalangan Bay. The bay is divided into 4 districts, each of which is examined in terms of present conditions, direction of future development, social and economic conditions, and natural environment. Behind the central bayhead lies a major residental area, houses are clustered along the National Road No. 3. The water areas along both sides of the bay are the fishing ground of the local fishermen. The water area around the existing pier is relatively calm, though the bottom ground is soft. Considering these factors, the southwest part of Casambalangan Bay has been chosen as the site for port construction. This alternative seems to least affect the life of local residents, and at the same time, make effective use of the past investment in the port.

(2) Master Plan (2000)

The cargo is expected to amount to 850,000 tons (foreign trade goods: 450,000 tons, domestic trade goods: 400,000 tons) in the year 2000. Taking into account the cargo handling capacity and other factors, the number of berths necessary for this expected volume is calculated. Assuming that the cargo handling capacity of Port of Irene will improve to the level of the Philippines' most efficient port at present by the year 2000, the port will need a −10 m berth (3

berths) a −7.5 m berth (2 regular berths, 1 container berth), and a −5.5 m berth. As there is presently a large pier, 6 new berths are required. Other waterlines that are in need are a basin for patrol boats, etc., a fishing port for fishing boats and a pier for petroleum products. The basic policies in compiling the Master Plan are stated in the following.

i) The face line of large berth shall be placed in north south direction as much as possible to facilitate the manipulation of vessels.
ii) Calm water areas shall be effectively utilized.
iii) The commercial port area and the fishing port area shall be independently planned.
iv) Considering the low frequency of the wave occurrences, breakwaters shall not be built.
v) The impact upon the surrounding natural environment shall be kept to the minium.
vi) Storage areas for transit sheds and warehouses shall be secured.

Three alternative plans in line with these policies are prepared and evaluated in view of manageability, cordination with the present facilities, future prospects, workability and the scale of investment. These plans are shown in Fig. 1 and the result of evaluation is summarized in Table 2.

Comprehensive study of these plans seems to conclude that Plan (B) is the best alternative. Therefore, Plan (B) shall be adopted as the Master Plan of the Port of Irene Development, which is to be completed in 2000 (Fig. 2).

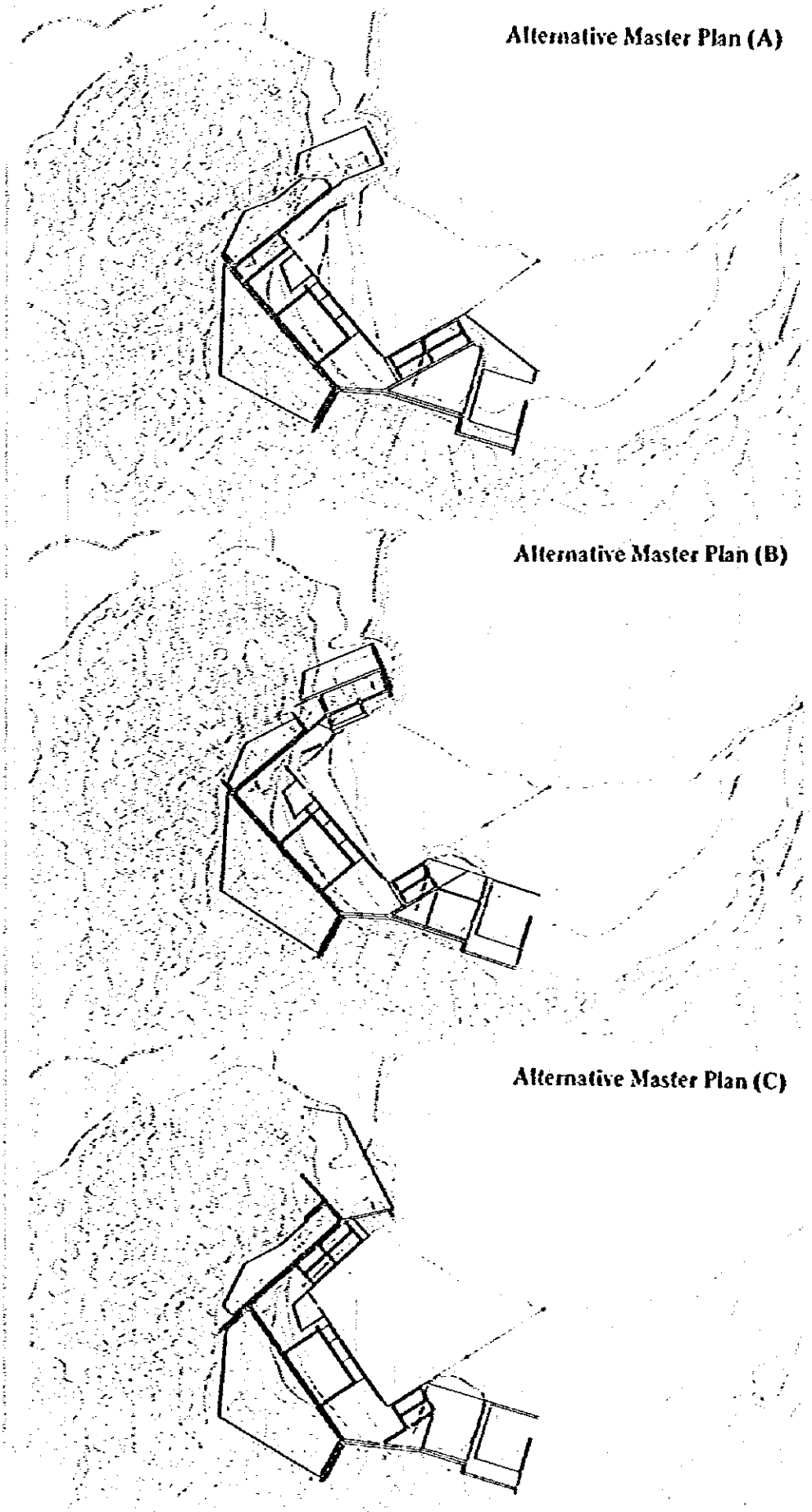


Fig.-1 Alternative Master Plan

Table 2 Comparison of Alternative Plans

Item	Important Points of Comparison	Plan (A)	Plan (B)	Plan (C)
Maintenance of Facilities	Is it easy to maintain the constructed facilities? In this project, land subsidence is feared to pose difficult problems in maintenance.	○	△	×
Management and Utilization of Port	It is easy to manage and use the port. Comparison should be made both at an initial stage and upon completion of the project.	△	○	○
Cordination with Existing Pier	If the use of the existing pier and the new berth may be incorporated at the beginning stage, the scale merits of the facilities may be gained.	×	○	△
Utilization with Past Investment	May the existing port road and transit shed be effectively utilized?	×	○	○
Future Prospects	Is the project flexible enough to cope with new development plans after 2000?	○	○	△
Calmness within Port	Is the port sufficiently calm without breakwaters?	△	○	△
Soil Conditions	Is the site suitable for the construction of port structure?	○	△	×
Manipulation of Ships	Can the ships enter and leave the port without difficulty? Are berthing and unberthing easy?	○	○	△
Utilization of Land	Is the Port Development Plan in line with the land-utilization scheme of the area? Are the storage areas and green zones in harmony with the surrounding environment?	○	△	○
Environmental Protection	Are port activities and port construction work so carried out that they are not destructive to the surrounding social and natural environment?	○	○	○
Workability	Is the construction of each facility easy? Is the gradual execution from planning to completion smooth?	△	○	△
Investment	Comparison of construction cost of basic port facilities.	○	○	×

Note: ○: Excellent △: Some Problems ×: Poor

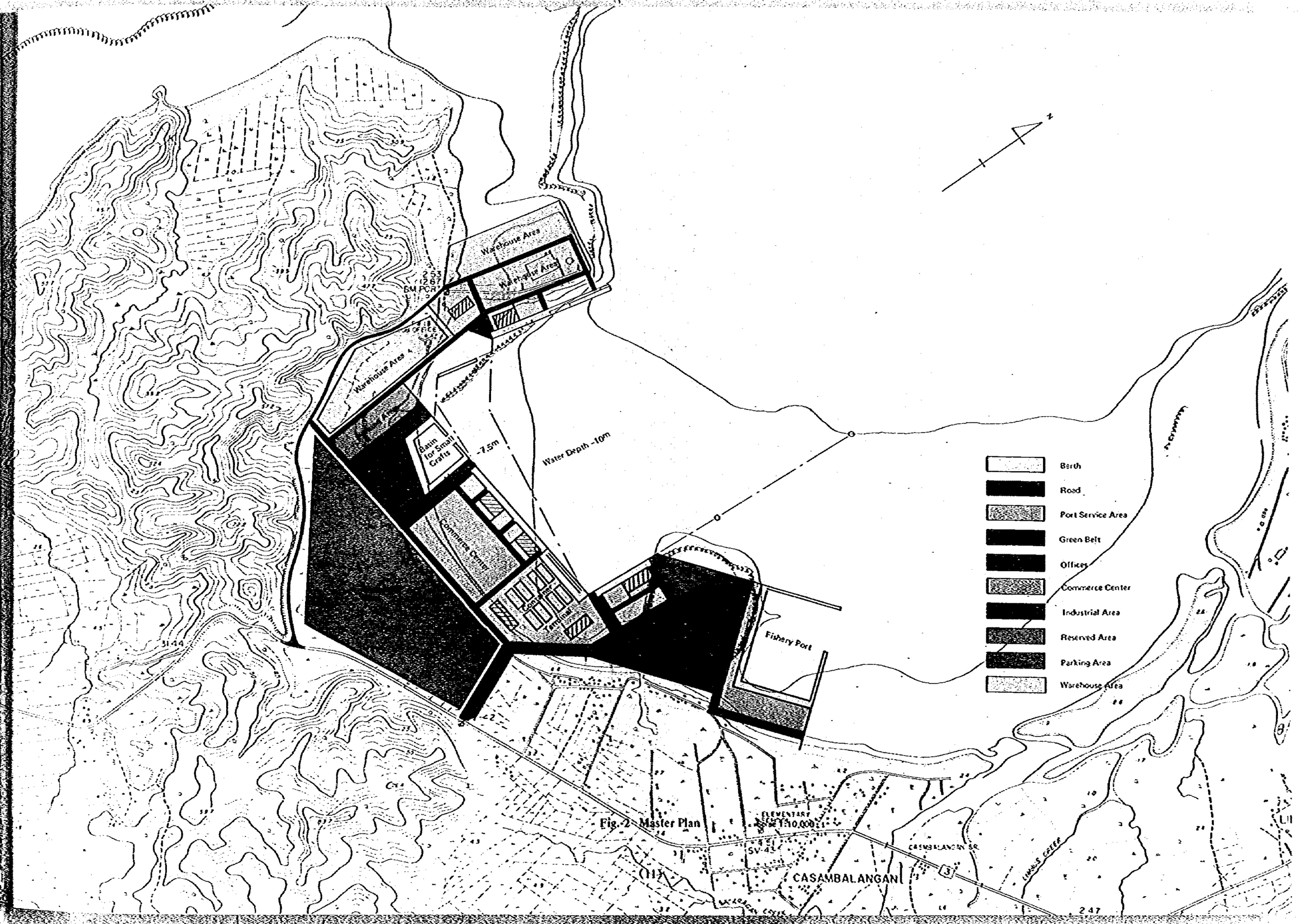


Fig. 2 Master Plan

Table 2 Comparison of Alternative Plans

(3) Short-Term Port Development Plan (1987)

2 berths will be necessary to smoothly handle the 248,000 tons of cargo (foreign trade goods: 153,000 tons, domestic trade goods: 95,000 tons) in 1987. As there is already a existing pier, one −10 m berth is to be constructed to handle both foreign and domestic trade goods. Suggestion has been made that quaywalls for foreign and domestic cargoes be separated to ascertain smooth handling of bonded goods. However, as no major setbacks are foreseen and it is desirable to keep the investment to the minimum, one −10 m berth will be built in the Short-Term Port Development Plan. In the Master Plan, a −10 m berth is planned near the existing pier, and another is the central coral area. The former has to disadvantage of soft ground, leading to difficulty in maintenance after completion. The advantage of the former site is that the use of the new berth can be incorporated with that of the existing pier and that the past investment, e.g. port road and other terminal facilities, can be fully utilized. The latter is superior in terms of natural conditions, however, the separation from the existing pier makes the utilization inconvenient and the investment large. Therefore, a new −10 m berth will be constructed adjacent to the existing pier.

As to the berth type, T-Head Type and Wharf Type are considered, because the bottom ground of the site is soft. Although the construction cost of the T-Head Type is smaller than that of the Wharf Type, the former is less convenient and less capable in cargo handling. Compared in the investment per tonnage of cargo, the T-Head Type is slightly at a disadvantage. Giving the convenience and capacity of cargo handling a higher priority, the berth will be of the Wharf type. The Short-Term Port Development Plan is shown in Fig. 3.

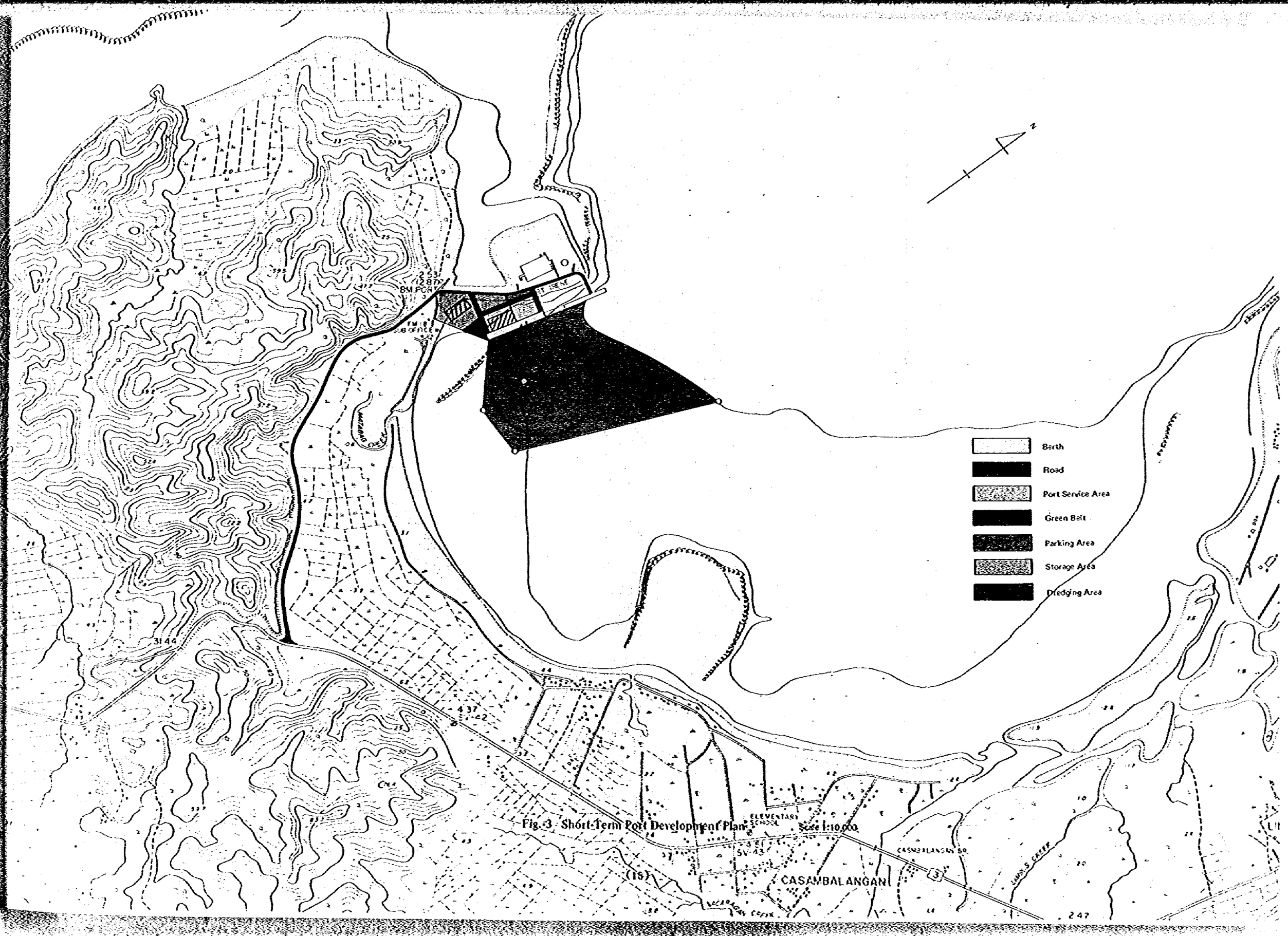


Fig. 3 Short-Term Port Development Plan Scale 1:10,000

4. Construction Plan

(1) Designing

The designing in the Short-Term Port Development Plan will be based on the conditions in Table 3.

Table 3 Design Conditions

Tidal Levels	H.W.L.	M.L.L.W. + 1.37
	M.S.L.	M.L.L.W. + 0.58
	L.W.L.	M.L.L.W. – 0.28
Seismic disturbance	0.15 g	
Vessels for design	General cargo vessel – 15,000 DWT	
Water depth of berth	M.L.L.W. – 10 m	
Crest height of berth	M.L.L.W. + 3.5 m	
Surcharge load of berth	Ordinal load condition – 2.5 t/m^2	
	Particular load condition – 1.0 t/m^2	
Berthing velocity	0.15 m/sec.	
Life span of structure	50 years	

As to the structure, piled wharf, steel sheet pipe pile and gravity quaywall are examined and compared from the viewpoint of soil conditions, availability of construction materials and construction cost. The conclusion is that the steel sheet pipe pile type is the most suitable structure.

(2) Work Process

4 years is required to complete all the processes including detailed designing and bidding and other preparations before the berth is put to service. The actual construction is estimated to take 2 years. (Table 4).

(3) Construction Cost

The construction cost of the Short-Term Port Development Plan is approximately 103 million pesos (1981 price). (Table 5).

Table 4 Construction Schedule for Short-Term Development Program

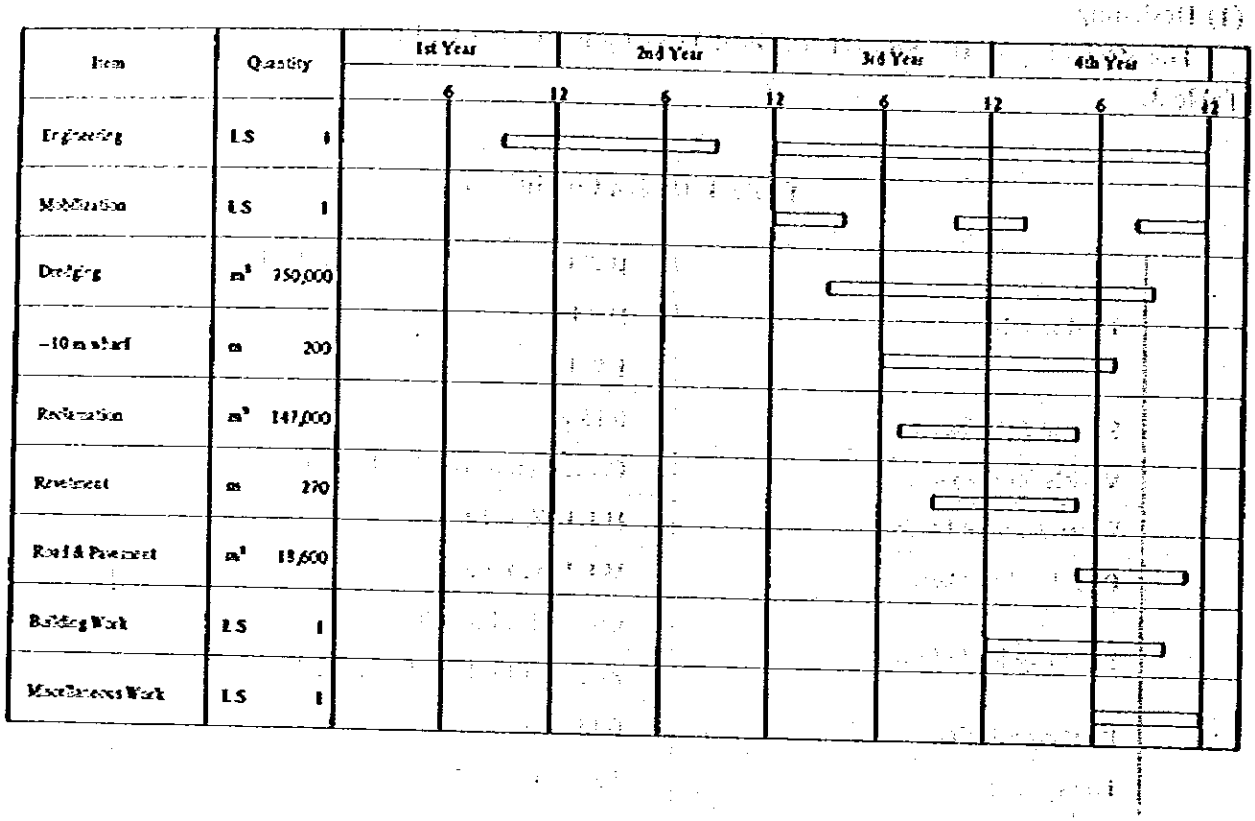


Table 5 Construction Cost for Short-Term Port Development Plan

Item	Quantity	Amount (1,000 ₱)		
		L.C	F.C	Total
Dredging	m³ 750,000	2,025	18,225	20,250
-10 m Berth	m 200	7,982	22,718	30,700
Revetment	m 270	1,371	1,371	2,742
Reclamation	m³ 147,000	1,470	2,205	3,675
Building Works	m² 3,900	4,992	1,248	6,240
Road & Pavement	m² 18,600	3,627	409	4,036
Miscellaneous Works	L.S 1	2,645	1,654	4,299
Mobilization	L.S 1	1,086	9,776	10,862
Sales Tax	L.S 1	1,809	0	1,809
Engineering (5%)	L.S 1	2,034	3,052	5,086
Physical Contingency (15%)	L.S 1	4,085	9,099	13,184
Total		33,126	69,757	102,883

5. Economic Analysis

(1) Method of Economic Analysis

In the Benefit/Cost analysis in the Short-Term Port Development Plan, construction and maintenance costs are regarded as Cost, and reduction in the transportation cost of cargo is regarded as Benefit. Market prices are adopted in the calculation of Benefit and Cost, although partly corrected by economic prices. For comparison, an alternative case, "Case without the Development Plan" is prepared, it reveals the state of Port of Irene without the Development Plan. The economic returns are assessed by the Internal Rate of Return (IRR); IRR is to be calculated for 20 years beginning in the year of initial investment.

(2) Cost and Benefit

Cost is incurred by the construction and maintenance in the short-Term Port Development Plan.

Benefit is derived from

i) Reduction in the transportation cost
ii) Effect on regional development (development of resources, urban development by industrilization, etc.)
iii) Effect on expansion of employment opportunities and increment of income of local residents
iv) Promotion of trade with neighboring nation and
v) Strengthening of regional transportation capacity and contribution to the establishment of maritime transport system.

In this economic analysis, however, it is just the reduction in transportation cost that is interpreted as Benefit, for it is the only measurable factor.

(3) Evaluation

IRR, on the basis of the above Benefit and Cost, is calculated to be 25.2%. Therefore the project can be judged as economically feasible.

6. Financial Analysis

(1) Purpose and Premises of Financial Analysis

The purpose of the analysis is to examine the revenue and expenditure, source and application of funds and financial state of the Short-Term Port Development Plan, and further to identify problems and countermeasures.

The premises of the financial analysis are as in the following:

i) The Port of Irene will take over both old and new fixed assets, and liabilities pertaining to this project; the financial accounting will be started in 1987.
ii) Revenue shall be calculated on the basis of the present rates of the standard tariff that has been provided by PPA.
iii) As to the fund raising, the share of the domestic currency shall be disbursed from the owned capital of PPA, and the share of the foreign currency shall be covered by overseas loans with the annual interest rate of 3 percent and the repayment term of 30 years (with 10 years of

grace term).

(2) Examination of Financial Statements

The result of the examination of the financial statements, the revenue at the current tariff rates shall be sufficient to cover the operating cost and the interest of loans, but not sufficient to meet the depreciation expense. This poses a problem in the financial accounting.

(3) Concluding Remakrs

There seem to be 2 effective ways to improve the situation of financial accounting. One is to increase income by raising the tariff rates, and the other is to introduce the public funds.

The soundness and the profitability of this project can be ensured by raising current tariff rates.

If the current tariff is doubled, FRR of this project is estimated to be 5.2 percent.

The revised tariff rates are acceptable since all the dues and charges collected by this tariff rate raise are well within the entire benefit of this project. This raise can also be said reasonable compared to those in neighbouring countries.

And introduction of public funds to secure the financial self-supporting seems to be a recommendable alternative, since this project contributes greatly to the regional development and is expected to yield great benefit to the national economy.

PURPOSE OF THE STUDY

PURPOSE OF THE STUDY

1. Background

In the Cagayan Valley Region (Region II) of northern Luzon Island, regional development of agriculture and forestry has been promoted. Because of this, increases in port cargo volume are predicted.

But the capacity of the ports and harbours in the Region is not necessarily to handle the predicted increases, so their development is indispensable to the Region.

The port of Irene, a sub-port of the port of Aparri, has helped serve this Region. The port of Aparri, however, is considered to have certain technical defects which hinder expansion of port capacity. Thus port of Irene is expected to play an important role in the development of Region II.

In consideration of these circumstances, the Government of Republic of the Philippines has requested the Government of Japan to conduct a study concerning further development of the port of Irene.

The Japan International Cooperation Agency (JICA) organized and dispatched to the Philippines a preliminary study team in January, 1981, and then JICA sent the Study Team in May, 1981.

2. Purpose

The study was carried out to formulate a master plan up to the year 2000 for the port of Irene in order to support the expected significant growth of Region II. Also, a short-term development plan for the port was prepared, covering the period up to 1987, and including feasibility study.

3. Major Study Items

The main contents of the study are as follows:

1) Technical Investigation of Natural Condition
2) Topographical and Sounding Survey
3) Port Activities Forcast
4) Port and Harbour Planning
5) Design and Execution of Port Facilities
6) Economic Analysis
7) Financial Analysis

4. Participants in the Study

1) Study Team

Team Leader	Mr. Ikuhiko YAMASHITA	The Overseas Coastal Area Development Institute of Japan
Port Planning	Mr. Shinya IZUMI	The Overseas Coastal Area Development Institute of Japan
Economic and Financial Analysis	Mr. Masataka TAKAHASHI	The Overseas Coastal Area Development Institute of Japan
Cost Estimation and Construction Plan	Mr. Takeaki HOSHINO	The Overseas Coastal Area Development Institute of Japan
Port Activities Forcast	Mr. Masayuki FUJIKI	The Overseas Coastal Area Development Institute of Japan
Structural Design	Mr. Ryoichi NISHIMURA	The Overseas Coastal Area Development Institute of Japan
Natural Condition	Mr. Yoshimitsu SUZUKI	The Overseas Coastal Area Development Institute of Japan
Natural Condition	Mr. Makoto YAMAMOTO	The Overseas Coastal Area Development Institute of Japan
Topographical and Sounding Survey	Mr. Tsutomu KUSAKA	International Engineering Consultants Association
Topographical and Sounding Survey	Mr. Mitsuo HASEGAWA	International Engineering Consultants Association
Coordinator	Mr. Takao KAIBARA	Japan International Cooperative Agency

2) Counterparts

Philippine Ports Authority

Mr. M.S. Dumlao	Assistant General Manager
Mr. R.D. Gonzales	Acting Manager
Mr. R.C. Aquino	Senior Port Economist
Mr. D.P. Bassig	Port Operation Specialist

Mr. F.B. Reyes	Port Economist
Mrs. B.J. Samia	Financial Analayst

Cagayan Integrated Agricultural Development Project

Atty. A.R. Reyno Jr	Project Director, Chairman
Atty. Carole. Y. Quirolgico	Chief MLO
Mrs. G.S. Araullo	Chief, Programs & Project
Mr. J.W. Baliao	Senior Architect
Mr. A.C. Alonzo	Consultant
Mrs. M.C. Esquerra	Monitoring Staff
Mrs. B.T. Pinson	Engineer Infrustructure

Staffs of PMU Irene, PMU San Fernando and CIADP (Tuguegarao) supplied all the required informations on operational, administrative and technical characteristics of the ports and assisted in coordinating the planning work with other governments and private companies.

5. Organization Visited by the Team

Philippine Ports Authority
Cagayan Integrated Agricultural Development Project
Agriculture Pilot Center (in Tuguegarao)
Asian Development Bank
Export Processing Zone Authority
Maritime Industry Authority
Ministry of Agriculture
Ministry of Public Works and Highway
National Cottage Industries Authority
National Economic and Development Authority
National Food Authority
National Irrigation Authority
National Transportation Planning Project
Office of Sta Ana City
Office of Cagayan Province
Office of Gonzaga City

Office of Santa Ana City
Overseas Economic Cooperation Fund of Japan (in Manila)
Philippine Atmospheric Geophysical and Astronomical Services Administration
Port Management Unit Irene
Port Management Unit Manila
Port Management Unit San Fernando

CHAPTER I. OUTLINE OF REGION II

CHAPTER 1. OUTLINE OF REGION II

1-1 Population and Gross Value Added

The socioeconomic development of the Philippines is executed in accordance with the Long-Term Philippine Development Plan up to the Year 2000. The targets of this plan are as follows:

1) Social development through the increase of opportunities of employment, the correction of income gaps and the raising of living standards.
2) Self-sufficiency in food and energy.
3) Accomplishment of rapid and sustained economic growth.
4) Stabilization of prices and improvement of foreign trade balance.
5) Acceleration of development of undeveloped areas.

The development of Region II is being steadily executed in accordance with the Cagayan Valley Five-Year Regional Development Plan which is under the above-mentioned the Long-Term Philippine Development Plan up to the Year 2000.

Region II is situated in the northeastern part of Luzon Island (Fig. 1-1). Its area is 36 thousand km^2 or 12 percent of the total Philippine area (300 thousand km^2). This area is the second largest after that of Region IV (Southern Tagalog).

Administratively, Region II is divided into seven provinces and 107 municipalities. These municipalities are divided into barangays.

The population in 1980 was 2,200 thousand persons or 4.63 percent of the total Philippine population (47,914 thousand persons). The population density is 61.0 persons/km^2, the lowest figure in all the Philippines. The rate of population increase from 1975 to 1980 is 2.79 percent which is larger than the nation's increase rate of 2.64 percent.

As for Region II's population distribution by province, population concentrates on the provinces of Isabela (870 thousand) and Cagayan (712 thousand), these two provinces accounting for 71 percent of the population of the entire Region II. (Table 1-1)

The per-capita GDP in 1979 is 1,222 pesos or 65.2 percent of the national average, as indicated in Table 1-2. Gross Value Added (GVA) in 1979 is 2,615 million pesos in terms of 1972 prices. The composition of GVA is 1,310 million pesos for the agricultural sector, 602 million pesos for the industrial sector and 703 million pesos for the service sector. (Table 1-3)

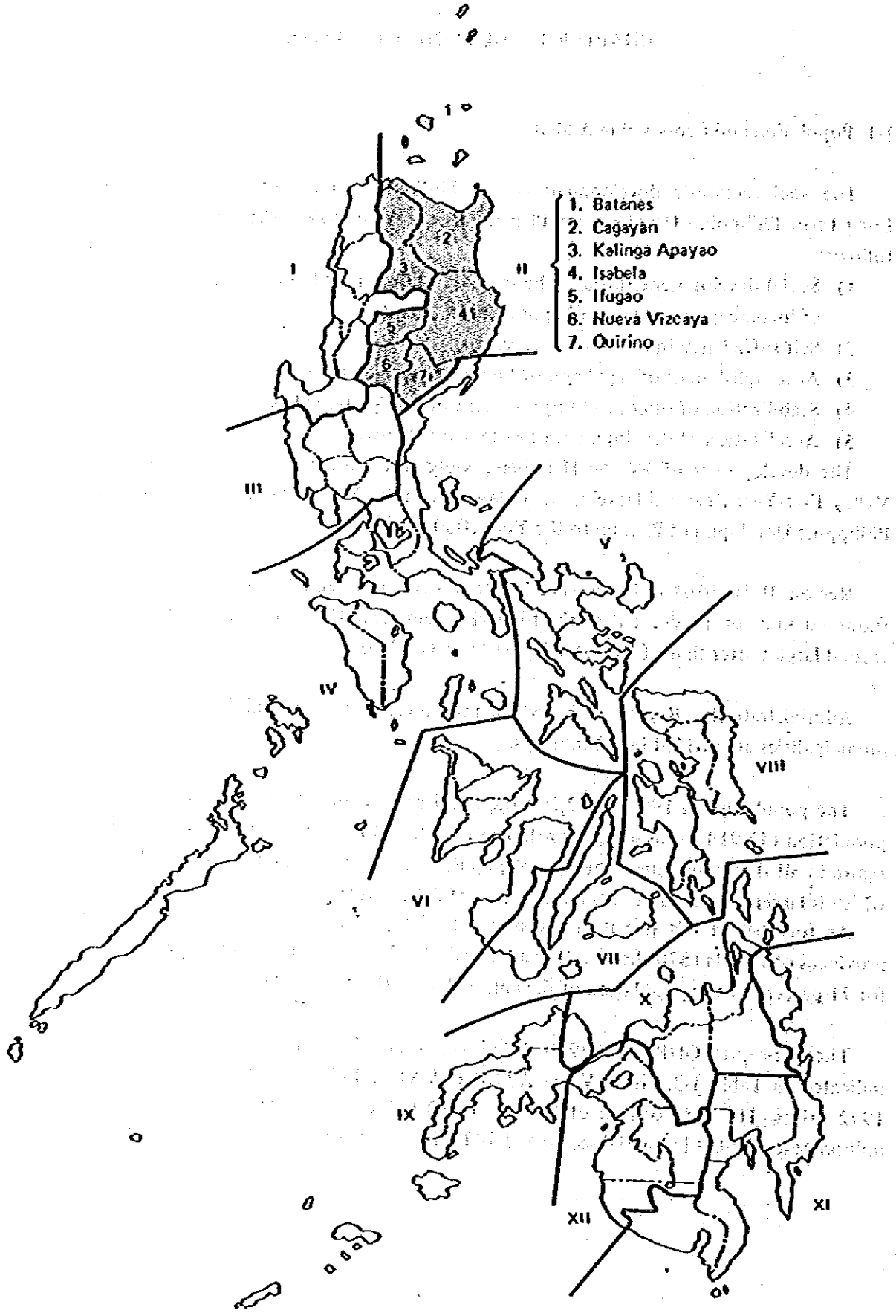


Fig. 1-1 Regional Map of the Philippines

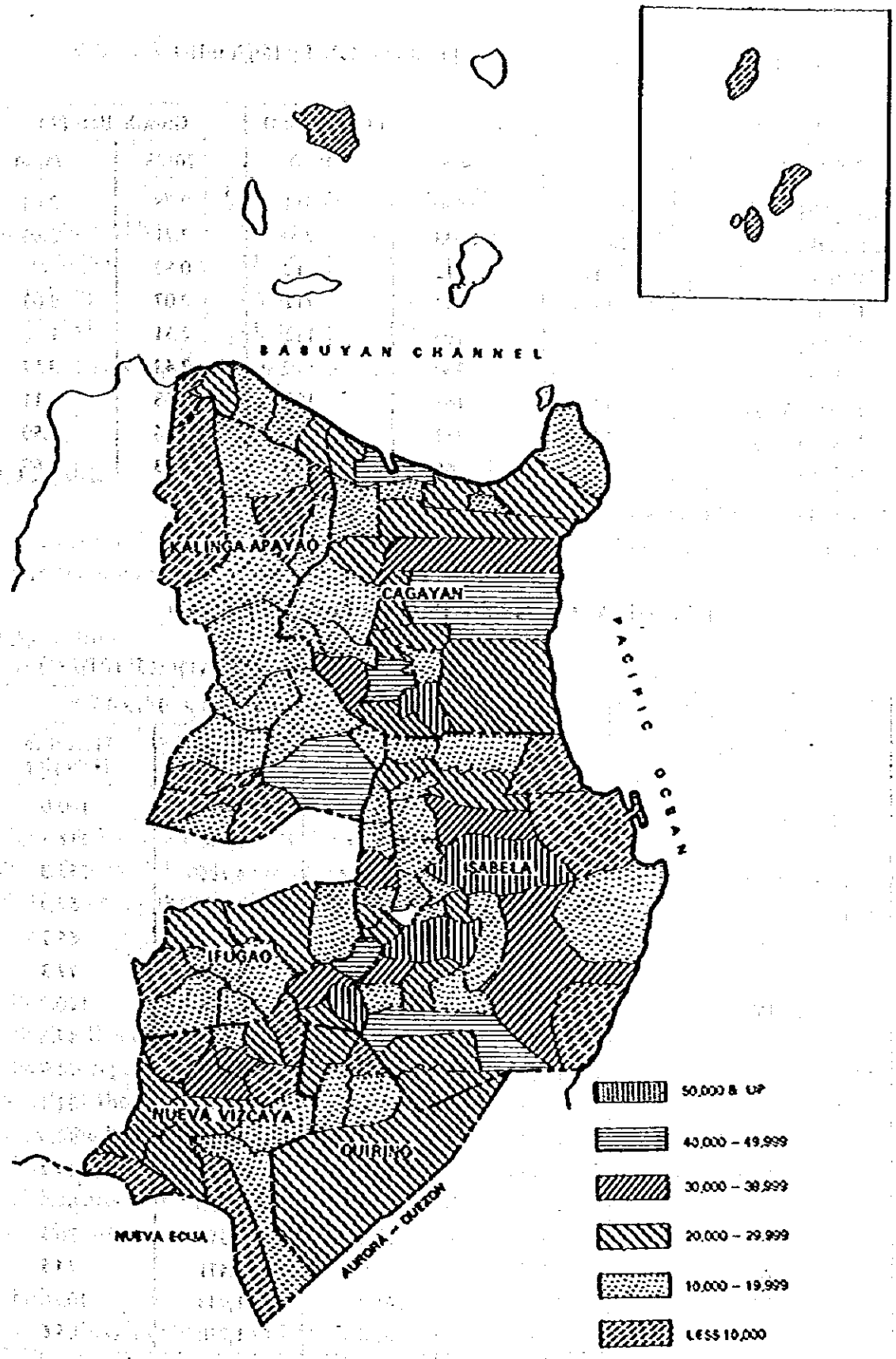


Fig. 1-2 Population Level of Region II
(by Municipality)
1980

Table 1-1 Population and Growth Rate by Region II

	Population (.000 persons)			Growth Rate (%)	
	1970	1975	1980	70/75	75/80
Philippines	36,684	42,070	47,914	2.78	2.64
Region II	1,691	1,933	2,220	2.71	2.80
Batanes	11	12	12	0.82	–
Cagayan	581	644	712	2.07	2.03
Ifugao	93	105	112	2.51	1.30
Isabela	648	730	870	2.42	3.57
Kalinga-Apayao	136	163	190	3.68	3.11
Nueva Vizcaya	172	213	241	4.36	2.50
Quirino	50	66	83	5.73	4.69

Source: Philippine Yearbook 1979

Table 1-2 Per Capita Gross Domestic Product by Region

(In Pesos at 1972 Prices)

	1974		1979	
	GDP	Percent to Philippine	GDP	Percent to Philippine
Philippines	1,526	100.0	1,875	100.0
Luzon	1,814	118.9	2,218	118.3
NCR – Metro Manila	3,971	260.2	4,786	255.3
Region I	861	56.4	1,069	57.0
II	1,090	71.4	1,222	65.2
III	1,331	87.2	1,449	77.3
IV	1,694	110.0	2,076	110.7
V	768	50.3	889	47.4
Visayas	1,210	79.3	1,405	74.9
Region VI	1,375	90.1	1,526	81.4
VII	1,364	89.4	1,688	90.0
VIII	748	49.0	828	44.2
Mindanao	1,161	76.1	1,530	81.6
Region IX	830	54.4	1,319	70.3
X	1,190	78.0	1,471	74.5
XI	1,598	104.7	1,943	103.6
XII	898	58.8	1,230	65.6

Source: NCSO, NEDA-NAS

Table 1-3 Gross Value Added, by Industrial Origin, Region II 1974 and 1979

(1972 Prices, Million Pesos)

	1974		1979		Annual Growth Rate	
	Philippine	Region II	Philippine	Region II	Philippine	Region II
Gross Value Added	62,734	2,062	87,328	2,615	6.8	4.9
Agriculture	17,305	1,244	22,637	1,310	5.5	1.0
Industry	20,711	275	31,429	602	8.7	17.0
Services	24,718	543	33,262	703	6.1	5.3

Source: NEDA, The Regional Income Accounts of the Philippines, CY 1971–1979

1-2 Industries

The main industries of Region II are forestry, agriculture and fishery. Particularly important are forestry and agriculture.

(1) Agriculture

The total harvest area in the agricultural sector in 1979 was 837 thousand ha. As for the staples, 969.6 thousand M.T of palay and 338 thousand M.T of corn were produced. Self-sufficiency has already been achieved for staple foods and palay began to be exported in recent years.

Table 1-4 shows the cultivated area for food crops and production in Region II. Though the cultivated area did not increase in recent years, the production steadily increased. This is probably due to the great efforts made by the State in irrigation and breeding as national projects.

(2) Forestry

Region II is one of the most central parts of Philippine forestry.

Forests represent 2,625 thousand ha or 72 percent of the total area of Region II and, of this area, 2,093 thousand ha are productive forests. The production in 1979 is shown in Table 1-5. Some of the logs produced from the productive forests are shipped as is from ports in Region II for foreign or domestic trade, some are sawed or made into plywood for intra-regional demand remaining products being exported from the Region II's ports for foreign or domestic trade. However most are transported mainly to Manila by truck.

(3) Fishery

The fishery production in Region II is as shown in Table 1-6. It is not self-sufficient because of undeveloped ocean fishing, inadequate fishing equipment and limited period of fishery activities which is only five to six months a year.

Table 1-4 Selected Agricultural Production Region II, 1978 and 1979

CROPS	1978		1979	
	Area Planted .000 Ha	Production .000 M.T	Area Planted .000 Ha	Production .000 M.T
Food Crops				
Palay (Rough Rice)	413.8	808.7	416.1	969.6
Corn (Shelled)	337.2	336.7	330.4	338.1
Fruits & Nuts	11.8	113.1	17.1	124.4
Root Crops	13.2	58.5	12.8	64.6
Vegetables		17.3		25.1
Beans & Peas	2.6	1.4	2.4	1.1
Coffee		6.5		6.6
Peanuts		12.6		13.5
Commercial Crops				
Coconut	5.6	37.0	5.5	23.3
Sugar Cane	4.2	9.6	4.6	22.4
Tobacco	20.0	13.4	14.6	27.4

Source: BAE con

Table 1-5 Production of Wood Products by Region II, 1979

(.000 m^3)

	Philippines	Region II	Percent to Total
Log	6,578	945	14.3
Lumber	1,626	397	24.4
Plywood	503	35	6.9
Veneer	634	52	8.2

Source: Bureau of Forest Development (BFD)

Table 1-6 Fishery Production by Region, 1972 and 1976

(.000 Kg)

	Commercial Fishing		Fishpond Productions	
	1972	1976	1972	1976
Philippines	424,754	508,197	98,922	12,760
Region II	1,412	1,005	145	158
Cagayan	1,412	1,005	130	145
Isabela	–	–	15	13
Nueva Vizcaya	--	–	0.17	0.15

Source: Bureau of Fisheries and Aquatic Resources (BFAR)

(4) Others

The production of livestock and poultry is shown in Table 1-7. Livestock and poultry in Region II represent about 10 percent and 7 percent, respectively, of the national total.

As a whole, the output of livestock products in Region II seems unlikely to be self-sufficient.

Table 1-7 Livestock and Poultry Population Region II, 1978 and 1979

(.000 Heads)

	1978			Region II (1979)
	Philippines	Region II	Percent	
Cattle	1,820	198	10.9	208
Carabao	2,959	471	15.9	495
Hog	6,910	718	10.4	753
Goat	–	22	–	23
Poultry	64,258	4,617	7.2	4,865

Source: BAE con, Philippine Yearbook 1979

As for mineral resources, the reserves of coal, lime-stone, iron-stone, etc. are known to be large. However, large-scale production development has not yet been started. Gold, silver and manganese are produced in small quantities in the Province of Isabela and manganese is produced also by small quantities in the Province of Kalinga Apayao.

As for Industries, notably sawing, are developed but large factories do not exist due to delays in the social infrastructures. As for modern factories, there is a sugar mill (CASUCO) in the province of Cagayan but it is not yet in full operation.

1-3 Transportation

Region II is linked to Metropolitan Manila by the Pan-Philippines Japanese Friendship Highway routed via Nueva Vizcaya in the province of Isabela and Aparri in the province of Cagayan (Fig. 1-3). However, road construction in the mountainous area on the east side of the Pan-Philippines Japanese Friendship Highway is delayed. On the west side, there are several roads linking this region with Region I but these are not necessarily convenient for transportation.

The total length of roads in Region II is 11,524 km, which is 7.6 percent of the national total.

The Philippines has 19 Port Management Units (PMU) and ports in Region II are under the control of PMU Irene. The volume of cargoes handled by PMU Irene in 1979 is 219 thousand tons of which 62 percent is foreign trade cargoes.

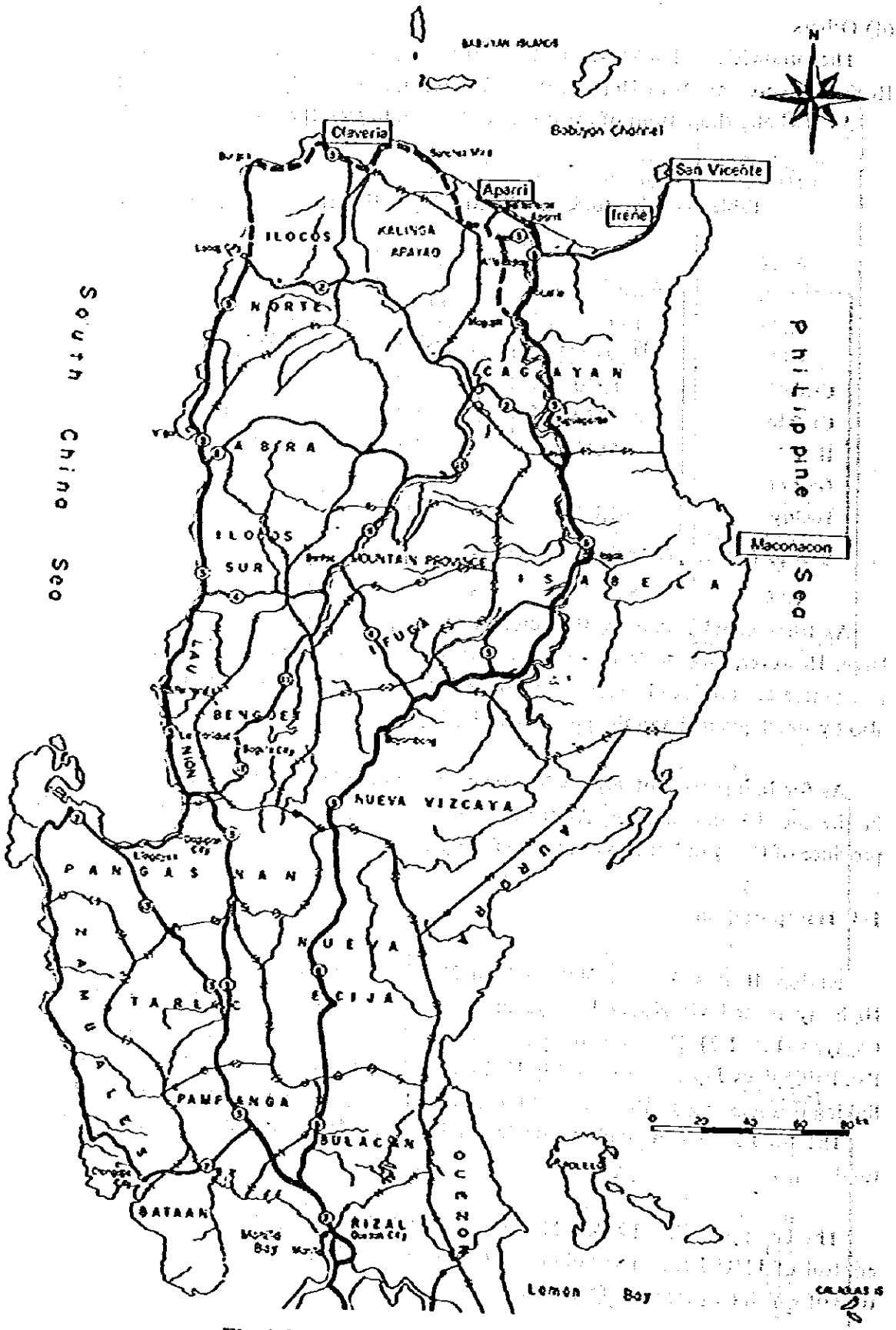


Fig. 1-3 Road Network of Northern Luzon

Port of Aparri, Irene, Claveria and Maconacon are the four main ports in Region II. These ports are used by trampers.

Port of Aparri is used for the import of petroleum products in domestic trade and the export of logs in foreign trade. Port of Irene is used for the export of logs in domestic and foreign trade and the export of molasses in foreign trade. Port of Claveria and Port of Maconacon are mainly used to export logs.

Region II has six domestic airports. Of these, only one, the airport of Tuguegarao in the Province of Cagayan, is a primary airport. As secondary airports, there are the airports of Cauayan in the Province of Isabela and the airport of Bagabag in the Province of Nueva Vizcaya.

The airport of Tuguegarao serves as a relay point for the airports of Manila and Basco and is linked to the airport of Laoag in Region I.

CHAPTER 2. PMU IRENE

CHAPTER 2. PMU IRENE

2-1 Philippine Ports Authority

1. General

The Philippine Ports Authority (PPA) is the government agency directly responsible for the control, management and development of the nation's 94 national ports and administratively responsible for the 528 municipal ports. It was set up by Presidential Order 505 of July 1974 and strengthened by Presidential Order 857 of December 1975. Article 2 of this Presidential Order 857 specifically sets forth the functions of the PPA as follows:

ARTICLE II. DECLARATION OF POLICIES

SECTION 2 Declaration of Policies and Objectives – It is hereby declared to be the policy of the state to implement an integrated program for the planning, development, financing, and cooperation of Ports or Port Districts for the entire country in accordance with the following objectives:

1) To coordinate, streamline, improve and optimize the planning, development, financing, construction, maintenance and operation of Ports and port facilities, port physical plants, and all equipments used in connection with the operation of a port.

2) To ensure the smooth flow of water-borne commerce passing through the country's ports whether public or private, in the conduct of international and domestic trade.

3) To promote regional development through the dispersal of industries and commercial activities throughout the different regions.

4) To foster inter-island seaborne commerce and foreign trade.

5) To redirect and reorganize port administration beyond its specific and traditional functions of harbor development and cargo handling operations to the broader function of total port district development, including encouraging the full and efficient utilization of the Port's hinterland and tributary areas.

6) To ensure that all income and revenues accruing out of dues, rates, and charges for the use of facilities and services provided by the Authority are properly collected and accounted for by the Authority, that all such income and revenues will be adequate to defray the cost of providing the facilities and services (inclusive of operating and maintenance cost, administration and overhead) of the Port Districts, and to ensure that a reasonable return on the assets employed shall be realized.

At its initial period, the PPA mainly worked to establish its organization and improve its control system. It started its regular activities when it assumed the control and operation of main national ports. In 1978 and 1979, the second stage, it promoted the effective use of existing facilities by rational methods of management and the maintenance and redevelopment of ports. During the 1980s, it is considered important for the PPA not only to further these measures more actively than ever but also to carry out the following:

1) Prioritization of Development Projects
2) Accelerated Ports Development and Maintenance Program
3) Rationalizing Port Operations
4) Rationalization of Philippine Port Tariff Structure
5) Rationalizing the PPA Management System

2. Organization

The corporate powers of the PPA rest with its Board of Directors (Fig. 2-1). The Board is prescribed by Article 7 of Presidential Order 857 and composed of the following seven persons:

The Minister of Transportation and Communication (as Chairmen)
The General Manager of the PPA (as Vice-Chairman)
The Director-General of NEDA
The Minister of Finance
The Minister of Natural Resources
The Minister of Trade
One person from the private sector appointed by the President of the Philippines

Under this Board, the General Manager and his staff work at the substantial business. Ports in different areas are controled and managed by the 19 Port Management Units, PMU, established throughout the country. Ports where Port Management Unit is located are Manila, Cebu, Batangas, San Fernando, Illoilo, Legaspi, Dumaguete, General Santos, Ilegan, Surigao, Zamboanga, Masao, Tacloban, Puerto Princesa, Cagayan de Oro, Davao, Irene, Jolo and Polloc (Fig. 2-2).

The construction and dredging of ports are the charge of the Ministry of Public Works in accordance with Article 37 of Presidential Order 857.

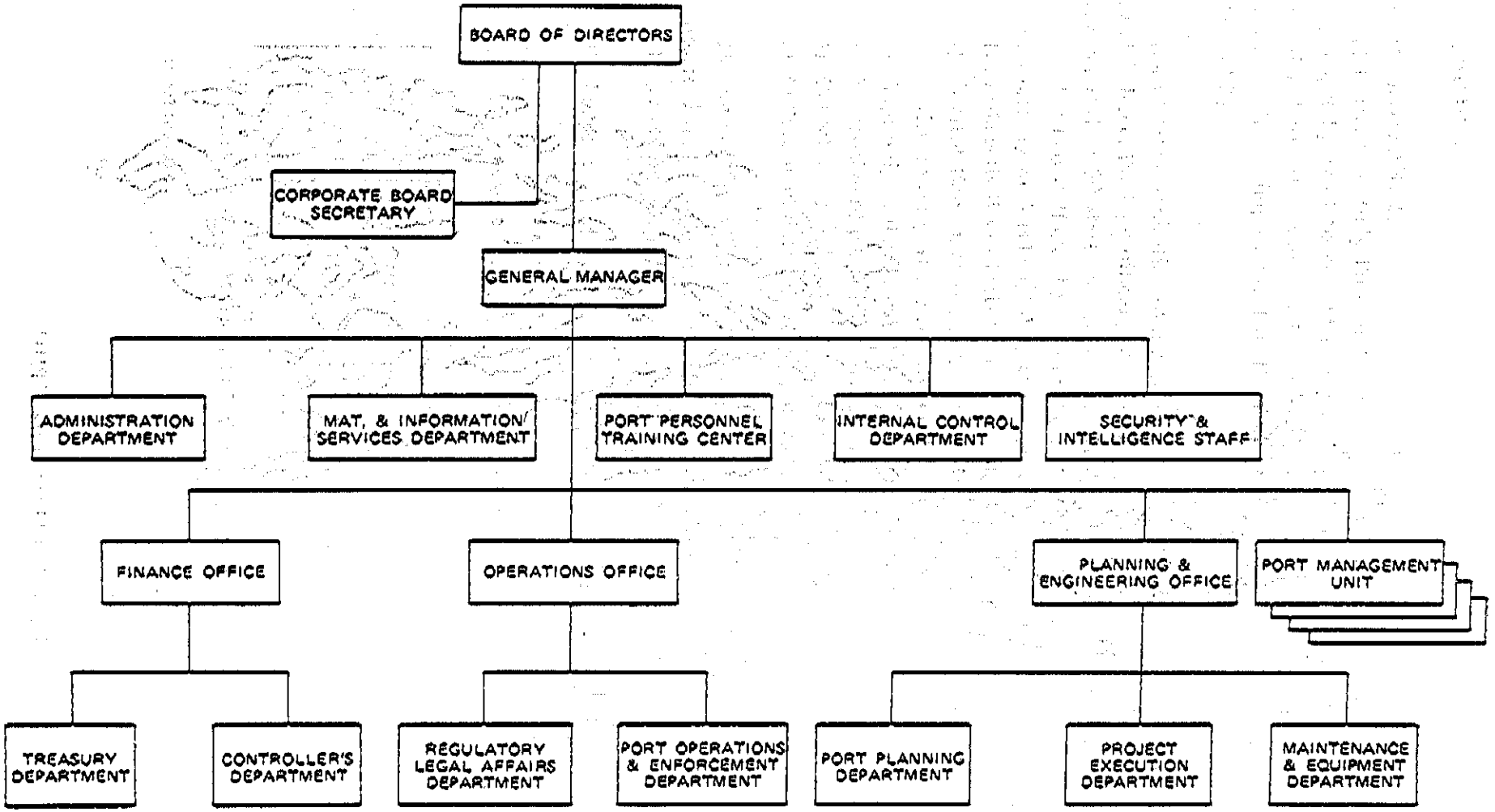


Fig. 2-1 Philippine Ports Authority Organizational Chart

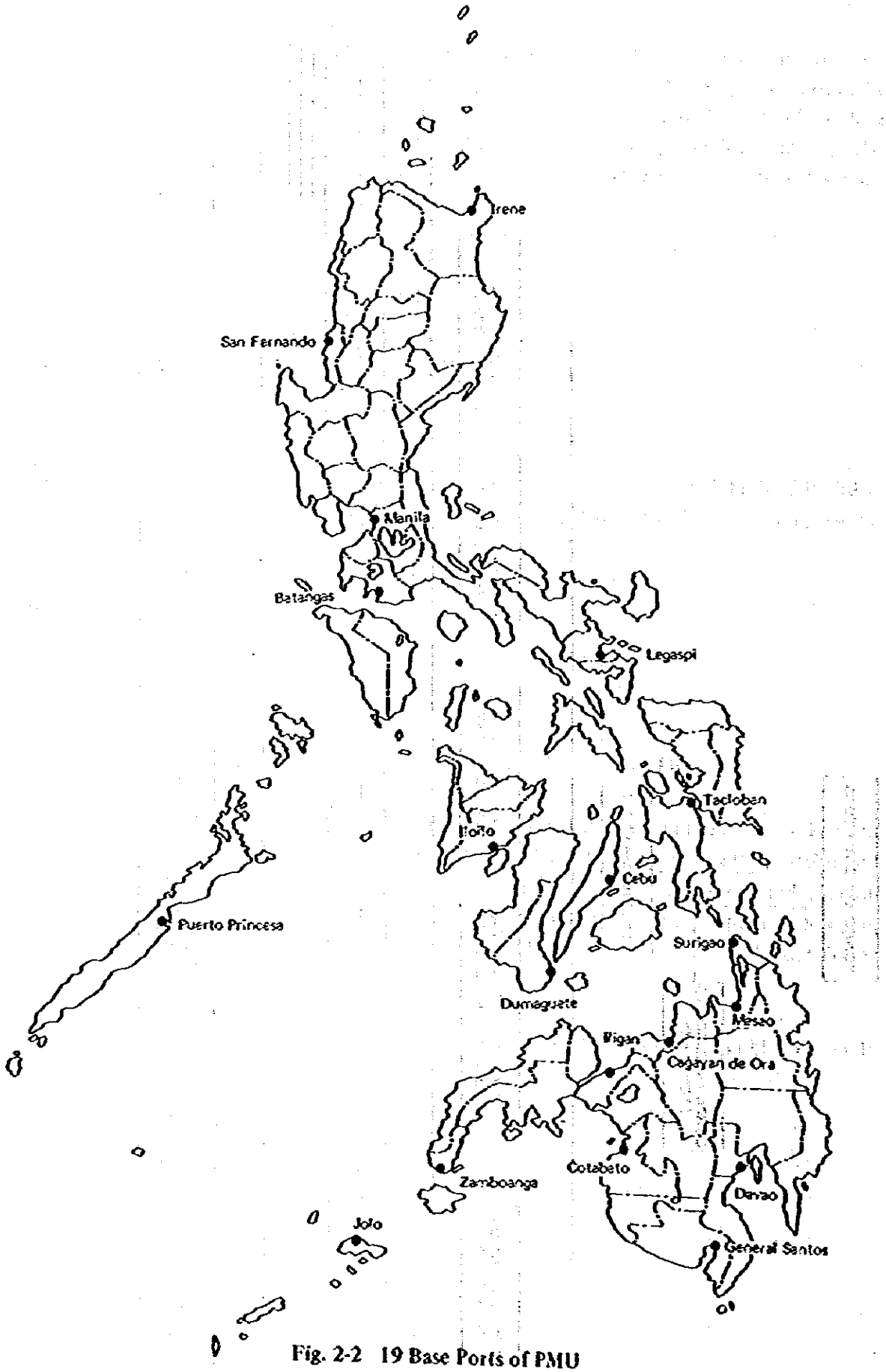


Fig. 2-2 19 Base Ports of PMU

2-2 PMU Irene

1. Management System

PMU Irene controls Port of Irene, Port of Aparri, Subport of San Vicente, Subport of Claveria, Subport of Basco and four private ports (Fig. 2-3). PMU Irene was first called PMU Aparri and its office was established in Aparri City. The PMU Aparri was renamed PMU Irene when the drastic improvement of the Port of Irene was planned but its office still remains in Aparri City.

The general organization of a port management unit is as shown in Fig. 2-4. But in the office of PMU Irene, the legal officer and the commercial development section are missing and the unit is composed of 20 staff members including the port manager. As for subports, the subport of Claveria has two staff members but the Port of Irene has none. So, when a ship enters the Port of Irene, necessary work is handled by staff members dispatched from the Aparri office.

The main activities of PMU Irene are as follows:

1) Construction, maintenance, management and regulation of necessary facilities and services in the port and related area.
2) Approval, regulation and supervision of facility construction in the port district.
3) Supervision of pilots and provision of pilot service.
4) Collection of facility using charges and taxes, etc.
5) Collection of data concerning port cargoes and ships.

The following port-related government agencies are represented in Aparri City: Bureau of Customs, Philippine Coast Guard, Ministry of Public Works, Animal Quarantine, Plant Quarantine, Bureau of Immigration and Deportation and Ministry of Health

The budget scale of PMU Irene is as shown in Table 2-1.

Table 2-1 Annual Budget

('000 Pesos)

	1978	1979	1980
Budgeted Income	577	716	825
Budgeted Expenditure	736	688	919
Actual Income	609	650	533
Actual Expenditure	486	679	896

Source: DATA/INFORMATION FOR PPA-PMU APARRI

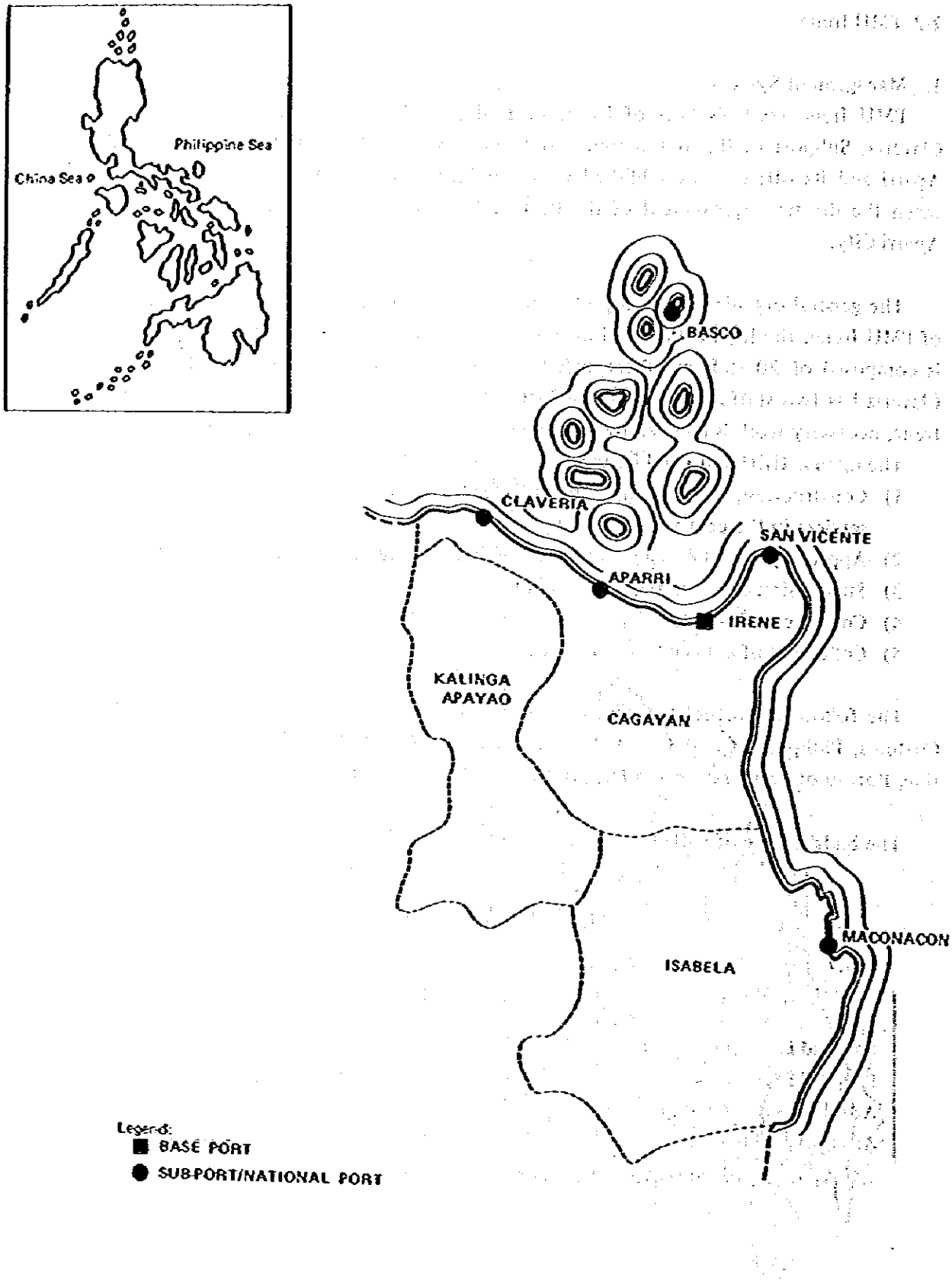


Fig. 2-3 Ports of PMU Irene

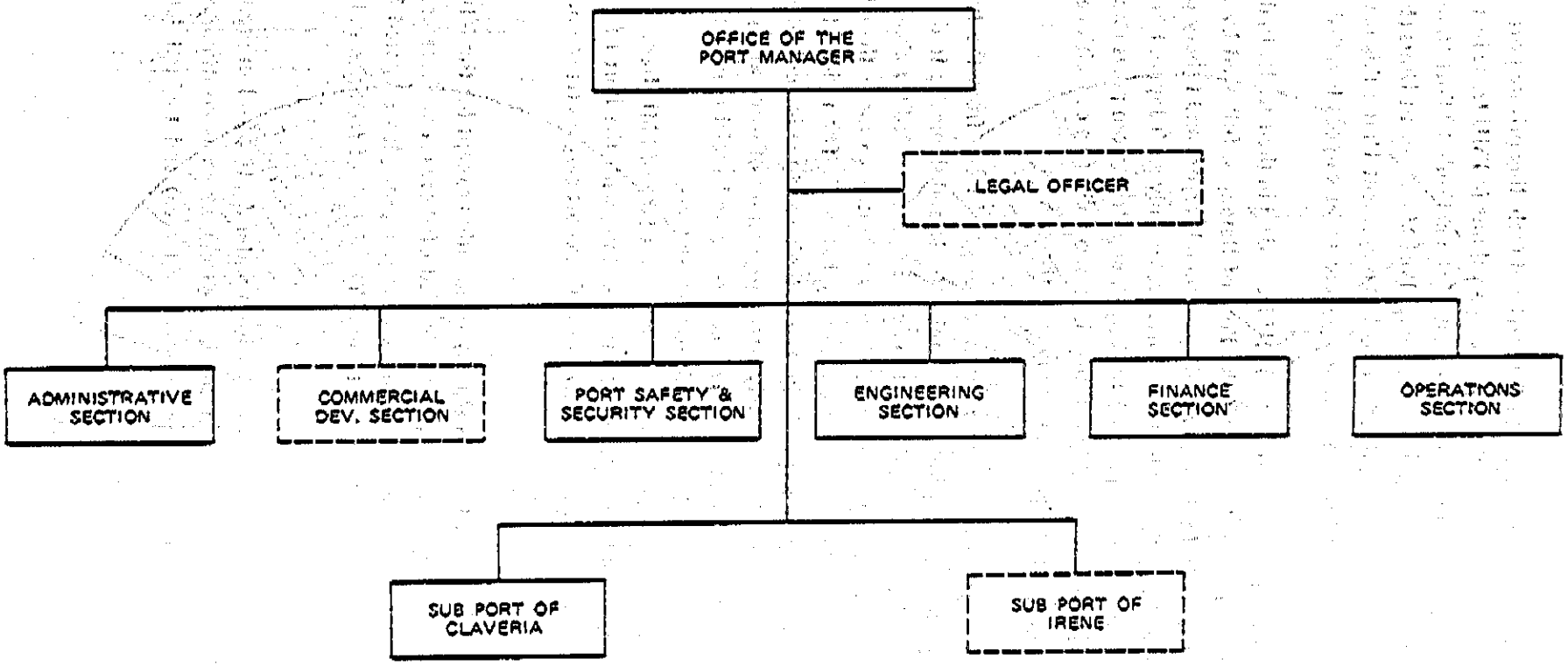


Fig. 2-4 Organizational Structure of PMU Irene

2. Port Activities

Under PMU Irene, 10 ports -- mainly the Port of Aparri and including private ports -- are in operation. However, their activities are so small that the cargo volume in PMU Irene in 1979 was only about 220 thousand tons, which is the second smallest of the nation's 19 Port Management Units. The number of ships that called was the smallest of all Port Management Units (Fig. 2-5). The average size of ships that called was the 5th of all Port Management Units; this means that relatively large ships call. The presumed reason is that logs are main cargoes handled and the per-ship lot is large.

Let us now see the parties with which ports under PMU Irene deal in their trade. In domestic trade, they mainly deal with the Port of Manila and the Port of Batangas, followed by dealings between ports within PMU Irene itself. In the latter dealings, general cargoes and fishery products are transported by small vessels. In foreign trade, these ports deal mainly with Japan, Europe and Taiwan and a considerable number of ships proceed to foreign countries from ports under PMU Irene via other Philippine ports. This is probably because the cargo collecting capacities and port facilities of ports under PMU Irene are inadequate to fully load these ships.

Hereunder is a general description of the characteristics of PMU Irene from the types and volume of cargoes in 1980. As to the composition of foreign trade and domestic trade, foreign trade represented about 60% and consisted entirely of export. Logs accounted for about 85% of export cargoes and the volume including wooden products amounted to more than 90%. In domestic trade, the outgoing and the incoming were generally balanced. The ratios of logs and petroleum products were overwhelming in, respectively, the outgoing and the incoming. The port cargoes of PMU Irene are remarkable for the extremely large proportions of wood and petroleum products and the total absence of import cargoes. The economic and social conditions of the hinterland of ports in PMU Irene Ports can be presumed from these facts.

The Port of Aparri is predominant in cargo volume with about 50% of PMU Irene. This port handles both foreign trade cargoes and domestic trade cargoes along with the Port of Irene but the ports of Claveria and Maconacon make special activities with export cargoes representing 80% (Table 2-2).

Ports under PMU Irene have no port facilities worthy of mention except for the -10 m pier at the Port of Irene. Large ships have to be loaded or unloaded offshore (at anchorages) and no adequate public storage facilities exist. The port improvement five-year plan prepared by PMU Irene only proposes maintenance for all but the Port of Irene. The details of facilities and services of each port are as follows:

1) Port of Aparri: It has a wharf (length: 345 m) with a water depth of -1 m presumed to have been constructed in the 1930s, a bulkhead (length: 490 m) which is continuous to this wharf and a port area of 4,000 m^2. Pilotage (compulsory pilot area) and tugboat service are available (Fig. 2-6).

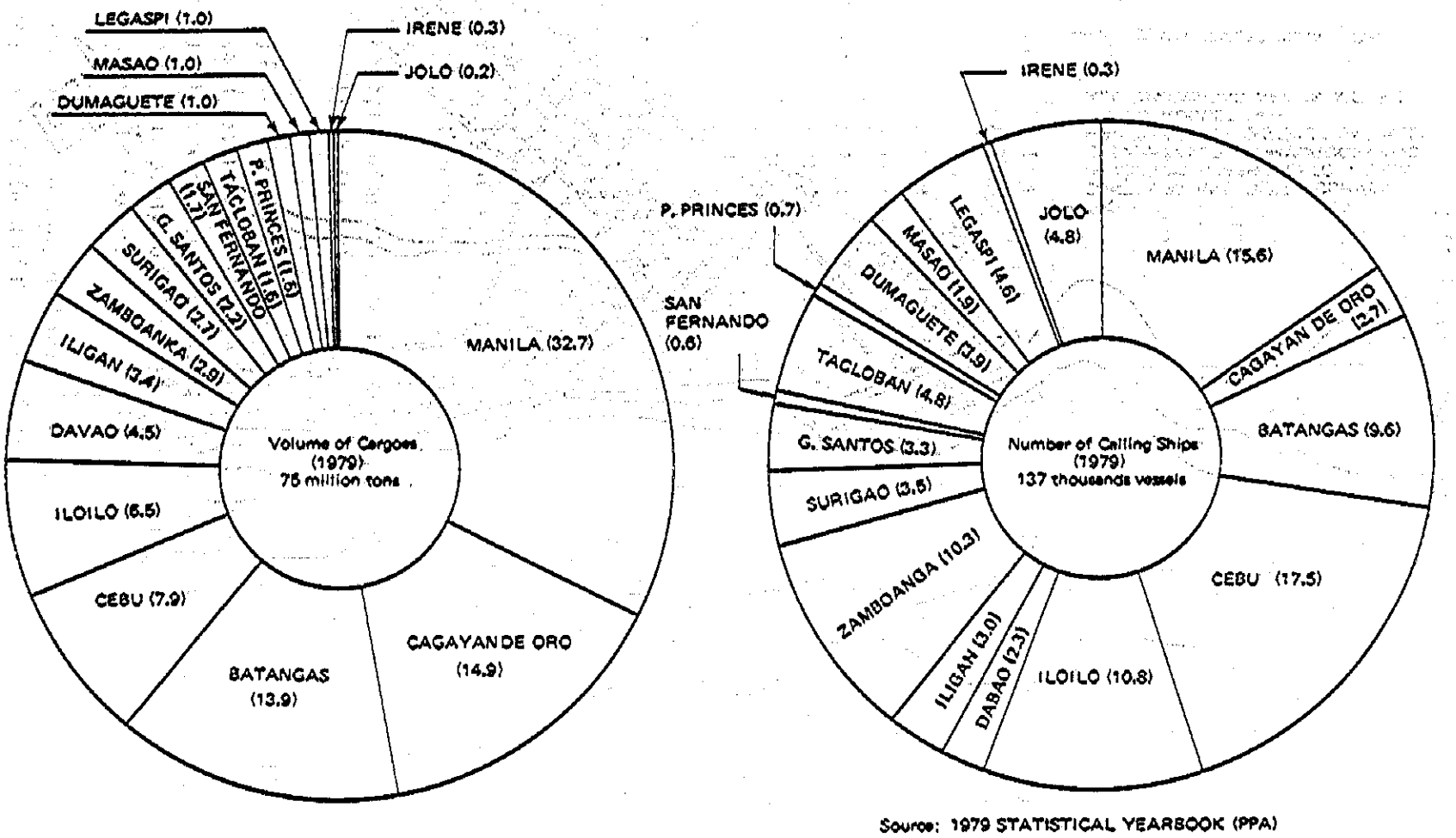


Fig. 2-5 PMU in Port Activities

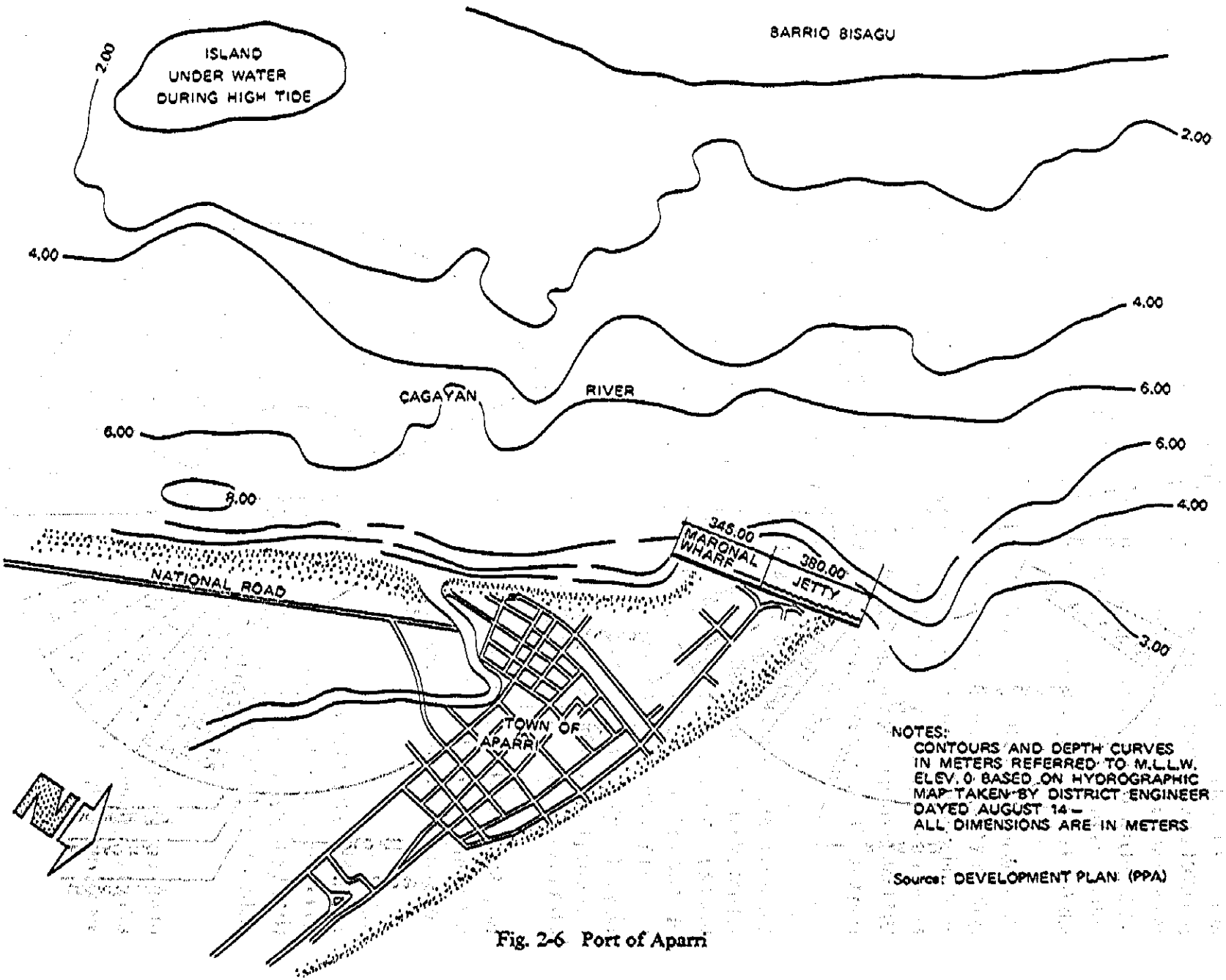


Fig. 2-6 Port of Aparri

Table 2-2 Cargo Volume of PMU Irene Ports (1980)

(.000 tons)

Trade	Commodities	Irene	Aparri	Claveria	Maconacon	Total
Export	Logs	10,659	39,276	17,102	41,062	108,099
	Lumber	1,139	661	367	217	2,384
	Plywood/Veneer		776	7,086	1,415	9,277
	Molasses	6,870				6,870
	Chrome Ore				994	994
Import						
Sub Total		18,667	40,713	24,555	43,688	127,624
Outward	Logs	18,567	21,854	3,029	1,034	44,484
	Lumber		10	96	297	403
	Plywood/Veneer		13	1,666	39	1,718
	General Cargo		28	110	13	151
	Petroleum Products		247			247
Inward	Logs			10		10
	Plywood/Veneer		51	10		61
	General Cargo		44	94	221	359
	Petroleum Products	4,428	41,778		586	46,792
Sub Total		22,995	64,025	5,015	2,190	94,225
Total		41,663	104,738	29,570	45,878	221,849

Source: PMU Irene

2) Subport of Claveria: It has a wooden pier (length: 101 m, width: 5 m) constructed by a private company. It engages in the export of plywood and veneers for foreign and domestic trade more actively than any other port under PMU Irene.

3) Subport of San Vicente: It has a jetty (length: 20 m, width: 10 m) and a stone causeway (length: 315 m). The harbor area is shielded by an island, etc. and serves for refuge in a typhoon.

4) Port of Irene: This port is located at the northeastern tip of Luzon Island and at a distance of about 70 km from the Pan Philippine Highway. It has a pier (length: 144 m, width: 15 m) with a water depth of −10 m, a sugar storage (capacity: 24,000 tons) and a molasses storage tank (capacity: 6,000 tons) of the Cagayan Sugar Company (CASUCO) and an open storage yard of 4,500 m².

Though the water depth of the pier is supposed to be −10 m (nominal water depth: −14 m), some parts of the front of the pier are not 10 m deep. The pier is 144 m long at present and an extension of 66 m toward the recesses of the bay is being constructed. This extension is

structurally the same as the existing pier. The construction of the extension has not progressed beyond pile driving, though. The shore area and the pier are connected by a bridge of 65 m in length and 10 m in width. The apron of the pier is narrow (15 m) and the bridge is also narrow, thus, efficient cargo handling can hardly be expected. Particularly, since the main cargoes of the Port of Irene are long logs, the apron is all the more crowded. Users expect much of this port because it is the only port with a large pier in the jurisdiction of PMU Irene.

Under the PPA charter, arrastre and stevedoring are essentially service functions of government. However, almost all of the cargo handling operations in the Philippines are being undertaken by private arrastre/stevedoring contractor. These operators are given permits or franchise to operate arrastre/stevedoring services under certain terms and conditions.

In this port, cargo handling services are provided by the North Luzon Port Services Incorporation. Most of the port does not follow shifting system. The normal practice is for the same gangs to start working on a ship to finish it even though it may involve long working hours.

There is no shift system at Port of Irene, either. In the example of the logs cargo handling at the port at the time of this study, the cargo handling hours were from 0800 hours to 2100 hours (lunch break: 1 hour).

Pilotage service is provided by pilots of the Irene Pilotage District of the United Harbour Pilots Association of the Philippines. Tug assistance that may be necessary is provided by the above-mentioned North Luzon Port Services Incorporation.

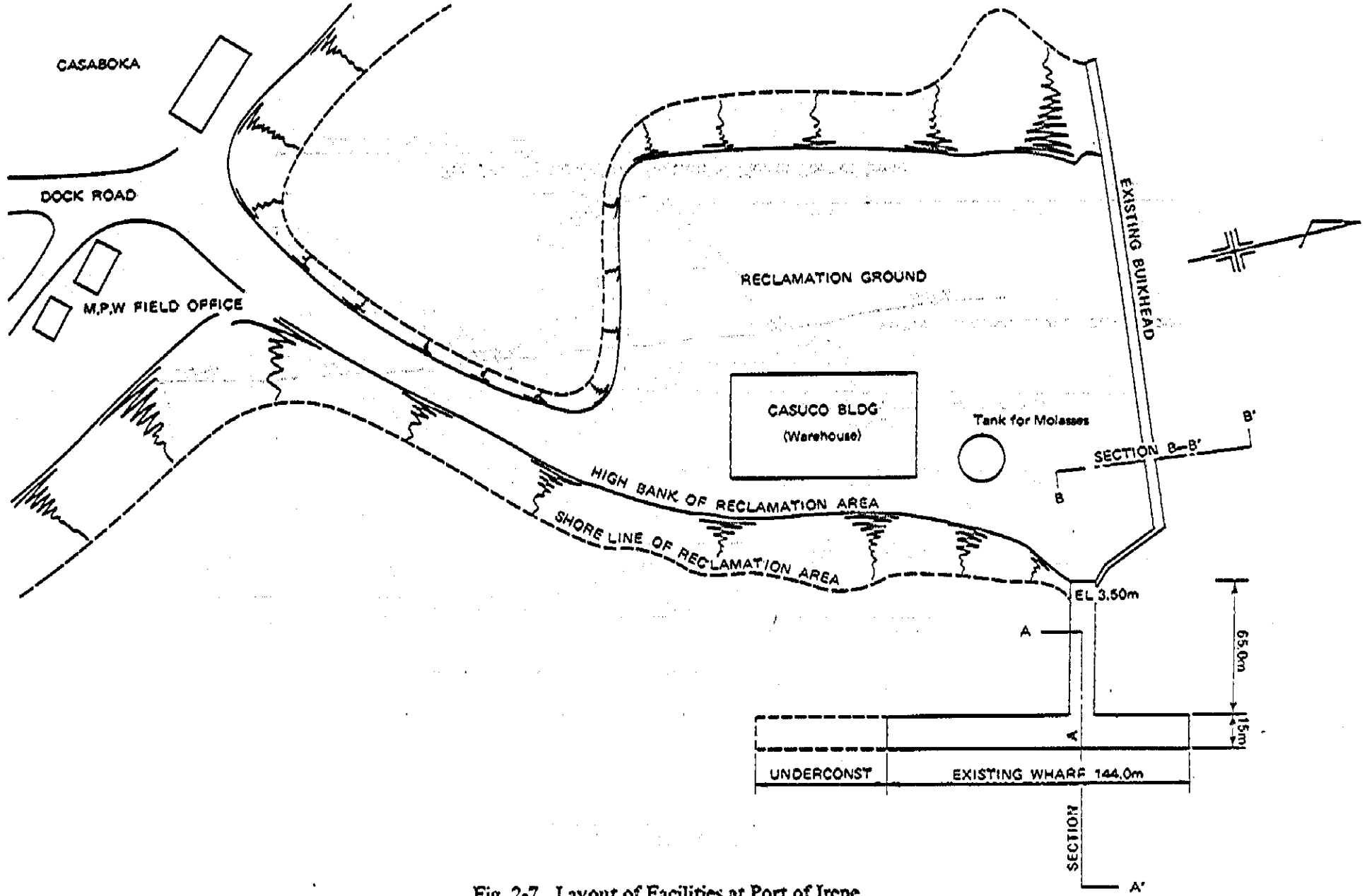


Fig. 2-7 Layout of Facilities at Port of Irene

SECTION A–A'

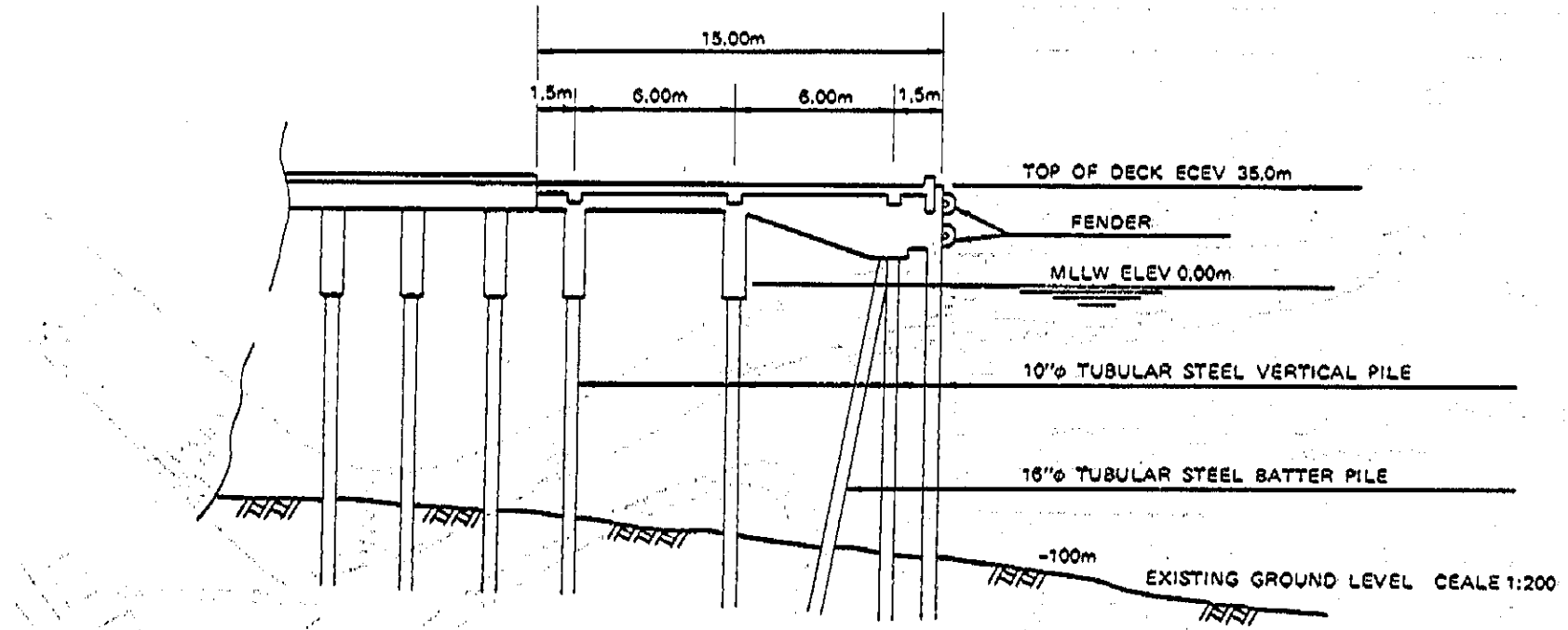


Fig. 2-8 Typical Cross Section of Pier at Port of Irene

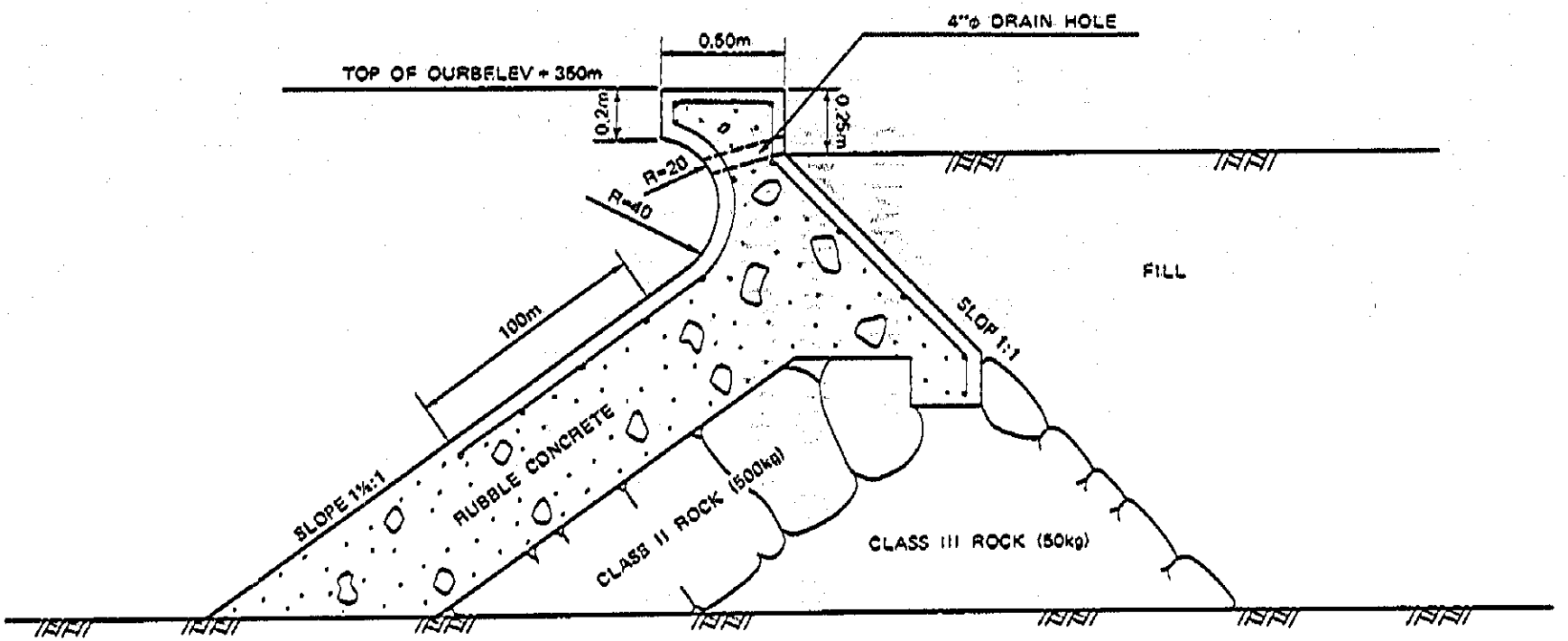


Fig. 2-9 Typical Cross Section of Bulkhead at Port of Irene

CHAPTER 3.
SIGNIFICANCE OF DEVELOPMENT OF PORT OF IRENE

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3-1 Establishment of Port Hinterland

A port hinterland is established by a variety of factors intricately affecting one another; specifically, establishment of a port hinterland depends upon such factors as geographical conditions around the port, relationship with other ports and other transportation facilities, maturity of commercial activities in the related areas, and so forth. The Port hinterland, changing with time, covers different spheres by kinds and types of cargoes handled therearound. The hinterland of port of Irene can be defined by two major factors; one is the administrative division and the other the geographical conditions. Port of Irene is with in the area belonging administratively to Region II and all administration works are conducted as part of the management of the Region II unit. Hence, the direction in administration such as that in regional development, has had considerable influence on characterizing Port of Irene and consolidating its facilities. Geographically, the Cagayan river basin isolated from Region I, III and IV by mountains, has had its own culture since early times (Fig. 3-1). Judging from these facts, the hinterland of Port of Irene covers primarily Region II, the so-called Cagayan Valley Region.

In terms of present economic and social activities, the hinterland of Port of Irene can be defined as follows.

The Pan-Philippine Highway runs through the center of Region II. The area, connected with Manila with this highway has been largely dependent upon Metro Manila for its economic and social activities. Suppose Tuguegarao as the center of the Region, the physical bisectional point on the road between Manila and Tuguegarao lies around Bayombong.

Furthermore, the balancing point of the territory of these two municipalities is expected at around boundary of provine of Cagayan, if the size of these municiparities is expressed by the product of population and production.

The above indicates that, even admitting that Region II is administratively and geographically one, it should be separated for economic and social activities. Specifically, it should be considered from the view-point of present socio-economic conditions that the southern part of Region II is under the strong influence of Metropolitan Manila. Therefore, the hinterland of the Port of Irene is limited to the area composed mainly of the province of Cagayan (Fig. 3-2).

Let us now see the hinterland of the Port of Irene from the aspect of distribution mechanism deeply concerned with the function of collecting or distributing cargoes. Cargoes presently handled by ports under PMU Irene consist particularly of wooden products and petroleum products and do not include fertilizers and cement used in the region or palay whose production is increasing. It is clear even without reference to the results of a commodity flow survey that there is a considerable volume of these cargoes there. But all this is handled by truck transportation. This is probably because, in the jurisdiction of PMU Irene, a distributing system is not sufficiently developed to enable these cargoes to be turned into port cargoes and because the

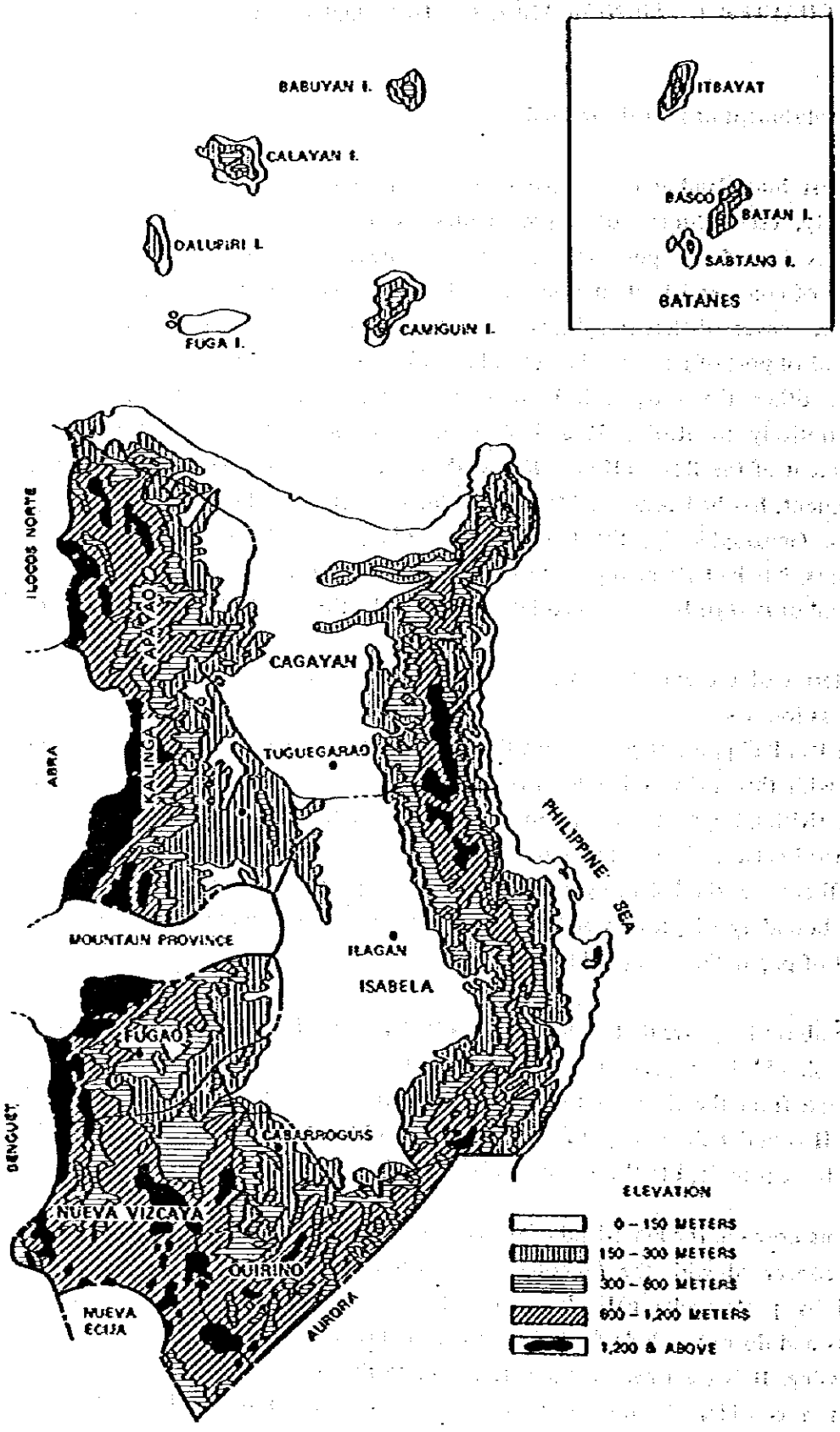

Fig. 3-1 Topographic Map of Region II

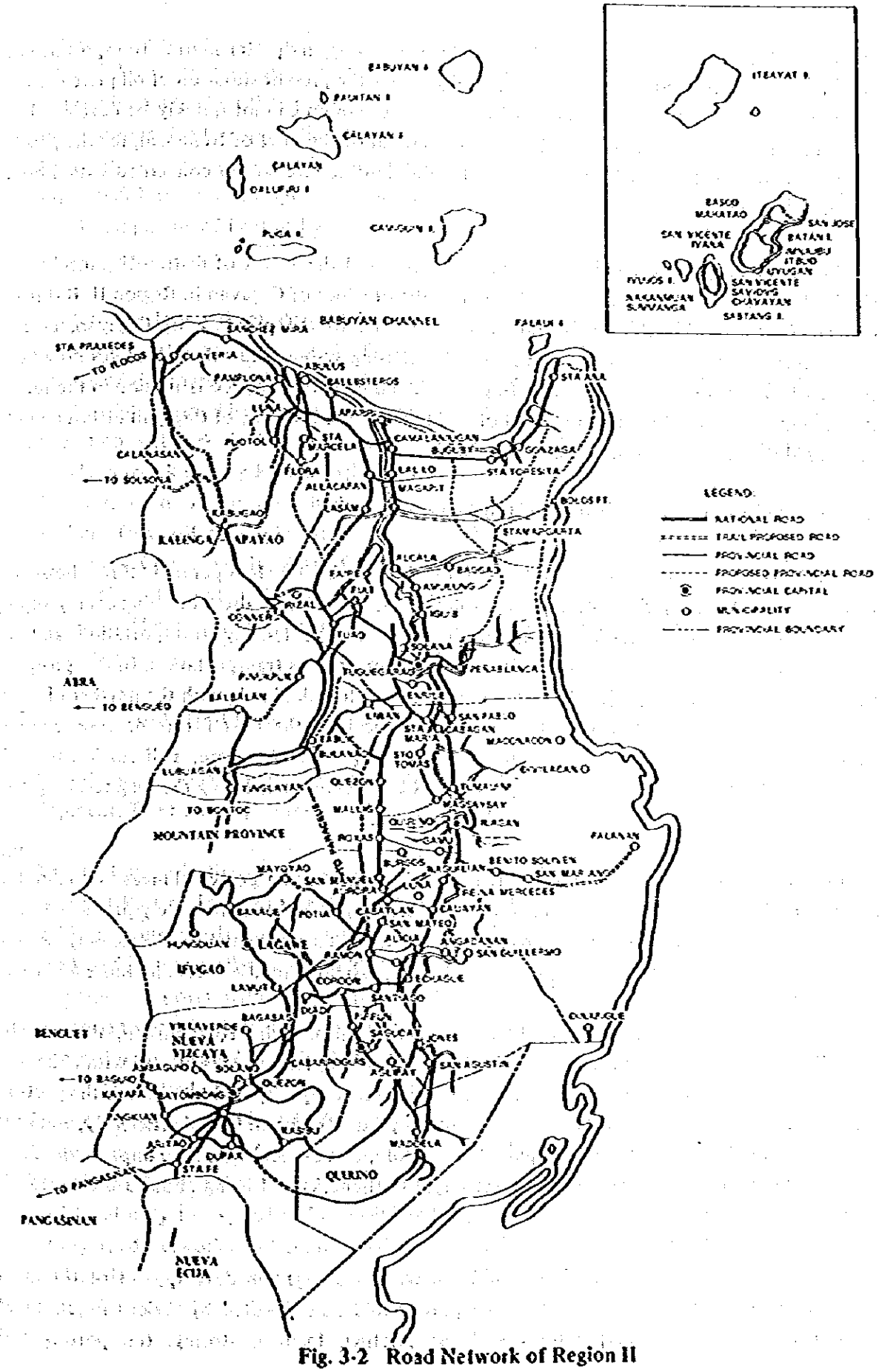

Fig. 3-2 Road Network of Region II

local port facilities are inadequate. Meanwhile, many shippers prefer marine transportation by which transportation cost can be cut, especially under the present situation of oil price increase. Even if port facilities are improved, a distributing mechanism cannot quickly be developed and improved. It is, therefore, assumed that the hinterland of the Port of Irene will, for the present, be expanded and developed on the basis of a distributing mechanism concerned with wooden products.

From the geographical and administrative aspects and the aspect of distributing mechanism, the hinterland of the Port of Irene is limited to the province of Cagayan in Region II. But it will expand to the entire Region II, rather than limited to the province of Cagayan, as road improvement, urbanization, the buildup of a distributing system and other measures now being planned in various sectors are realized. In planning and preparing port construction in the future, it is assumed that the hinterland of Port of Irene will be the province of Cagayan in 1987 and be composed mainly of the entire Region II in 2000.

3-2 Significance of Development of Port of Irene

The main transportation means in the nothern Luzon is operated throughout the Pan-Philippine Highway and its linking road networks. Considering the worsening energy supply and the soaring transportation cost, improvement of the railway transportation and sea transportation will be required as the alternative means of mass transportation. In this prospect, the railway construction project has been contemplated to link Manila with the northern Luzon, however, the implementation of this plan seems difficult in the near future because long and detailed studies on operation and management are required. Therefore, a discussion is made herein how Port of Irene development plan would be effective in meeting the long-term regional requirements.

Firstly, the development of port of Irene may be considered a powerful measure to develop Region II where production of palay, corn and other corps has been intensively promoted. And the Region abounds with forest resources which are the mainstay of the local economy. As the production increases, however, the provision of transportation facilities becomes more and more of a problem.

Due to the limited capacity of truck transportation and the cost burden, it might be unavoidable to restrict the production volume. Furthermore, Region II is blessed with abundant natural resources such as copper, coal, etc.. But the present capacity and facilities of the ports in the Region are too insufficient to handled plentiful products smoothly and efficiently, and thus hamper the Region's resources development. Therefore, it is expected that the improvement and development of Port of Irene will eliminate major bottlenecks and bring about a breakthrough for the regional development.

Secondly, the development of Port of Irene will encourage the development of the areas adjacent to the port. Cargo handling at the port should be supported by various functions of many organizations and corporations such as piloting, loading, storing, transporting and

administering and other services. It is self-explanatory in the example of successfully developed port city of Aparri that prosperity of a port city is a result of effective integration of these various functions. On the other hand, port oriented industries, the industries that depend upon maritime transport for transportation of their raw materials and products, will seek the plant sites and firm lots in the areas neighbouring ports and harbours. The development of various enterprises will bring about a great deal of effect of employment and tax in the area. It is certain that the development of Port of Irene will give considerably large impacts on the adjacent area as well.

Thirdly, development of Port of Irene is expected to contribute to the establishment of maritime transportation system in the Country. In the Philippines, the archipelago nation, the importance of the maritime transportation is supposed to increase more and more in the course of its industrialization. The PPA currently owns nucleus ports in every PMU, around which the transportation network is being established among PMU. The next step is to establish a nationwide network linking PMU's nucleus ports.

However, there is no port under PMU Irene that can be a substantial nucleus in this connection. This will adversely affect the establishment of the national network of maritime transportation. Consequently, Port of Irene plays a vitally important role in creating the national network. The efficient national maritime transportation network will alleviate the port congestion in Manila and greatly contribute to the realization of an effective and economical transportation.

3-3 Functions of Port of Irene

Functions of Port of Irene are expected to be different in the first and the second stages of its development. The first stage is the first 10 years and the second stage is the period therefrom.

The first stage is the period when the foundation of port of Irene is established and the functions of Port of Irene in this stage is to transport the indigenous raw materials and products smoothly and efficiently to destinations within its hinterland. In other words, Port of Irene is required to function well as a key port for safe and reliable maritime transportation. Absence of well-functioning ports with in the hinterland of Port of Irene has compelled the producers (consumers) to bear under unreasonably heavy burden of high transportation costs in either truck transportation or in vessels-via-Manila sea transportation.

Due to the disadvantage, the goods from the region are not competitive enough in commerce and the expansion of production (consumption) is not possible, the regional economy in general is being hampered. Therefore, the primary role of Port of Irene would be to smoothly and effectively collect and distribute the goods rather than to create new demand. In this stage, it is essential not only to expand and consolidate the port facilities but to improve infrastructure like necessary road networks and commercial functions. The consolidation of the port facilities will require to the regions provide a variety of functions. On the contrary, lack of various functions in these regions would limit the development of Port of Irene.

In the second stage, the port is expected to assist in the development and production increase of natural resources in the hinterland. The development of the water front area will also be promoted in this period. The port should be well-equipped to the provide quick, safe and competitive transportation services. In summing up, the goal of the second stage is to construct a large scale berth and a container berth to cope with the realization of the scheduled regional development. Furthermore, Port of Irene should stimulate the regional development and contribute to the formation of the stable regional social structure.