REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

RURAL INFRASTRUCTURE FUND PROJECT

(AID PROJECT NO. 492-0420)

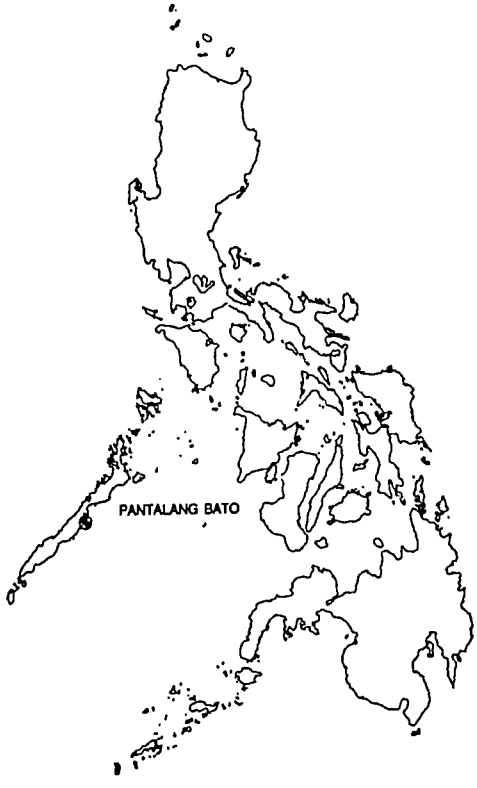
FEASIBILITY REPORT

THE PORT OF

PANTALANG BATO

PALAWAN ISLAND

OCTOBER 1990



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I.
SUMMARY

I. SUMMARY

A. INTRODUCTION

The subproject Port of Pantalang Bato is located in Barangay Mangingisda, in the Municipality of Puerto Princesa. Puerto Princesa is the capital city Island Province of Palawan, in Region IV. Figures 1-1 and 1-2 locate and detail the port site.

B. EXISTING PORT

The existing facility at Pantalang Bato consists of a twenty meter long rock causeway. The causeway is currently in poor condition and thus, not serviceable. The port site is located in a small cove in the Saguit Inlet and serves as a storm shelter for local fishermen. This site is surrounded by mangrove and only accessible by steep trails.

An alternate site for this port is located at Sitio Sampaloc, the principal settlement area of Barangay Mangingisda, approximately two kilometers northeast of Pantalang Bato. At this site, there are two crudely constructed wooden platforms serving as improvised docks at high tide. At low tide, the structures are fully exposed.

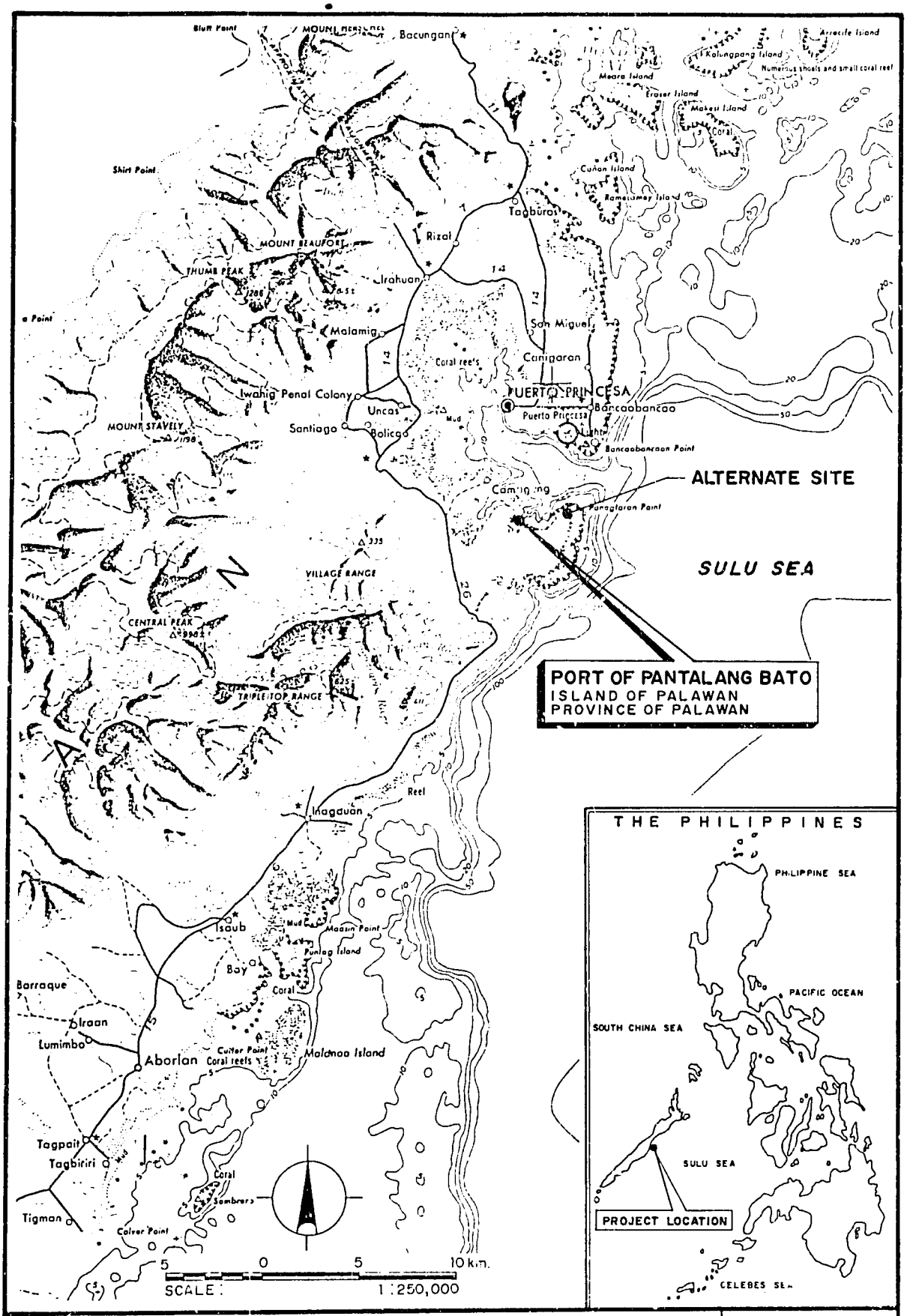
C. ECONOMIC OVERVIEW

Barangay Mangingisda and the adjacent inland Barangay Luzviminda are newly created barangays under the 1989 Presidential Proclamation. The purpose of the proclamation is to provide a new settlement for squatters relocated from Puerto Princesa.

This port subproject would accelerate and enhance the resettlement program by providing much needed transport infrastructure.

D. PROPOSED PORT SUBPROJECT

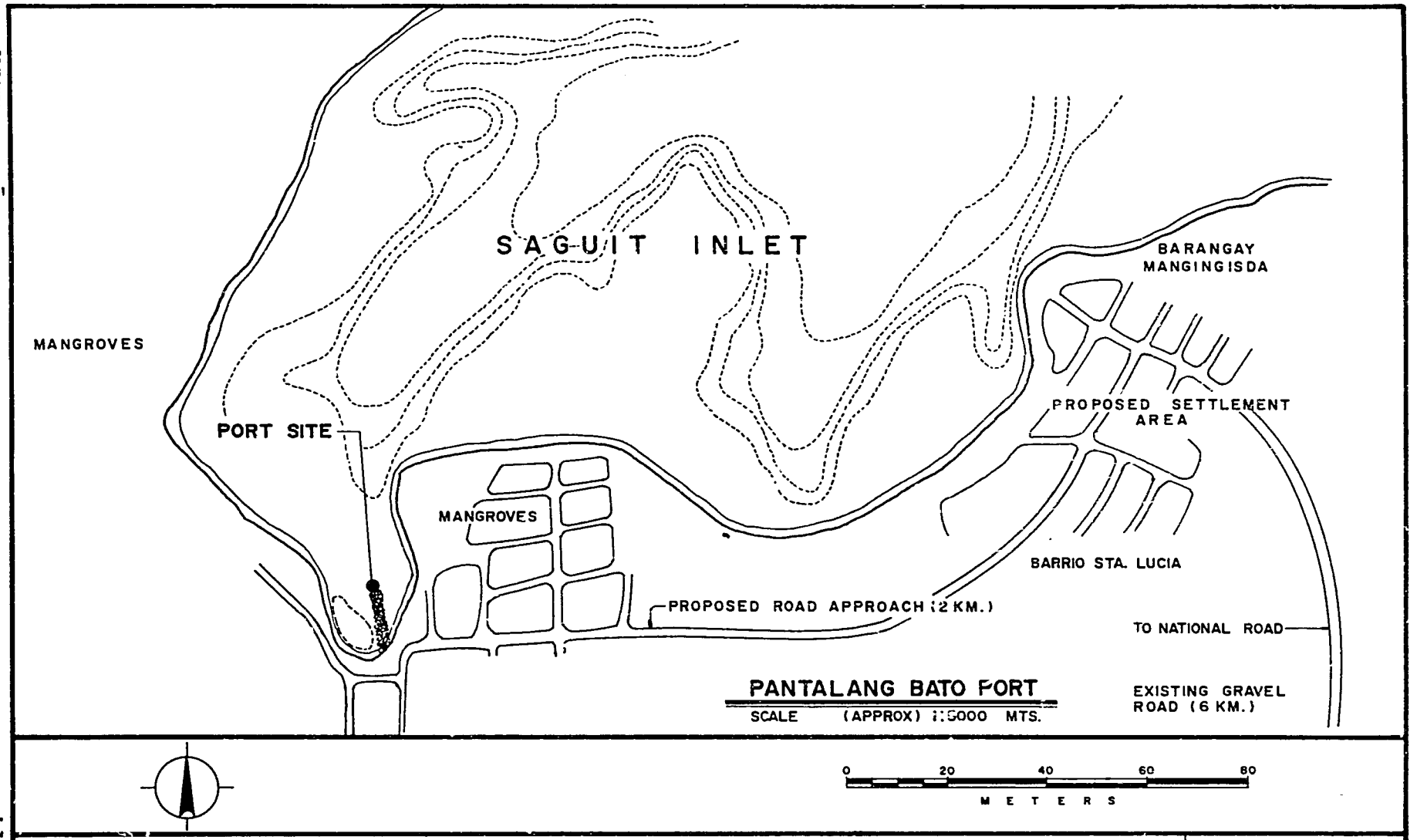
The proposed port facility includes a 3.5 meter wide by 150 meter long rock causeway, complete with stairlandings and mooring rings or cleats. The causeway is designed with two vehicle maneuvering areas. A new port building is proposed on the landing area as well as a two-kilometer long access road to Sitio Sampaloc, the principal settlement area in Barangay Mangingisda.



RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492-0420

LOCATION MAP

FIGURE 1-1



RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492 - 0420

PORT AREA MAP

FIGURE 1-2

E. COST CONSIDERATIONS

The cost of constructing the proposed subproject is estimated at ₱9,925,000.

The cost of maintenance for the first year is assumed to be 2% of the initial investment and is projected to increase 8.5% annually.

F. SOCIAL SOUNDNESS

All anticipated social impacts from the proposed construction at Pantalang Bato are positive. Family income benefits will accrue primarily to the lower- and middle-class residents of the area rather than any privileged group. Significant population migration is anticipated resulting from the current resettlement program in which this port is intended to serve. There are no vulnerable cultural minorities in the area that might be adversely affected. Thus, the project is socially sound.

G. ECONOMIC EVALUATION

The development proposed for the Port of Pantalang Bato is not economically feasible at an economic cost of ₱7,886,000 and a financial cost of ₱9,925,000 with an EIRR of 14.77%. Therefore, the Consultant recommends not constructing the proposed port improvements at Pantalang Bato.

However, the alternative site at Sitio Sampaloc is likely to be feasible since all benefits associated with Pantalang Bato would apply to it and the road between Sitio Sampaloc and Pantalang Bato would not be required. Therefore, the Consultant recommends that a full engineering study be undertaken at the Sitio Sampaloc site, the feasibility revised and the project designed, if feasible, on a later project.

H. ENVIRONMENTAL ASSESSMENT

Pantalang Bato is a relatively isolated, underpopulated site that is a component of the larger, Barangay Mangingisda resettlement area.

Construction activities proposed for the Pantalang Bato Port subproject will not result in the significant disruption of the physical or natural environment. However, the improved access provided by the subproject may contribute substantially to secondary degradation of the environment including water quality and mangrove forests.

The nearby, principal resettlement of Sitio Sampaloc is proposed as an alternative construction site. Sitio Sampaloc is the existing transit point to Barangay Mangingisda and is

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presumed to be less environmentally sensitive due to the presence of an existing human settlement and the potential for improved water circulation near the alternative port site.

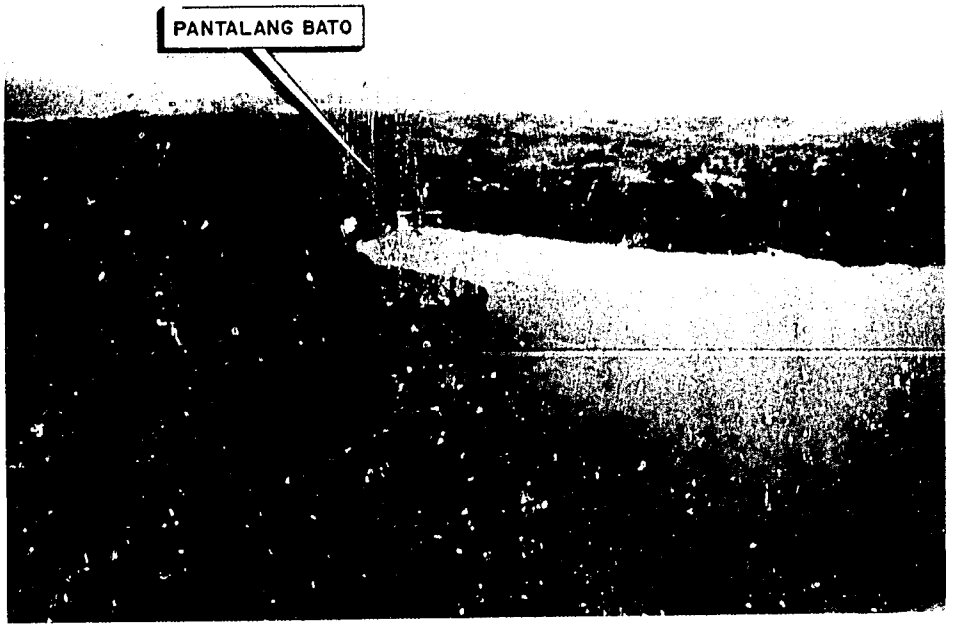

PHOTO 1: AERIAL VIEW OF EXISTING PANTALANG BATO PORT WITHIN SAGUIT INLET, LOOKING SOUTHWEST

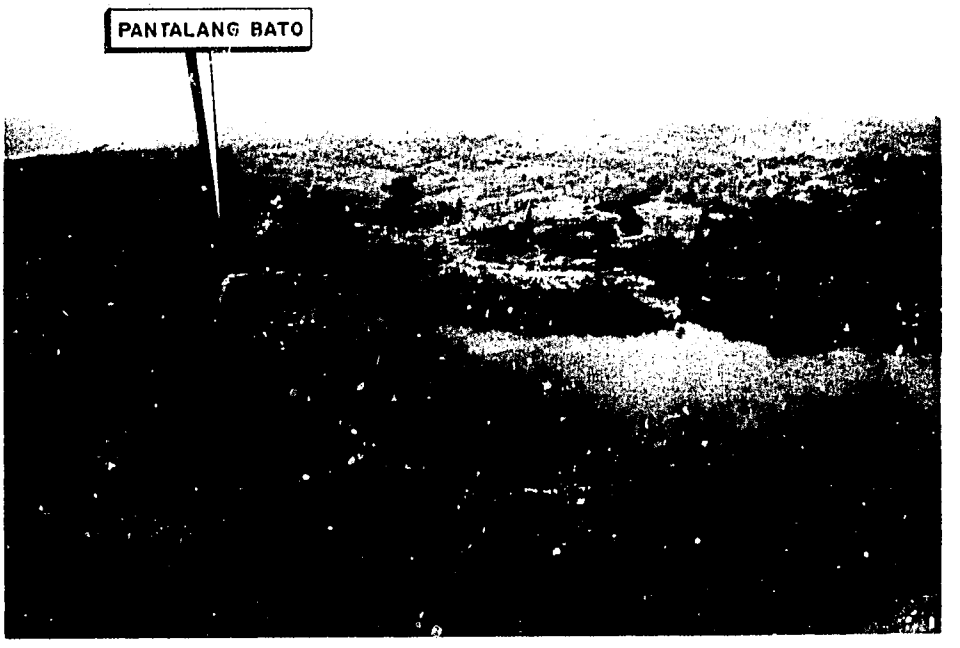

PHOTO 2: AERIAL VIEW OF EXISTING PANTALANG BATO PORT WITHIN SAGUIT INLET, LOOKING SOUTHWEST

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II.
ECONOMIC OVERVIEW

II. ECONOMIC OVERVIEW

A. PROFILE OF PROVINCE AND HINTERLAND

The proposed feeder port is located at Barangay Mangingisda in Puerto Princesa City, capital city of the Province of Palawan. Barangay Mangingisda is a newly created barangay, one of sixty-two barangays under the jurisdiction of Puerto Princesa. Barangay Mangingisda borders Barangay Luzviminda and was formerly part of the Iwahig Penal Colony on the Santa Lucia Estate. Both barangays are newly created political entities under the 1989 Presidential Proclamation to settle squatters.

The Pantalang Bato Port is located opposite Puerto Princesa City, across Puerto Princesa Bay, at Latitude 9°43' N and Longitude 118°42' E. It is linked to Puerto Princesa City by a forty kilometer road, which skirts the coast, or by crossing the bay in motorized bancas.

The **zone of influence** for Pantalang Bato Port includes Barangay Mangingisda with a land area of 24,500 hectares, and a **population** of 1,600. Fifty percent of the population are dependent on fishing for their livelihood while the other 50% engage in agriculture. The hinterland extends up to the neighboring Barangays of Luzviminda, Santa Lucia-Iwahig Penal Colony and Puerto Princesa City.

The **existing facility** at Pantalang Bato, a twenty meter long causeway constructed of medium-size boulders. It is located within a Saguit Inlet cove, making it an ideal berth during inclement weather. It is, however, separated by a two kilometer trail from the town center, where most residents dwell, at Sitio Sampaloc. Pantalang Bato is surrounded by mangrove forests and is also next to steep a shoreline, making it difficult for fishermen in this resettlement area to access their boats.

An alternative location at a timber pier adjacent to the poblacion presently handles 80% of the marine traffic throughput. However, moorings are exposed to the open sea, making it unsafe during inclement weather.

The **importance** of Pantalang Bato Port has been significant over the years as majority of the cargo and passenger traffic is generated through Sitio Sampaloc. Puerto Princesa relies on Barangay Mangingisda for its produce requirements. Barangay Mangingisda exports its entire annual agricultural production of approximately 5,000 tons to Puerto Princesa via sea transport.

Although Barangay Mangingisda is a part of the Palawan capital, it is still a depressed barangay. The need for land and sea transport infrastructure is one of many problems which impedes development for this community. Other factors include

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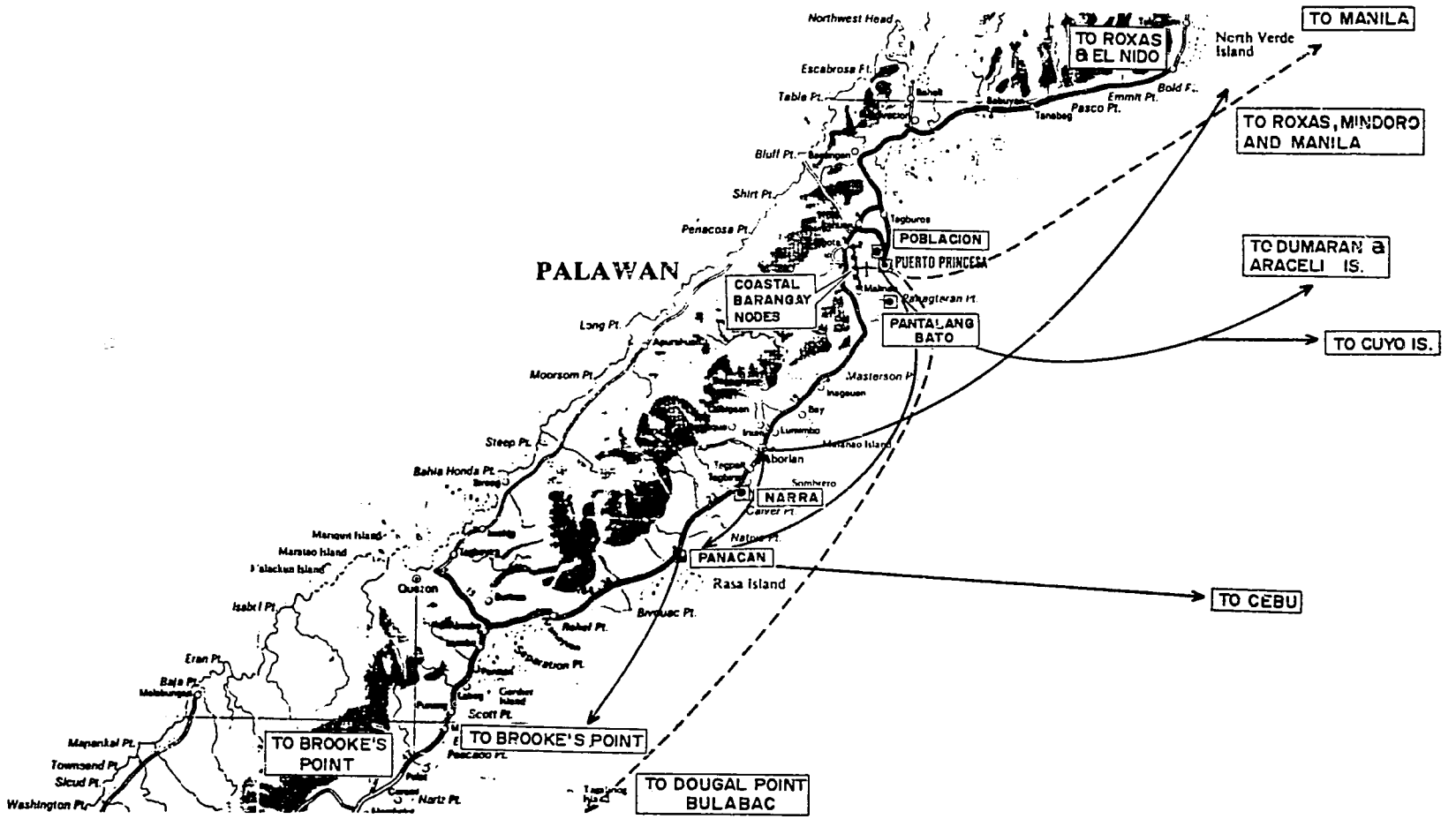

LEGEND:

- LARGE INTER-ISLAND VESSEL
- SMALL I-I OR LOCAL VESSEL
- ROAD CONNECTION
- SECONDARY DISTRIBUTION NODES
- MAIN DISTRIBUTION NODES

0 10 20 30 40 50 60 KILOMETER

RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492 - 0420

PANTALANG BATO PORT CENTRAL PALAWAN LOGISTIC NETWORK

FIGURE 2 - 1

the lack of electricity, telephone communication, medical facilities and etc. However, the Pantalang Bato Port subproject, complemented by other improvements, would generate substantial development and economic benefits to enhance the future role of Barangay Mangingisda.

B. TRANSPORT SYSTEM PROFILE

Barangay Mangingisda is linked to Puerto Princesa by a forty-kilometer road skirting along the coast of the bay. Thirty kilometers of the road are along the asphalt-paved national highway to Brooke's Point. From Brooke's Point to the barangay center at Sitio Sampaloc, motor vehicles travel along a ten-kilometer unpaved access road that is presently in poor condition. The access road is impassable during the rainy season, from July to September. Only trails designed for carabao sledges exist from Sitio Sampaloc to Pantalang Bato, thus making travel difficult.

Jeepneys make regular trips to the area from Puerto Princesa City. Jeepneys normally only travel up to Barangay Luzviminda. However, upon request, drivers continue their trip to Mangingisda. Each jeepney make two to three roundtrips daily.

Presently, there are nine motorized and numerous non-motorized boats plying the Mangingisda-Puerto Princesa route, transporting passengers and cargo. Sea transport is the most efficient and preferred transport for Puerto Princesa-bound passengers as land transport is more costly and travel time is longer.

Philippines Airlines maintains daily scheduled service between Manila and Puerto Princesa.

C. SOCIO-ECONOMIC CHARACTERISTICS OF THE ZONE OF INFLUENCE

Pantalang Bato is located, across the bay from Puerto Princesa City, at Barangay Mangingisda. Puerto Princesa is the provincial capital of Palawan Province. Barangay Mangingisda is newly created and is designed to open an isolated area for resettling squatters from Puerto Princesa City. Unlike other port projects, Pantalang Bato would play a major role in the economic development of its hinterland.

As a frontier province, Palawan is characterized by abundant economic resources accompanied by underdeveloped infrastructure and living conditions. It is a relatively poor province. With an average family income of ₱20,746 in 1985, Palawan is ranked forty-ninth among the country's seventy-four provinces. Most families in Palawan are agricultural entrepreneurs (53%). The poor were usually small farmers (59%). The few very affluent (earning over ₱60,000 per year) were mostly (58%) non-agricultural entrepreneurs (Table 2-1).

TABLE 2-1

FAMILIES BY MAIN SOURCE OF INCOME AND TOTAL FAMILY INCOME FOR PALAWAN

Main Source of Income	Total	Income Category: Under 10K	10K-14K	15K-19K	20K-29K	30K-39K	40K-59K	60K & Over
	Percent of Families							
Agricultural Wages/Salaries	7.4%	4.2%	9.8%	4.6%	7.7%	10.9%	14.9%	0.0%
Non-Agricultural Wages/Salaries	18.3	11.4	24.2	13.5	22.9	37.6	0.0	0.0
Agricultural Entrepreneurial	53.3	59.3	58.8	50.6	52.1	40.6	55.4	21.1
Non-Agricultural Entrepreneurial	13.7	12.5	0.0	26.6	9.5	10.9	29.7	57.9
Other	7.3	12.6	7.2	4.7	7.8	0.0	0.0	21.0
	100%	100%	100%	100%	100%	100%	100%	100%
Total Families (Thousands)	82.5	16.6	19.4	15.0	18.0	6.4	4.7	2.4

SOURCE: National Census & Statistics Office. 1987. 1985 Family Income and Expenditures Survey, Vol. II. Manila: NCSO.

Palawan has been subject to successive waves of immigrants from other islands seeking new lands. Original inhabitants have moved westward as new arrivals increase the population density. Today, Palawan is a polyglot mixture of native tribespeople in the interior and Muslim, Visayan, Tagalog, and Ilocano settlers on the coast. Most urban families (57%) speak Tagalog at home. Cuyonin (23%) is most common in the rural areas. Fourteen percent of rural residents speak Pinalawan at home. Three tribes, the Tagbanwa, the Palawan, and the Batak, appear to be descendants of the original inhabitants.

The 1990 population of Palawan is estimated at 503,665. In 1985, the population growth rate was 3.6%, down from 5.36% in 1975. The province remains relatively rural and underpopulated. In 1980, Palawan was 78% rural and had a population density of only thirty-four persons per square kilometer, compared with 174 for the Southern Tagalog Region.

In 1980, the education level in Palawan was below the national average. Only one-fourth of the population entered

high school, compared with one-third for the Philippines as a whole. Four-fifths of the men, but only one-sixth of the women were employed. Four out of five employed men (81%), and 37% of employed women worked in agriculture.

Palawan families were more likely to own their home (74% versus 62% for the Philippines). Electrical service was low, with one-third (36%) of urban homes and 3% of rural homes having electric lighting.

III.
PORT THROUGHPUT

III. PORT THROUGHPUT

A. INTRODUCTION

The Pantalang Bato feeder port site was surveyed on four levels between November of 1989 and July of 1990. There was an initial reconnaissance survey in November of 1989, an environmental "flyover" in April of 1990, an environmental site visit in June and an economic survey in July, 1990 (Appendix B, Exhibits 1 through 3).

Appendix B displays the data base used to forecast port throughput. This data was developed during an early reconnaissance survey from secondary sources and subsequently finalized after a more specific economic survey (Exhibits 4 through 9).

The aforementioned surveys, data and projections form the basis for the economic evaluations of all proposed feeder port projects.

The Port of Pantalang Bato is located in a new barangay of Puerto Princesa recently created out of a former prison colony. It is now readily accessible by banca from Puerto Princesa and approachable by jeepney except during the rainy season. Regardless, the sea route to Puerto Princesa is about thirty kilometers closer than the forty to forty-five kilometer land route.

The barangay is a resettlement area for impoverished fishermen and the next adjacent barangay a resettlement area for impoverished farmers. Consequently, population growth will likely be above and average incomes will be well below national and provincial averages.

Essentially, the changes reflect fish landings increasing with population, base cargos normally considered income inelastic exhibiting an income demand elasticity of 0.5 and other cargos normally projected with an income elasticity of 0.5 being increased to reflect an income elasticity of 0.8.

In the absence of any reliable barangay population growth estimates, the increased income demand elasticities selected are of sufficient magnitude to reflect some substantial population growth as well.

B. THROUGHPUT FORECAST

Existing throughput were developed from an comprehensive survey and network analysis of the interactive network that encompasses Barangays Pantalang Bato, Liberty and Poblacion.

1. FISH TRAFFIC

Fishermen were surveyed to determine the fish landed from marginal (inner-coastal) and commercial (deep-sea) activities.

Commercial fishing vessels have been defined as those of three DWT and over and registered with the government for commercial fishing activities.

Because Pantalang Bato Port within a resettlement area and because the barangay itself has been set aside ostensibly for the resettlement of fishermen, fish landings have been projected to increase at least with the growth in population of 2.65% per year (Exhibit 4).

2. CARGO TRAFFIC

a. Rice, Bagged and Bottled Cargos

Rice, bagged and bottled cargos are derived from the Consultant's survey and subsequent network analysis.

Rice consumption is relatively income inelastic. This condition of general income inelasticity has been applied to other **bagged cargos** and to **bottled cargos** as well since present per capita bottled consumptions are already quite high.

However, as Pantalang Bato is considered to be a resettlement area, rice, bagged and bottled cargos have been collectively projected to increase at 4.90% per year derived from population growth, per capita income growth and an assumed demand elasticity of 0.5% (Exhibit 6).

b. Fuel, Consumables and Others

Fuel movements are derived from the Consultant's survey and subsequent network analysis.

Consumables, representing all manner of consumer goods, vegetables and fruits was derived from the Consultant's survey and subsequent network analysis. This category is not entirely consistent when comparing one port with another due to substantial differences in the manner in which cargos are recalled or recorded. Consumable volumes have been taken as those volumes determined by survey or 20% of total **other** volumes whichever is the greater.

Others is a residual category reserved for cargos that do not easily fit into the other aforementioned categories. Typical examples are consumer goods such as fabrics, canned goods and household effects.

However, since Pantalang Bato is considered to be a resettlement area, throughput has been projected to increase as previously described for rice, bottled and bagged cargos but

with an income demand elasticity of 0.8 instead of 0.5 (Exhibit 8).

Throughput of fuel, consumables and other cargos has been projected by the following formula:

$$F = P + I*E_1$$

Where:

F: Annual growth rate for identified cargos

P: Annual growth rate of population for the province

I: Annual growth rate of per capita income for the province

E_1: Elasticity of demand for identified cargos to change in per capita income for the province

The growth rates described above (P and I) for each province are shown in Exhibits 4 and 5.

E_1, the elasticity of demand for fuel and consumables is assumed to be 0.8. Therefore, the estimated annual growth rate for fuel and consumables at Pantalang Bato is 6.25%.

c. Cargo Allocations

Where definite origin/destination data was deficient, cargos were allocated to the network in proportion to the surveyed passenger distribution (Exhibit 9).

3. PASSENGER TRAFFIC

Growth in passenger traffic is based on the macro-economic analysis of household expenditures on transportation.

The formula used is:

$$T = P + I*E_2$$

Where:

T: Annual growth rate for passenger travel

P: Annual growth rate of population for the province

I: Annual growth rate of per capita income for the province

E_2: Elasticity of passenger travel demand to change in per capita income for the region

The growth rates and demand elasticity described above (T, P and I), for each province and for different transport modes are shown in Exhibits 4, 5 and 6.

Because Pantalang Bato is a resettlement area the growth rate of the projected cross-bay passenger travel demand to change in per capita income for inter-island travel is assumed to be 6.25% per year or the same as that for bus travel demand as determined by previous DPWH studies (Exhibit 6).

4. VESSEL THROUGHPUT

Daily commercial vessel throughput were determined by survey and represents effective vessel throughput except during periods of inclement weather.

Commercial vessels are defined as registered vessels exceeding three DWT. The principal vessels envisaged through the Port of Pantalang Bato are medium bancas of about four DWT.

However, because the average size of the bancas in service will increase over the forecast period vessel growth has been projected at less than the projected passenger growth of 6.25% per year. Vessels are projected to increase with banca travel demand at 4.90% per year (Exhibit 6).

Table 3-1 displays the throughput projections described above for passengers and cargos.

TABLE 3-1

PANTALANG BATO PORT THROUGHPUT PROJECTIONS

COMMODITY	1989/90 SURVEY	1992 PROJECTED	2001 PROJECTED	2011 PROJECTED
FISH (i) (tons per year)				
1 Off Shore (i)	0	0	0	0
2 Marginal (i)	80	84	109	142
3 Ipon	0	0	0	0
4 Bangus	0	0	0	0
5 Transhipped (out)	0	0	0	0
Total:	80	84	109	142
% of 1992:	95%	100%	130%	169%
CARGO (tons per year)				
1 Rice (ii)	1,700	1,871	3,018	4,870
2 Consumables (iii)	1,788	2,018	3,701	6,786
3 Bagged Cargos (ii)	2,340	2,575	4,155	6,703
4 Bottled Cargos (ii)	50	55	89	143
5 Fuels & Oils (iii)	330	373	683	1,252
6 Others (iii)	1,960	2,213	4,057	7,439
Total:	8,168	9,104	15,703	27,193
% of 1992:	90%	100%	172%	299%
PASSENGERS (per year)				
1 Local (iv)	60,000	67,734	124,193	227,713
2 Regional	0	0	0	0
3 Inter-island	0	0	0	0
Total:	60,000	67,734	124,193	227,713
% of 1992:	89%	100%	183%	336%
VESSELS (per day)				
1 Scheduled Commercial	6.0	6.6	10.7	17.2
2 And/Or Unscheduled Commercial	0.0	0.0	0.0	0.0
3 Scheduled Inter-Island	0.0	0.0	0.0	0.0
4 And/Or Unscheduled Inter-Island	0.0	0.0	0.0	0.0
(v) Total:	6.0	6.6	10.7	17.2
% of 1992:	91%	100%	161%	260%

SOURCE: Consultant's surveys

BASIS: (1992 Projections)

(i) 84 tons fish increasing with population at 2.65% per year (Exhibit 4)

(ii) 4,501 tons rice, bagged and bottled cargos projected to increase at 4.90% per year derived from the product of population growth per capita income growth & a demand elasticity of 0.5 (Exhibit 6)

(iii) 4,604 tons projected to increase at 6.25% per or a rate equal to the product of population growth, income growth and an income demand elasticity of 0.8 (Exhibit 6).

(iv) 67,734 passengers increasing at 6.25% per year (Exhibit 6).

(v) 6.6 vessels per day projected to increase with banca travel demand at 4.90% per year (Exhibit 6).

IV.
ENGINEERING DESIGN

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IV. ENGINEERING DESIGN

A. DATA COLLECTION

1. RECONNAISSANCE SURVEY

The reconnaissance survey for the Port of Pantalang Bato was conducted on November 23 and 24, 1989 (Appendix C, Plates C-1 through C-6).

The survey team met with the following officials in Puerto Princesa:

Engr. Edmar Valencia	-	Assistant City Engineer (National)
Engr. Rodolfo Aguirre	-	Assistant City Engineer (Local)
Mr. Angel Padon	-	City Planning and Development Coordinator
Engr. Mario Ordillo	-	City Planning and Development Coordinator Officer
Engr. Vicente Licerno	-	Project Development Officer
Engr. Eduardo Juan	-	Planning Officer II

In addition, the team met with Engr. Silahas Lanzanas, the Special Project Officer of Barangay Mangingisda.

Engrs. Licerno and Lanzanas indicated the location of the subproject port site, accompanied the team during the survey and recommended the proposed upgrades, as were also outlined by the officials in Puerto Princesa.

2. EXISTING FACILITIES

The Port of Pantalang Bato comprises a twenty meter long, currently unserviceable rock causeway located in a small cove in the Saguit Inlet (Figure 1-2). This cove is well protected and is used by local fisherman as a storm shelter.

The three meter wide causeway has no paved surface. Many of the undersized rocks are scattered. These rocks, averaging less than twenty-five centimeters in diameter, were hand placed by prisoners of the Iwahig Penal Colony. There are no other port facilities at the site.

The existing approach to the port is a foot path leading two kilometers back to Barangay Mangingisda. There are some short, steep portions in this pathway, which may have to be detoured.

The water depth at the end of the causeway is about one meter below Mean Lower Low Water (MLLW).

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3. METEOROLOGICAL AND HYDROLOGICAL CONDITIONS

Weather data is not recorded at the Port of Pantalang Bato. The nearest weather station to Pantalang Bato is Puerto Princesa. Climatological data from this station is being used as reference due to its proximity to the port site (Exhibits 13 and 14).

a. Climate

The climate at Pantalang Bato can be categorized as tropical with heavy rains. Pantalang Bato has no pronounced maximum rainy period. There is a short dry period, usually lasting from one to three months each spring.

b. Rainfall

Rainy days are distributed throughout the year and range from an average monthly minimum of two days in February to a maximum of seventeen days in August. There are an average of 130 rainy days per year.

The average monthly rainfall ranges from a minimum of seventeen millimeters in February to a maximum of 210 millimeters in October. The total average annual rainfall is 1,564 millimeters.

The greatest daily rainfall recorded for Puerto Princesa was 269.3 millimeters, which occurred on December 29, 1975.

c. Temperature

The annual mean temperature is 27.4°C. The warmest month is April with maximum temperature averaging 32.9°C. January is the coolest month with minimum temperatures averaging 22.7°C.

The maximum temperature ever recorded at Puerto Princesa is 36.0°C. The minimum temperature recorded is 18.3°C.

d. Winds

Wind velocities throughout the year are typically one to two meters per second except during the passage of a typhoon. The prevailing winds are out of the northeast from November to April. Winds are from the south or west during the remainder of the year.

The maximum wind speed ever recorded in Puerto Princesa was forty-nine meters per second out of the northwest.

The most destructive typhoons to hit Puerto Princesa were Typhoon Auring (January, 1975), Typhoon Bebing (March, 1967) and Typhoon Wanda (November, 1950). Each had maximum center winds ranging from 110 to 120 kilometers per hour (thirty-one to thirty-three meters per second).

e. **Waves**

The significant wave height calculated for Pantalang Bato is approximately one meter. Any armour rock required to withstand these waves would be on the order of 200 kilograms with a diameter of about forty-five centimeters.

f. **Tides**

Tides at Pantalang Bato are semi-diurnal. The mean tidal range is 1.34 meters. Maximum tidal range is 2.31 meters.

4. SITE TOPOGRAPHY AND HYDROGRAPHY

The Port of Pantalang Bato is located in a small, 200 meter wide cove in the Saguit Inlet within Puerto Princesa Bay. The cove is shallow, averaging between one to two meters deep, but of sufficient depth for the local bancas and small vessels. The bay is also well protected against wave attack.

The foreshore area is covered with mangroves. The hinterland area, including the proposed approach road alignment, is rolling terrain covered with dense foliage.

5. AVAILABILITY OF CONSTRUCTION MATERIALS

Prime construction materials can be sourced locally from Puerto Princesa. Sand and gravel can be obtained from either the Monteble or Iwahig Rivers near Puerto Princesa Bay. Rock material can be sourced from these two rivers and from the Irahuan River as well.

Cement, reinforcing steel, timber and marine hardware can also be obtained in Puerto Princesa.

6. SOIL AND SUBSURFACE CONDITIONS

No geotechnical investigation or soil boring survey has yet been conducted at Pantalang Bato. However, the geotechnical engineer on the initial reconnaissance survey noted that the Saguit Cove foreshore consists of clayey sand to sandy clay with coral and shell fragments. These are overlain by a thin layer of very light brownish gray coarse to fine sand with coral and shell fragments.

7. SEISMIC CONDITIONS

The Philippines is located along the peripheral boundary of the Pacific earthquake belt. The Island of Palawan where Pantalang Bato is located, together with the Islands of Cebu and Bohol, are the only major islands in the Philippines that experience an average of only one perceptible seismic shock per year. Palawan did experience one major earthquake over forty years ago, but has not had a major quake since.

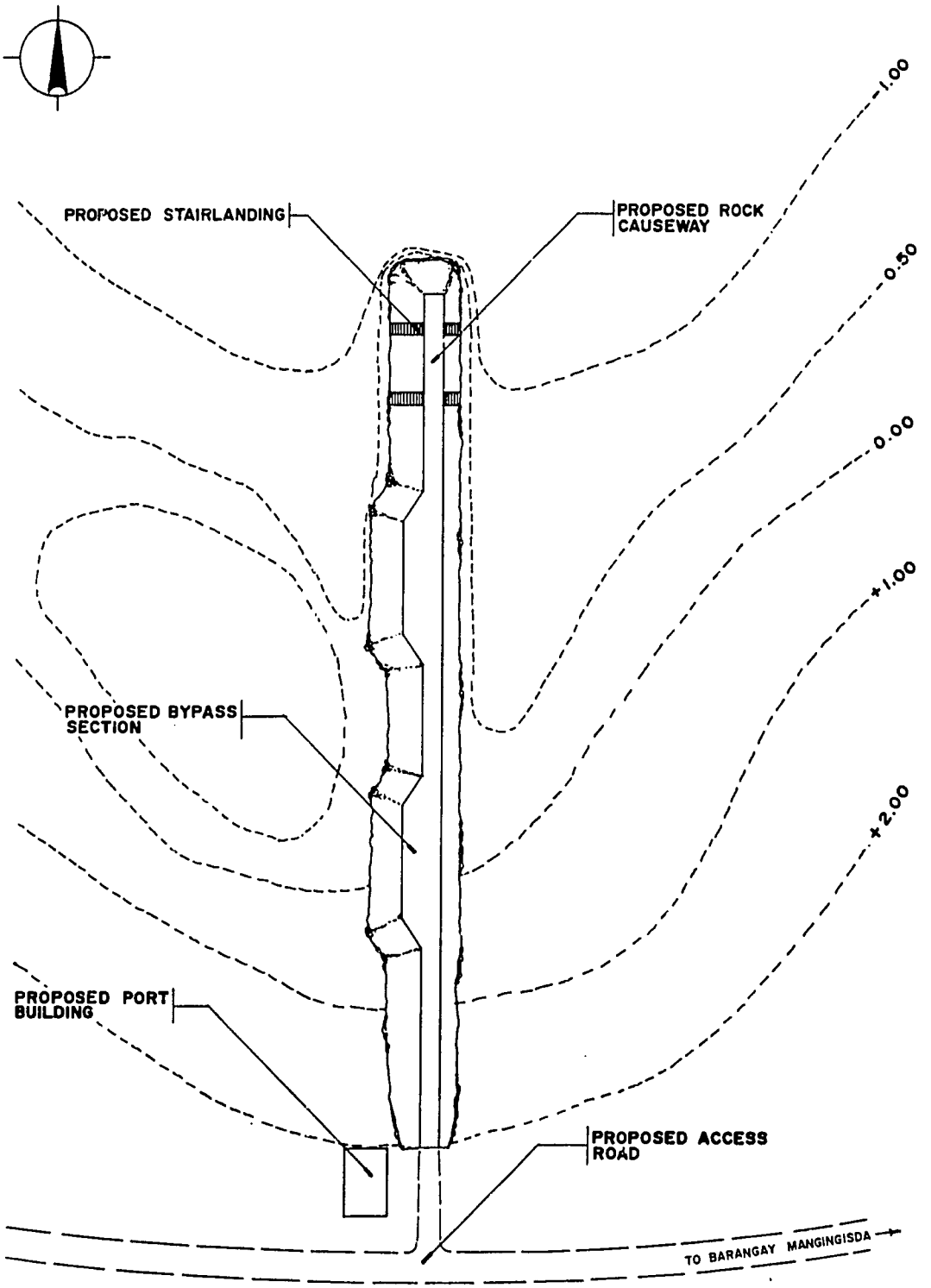
Earthquake intensities of over 5.0 on the Richter Scale are not uncommon in the Philippines (Figure A-6). Only very recently (July 16, 1990) an earthquake of intensity 7.7 on the Richter Scale hit central Luzon and caused severe damage. Design of any structure at Pantalang Bato will take into account earthquake forces.

B. PRELIMINARY DESIGN

The proposed improvements for the Port of Pantalang Bato (Figures 4-1 and A-7 through A-13) include the following:

- A 150 meter long by 3.5 meter wide rock causeway, complete with stairlandings and mooring rings or cleats
- Two seven meter wide maneuvering area on the causeway
- A port building on the landing area
- A two-kilometer access road to the existing road network at Barangay Mangingisda

The elevation of the rock causeway is proposed to be at +2.5 meters because there is relatively little wave action in the Saguit Cove. In addition, since only small water craft will call at the port, this top of causeway elevation, although below normal, is sufficient.



RURAL INFRASTRUCTURE FUND PROJECT	AID PROJECT NO. 492-0420	
PROPOSED PORT FACILITY		FIGURE 4 - 1

V.
COST ESTIMATES

V. COST ESTIMATES

A. COST OF PROPOSED PORT FACILITIES

The proposed port facilities are shown in Figures A-7 through A-13 (Appendix A). The construction cost of the proposed improvements is estimated at ₱9,925,000.

B. UNIT RATES

The construction costs were determined by applying unit rates to the quantities. Unit rates are presented in Exhibit 10. These unit rates were developed from available data of current contracts for construction of ports at various locations in the country. In general, unit rates for port construction vary from port to port depending on the remoteness of the port. Applied unit rates are based on 1990 costs.

C. REMOTENESS FACTOR

An evaluation was made by comparing awarded contract unit prices for port subprojects at various locations throughout the Philippines. Subprojects on smaller, remote islands far from urban centers (Manila, Cebu, or Davao) or at sites accessible only by water were typically more expensive to construct than similar subprojects readily accessible by road. Therefore, a remoteness factor has been included in the cost estimate to help quantify the additional, above-normal mobilization and procurement costs required when constructing a port improvement at a remote location. This factor has been derived for each port subproject using the appropriate cost data available from other, similar port construction contracts.

Since Pantalang Bato Port is within six kilometers of Puerto Princesa, the main distribution port for Palawan, and no above-normal construction costs are anticipated, the remoteness factor for Pantalang Bato has been assumed as 1.00.

D. CONTINGENCIES AND OTHER COSTS

A contingency factor of 10% has been taken into account for all port improvement construction. However, adverse construction conditions or unforseen obstacles are more likely for in-water construction than land-based construction. Typically, this extra uncertainty or contingency is reflected in higher unit rates for in-water construction instead of a separate, higher contingency factor. The unit rates presented in Exhibit 10 are derived in keeping with this method.

The following additional costs are tabulated in the manner shown in the Cost Estimate Summary (Table 5-1).

- Contractor's site-related costs:

- Mobilization and demobilization		2%
- Surveying		1%
- Engineer's building at site		1%
- Office supplies, watchman, janitor		1%
- Site supervision		4%
	Total	9%

- Contractor's overhead and profit:
  (based on DPWH standards)

- Contractor's overhead		10%
- Contractor's profit		9%
	Total	19%

E. FINANCIAL AND ECONOMIC COST ESTIMATE

The economic and financial analyses of this subproject have been made based on the data shown in Table 5-1. The economic cost of construction components typically varies between 70% and 90% of the financial cost. The financial and the economic costs of the proposed facilities of Pantalang Bato are tabulated in the estimate.

F. CONSTRUCTION PERIOD

The estimated construction time required for the proposed port improvement and access road is between sixteen and eighteen months, provided that the required equipment is on site or can be mobilized from Puerto Princesa, Manila, or other urban centers.

TABLE 5-1 - COST ESTIMATE SUMMARY
THE PORT OF PANTALANG BATO
(Sheet 1 of 1)

ITEM	DESCRIPTION	UNIT	UNIT COST (Pesos)	QUANTITY	COST COMPONENTS [1000 Pesos (% of Financial Cost.)] FOREIGN	LOCAL	TAXES	ECONOMIC COST (1000 P)	FINANCIAL COST (1000 P)
	I. CAUSEWAY								
22	Crushed Aggregate Base Course	CU.M.	240	137	17 (52%)	7 (22%)	9 (26%)	24	33
33	Portland Cement Concrete Pavement	SQ.M.	400	700	140 (50%)	87 (31%)	53 (19%)	227	280
50	Reinforcing Steel	KG	21	2,800	26 (45%)	26 (44%)	6 (11%)	52	58
51	Structural Concrete, Class A	CU.M.	2,100	22	19 (41%)	20 (44%)	7 (15%)	39	46
68	Core Rock for Causeway or Breakwater	CU.M.	260	2,680	348 (50%)	209 (30%)	139 (20%)	557	696
69	Underlayer Rock	CU.M.	450	1,700	383 (50%)	230 (30%)	153 (20%)	613	766
70	Armor Rock , Small (up to 1 ton)	CU.M.	575	2,530	727 (50%)	436 (30%)	291 (20%)	1,163	1,454
	TOTAL				1,660 (50%)	1,015 (30%)	658 (20%)	2,675	3,333
	II. STAIRLANDING								
50	Reinforcing Steel	KG	21	5,700	54 (45%)	53 (44%)	13 (11%)	107	120
64	Structural Concrete, Class A (over water)	CU.M.	3,300	25	29 (35%)	41 (50%)	12 (15%)	70	82
66	Structural Concrete, Class A (under water)	CU.M.	5,300	13	24 (35%)	34 (50%)	10 (15%)	58	68
	TOTAL				107 (40%)	128 (47%)	35 (13%)	235	270
	III. PORT BUILDING								
80	Building w/ Comfort Room, Office	S.M.	4,000	100	164 (41%)	176 (44%)	60 (15%)	340	400
	TOTAL				154 (41%)	176 (44%)	60 (15%)	340	400
	IV. ACCESS ROAD								
10	Cut and Fill	CU.M.	95	5,500	246 (47%)	146 (28%)	131 (25%)	392	523
2[illegible]	Crushed Aggregate Base Course	CU.M.	240	3,640	454 (52%)	192 (22%)	227 (26%)	646	873
25	Bituminous Prime Coat, MC-70	SQ.M.	11	15,400	93 (55%)	42 (25%)	34 (20%)	135	169
28	Double Bituminous Surface Treatment	SQ.M.	49	15,400	400 (53%)	189 (25%)	166 (22%)	589	755
	TOTAL				1,193 (51%)	569 (25%)	558 (24%)	1,762	2,320

SUBTOTAL		5,012	6,323
Remoteness Factor :	1.10	501	632
SUBTOTAL		5,513	6,955
Contingencies (10%)		551	696
SUBTOTAL		6,064	7,651
Site Costs (9%)		546	689
SUBTOTAL		6,610	8,340
Overhead & Profit (19%)		1,256	1,585
TOTAL COST		7,866	9,925

VI.
ECONOMIC EVALUATION

VI. ECONOMIC EVALUATION

A. INTRODUCTION

Feeder port subprojects have to meet certain economic criteria to prove that the necessary investments will be beneficial to the community. All RIF port subprojects are subject to the following evaluation:

- an economic evaluation with a cut-off of 15% economic internal rate of return (EIRR)

The **economic evaluation** of feeder port subprojects is performed by using a Port Evaluation Model (Table 6-1). This spreadsheet model permits the easy economic evaluation of improvement proposals and alternatives for the proposed port subprojects. These alternatives can include the additional provision or extension of breakwaters, causeways, piers, seawalls and port buildings.

The main inputs to the model, drawing on the data discussed earlier, are:

- Traffic forecasts (Chapter III)
- Static port vessel capacities (Exhibit 11)
- Optimum vessel capacities (Exhibit 11)
- Representative vessel standby and operating costs (Exhibit 11)
- Value of passenger time (Exhibit 6)
- Construction costs for each alternative (Chapter V)

The benefits quantified can include vessel operating cost savings, time cost savings and maintenance cost savings as well as reduced handling, spoilage and development benefits. The economic evaluation of this subproject has been carried out with the following assumptions:

- The subproject life is assumed to be twenty years.
- For discounting purposes, annual values are assumed to be incurred at the end of each year.
- The opportunity cost of capital is set at 15%.

The benefits not quantified are:

- The expected new revenue opportunity for vessel, passenger, cargo and fish landing fees presented by the proposed new facilities (Chapter VII)

- Social benefits and some indirect development benefits

B. SUBPROJECT BENEFITS

The proposed feeder port subproject at Pantalang Bato is designed to enhance the official role of this port as a new fishing port for fishermen and farmers being resettled in two new barangays recently created from a former penal colony.

The port is located in the new barangay of Mangingisda, designated primarily for the resettlement of fishermen, and is adjacent to the new inland barangay of Luzviminda, designated for the resettlement of farmers.

Both barangays are essentially undeveloped with only one poor quality access road and only a few caribou trails. There are as yet no deep wells, established schools, electricity or medical and social facilities.

Consequently, the Port of Pantalang Bato has been considered as a **development port** and throughput increases have been projected at accelerated rates.

Once the development has been in progress for a number of years, additional access roads will become available. However, the extra distance by road to Puerto Princesa as compared to the shorter distance across the bay should assure continued, above average growth of the port over the forecast period.

The fishing activity from Pantalang Bato will likely be concentrated offshore in the Sulu Sea, rather than in Puerto Princesa Bay, since the Sulu Sea is apparently still able to support a larger annual harvest. However, it is likely much of these new landings by vessels based in Pantalang Bato will be landed directly at Puerto Princesa. Consequently, fish landings have been projected to increase only with the projected average increase in population, likely a conservative estimate.

Cross-bay passenger activities to and from Puerto Princesa will grow in importance as incomes increase and should as well be able to resist much of the potential road competition that will be available once connecting roads are constructed to reasonable standards.

Consequently, the principal sources of assured benefits from the proposed construction will be from vessel and passenger

port time savings and from reduced fish and consumable handling and spoilage costs.

Direct economic benefits for the 1992 base year have been estimated as follows:

1. VESSEL TURN-AROUND SAVINGS

Commercial vessel turn-around savings reflect the reduced time to approach a berth as opposed to a beach and from the reduced time in port due to the provision of stairlandings on the new causeway.

Commercial vessels are defined as vessels of three DWT and greater registered with the government.

The following data and assumptions were used to estimate the 1992 benefits due to vessel turn-around savings:

- 6.6 commercial vessels per day (Table 3-1)
- 300 active sailing days per year
- 1/2 hour per day saved by commercial vessels
- ₱69 per hour standby costs for medium bancas (Exhibit 6)
- 4.90% per year increase in vessels based on a compromise between projected passenger travel at 6.25% per year and a projected increase in banca capacities over the forecast period (Exhibit 6)

Using these data and assumptions, the 1992 benefit due to vessel turn-around savings would be ₱68,300. This is projected by multiplying the 1992 benefit by the factor 1.049.

2. PASSENGER TIME SAVINGS

Passenger time savings reflect the savings due to the reduced time taken for vessels to approach the new causeway and the accelerated discharge and embarkation of passengers made possible through the addition of stairlandings.

The following data and assumptions were used to estimate the 1992 benefits due to passenger time savings:

- 67,734 passengers in 1992 (Table 3-1)
- 6.25% per year increase in inter-island passenger travel demand rather than a 4.90% increase as would otherwise be projected for local banca travel.

- ₱3.67 per hour as the value of passenger in 1990 time projected to increase with per capita income growth of 4.50% per year (Exhibits 5 and 8)

- 1/4 hour saved per trip including vessel berth approach time savings

Using these data and assumptions, the 1992 benefit due to savings in passenger time would be ₱67,900. This is projected by multiplying the 1992 benefit by the factors 1.0625 and 1.0450.

3. HANDLING COST SAVINGS

Handling cost savings at the proposed new facility resulting from the addition of stairlandings adjacent to the port building are estimated at ₱5 per ton handled.

Fish volumes are projected to increase over the forecast period at the same rate as the average population of Palawan(Table 3-1).

Base cargo volumes for rice, bagged and bottled cargos consist generally of inelastic demand commodities and are usually projected to increase directly with population projection. However, as Pantalang Bato is a development port, base cargo volumes have been projected to increase at 4.90% per year (Exhibit 6).

Other cargos are also projected to increase with population and per capita income growth, but in this case with an income demand elasticity 0.8.

The following data and assumptions were used to estimate the 1992 benefits due to handling cost savings:

- 84 tons of marginal fish per year projected to increase with population at 2.65% per year

- 4,501 tons of base cargos increasing at 4.90% per year

- 4,604 tons of other cargos increasing at 6.25% per year

- Savings estimated at ₱5 per ton handled

Using these data and assumptions, the 1992 benefit due to handling cost savings would be ₱45,900. This is projected by multiplying the 1992 base fish benefit by 1.0265, the base cargo benefit by 1.049 and the other cargo benefit by 1.0625.

4. REDUCED SPOILAGE SAVINGS

There are important reduced spoilage savings due to the provision of a new port building at Pantalang Bato.

The following data and assumptions were used to calculate the 1992 benefits due to reduced spoilage:

- 2% of 84 tons of fish per year at ₱20,000 per ton increasing with population at 2.65% per year (Table 3-1 and Exhibit 4)

- 1% of 2,018 tons of consumables per year at ₱40,000 per ton increasing at 6.25% per year (Table 3-1 and Exhibit 6)

Using these data and assumptions, the 1992 benefit due to spoilage savings would be ₱840,800. This is projected by multiplying the 1992 fish spoilage benefit by 1.0265 and the consumable benefit by 1.0625.

5. DEVELOPMENT BENEFITS

Development benefits are considered as those derived from economic development generated by the proposed port improvement or construction. Generated activities are related to the type of investment and may occur in the port's direct or indirect zone of influence. The additional development may originate in extending agricultural areas that were not cultivated before, by improving agricultural technology, by attracting new tourists, by increasing fish catch, by increasing mineral exploitation, etc.

In order to attribute development benefits to a specific port investment, one must be sure that the existing port condition and the facilities are the principal constraints for that development. The following four threshold criteria are considered essential to determine if further analysis of possible development benefits needs to be carried out:

- Investment type

The proposed investment is classified as:

  - Construction of a new port
  - Increasing the number of months of service or upgrading the port to an all-weather port
  - Significantly increasing the port's capacity in terms of space or vessel type

- Complimentary investment

In order to generate the new activities, an additional substantial complimentary investment is not required.

- Transport [illegible]

The transport system will fall into one of the following categories:

- The port is the only outlet for passenger or cargo movements from and to its hinterland
- There is no alternative all-weather transport system, cheaper than the proposed port, which serves its hinterland
- There is an effective port capacity constraint

o Development potential

An unexploited potential is identified in the port's hinterland (sea or land).

There is a resettlement area covering 2,300 hectares of agricultural land around Pantalang Bato. About 5,000 families, mostly fishermen from Puerto Princesa, are to be relocated in this area. The port improvement, followed by the implementation of other infrastructures, is expected to encourage migration and economic development of the area.

The nearest market outlet for the hinterland's production is Puerto Princesa City. Barangay Mangingisda is currently a good departure point to Puerto Princesa City for the area residents, in view of an existing ferry service and the relative shorter travel time by boat as compared to road. In fact, residents from Pantalang Bato are likely to divert some of the traffic to Barangay Mangingisda.

The development of the resettlement area would depend not only on the port development but also on a good road network. This is validated by the concentration of recent farmer/settlers in Barangay Luzviminda near the national highway and fishermen in Barangay Mangingisda near the existing wooden pier. The farmers would most likely prefer to use the improved road for direct market access than to avoid double handling of their produce. Likewise, farmers residing near the ports will continue to use the port facilities. Hence, development benefits could be attributed more to the road network, which might be an important complementary investment to the port development.

C. SUBPROJECT COSTS

1. CONSTRUCTION COSTS

Subproject costs are developed and described in detail in Chapter V.

2. MAINTENANCE COSTS

Maintenance costs are projected to commence at 2% of original investment costs and to increase thereafter at 8.5% per year until the asset is replaced.

D. ECONOMIC EVALUATION

Table 6-1 presents the results of the economic evaluation undertaken.

The new facility recommended is for the provision of a new causeway with stairlandings, a landing platform with a port building and the provision for an access road of over two kilometers.

Benefits are calculated as described previously. The results of the analysis for the base case are:

- Net Present Value (15%) ₱(124,000)
- Benefit/Cost Ratio 0.98
- EIRR (%) 14.77%

E. SENSITIVITY EVALUATION

The proposed program was found (Table 6-1) not to be economically feasible with an EIRR marginally below 15%. Each of the following sensitivity scenarios undertaken has an EIRR of less than 15%, despite the allocation of benefits within a generally accelerated basis of future growth as befits a development port such as Pantalang Bato. On the other hand, the proposed construction includes a 2.2-kilometer access road, of which all costs may not be properly attributable to the port requirement.

Costs:	+15%	+0%	+15%
Benefits:	-0%	-15%	-15%
Net Present Value (1%)	₱(1,553,600)	₱(1,535,600)	₱(2,964,500)
Benefit/Cost Ratio	0.83	0.80	0.67
EIRR (%)	12.40%	12.03%	9.79%

F. RECOMMENDATION

Since the proposed improvement for the Port of Pantalang Bato has a base EIRR of 14.77%, which is below the minimum 15% requirement, and for other considerations described elsewhere, the Consultant does not recommend that the proposed subproject be undertaken.

However, it should be noted that 37% of the costs are attributable to the proposed access road. Should a subsequent analysis determine there are significant **settlement benefits** in addition to the described **port benefits** an appropriate portion of the access road costs would not be allocated to the proposed port subproject. Any reallocation would result in a base EIRR in excess of 15%. A major reallocation would also likely result in EIRRs in excess of 15% for the three sensitivity scenarios.

As an alternative, the site at Sitio Sampaloc is likely to be feasible. All benefits associated with Pantalang Bato would apply at Sitio Sampaloc and the access road would not be required. Therefore, the Consultant recommends the site at Sitio Sampaloc for feasibility and design on a later project.

TABLE 6-1

ECONOMIC ANALYSIS
(1000 Pesos)

PORT: Pantalang Bato LOCATION: Palawan

YEAR	VESSEL SAVINGS (1)	PASSENGER SAVINGS (2)	HANDLING SAVINGS (3)	SPOILAGE SAVINGS (4)	MAINTENANCE NET COSTS (5)	PROJECT COSTS (6)	NET BENEFIT STREAM (7)
1991	0.0	0.0	0.0	0.0	0.0	7,866.0	(7,866.0)
1992	68.3	67.9	45.9	840.8	157.3	0.0	865.7
1993	71.7	75.4	48.5	892.1	170.7	0.0	917.0
1994	75.2	83.8	51.2	946.7	185.2	0.0	971.6
1995	78.9	93.0	54.0	1,004.5	200.9	0.0	1,029.5
1996	82.7	103.3	57.1	1,066.0	218.0	0.0	1,091.0
1997	86.8	114.6	60.2	1,131.3	236.6	0.0	1,156.4
1998	91.0	127.3	63.6	1,200.6	256.7	0.0	1,225.9
1999	95.5	141.3	67.1	1,274.3	278.5	0.0	1,299.7
2000	100.2	156.9	70.9	1,352.5	302.1	0.0	1,378.3
2001	105.1	174.2	74.9	1,435.5	327.8	0.0	1,461.8
2002	110.2	193.5	79.1	1,523.7	355.7	0.0	1,550.7
2003	115.6	214.8	83.5	1,617.3	385.9	0.0	1,645.3
2004	121.3	238.5	88.2	1,716.8	418.7	0.0	1,746.0
2005	127.2	264.8	93.1	1,822.4	454.3	0.0	1,853.3
2006	133.5	294.0	98.4	1,934.7	492.9	0.0	1,967.5
2007	140.0	326.4	103.9	2,053.8	534.8	0.0	2,089.3
2008	146.9	362.4	109.7	2,180.4	580.3	0.0	2,219.1
2009	154.1	402.4	115.9	2,314.8	629.6	0.0	2,357.6
2010	161.6	446.8	122.5	2,457.6	683.2	0.0	2,505.4
2011	169.5	496.1	129.4	2,609.3	741.2	0.0	2,663.1
TOTAL	2,235.0	4,377.5	1,617.1	31,375.2	7,610.7	7,866.0	24,128.2

TOTAL BENEFITS: 39,604.9 COSTS: 15,476.7

RESULTS:

Net Present Value (15%)	(124.1)	(1000 Pesos)
Benefit Cost Ratio	0.98	
EIRR (%)	14.77%	

SENSITIVITY ANALYSIS:

	Costs:	+15%	+0%	+15%
	Benefits:	+0%	-15%	-15%
Net Present Value (15%)		(1,553.6)	(1,535.0)	(2,964.5)
Benefit Cost Ratio		0.83	0.80	0.67
EIRR (%)		12.40%	12.03%	9.79%

VII.
FINANCIAL ANALYSIS

VII. FINANCIAL ANALYSIS

A. INTRODUCTION

The terms of reference require the study to determine if the proposed project could be sustained by the responsible municipality from revenues generated by the port as a whole. This analysis assumes that the municipality is prepared to assess wharfage, layover, cargo, passenger and concession fees as is currently undertaken at Caramoan (Guijalo) on the Lagonoy Gulf. Further, it has been assumed that the municipality is prepared to increase such fees proportionate to the projected growth in per capita income until the port becomes self-sustaining.

Although Caramoan assesses such fees, it should be noted, however, that the assessment and collection of port fees by municipalities is the exception rather than the rule throughout the Philippines.

In any case, it has been assumed that a depreciation fund will be set aside just as soon as revenues exceed maintenance costs or at the tenth year, whichever is the later. In the case of Pantalang Bato, this is not likely to occur before the end of the tenth year, after which time funds equal to 5% of the original costs are to be deposited. The effective depreciation period is therefore thirty years.

Throughput projections for this designated development port are projected at accelerated rates in order to reflect the above average growth potential of the subproject port.

The Financial Analysis for the proposed facility is presented in Tables 7-1 at the end of this chapter.

B. REVENUES

Vessel wharfage revenues (Table 7-1 Column 1) have been projected by multiplying the number of commercial inter-island and local vessels larger than three DWT by a wharfage fee of ₱20 per day for inter-island and local banca-type vessels.

Vessels have been projected to call on the proposed new facility the equivalent of 300 days per year.

Cargos and passengers carried by inter-island and local bancas and launches are projected to increase in excess of population increases which will be partly compensated by inter-island vessels slowly evolving to larger capacities over the forecast period. Consequently, vessel arrivals and departures are projected to increase at 4.90% per year derived from a formula based on population growth, per capita income growth and an income demand elasticity of 0.5. This is the same

formula previously developed for DPWH used to project banca travel demand (Exhibit 6).

Fee schedules are projected to increase with the projected increase in per capita incomes of 4.50% per year (Exhibit 5).

Vessel layover revenues (Column 2) have been determined in an identical manner for the balance of sixty-five port days per year.

Cargo fees (Column 3) are assumed applicable to the projected base cargo landings of 4,501 tons and other cargo landings of 4,604 tons (Table 3-1). Base cargos are projected to increase at 4.90% per year. Other cargos are projected to increase at 6.25% per year (Exhibit 6).

Cargo fee schedules are projected to increase from a base level of ₱20 per ton handled directly with the projected increase in per capita income (Exhibit 5).

Stevedore, or **arrastre fees** (Column 4) are generally assessed at a rate of ₱20 per ton of cargo or commercial fish handled. Fees are not assessed for non-commercial fish landings. Only about 10% of the fees are normally allocated to a municipality by the arrastre firms.

It is a mute question if such fees would be applicable at Pantalang Bato in the initial years. However, the impact on the overall evaluation is small and the overall requirement for a consistency of approach, demands an even handed appraisal of each subproject proposal.

In any case, fees are projected to increase with the projected increase in per capita incomes at 4.50% per year (Exhibit 5).

Passenger fees (Column 5) should be the easiest to collect at a base assessment of ₱0.50 per passenger.

Passenger volumes are projected to increase at 6.25% per year, the same rate as projected for inter-island travel demand (Exhibit 6).

Base passenger fee levels are projected to increase in proportion to the projected increase in per capita income of 4.5%.

Fifty percent of the passenger fees collected are generally retained by longshore unions or port employee benevolent funds as a kind of service commission (Exhibit 5).

Transit fee (Column 6) opportunities, other than those for surplus fish exports, are not apparent for Pantalang Bato.

Concession fee (Column 7) opportunities at the proposed new port building are assessed at for a lease of about twenty square

meters at an estimated average revenue of ₱600 per square meter per year increasing with the projected increase in per capita income of 4.50% per year (Exhibit 5).

C. OPERATING EXPENSES

Maintenance (Column 8) is estimated at 2% of the initial investment costs for the first year. Maintenance costs are assumed to increase at 8.5% per year over the life of the asset.

Wages (Column 9) are estimated for two employees in year one at the proposed facility.

Employees are projected to increase at the same rate as base cargos at 4.90% per year (Exhibit 6).

Wages are projected to increase from ₱6,000 per employee per year with the projected increase in per capita incomes of 4.50% per year (Exhibit 5).

Total Expenses (Column 10) are those expenses before any provision for asset replacement.

Total revenues (Column 11) are those prospective revenues already described. **Net revenues** (Column 12) are prospective revenues less prospective operating costs before depreciation.

The **net recovery factor** (Column 13) is the percentage of costs before depreciation recovered from the proposed service fee assessments. Over the forecast period of twenty years, this factor is 158% of costs.

Depreciation fund contributions (Column 14) are assessed in this appraisal as 5% of the original improvement costs commencing after the initial ten years.

Finally, the **adjusted net cost recovery factor** (Column 15) reflects the application of the depreciation fund contribution charge. Overall, the port is projected to be able to recover 101% of the costs over the forecast period.

D. CONCLUSION

It is the consultant's judgement that the proposed subproject for Pantalang Bato could be maintained by the municipality without undue supplement from general revenues provided the municipality was prepared to assess the suggested port fees and charges in the manner projected in this analysis.

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TABLE 7-1

FINANCIAL ANALYSIS
(1000 Pesos)

PORT: Pantalang Bato LOCATION: Palawan

	REVENUES							OPERATING EXPENSES		SUMMARY RESULTS				DEPRECIATION	
	Vessel Whrfge. (1)	Vessel Layover (2)	Cargo Fees (3)	Arrastre Fees (4)	Psgr. Fees (5)	Transit Fees (6)	Cncssion Fees (7)	Mntnce. (8)	Wages (9)	Total Expenses (10)	Total Revenues (11)	Net Revenues (12)	Cost Rcvry Fctr (13)	Deprec. (14)	Adj. Cost Rcvry Fctr (15)
1992	39.6	8.6	183.8	18.4	16.8	0.0	12.0	198.5	12.0	210.5	279.1	68.6	132.6%	0.0	132.6%
1993	43.4	9.4	202.9	20.3	17.6	0.0	12.5	215.4	12.5	227.9	306.1	78.2	134.3%	0.0	134.3%
1994	47.6	10.3	224.1	22.4	18.4	0.0	13.1	233.7	13.1	246.8	335.8	89.0	136.1%	0.0	136.1%
1995	52.2	11.3	247.4	24.7	19.2	0.0	13.7	253.5	13.7	267.2	368.5	101.3	137.9%	0.0	137.9%
1996	57.2	12.4	273.3	27.3	20.0	0.0	14.3	275.1	14.3	289.4	404.5	115.1	139.8%	0.0	139.8%
1997	62.7	13.6	301.8	30.2	20.9	0.0	15.0	298.5	15.0	313.4	444.1	130.7	141.7%	0.0	141.7%
1998	68.7	14.9	333.4	33.3	21.9	0.0	15.6	323.8	15.6	339.5	487.8	148.3	143.7%	0.0	143.7%
1999	75.3	16.3	368.2	36.8	22.9	0.0	16.3	351.4	16.3	367.7	535.9	168.2	145.7%	0.0	145.7%
2000	82.6	17.9	406.8	40.7	23.9	0.0	17.1	381.2	17.1	398.3	588.9	190.6	147.9%	0.0	147.9%
2001	90.5	19.6	449.4	44.9	25.0	0.0	17.8	413.6	17.8	431.5	647.3	215.9	150.0%	512.4	68.6%
2002	99.2	21.5	496.6	49.7	26.1	0.0	18.6	448.8	18.6	467.4	711.7	244.3	152.3%	512.4	72.6%
2003	108.8	23.6	548.7	54.9	27.3	0.0	19.5	487.0	19.5	506.4	782.7	276.3	154.5%	512.4	76.8%
2004	119.2	25.8	606.4	60.6	28.5	0.0	20.4	528.3	20.4	548.7	860.9	312.2	156.9%	512.4	81.1%
2005	130.7	28.3	670.1	67.0	29.8	0.0	21.3	573.3	21.3	594.5	947.2	352.7	159.3%	512.4	85.6%
2006	143.3	31.0	740.6	74.1	31.1	0.0	22.2	622.0	22.2	644.2	1,042.4	398.1	161.8%	512.4	90.1%
2007	157.1	34.0	818.6	81.9	32.5	0.0	23.2	674.8	23.2	698.1	1,147.3	449.2	164.4%	512.4	94.8%
2008	172.2	37.3	904.8	90.5	34.0	0.0	24.3	732.2	24.3	756.5	1,263.1	506.6	167.0%	512.4	99.5%
2009	188.7	40.9	1,000.2	100.0	35.5	0.0	25.4	794.4	25.4	819.8	1,390.8	571.0	169.6%	512.4	104.4%
2010	206.9	44.8	1,105.8	110.6	37.1	0.0	26.5	862.0	26.5	888.5	1,531.7	643.2	172.4%	512.4	109.3%
2011	226.8	49.1	1,222.5	122.3	38.8	0.0	27.7	935.2	27.7	962.9	1,687.2	724.3	175.2%	512.4	114.4%
Total	2,172.6	470.7	11,105.5	1,110.6	527.3	0.0	376.5	9,602.8	376.5	9,979.3	15,763.2	5,783.9	158.0%	5,636.0	100.9%

VIII.
ENVIRONMENTAL ANALYSIS AND SOCIAL SOUNDNESS EVALUATION

VIII. SOCIAL SOUNDNESS ANALYSIS

Social soundness analyses evaluate the effects of construction projects from the perspective of the intended beneficiaries, local residents and institutions in the zone of influence.

The Pantalang Bato Port subproject is designed to resettle squatters from Puerto Princesa, and thus, has important social implications, with must be examined carefully from various perspectives.

A. SANTA LUCIA SETTLERS

The proposal to build a port is popular with the present residents of Barrio Santa Lucia. But, they are concentrated at Sitio Sampaloc in Barangay Mangingisda and would prefer to have the new port constructed there rather than at Pantalang Bato. There are about 320 families in Barangay Mangingisda. They are about half farmers and half fishermen. Mangingisda is transforming into a real community, as witness by the expansion of the school system. In 1986, they only had first and second grades in their school. But in 1989, a complete high school curriculum was offered.

Prisoners had started cutting the mangroves around this community years ago and current settlers have continued this practice. In an August, 1990, public hearing, Mangingisda residents vowed to protect the mangroves if the port is located in this area.

It is necessary to distinguish between farmer and fishermen settlers. Two different types of lots have been laid out: one to two hectare inland homesteads for farmers and 0.6 hectare lots for fishermen near the coast. In all likelihood, farmers will use road transport rather than the port to take their goods to market, if an access road is built from the new settlements to the national highway. Even though travel time is longer, this saves loading into a banca and unloading into a jeepney in Puerto Princesa.

B. SQUATTERS

The squatters currently live in stilt supported structures around the edge of the bay in Puerto Princesa City. Most squatters are gathered around a temporary timber landing constructed at the Poblacion Port next to the main market of Puerto Princesa City.

Most squatters prefer not to relocate from Puerto Princesa to Barangay Mangingisda as most squatters are conveniently located next to the central market. Since most squatters are fishermen, they find the sites in the resettlement area unsuitable for them. The resettlement area is located on a

plateau away from the shore, making it difficult for the fishermen to access their boats. Since the shoreline is currently covered with mangroves and is protected from destruction, no coastal residences are permitted.

C. THE RESETTLEMENT PROGRAM

The resettlement program has been underway since 1986. It involves 2,300 hectares which have been laid out into 700 farm lots of one to two hectares each and about 5,000 home lots of 600 square meters each. About half of all titles for this resettlement program has been distributed. It was revealed that some squatters were accepting the land title but have not occupied their entitlement. In Mangingisda, there are deserted houses built and abandoned by new settlers.

In the past, the government has not enforced the title abandonment issue. New regulations requires a family to live in the new area for six months before being granted a title. There is a proposal which might require each title holder to pay a nonimal usage fee of about ten pesos per month for twenty-five years to discourage settlers who are non-committal.

The resettlement program involves two ports, Pantalang Bato and Poblacion Port in Puerto Princesa. Poblacion is intended as a market landing where settlers and others from Pantalang Bato can dock to go to market. A temporary wooden landing has already been completed at Poblacion. As promised, this long pier was constructed by the local government without tearing down any squatter homes.

While squatters delay moving in, immigrant families from other islands have already moved into the area. There are currently nine such families (three fishermen families and six farming families).

D. CONCLUSION

The port is socially sound and will result in major benefits for residents of the Barangay Mangingisda and Barangay Luzviminda area. Residents clearly prefer the location at Sitio Sampaloc in Barangay Mangingisda. Prior to finalizing the port location, considerations should be given to the needs and requirements of the local users. Their needs are based, in part, on the current lack of surface transport. It is, therefore, imperative that an access road be included as part of this port improvement project at either site, if possible.

For further analysis, refer to the Social Soundness Overview included in Appendix D.

IX.
ENERGY ANALYSIS

IX. ENERGY ANALYSIS

Energy savings derived from these proposed port improvements can be primarily attributed to the economies of consumption and the economies of scale. The economies of consumption result from a faster turn-around time at the improved port. Less time spent at the port allows more time for transit while maintaining the same transportation schedule. Transit at reduced speeds results in more efficient fuel consumption and realized energy savings.

The economies of scale evolve from the use of larger vessels made possible through port improvements. Approximately twice the amount of cargo or passengers can be shipped in a larger vessel at only a 50% increase in energy consumption.

A secondary but important source of energy savings results from the reduced wastage of other perishables, such as ice, when they can be protected in sheds and/or bodegas.

Other probable savings are not significant in the context of single municipal ports.

Representative vessel types were selected on the basis of general applicability to the current and future requirements of all municipal ports surveyed. Exhibit 9 displays vessel types, roles and costs and describes fuel consumption factors per unit of work undertaken. Vessel types are described in Table 9-1. Figure 9-1 shows the average fuel consumption in liters/hour for each vessel type.

TABLE 9-1

REPRESENTATIVE VESSELS

TYPE OF VESSELS	DESCRIPTION	PRINCIPAL ACTIVITY
Small Paddle Banca	without engines and not usually in excess of 3/4 DWT	subsistence fishing, some passenger and cargo handling as lighterage service
Small Motor Banca	16 HP Briggs and Stratton engines and not usually in excess of 1.5 DWT	fishing, (40 - 60%) transporting passengers (20 - 40%) and cargo (10 - 20%)
Medium Motor Banca	85 HP Fuso 4DR5 diesel engines and of an average displacement of 4 DWT	transporting fish, usually in support of much larger trawlers (40 - 60%) fishing (20 - 40%) and transporting cargo (10 - 20%)
Large Motor Banca	two 85 HP engines or single 165 HP Isuzu engine and of an average displacement of 9 DWT	transporting cargo (40 - 60%), fish (20 - 40%) and passenger (10 - 20%)
Medium Launch	two 85 HP engines or a single 165 HP Isuzu engine and of an average displacement of 10 DWT	transporting passengers (80 - 90%) and cargo (10 - 20%)
Large Launch	two engines totalling about 250 HP and of an average displacement of 20 DWT	transporting passengers (80 - 90%) and cargo (10 - 20%)
Small Trawler	two engines totalling about 250 HP and of an average displacement of 20 DWT	fishing (60 - 80%) and transporting fish (20 - 40%)
Large Trawler	two engines totalling about 300 HP and of an average displacement of 40 DWT	fishing (60 - 80%) and transporting fish (20 - 40%)

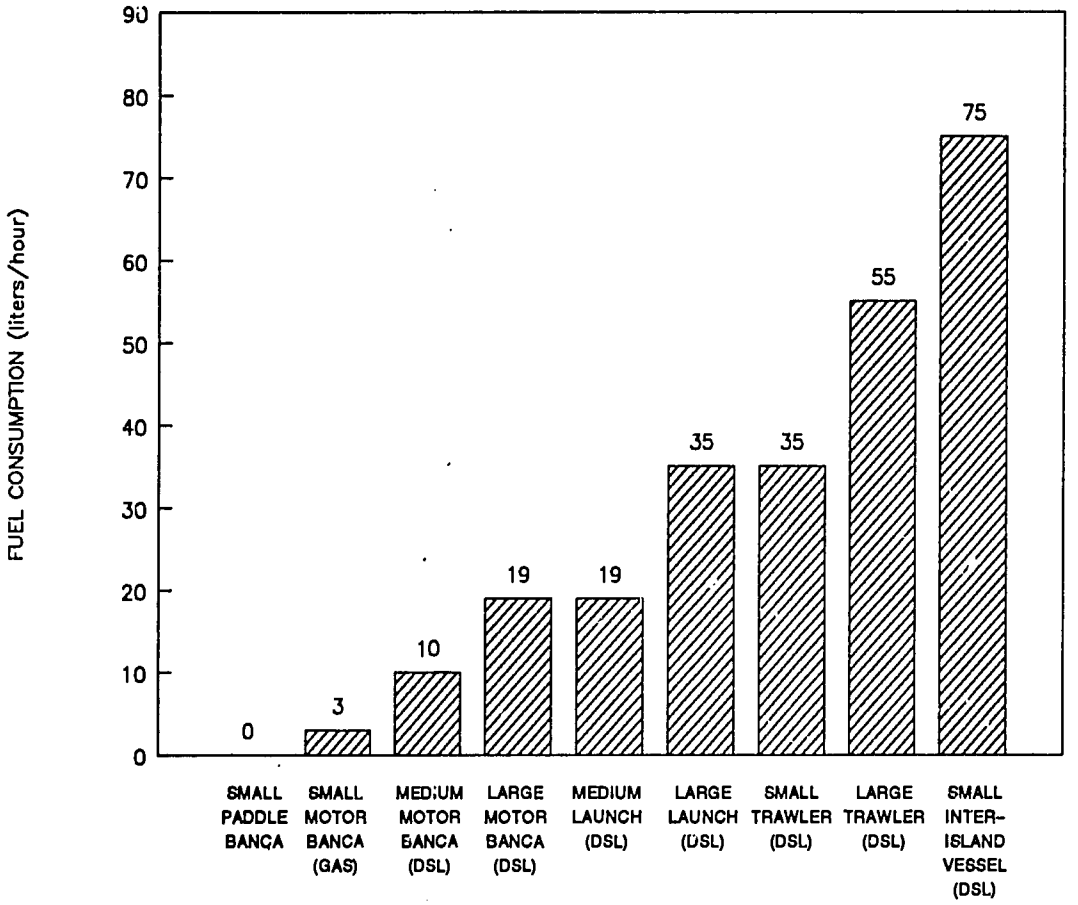
TABLE 9-1
(CONTINUED)

REPRESENTATIVE VESSELS

TYPE OF VESSELS	DESCRIPTION	PRINCIPAL ACTIVITY
Small Inter Island Vessel	two engines totalling about 400 HP and of an average displacement of 80 DWT	transporting passengers (40 - 60%), cargo (20 - 40%) and produce (10 - 20%)
Medium Inter Island Vessel	two engines totalling about 800 HP and of an average displacement of 1,000 DWT	transporting passengers (40% - 60%), cargo (20% - 40%) and produce (10% - 20%)
Large Inter Island Vessel	two engines totalling about 2,400 HP and of an average displacement of 2,000 DWT	transporting passengers (40% - 60%), cargo (20% - 40%) and produce (10% - 20%)

FIGURE 9-1

ASSUMED FUEL CONSUMPTION



(GAS) = Gasoline engine
(DSL) = Diesel engine

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X.
ENVIRONMENTAL ASSESSMENT

X. ENVIRONMENTAL ASSESSMENT

A. SUBPROJECT DESCRIPTION

Improvements proposed for the Pantalang Bato Port are described in detail in Chapter IV of this report. The construction involves replacement of the existing port structure with a one hundred fifty meter long rock causeway. Ancillary facilities of the subproject include a shoreline port building and a 2.2 kilometer gravel road to the existing Barangay Mangingisda feeder road (Figure 4-1).

B. EXISTING ENVIRONMENT

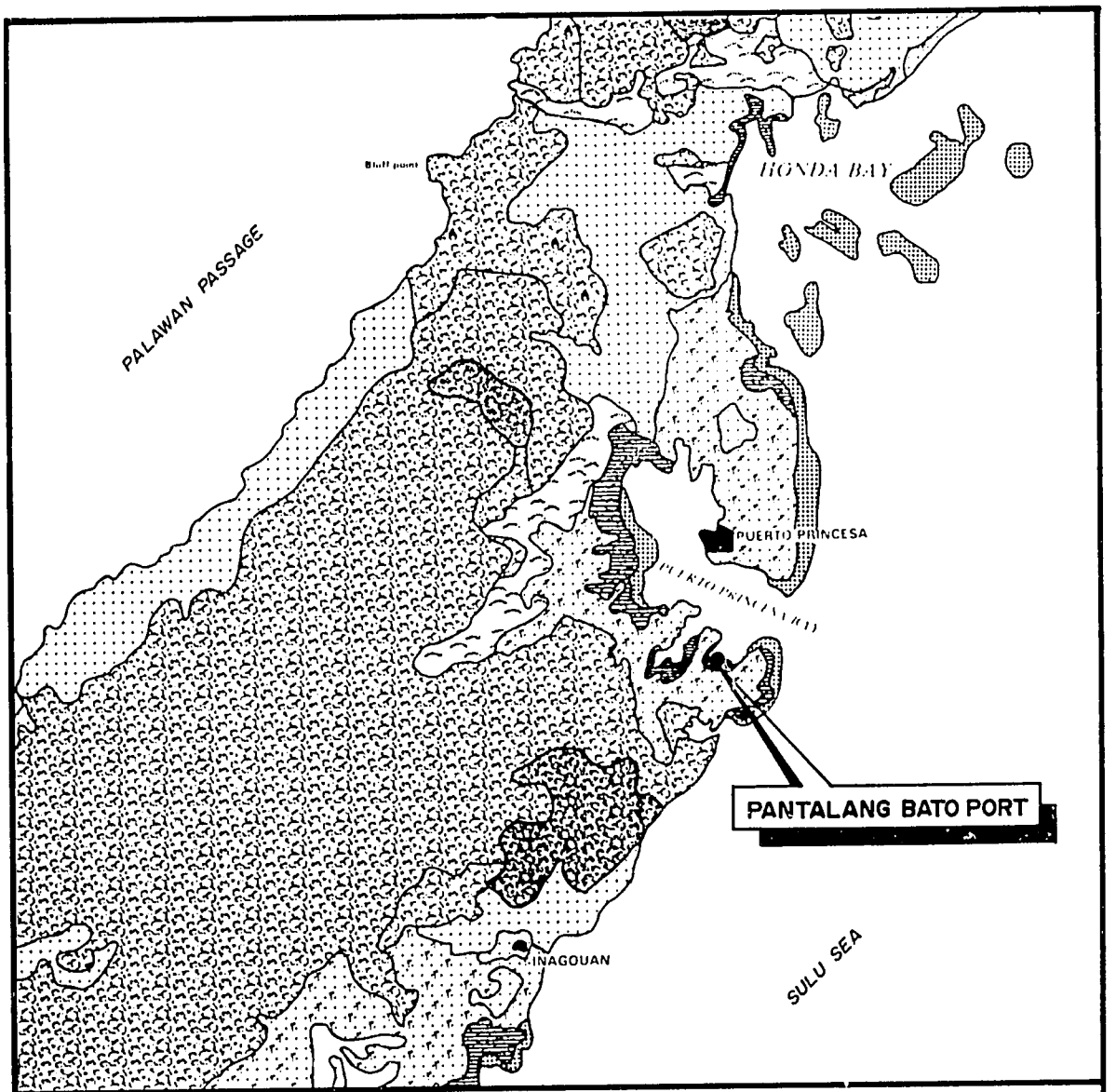
1. PHYSICAL ENVIRONMENT

The Pantalang Bato Port site is located on the east coast of the Island Province of Palawan, approximately seven kilometers south of the provincial capital of Puerto Princesa (Figure 1-1). The existing facility, an incomplete causeway consisting of a loose band of piled coral stones, is located in the southern extreme of the Saguit Inlet of the expansive Puerto Princesa Bay (Figure 1-2).

Puerto Princesa Bay is a component of a watershed catchment area that extends to the central Stavely and Thumb Mountain Ranges to the east and the Village Range to the south. This catchment basin includes the major drainage systems of the Iwahig and Irahuan Rivers, in addition to numerous secondary river systems (Figure A-4). Puerto Princesa Bay is ringed by coastal plains, alluvial deposits and shallow tidal flats bordering freshwater inlets, in a gradual transition to the deeper, increasingly marine environment of the bay. Due to the extensive agricultural activity within the drainage of the Puerto Princesa Bay catchment area, water quality of the bay and Saguit Inlet is notably turbid and silty.

2. NATURAL RESOURCES

Based on land cover maps (Figure 10-1) and field surveys of the area (Plate 1-1), remnant open canopy dipterocarp forest cover is present approximately five kilometers west and south of the subproject site. Forest cover increases to closed canopy communities in the rugged watersheds of the Tagduan and Tabarunis Rivers, over ten kilometers south of Pantalang Bato. The land area adjoining the port site has been cleared of the antecedent semi-deciduous forests that typify the lower elevations of the eastern Palawan coast. Cleared land areas have been converted into a patchwork of subsistence level agricultural plots including corn, banana and coconut, fields of parched cogon grass (**Imperata spp**) and low hills.



5 0 5 10 Km.
SCALE 1:250,000

L E G E N D :

- DIPTEROCARP FOREST, CLOSED CANOPY
- DIPTEROCARP FOREST, OPEN CANOPY
- CULTIVATED AREA MIXED W/ BRUSH & GRASS
- GRASSLAND, GRASS COVERING
- COCONUT PLANTATIONS
- CROPLAND MIXED W/ COCONUT PLANTATION
- LAKE
- FISHPONDS DERIVED FROM MANGROVE
- MANGROVES
- CORAL REEFS

SOURCE: PCGS 25
National Mapping and Resource Information Authority, 1987

PANTALANG BATO PORT

RURAL INFRASTRUCTURE FUND PROJECT	AID PROJECT NO. 492-0420	FIGURE 10-1
LAND COVER MAP		

The coastline near the proposed port and along most of the western shoreline of Puerto Princesa Bay (Figure 10-2) is extensively fringed by secondary growth mangroves. Three species of mangroves dominate this mangal community: **Avicennia marina**, **Rhizophora apiculata** and **Sonneratia alba**. **Nypa fructicans** (nipa palm), a back zone species commonly associated with brackish and freshwater conditions, is scarce in Saguit Inlet. These mangroves communities are noted for their biological richness and reportedly included monkeys (**Macaca**), monitor lizards (**Varanus**) and the nearshore occurrence of the endangered sea cow (**Dugong dugon**). The entire Province of Palawan is officially recognized as a game refuge and wildlife preserve (Proclamation 219; 1967) as well as mangrove swamp forest reserve (Proclamation 2152; 1981).

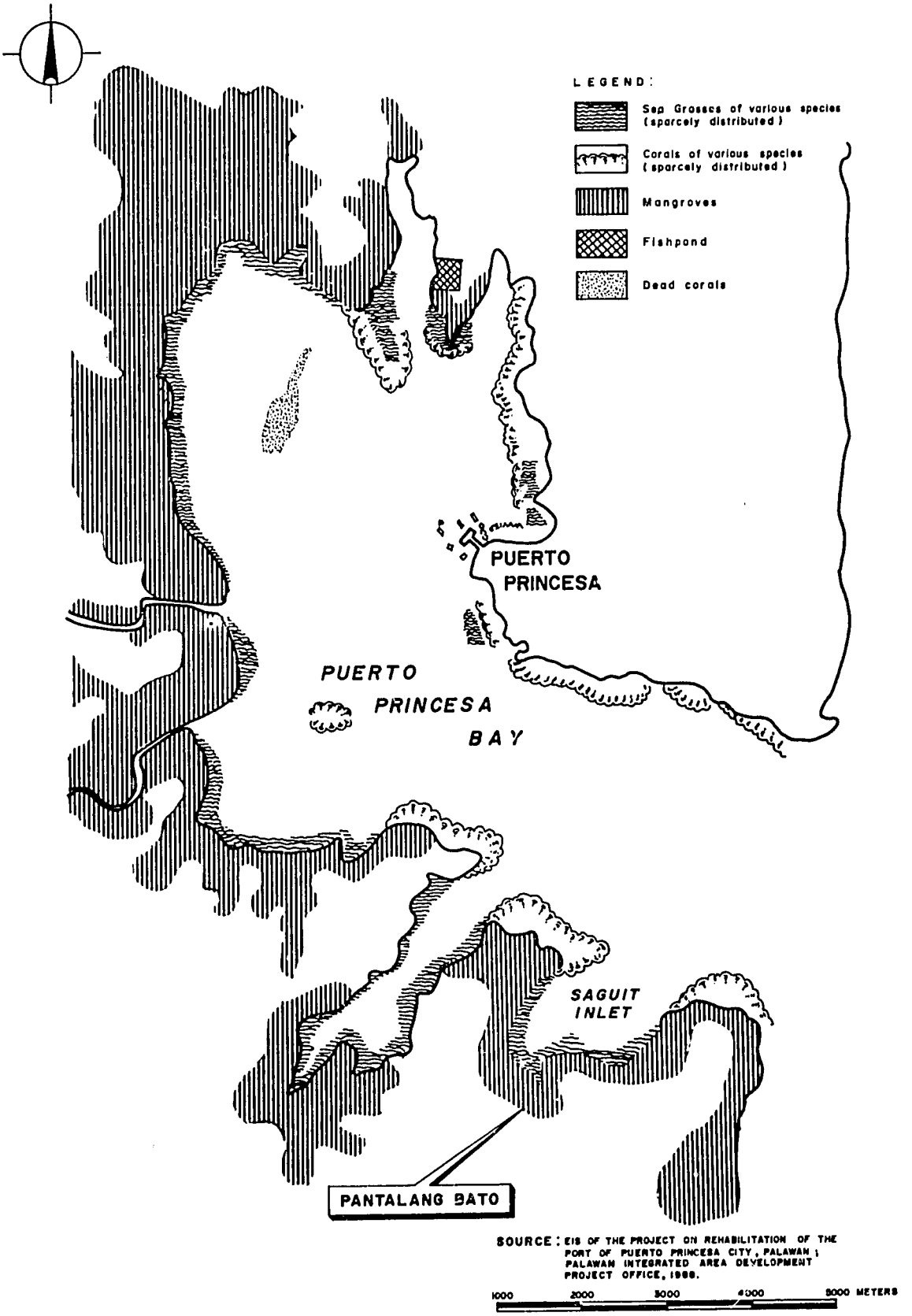
The gradually sloping sublittoral zone opposite the Pantalang Bato port site is composed of a sandy clay, muddy substrate colonized primarily by eel grass (**Enhalus acoroides**) and bottom dwelling invertebrates such as sea anemones (**Cerianthus spp**) and marine worms (**polychaetes**). Scattered coral communities are present along the steeper slopes of the deep channel which connects Saguit Inlet with Puerto Princesa Bay (Figure A-3). The development of coral communities is more substantial along the wave washed seaward exposures of Panagtaran Point and in the proximity of the Village Rocks (Figure 10-2).

3. CULTURAL AND SOCIO-ECONOMIC RESOURCES

a. Human Settlements and Livelihood

The Pantalang Bato area was previously a part of the Iwahig Penal Colony established in 1912 by Executive Order Sixty-Seven. The original land area of the Iwahig Penal Colony included most of the southern and western coast of Puerto Princesa Bay. The loose pile of coral stones that comprises the existing port facility was reportedly built by Iwahig prisoners to facilitate transportation to and from the colony.

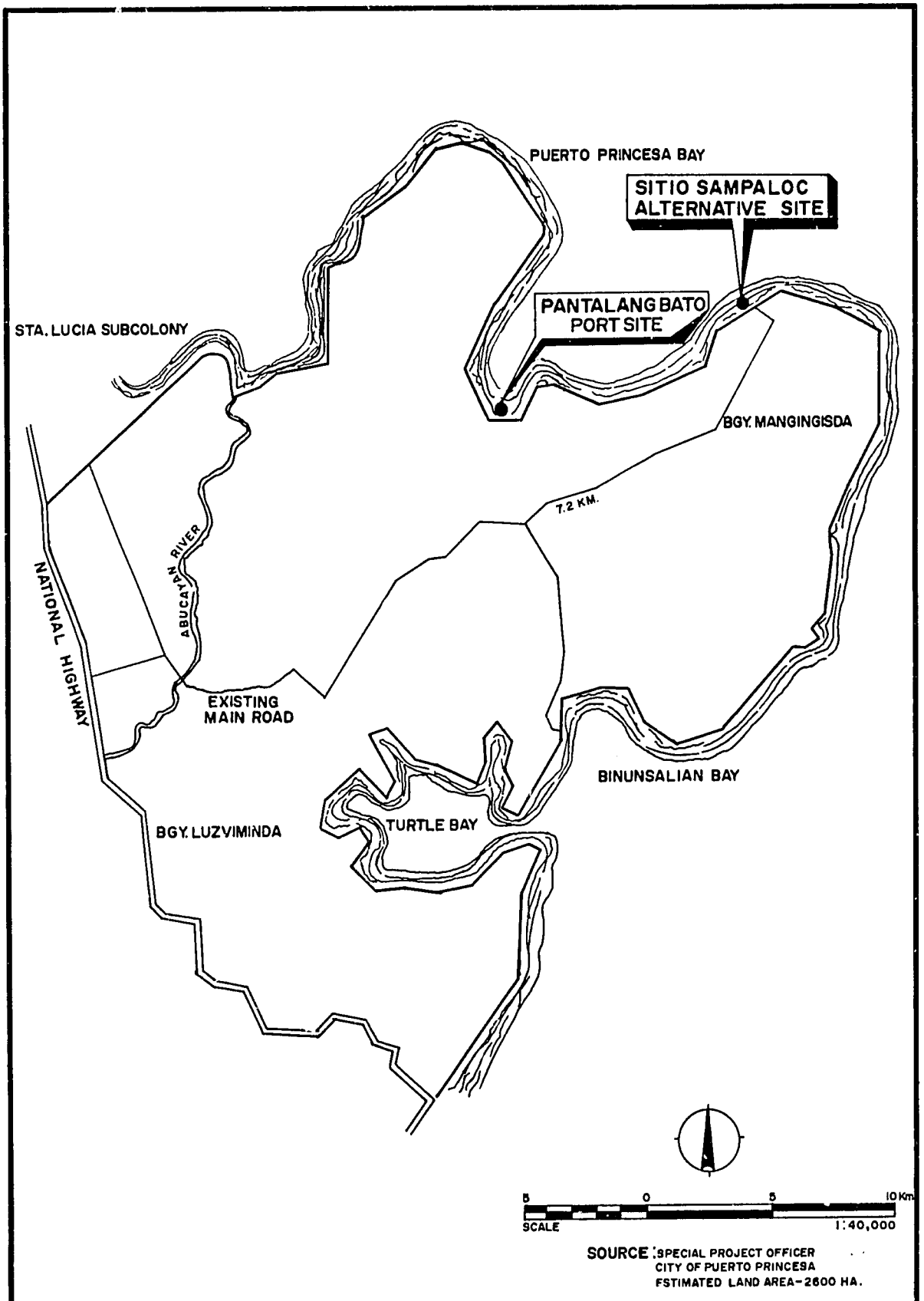
In 1984, a 2,600 hectare portion of the colony was designated as a resettlement area (Figure 10-3) to accommodate the numerous squatters and landless immigrants arriving in Puerto Princesa City (Plate C-3, Photo 7). A local government unit, Barangay Mangingisda, was formed within the jurisdiction of the Municipality of Puerto Princesa and included the Pantalang Bato area. As proposed by the city government and described in Chapter VIII of this report, the Barangay Mangingisda land area was intended for the development of a fishing oriented community, while the inland Barangay Luzviminda was designated as a farming community. Land titles have reportedly been distributed to landless applicants based on this livelihood formula.



RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492 - 0420

AQUATIC RESOURCES AROUND PUERTO PRINCESA BAY

FIGURE 10-2



SOURCE: SPECIAL PROJECT OFFICER
CITY OF PUERTO PRINCESA
ESTIMATED LAND AREA-2600 HA.

RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420

PANTALANG BATO RESETTLEMENT AREA

FIGURE 10-3

Occupation of the resettlement area to date is limited to the barangay centers of Mangingisda (Sitio Sampaloc) and Luzviminda. At present, a primary and high school already exists in Sitio Sampaloc to accommodate the increasing number of students from the settlement area. Pantalang Bato remains sparsely populated, consisting of a few temporary huts, a scattered patchwork of cleared fields and the incompleted causeway (Plate C-2). A recently constructed crab culture pond (Plate C-3, Photo 8) and a floating fish cage are located adjacent to the port site, though these particular structures are apparently owned by non-residents.

A economic overview of the proposed subproject is presented in Chapter II.

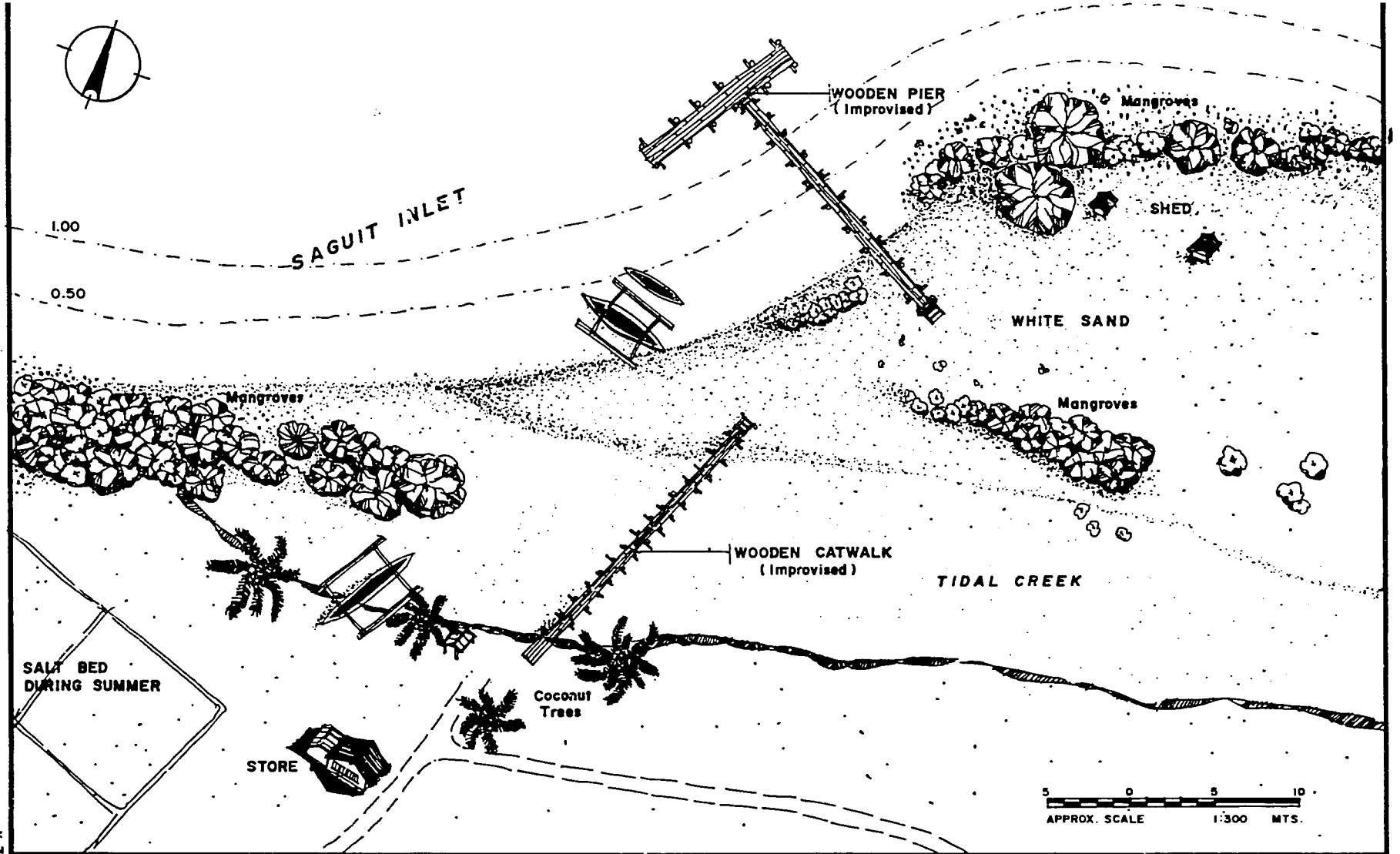
b. Transportation

A description of the transportation network serving the Pantalang Bato area is also provided in Chapter II. Settlers at the port site depend primarily on sea transportation due to the lack of an access road. A steep overgrown cart trail (Plate C-5) currently leads from Pantalang Bato to the road from the principal settlement of Barangay Mangingisda, Sitio Sampaloc, two kilometers to the east. The dirt feeder road continues inland approximately seven kilometers to reach the coastal highway (Figure A-2). This feeder road is reportedly impassable during the rainy season (May to December). In addition to the poor condition of local access and feeder roads, land transportation is further handicapped by the shortage of public utility vehicles serving the area, as well as the comparatively higher cost and time factors of travelling by land.

Local sea travel is primarily to and from Puerto Princesa. There are daily passenger bancas from Barangay Liberty, Puerto Princesa to the improvised pier landing at Sitio Sampaloc (Figure 10-4). Settlers living near Pantalang Bato have to pay more to be brought the additional distance to the Pantalang Bato area by boat.

c. Archaeological and Historical Sites

Based on available references and interviews with officials from the National Museum and local residents, no significant archaeological or cultural resources are known to be present at the subproject site. The lack of reported archaeological resources near the site may reflect limited survey and exploration efforts than an actual absence of such resources. The early history of the Puerto Princesa area and numerous archaeological finds elsewhere in Palawan increase the possibility that archaeological resources may be located in the general subproject area.



RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492 – 0420

EXISTING BARANGAY MANGINGISDA PORT IN SITIO SAMPALOC

FIGURE 10-4

C. IMPACT ASSESSMENTS

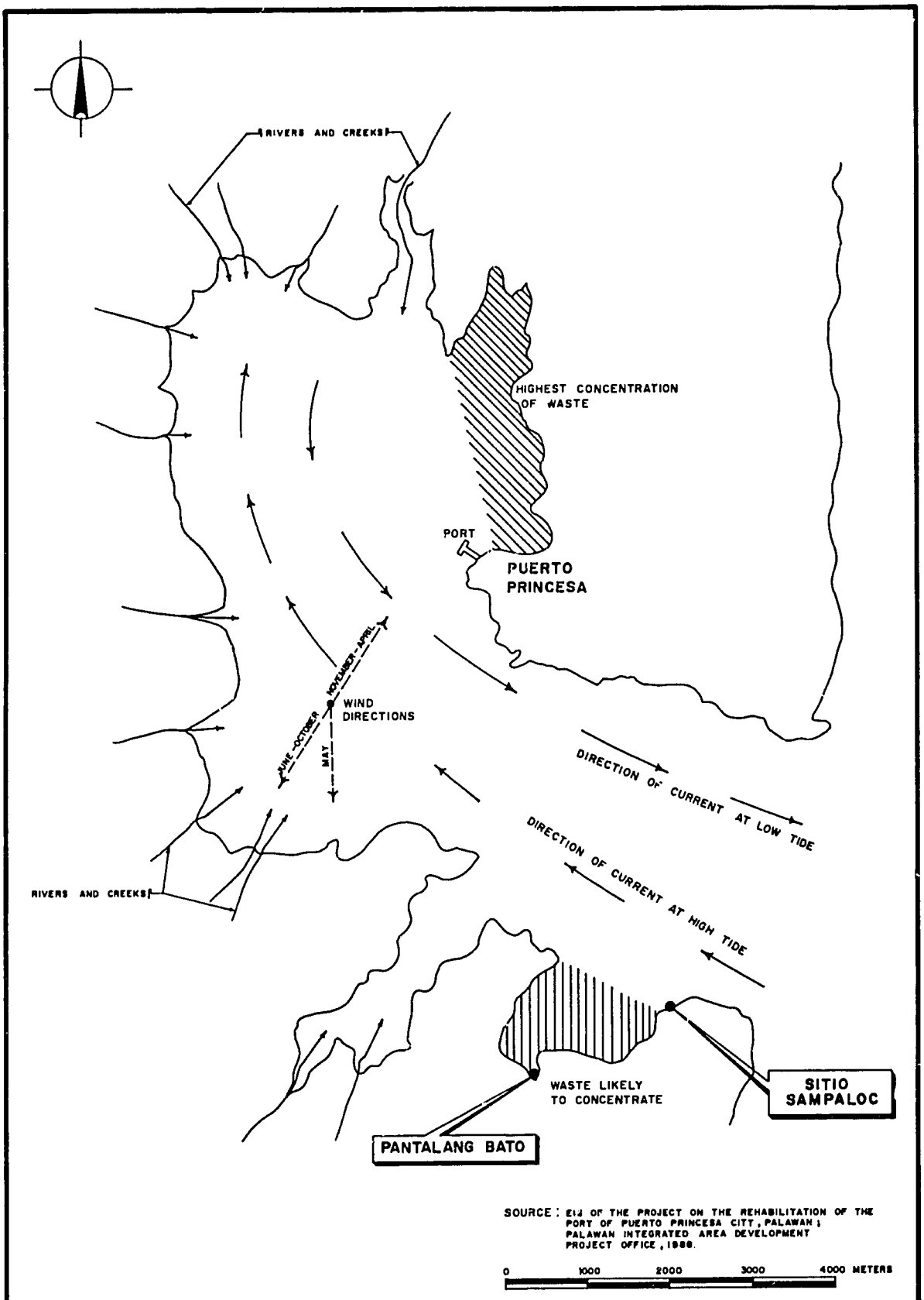
1. PHYSICAL ENVIRONMENT

The improvement of the subproject site involves the replacement and extension of an existing, nonfunctional port facility, and includes the provision of an access road. This improvement is unlikely to have significant direct impacts on the physical environment of the site but may cause secondary impacts. The subproject area of Saguit Inlet does not include any rivers or notable littoral drift patterns that would be obstructed or affected by the constructed causeway and access road. Of greater concern is the apparent lack of circulatory currents within Saguit Inlet to provide adequate rates of flushing for incidental wastes and silt load generated through anticipated port use and settlement of the Pantalang Bato area (Figure 10-5). This will contribute to the development of polluted conditions similar to those at Barangay Liberty in Puerto Princesa City and may eventually necessitate dredging to maintain access.

The Pantalang Bato port facility is defined in Chapter IV as a resettlement port expected to stimulate population and economic growth of the southern Puerto Princesa Bay area. Water quality of the port site is expected to decline with predicted population growth due to the restricted circulation pattern of Saguit Inlet in particular and Puerto Princesa Bay in general.

Identified sources of construction materials are listed in Chapter IV and include several river sources for sand,gravel and armour rock. Limited impact will result from the procurement and transport of the required sand, gravel and rock from the identified sites. The construction contractor is required to restore, to natural grade and condition, all borrow pits, laydown areas, side slopes and other construction affected areas per DPWH Standard Specifications, Volume One, Requirements and Conditions of Contracts. Adherence to these specifications and formulations of special guidelines where warranted is under the auspices of the local DENR (Department of Environment and Natural Resources) and DPWH District Offices.

Construction related impacts on the physical environment could occur as a result of improper disposal of solid waste (both construction debris and refuse from construction crews) and accidental spills of environmentally harmful materials such as petroleum products. It would be mandatory for the construction contractor to develop and implement a waste management plan for the duration of the subproject construction that assures safe and appropriate handling of all waste materials.



SOURCE: EIA OF THE PROJECT ON THE REHABILITATION OF THE PORT OF PUERTO PRINCESA CITY, PALAWAN; PALAWAN INTEGRATED AREA DEVELOPMENT PROJECT OFFICE, 1988.

RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492 - 0420	FIGURE 10-5
VARIOUS PATTERNS OF WATER MOVEMENT WITHIN PUERTO PRINCESA BAY	

2. NATURAL RESOURCES

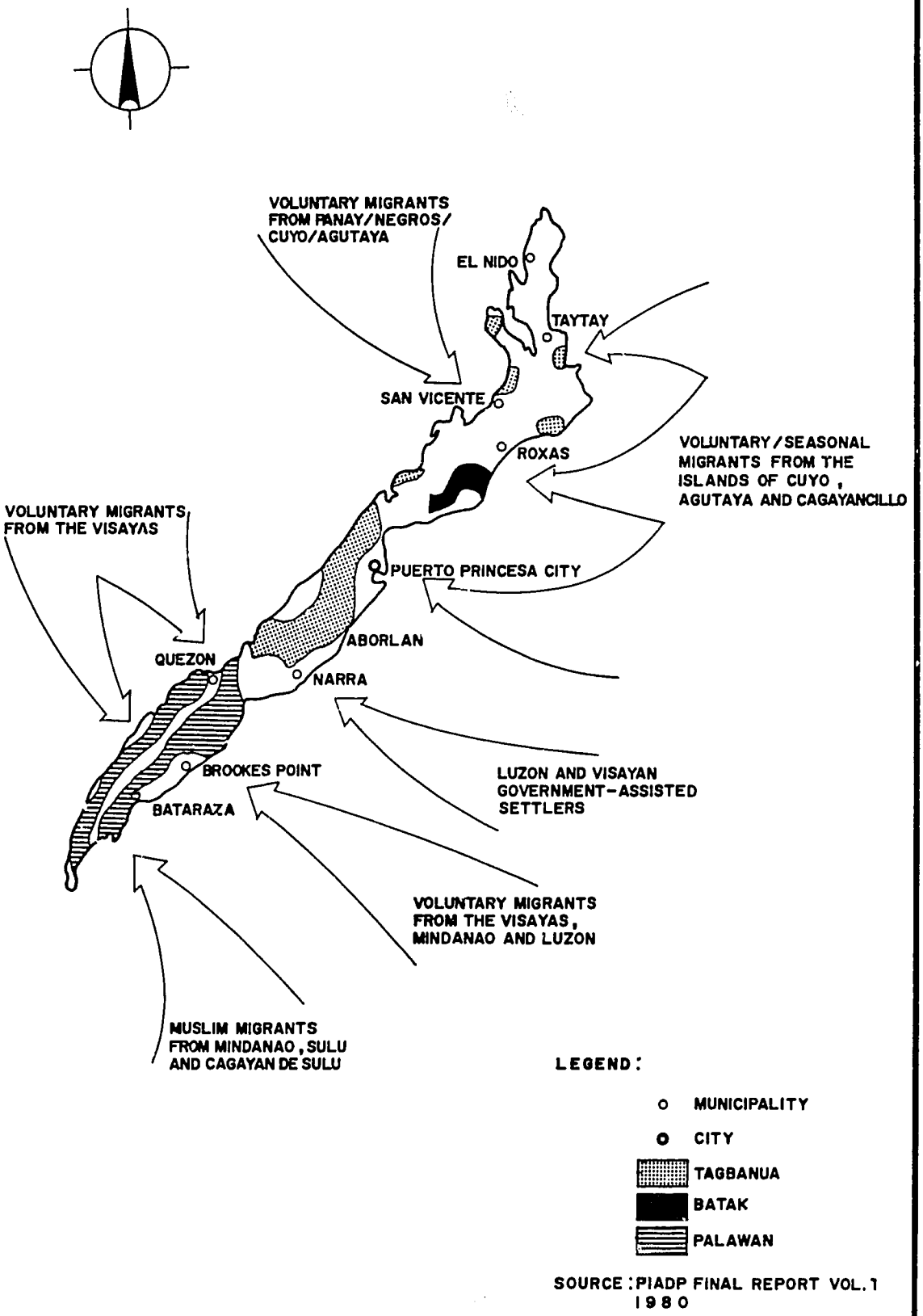
The actual construction of the proposed causeway and access road will have little direct impact on the natural resources of Pantalang Bato. The new causeway will be built on the site of an existing port facility in a clearing previously cut through the shoreline band of fringing mangrove (Plate C-2). The use of living coral, or coral rock, for construction purposes, as was done for the existing causeway, is prohibited under GOP Presidential Decree 1219 (1977), as amended by P.D. 1698 (1980). The alignment of the access road follows an existing cart trail which has been cleared of natural forest cover (Plate C-6).

Secondary impacts of the subproject on natural resources is predicted incidental to the benefits of improved transportation infrastructure. The completed port facility and access road will encourage accelerated development of the Pantalang Bato resettlement area. Palawan is undergoing a period of rapid population growth spurred by government assisted and voluntary immigration (Figures 10-6 and 10-7). The Palawan Integrated Area Development Program (PIADP) estimates the population of Puerto Princesa, which includes the subproject site, will reach 150,000 to 200,000 by the year 2007 from a current population of approximately 60,000. This population growth will transform the "frontier" status of the Pantalang Bato area. The many social and economic benefits attributed to the development of the area presuppose the risk of environmental costs.

The subproject, and the resettlement area it will serve, will improve access to a catchment area that includes the six major ecological zone recognized by the Integrated Environmental Program of PIADP. Best described as continuum of interactive ecosystems, these six major zones are:

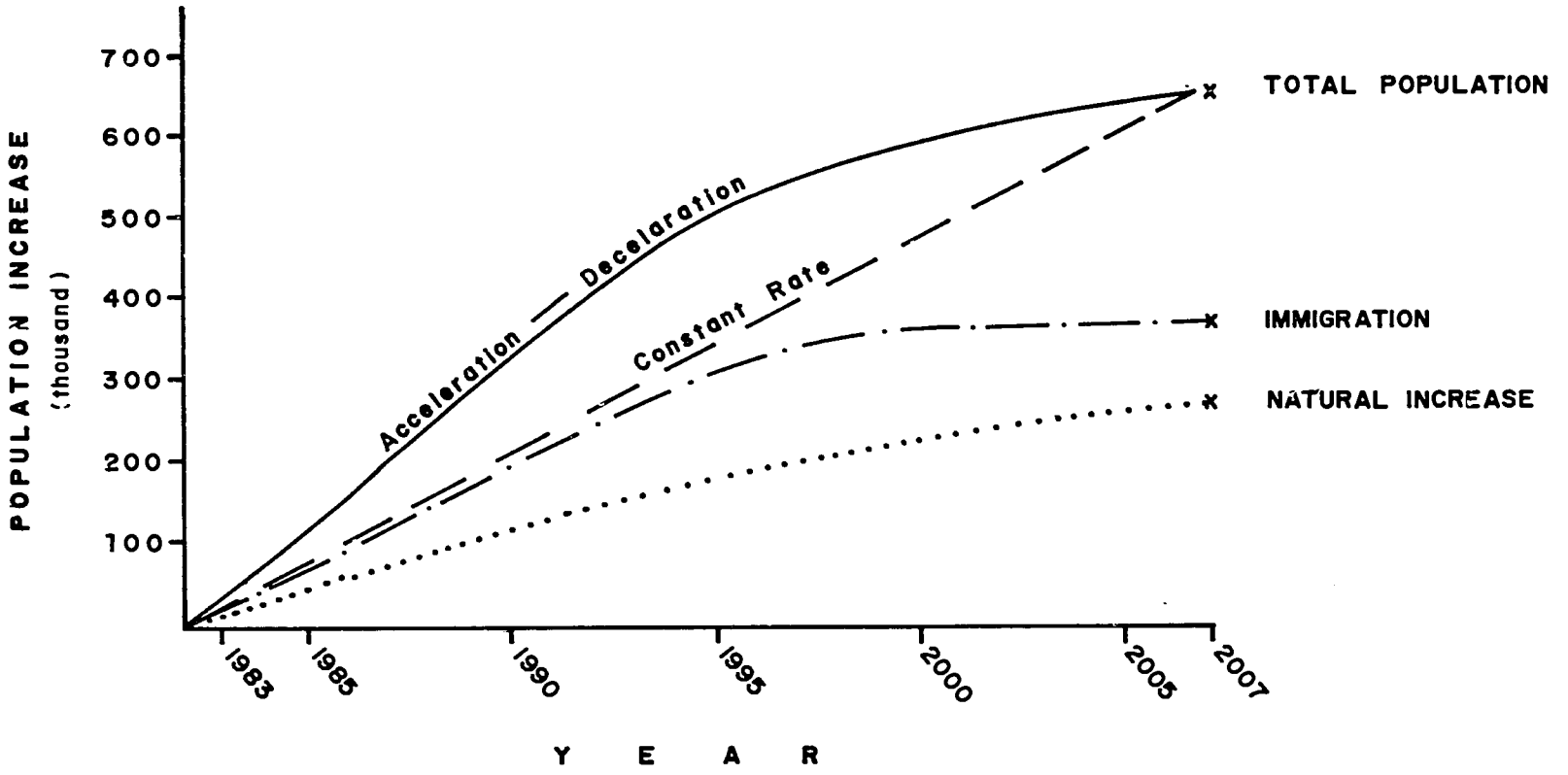
- inshore marine
- mangrove
- lowland
- lowhills
- steep hills
- mountains

Examples of development impact on these zones noted during the field studies include the conversion of a mangrove area to an aquaculture pond (Plate C-3, Photo 8) and rampant burning and clearing of remaining forest cover for shifting agriculture (**kaingin**). Port throughput data (Exhibit 1) reports outbound cargo of 500 sacks per week, 520 tons per year, of charcoal extracted from the forest and mangrove communities of Barangay Mangingisda. The continued clearing and conversion of forest and mangrove areas is anticipated under current settlement patterns and extractive livelihood practices. The rapid destruction of forest and mangrove ecosystems in the area prime factor (attributed by PIADP) contributing to a decline in watershed capacity, water quality and fishery yields in the Puerto Princesa Bay area.



SOURCE: PIADP FINAL REPORT VOL. 1 1980

RURAL INFRASTRUCTURE FUND PROJECT	AID PROJECT NO. 492 - 0420	FIGURE 10 - 6
TRIBAL POPULATION AND MIGRATION DESTINATION		
SCALE:	1:1,000,000	



SOURCE : PIADP FINAL REPORT VOL. 1, 1980

RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492-0420

POSSIBLE PATTERN OF POPULATION INCREASE, MAINLAND PALAWAN, 1983-2007

FIGURE 10 - 7

The PIADP Strategic Environmental Plan incorporates specific programs to address the environmental impact of development within the Palawan framework. These programs are:

- Establish an Environmentally Critical Areas Network (ECAN) for ensuring protection of vulnerable areas
- Implement positive development planning by intensified use of Environmental Impact Assessment (EIA) and provisions for control of development activities harmful to the environment
- Intensify lowland and lowhills agricultural development
- Foster proper use and care of common resources by local communities
- Rehabilitate degraded catchments and restore overused and badly damaged lands

A basic philosophy of the Strategic Environmental Plan is to promote community level consciousness and commitment to sustainable development. Implementation of such a plan and philosophy in the initial stages of community development at Pantalang Bato would mitigate the anticipated impact of the subproject on the forest and mangrove communities.

3. CULTURAL AND SOCIO-ECONOMIC RESOURCES

a. Human Settlements and Livelihood

The described subproject will not directly displace, or relocate any existing structures, inhabitants or livelihood activities. The proposed improvement of the access road to the port site follows an existing alignment and will not displace or disrupt any human settlements.

Socio-economic benefits of the proposed port subproject are described in detail in Chapter VIII and Appendix D. As a result of the completed subproject, the rate of settlement of the relatively isolated Pantalang Bato area will foreseeably increase. The principal existing population center of Barangay Mangingisda, Sitio Sampaloc, is not expected to significantly benefit from proposed improvements due to the distance to the subproject area.

Local interviews suggest that squatters from Puerto Princesa who have migrated to the resettlement area are mostly immigrant families oriented towards fishing livelihoods. They prefer the more open, sandy shoreline of Sitio Sampaloc to the muddy, mangrove-fringed Pantalang Bato site for the traditional practice of beaching and hauling out their outrigger boats, or bancas. Daily beaching of fishing boats at Pantalang Bato will

result in destruction of the mangrove fringe and will increase direct siltation of Saguit Inlet. Farming activities have been limited primarily to shifting agriculture (*kaingin*), which may be attributed to the poor soils of the lower elevation, semi-deciduous forests.

b. Transportation

In view of the currently low level of development in the Pantalang Bato area, the proposed subproject will not substantially improve the transportation network of the primary population center of Barangay Mangingisda, at Sitio Sampaloc. No diversion of traffic is projected for the completed Pantalang Bato Port facility. Residents of Sitio Sampaloc, the only significant residential area on the south shore of Puerto Princesa Bay will continue to utilize the improvided docking facilities (Figure 10-4) in Barangay Mangingisda. The access road, from Pantalang Bato to Sitio Sampaloc, may prove initially to be the most useful component of the subproject with respect to local transportation needs.

c. Archaeological and Historical Sites

The immediate vicinity where the port improvements are proposed has been subjected to human disturbances in the past and is not known to include archaeological sites, historical monuments or culturally significant features.

Based on Philippine Law, the contractor would be required to halt construction if any archaeological properties are encountered in order to allow the National Museum to investigate discoveries and put into effect chance find procedures. DPWH should coordinate with the archaeological authorities to implement national standards of reserve and recovery of finds as appropriate.

D. ALTERNATIVE CONSTRUCTION ACTION

1. NO ACTION ALTERNATIVE

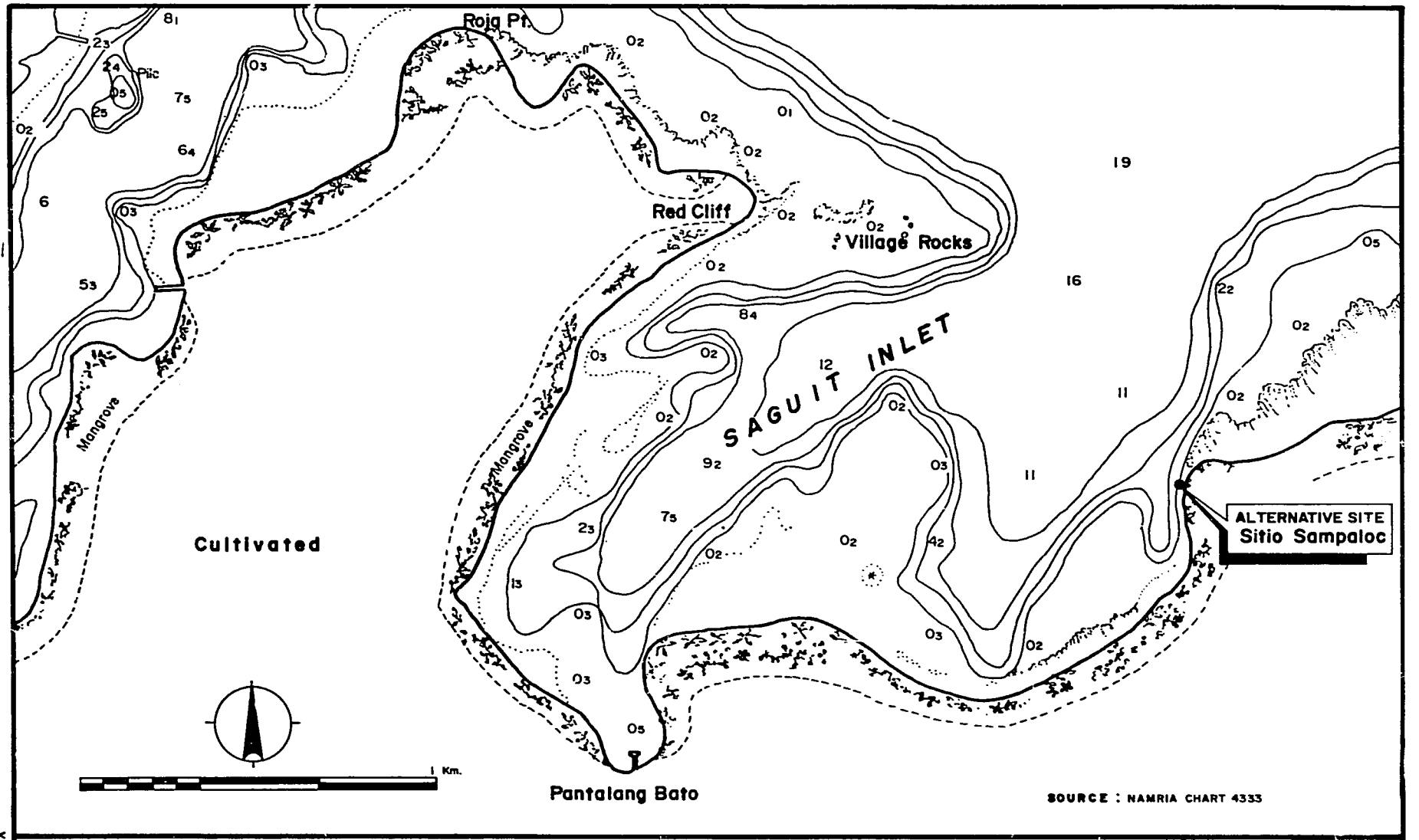
The no action alternative is recommended based primarily on socio-economic and secondary environmental impact considerations. As recommended in the next section on alternative construction action, a preferable port site location, in Sitio Sampaloc, may maximize transportation infrastructure improvements and socio-economic benefits while minimizing incidental environmental costs. Consequently, the no action alternative is considered preferable.

2. ALTERNATIVE CONSTRUCTION ACTION

Interviews with local residents suggest that the preferred port site is in Sitio Sampaloc, the principal community of the Barangay Mangingisda resettlement area. On their own initiative, they have constructed an improvised wooden pier to

temporarily service their shipping needs (Figure 10-4). Reference to the hydrographic charts of the area (Figure 10-8) indicates that the Sitio Sampaloc site provides deeper water access than the gradual slope fronting Pantalang Bato. The location of Sitio Sampaloc on the outer shore of Saguit Inlet is predicted to have higher rates of circulation and flushing, in contrast to the described situation of Pantalang Bato (Figure 10-5). Incidental environmental impacts of the subproject may be reduced by establishing the port facility adjacent to the existing population center and requiring implementation of a policy to protect mangrove forests east and west of the port area.

Advocates of the potential population growth at Pantalang Bato site should consider the potentially serious limitation of poor soil conditions and traditional fishing practices (beach landing and hauling out of bancas). As mentioned in the transportation section, improvement of the access road, from Sitio Sampaloc to the coastal highway, is also recommended since it will benefit all local residents.

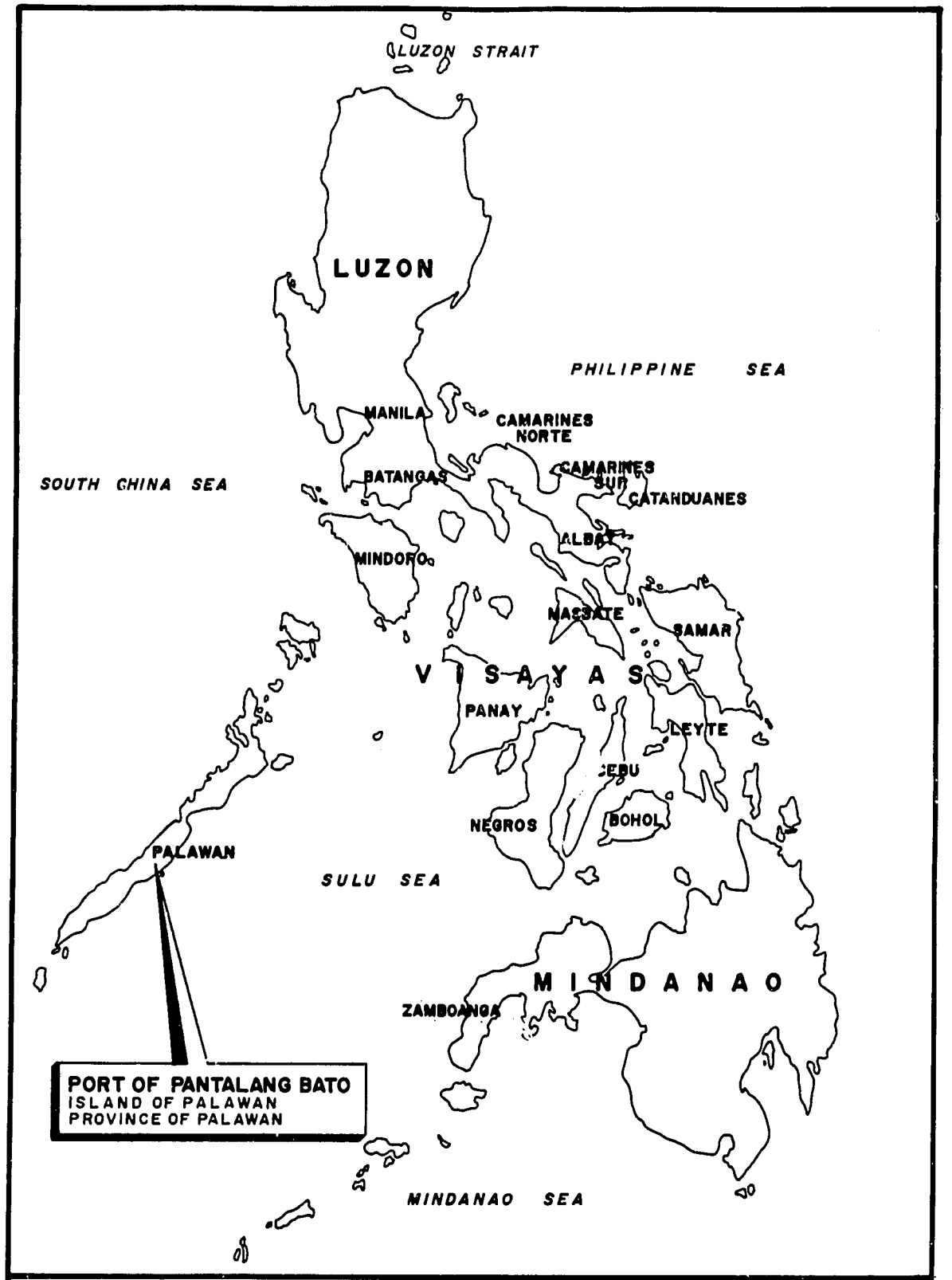


RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492 - 0420

HYDROGRAPHIC DETAIL OF SAGUIT INLET

FIGURE 10-8

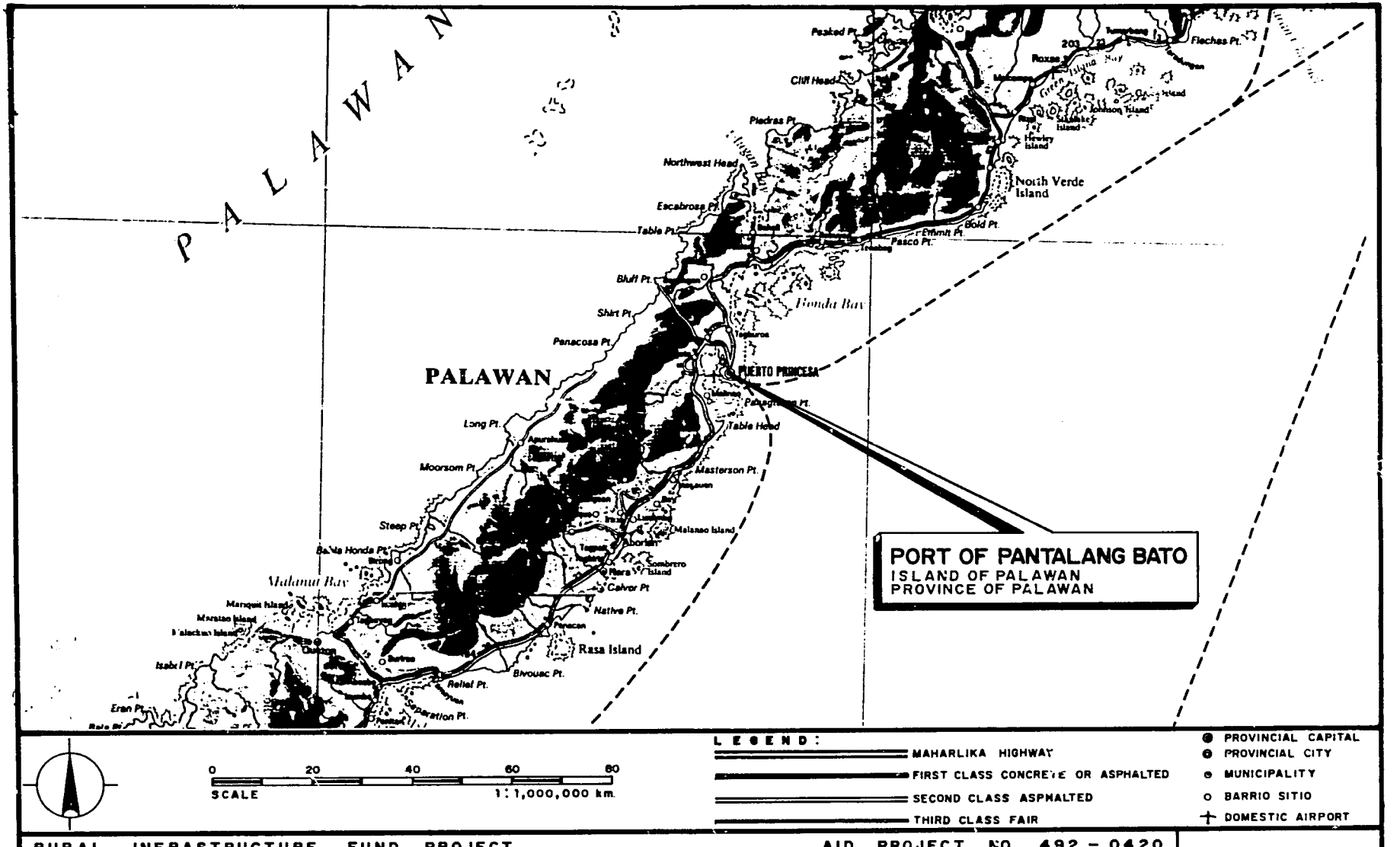
APPENDIX A
FIGURES



RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420

K E Y M A P

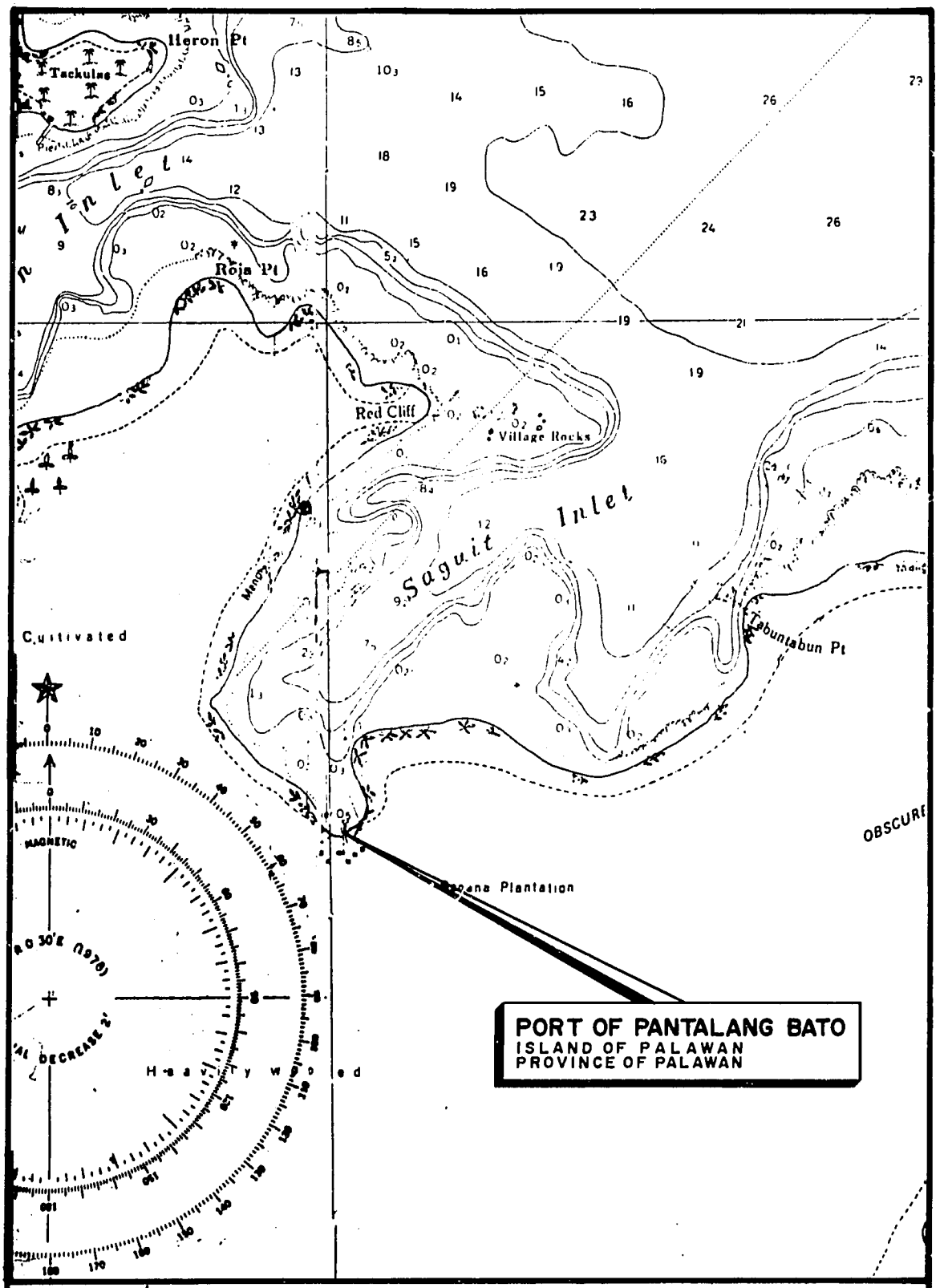
FIGURE A-1



RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492 - 0420

ROAD INFRASTRUCTURE MAP

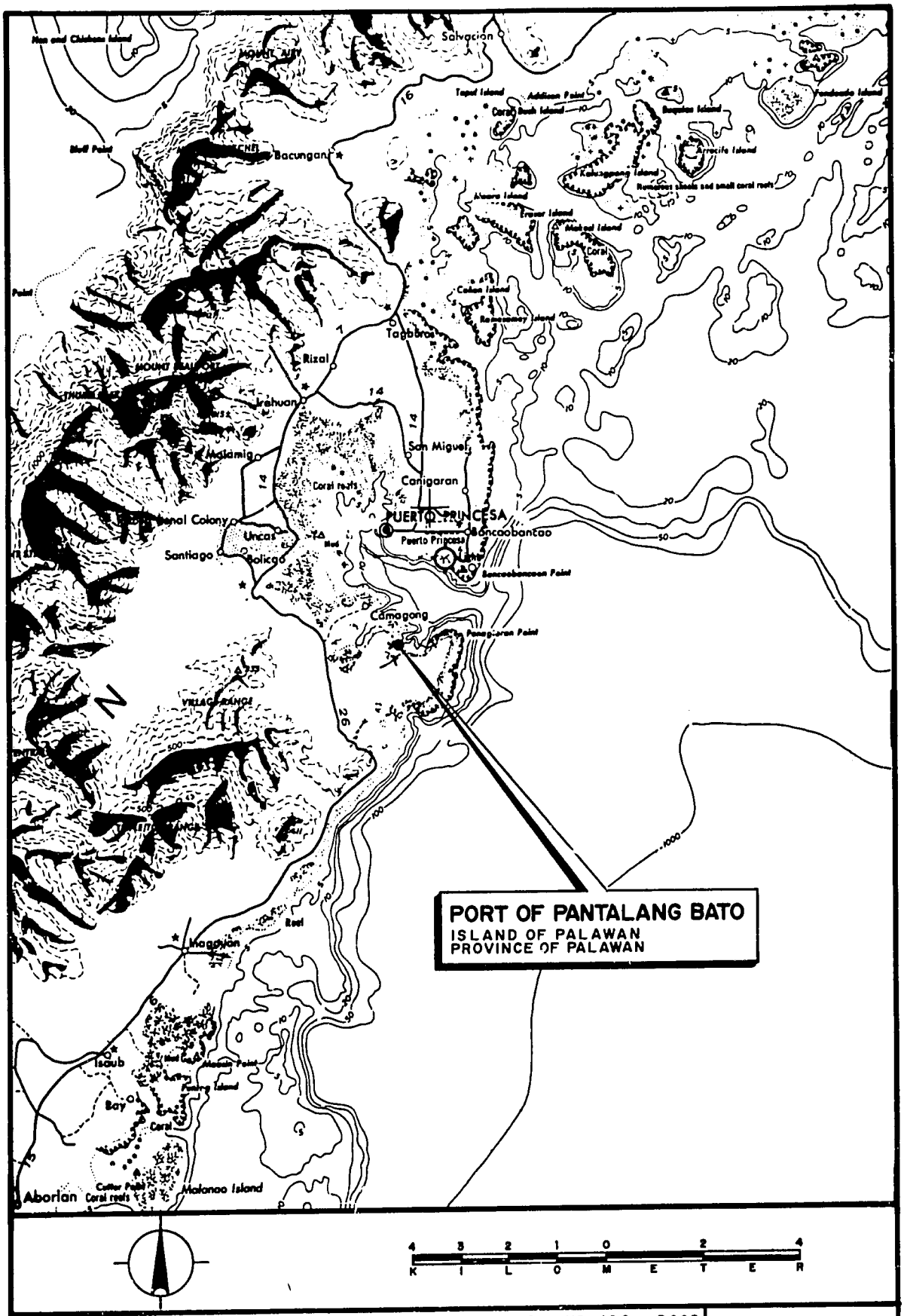
FIGURE A-2



RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420

REGIONAL HYDRO MAP

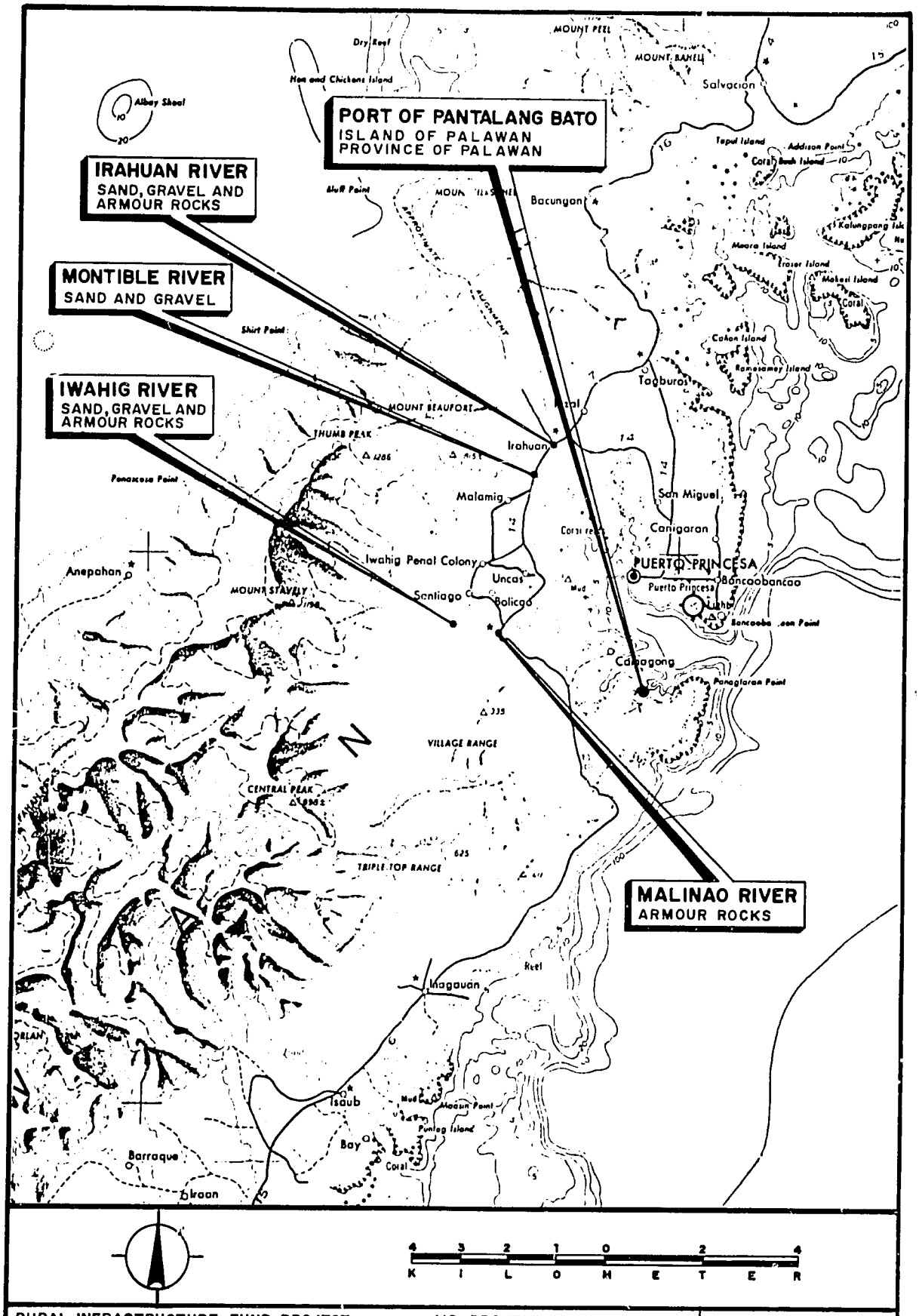
FIGURE A-3



RURAL INFRASTRUCTURE FUND PROJECT | AID PROJECT NO. 492 - 0420

REGIONAL TOPO MAP

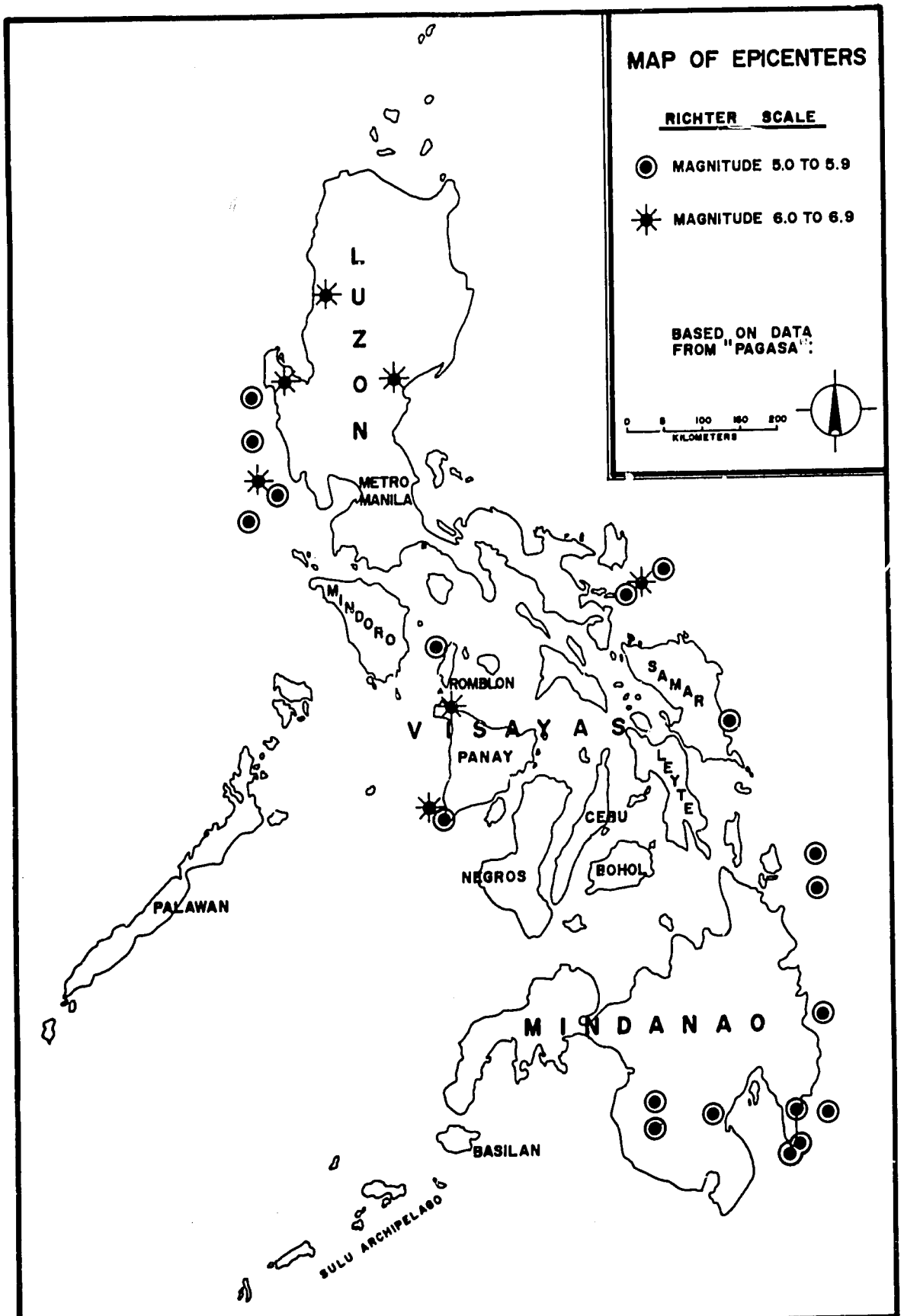
FIGURE A-4



RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492 - 0420

LOCATION OF CONSTRUCTION MATERIALS

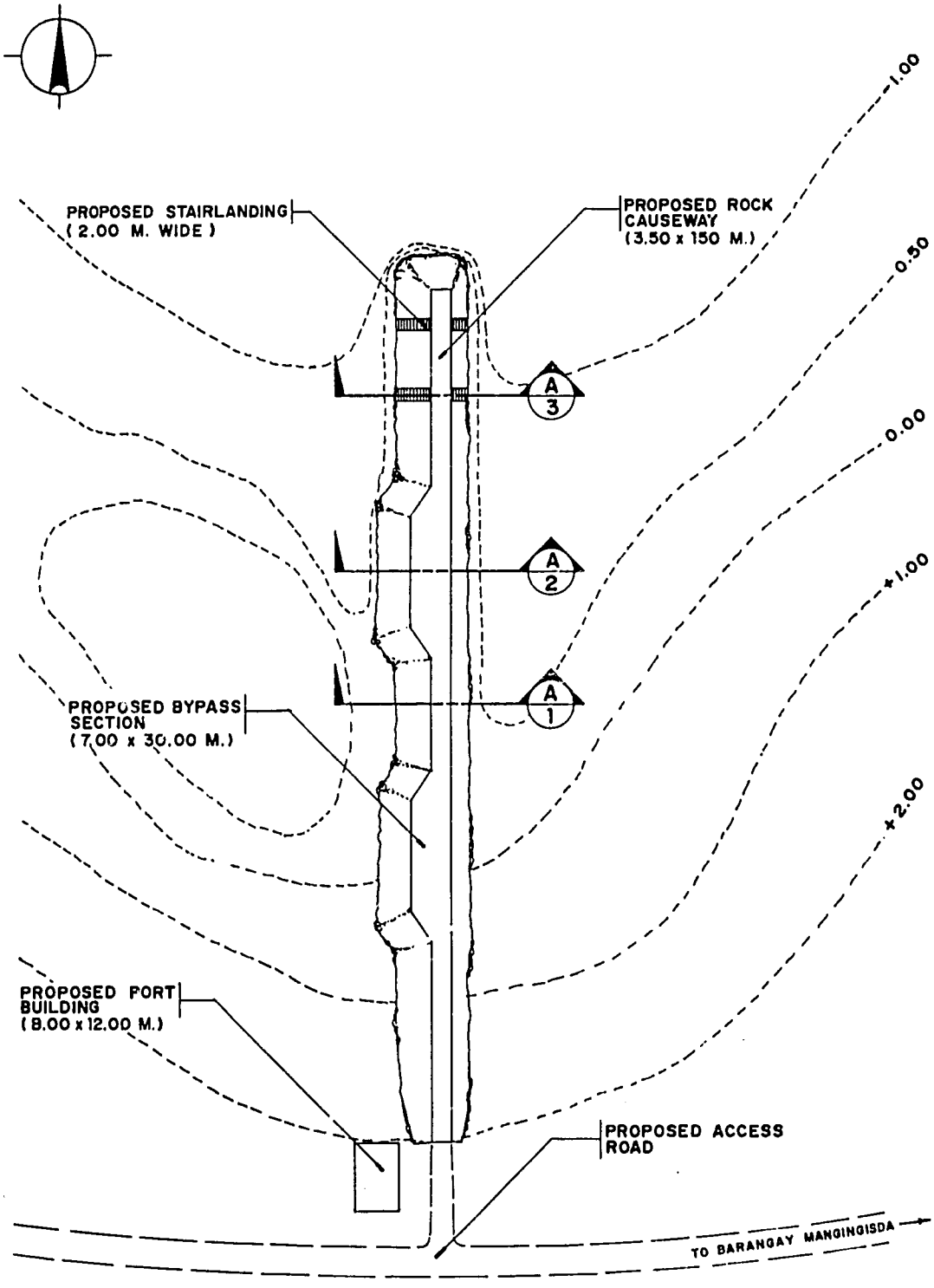
FIGURE A-5



RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT 492 - 0420

SIGNIFICANT PHILIPPINE EARTHQUAKES : 1960 - 1965

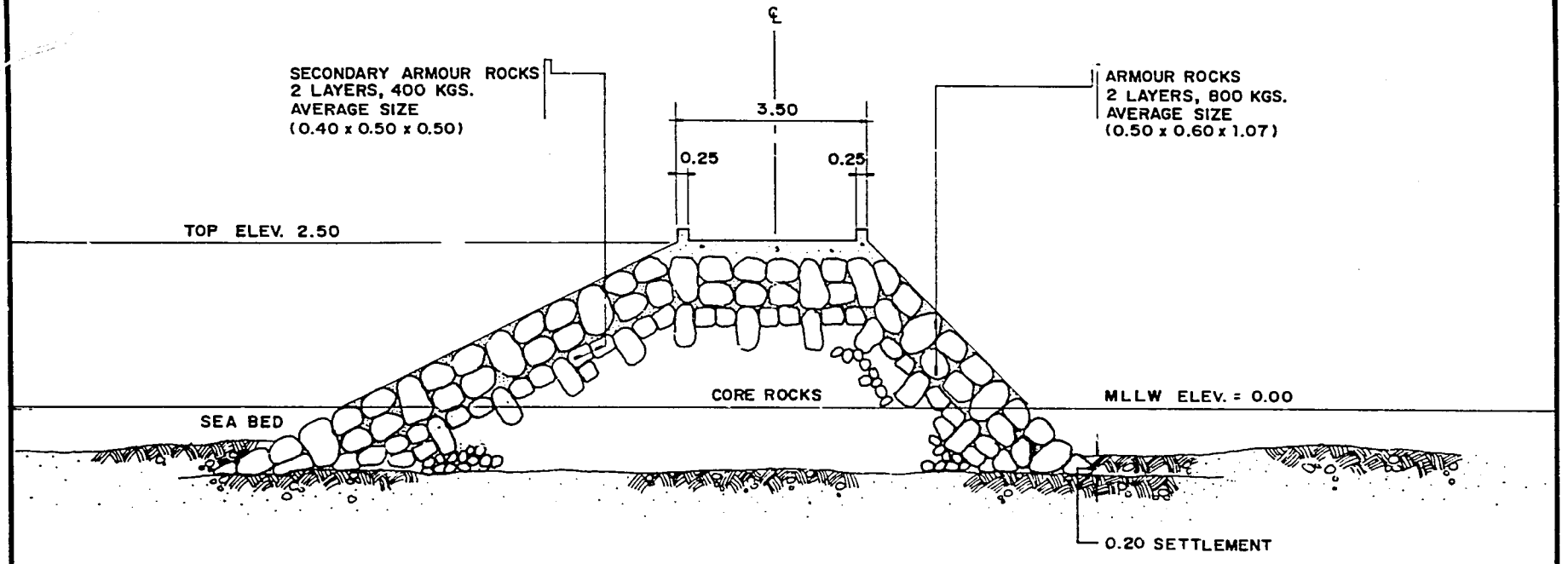
FIGURE A - 6



RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492-0420

DEVELOPMENT PLAN

FIGURE A - 7

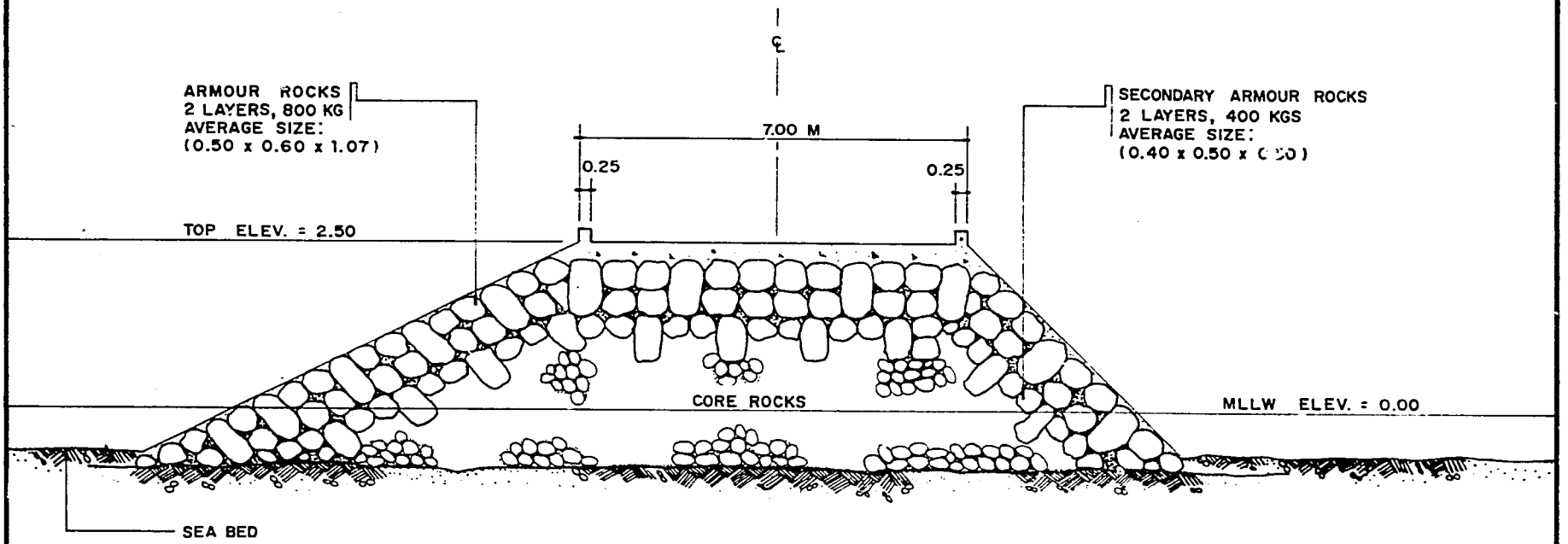


A/1 SECTION
SCALE 1:100 MTS.

RURAL INFRASTRUCTURE FUND PROJECT — PROJECT NO. 492-0420

PROPOSED ROCK CAUSEWAY

FIGURE A-8

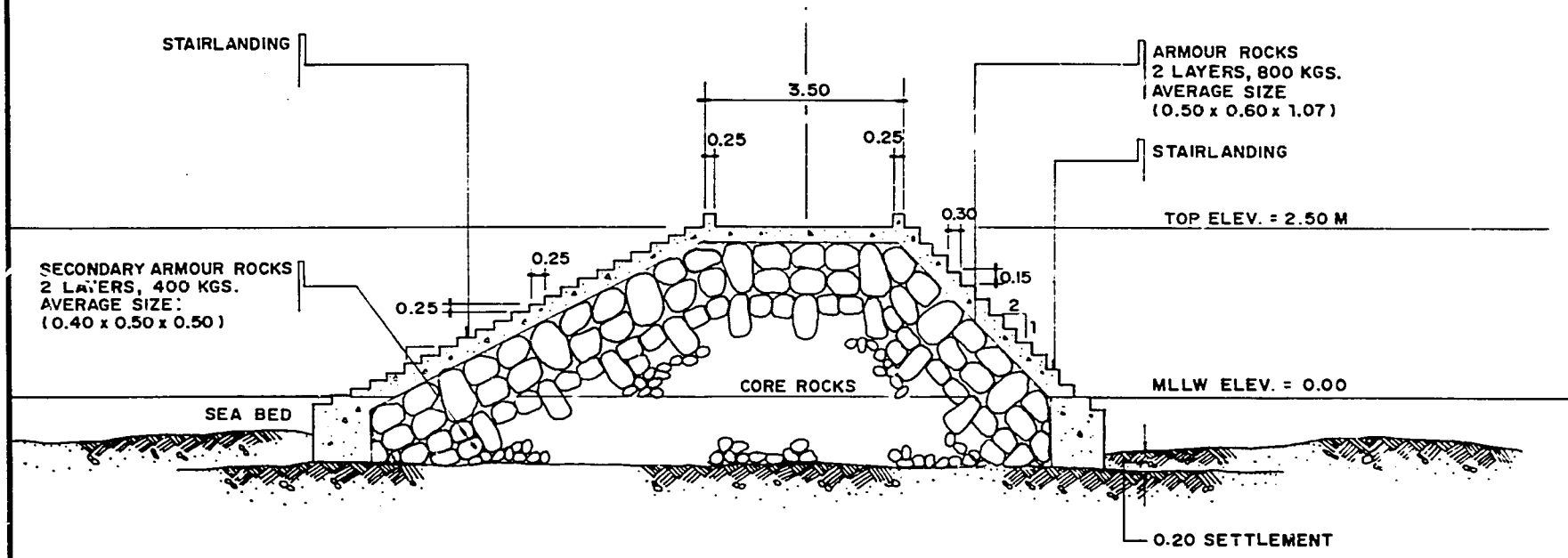


A/2 **SECTION**
SCALE 1:100 MTS.

RURAL INFRASTRUCTURE FUND PROJECT — PROJECT NO. 492 - 0420

PROPOSED BYPASS SECTION

FIGURE A-9

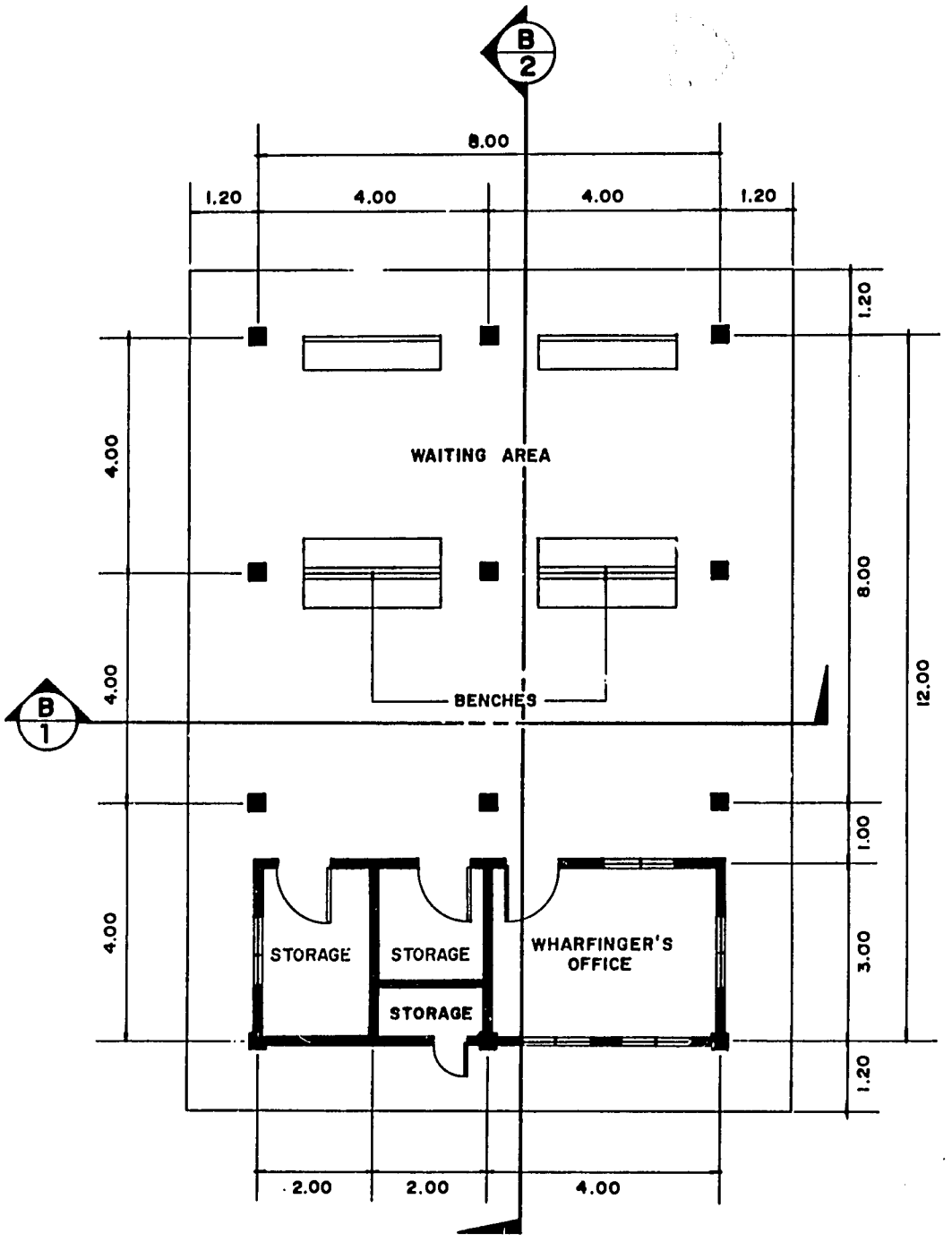


A/3 SECTION
SCALE 1:100 MTS.

RURAL INFRASTRUCTURE FUND PROJECT PROJECT NO. 492-0420

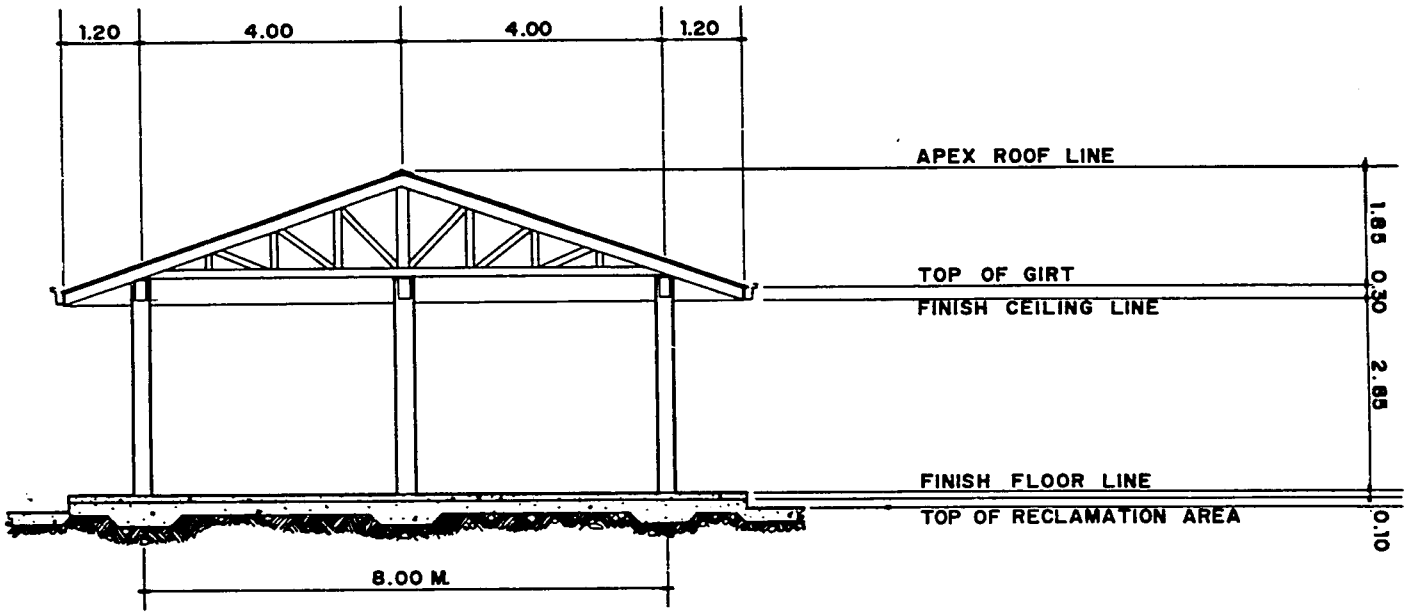
PROPOSED STAIRLANDING

FIGURE A-10



FLOOR PLAN
SCALE 1:100 M

RURAL INFRASTRUCTURE FUND PROJECT	AID PROJECT NO. 492 - 0420	FIGURE A - 11
PORT BUILDING PLAN		



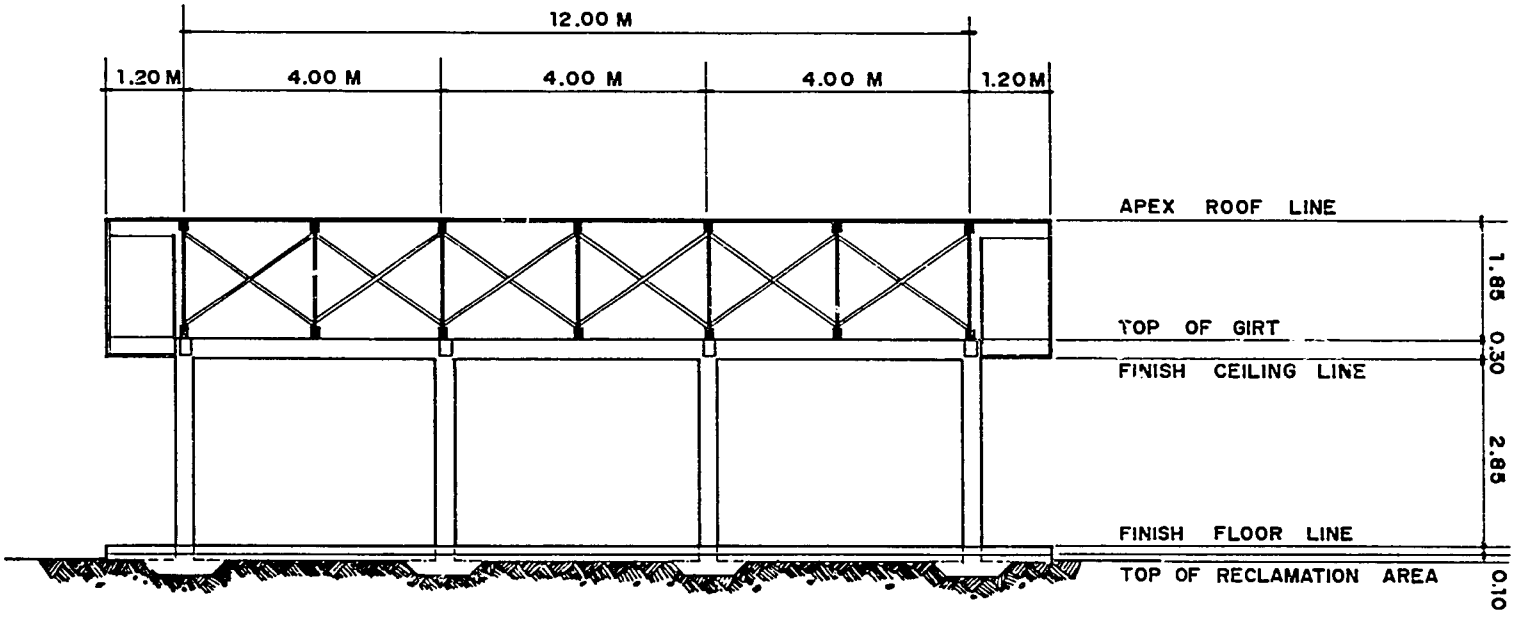
B/1 SECTION
SCALE 1:100 M

RURAL INFRASTRUCTURE FUND PROJECT

AID PROJECT NO. 492 - 0420

PORT BUILDING SECTION

FIGURE A-12



B/2 SECTION
SCALE 1:100 M

RURAL INFRASTRUCTURE FUND PROJECT — AID PROJECT NO. 492 - 0420

PORT BUILDING SECTION

FIGURE A-13

APPENDIX B
EXHIBITS

EXHIBIT I
PORT SHIPPING STATISTICS

PORT : PANTALANG BATO
PROVINCE : PALAWAN
ISLAND : PALAWAN
REGION : IV

DATE : JUNE 1990
REPORTED BY: R.T. RIGENO JR.

CARGO: (If one sheet is insufficient, use second sheet attached)

COMMODITY	INBOUND/ OUTBOUND (Check one) In	Out	TONS PER YEAR	TYPE OF VESSEL	TONS PER VESSEL	PESOS VALUES per/kg	ORIGIN or DESTINATION	TARIFF or FARE
FISH/MARINE PRODUCTS	✓		80				Marginal	
VEGETABLES		✓	1,428				Barangay Liberty	₱0.08/kg
RICE	✓	✓	out - 1,500 in - 200				Liberty	₱0.10/kg
FUEL								
CEMENT								
COPRA								
BOTTLED CARGO								
CORN		✓	2,240				Liberty	₱0.05/kg
ICE								
SUGAR								
ANIMAL FEED								
LUMBER								
MEAT								
SALT								
CHARCOAL		✓	520				Liberty	₱0.125/kg
OTHERS	✓		1,800				Liberty	

PASSENGERS PER DAY		VESSELS/ WEEK	DAY	PASSENGERS PER YEAR	TYPE OF YEAR	PASSENGERS PER VESSEL	FARE	DEST.
100	IN		6	30,000	300 Days	16	₱5.00	Pantalang bato
100	OUT		6	30,000	A year	16	₱5.00	Brgy. Liberty

VESSELS:

TYPE OF VESSEL	NO. OF VESSELS BOATS PER WEEK or DAY	MAX. TONNAGE	AVE. LENGTH (m)	MAX. DRAFT (m)	ORIGIN OF VESSEL	TRAVEL TIME	DISTANCE (km)	FUEL CONSP PER HOUR
Psgr/cargo vessel	6 boats daily	(see port	operation	inventory)	Pantalang Bato	20 Min	8 km	3 Lit/hr.

EXHIBIT 2

SOCIO - ECONOMIC DATA

MUNICIPALITY OF : PUERTO PRINCESA DATE : JUNE 1990

REPORTED BY: R.T. RIGENO JR.

ANNUAL PRODUCTION

NAME OF PRODUCTS	YEAR	YEAR
Agriculture	BRGY. MANGIGISDA	
rice (Palay)	3,000 MT cavans/year	cavans/year
copras	sacks/year	sacks/year
corn	2,400 MT cavans/year	cavans/year
Vegetable	184 MT kilos/year	kilos/year
Fishing		
fish marine catch	M.T./year	M.T./year
fish cultures	M.T./year	M.T./year
shell fish	M.T./year	M.T./year
Cattle & Poultry Raising		
cow	heads/year	heads/year
carabao	heads/year	heads/year
hogs	heads/year	heads/year
goat	heads/year	heads/year
chickens	heads/year	heads/year
Local Products		
Charcoal		

LAND TRAFFIC DATA (1990)

FROM: Puerto Princesa City TO: Barangay Mangingisda

VEHICLE			PASSENGER/DAY		CARGO (KILOS/DAY)	
TYPE	NO.	NO. OF TRIPS	INCOMING	OUTGOING	INCOMING	OUTGOING
Jeepney	3	2-3 trips/day	30/trip	30/trip	2,000 kg/trip	2,000 kg/trip

EXHIBIT 2
(CONTINUED)

SOCIO - ECONOMIC DATA

MUNICIPALITY OF : PUERTO PRINCESA CITY DATE : JUNE 1990

REPORTED BY: R.T. RIGENO JR.

LOCATION OF PORT SITE	DISTANCE TO NEAREST ROAD/TOWN/ BARRIO	AREA OF INFLUENCE	HINTERLAND TOPOGRAPHY
a. Pantalang Bato Port is located opposite Puerto Princesa city across the bay and so could be reach thru 40 km. road skirting the coast or by motor banca crossing the bay as its shortest sea route	The port is located 40 kms. from Puerto Princesa city, 30 kms. of which is along the asphalt-paved National highway to Brooks Point and the rest along a feeder road from the highway to the barangay.	Port area of influence includes the barangay Mangingisda, its neighboring brngys. of Lusviminda, Sta. Lucia, Penal Iwahig Colony and Puerto Princesa.	The terrain is generally flat and slightly rolling in some areas becoming hilly in areas near the mountain.

DEMOGRAPHY: PRESENT POPULATION BARRIO: barangay Mangingisda POPULATION: 1,600

PROVINCE: Palawan 503,665-1990 (Projection)

COMMUNICATION	RADIO	TELEPHONE	TELEX	FAX	TELEGRAM	OTHERS
Available? (Yes or No)	yes					

List other development projects in agriculture, fishing, health, etc. within 20 km of Port.

deep well construction

What is the purpose of the port projects? What will be the role of the port?

Considering Barangay Mangingisda as a newly created barangay this was coupled by the scarcity of social amenities, transport facilities making the barangay one of the depress in the province however its port development would be vital economic factor that will enhanced economic development complemented by the provision of social amenities, it is expected that developments and other economic benefits would accrue. Consequently this is the role of the port.

If the port is built or improved, from where will traffic be diverted?

Eventhough Pantalang Bato port is built, there is no likely diverted traffic that will add.

NAMES OF LOCAL OFFICIALS:

Edmar Valencia - Asst. City Engr. (National)
Rodolfo Aguire - Asst. City Engr. (Local)
Angel Padon - City Planning and Dev. Coordinator
Mauro Ordillo - City Planning and Dev. Officer
Vicente Licerio - Project Development Officer

EXHIBIT 3

NAME OF PORT: Pantalang Bato					PORT OPERATION INVENTORY									ISLAND: Palawan		PROVINCE: Palawan	
TYPE OF VESSELS	NO. OF VESSELS	VESSEL STATISTICS			CONSUMPTION				ENGINE TYPE	ORIGIN	DESTINATION	CARGOES / TON			AVERAGE NO. OF PASS. / YEAR	
		MAX. TONNAGE	LENGHT	DRAFT	LITERS / HR.	HRS. / TRIP	NO. OF TRIP/BOAT	DIST. / TRIP				COMMODITY	INCOMING	OUTGOING	IN	OUT
Pump/Cargo vessel	6	2 tons	L=12 ft. W=3 ft.		3 Lit./Hr.	20 Min	Daily	8 Km	16 HP 1 Engine	Puerto Princesa	Pantalang Boto	(See port	shipping	statistics)	60,000	x2
Fishing Boat	3	2 tons			3 Lit/Hr.				16 HP	Brgy. Mangigisda						

EXHIBIT 4

POPULATION BY PROVINCE

Socio-Economic Data by Province for Use in Forecasting Travel Demand.

This file contains, for each province, the base year (1990) and forecasted (for years 2000 and 2010) population and income per capita.

This spreadsheet uses these variables to calculate average annual traffic growth rates by province for the normal growth of passenger traffic.

Population by Province, Base Year (1990) and Forecasts for Years 2000 and 2010.

		POPULATION			AVERAGE ANNUAL GROWTH RATE	
REGION	PROVINCE	1990	2000	2010	1990 to 2000	2000 to 2012
I	Abra	190,634	223,919	252,506	1.62%	1.62%
I	Benguet	477,706	617,374	696,193	2.60%	2.60%
I	Ilocos Norte	455,395	517,582	583,661	1.29%	1.29%
I	Ilocos Sur	526,273	614,474	692,923	1.56%	1.56%
I	La Union	562,603	677,880	764,424	1.88%	1.88%
I	Mountain Province	126,455	151,647	171,007	1.83%	1.83%
I	Pangasinan	1,952,865	2,270,109	2,559,930	1.52%	1.52%
II	Batanes	14,748	17,510	19,746	1.73%	1.73%
II	Cagayan	891,370	1,077,806	1,215,408	1.92%	1.92%
II	Ifugao	138,827	167,787	189,208	1.91%	1.91%
II	Isabela	1,117,117	1,380,361	1,556,589	2.14%	2.14%
II	Kalinga Apayao	242,970	305,946	345,005	2.33%	2.33%
II	Nueva Vizcaya	322,034	410,811	463,259	2.46%	2.46%
II	Quirino	117,629	157,745	177,884	2.98%	2.98%
III	Bataan	479,034	659,363	743,543	3.25%	3.25%
III	Bulacan	1,395,274	1,695,899	1,912,411	1.97%	1.97%
III	Nueva Ecija	1,354,853	1,641,089	1,850,604	1.94%	1.94%
III	Pampanga	1,483,572	1,808,985	2,039,935	2.00%	2.00%
III	Tarlac	860,292	1,031,338	1,163,007	1.83%	1.83%
III	Zambales	568,593	692,201	780,573	1.99%	1.99%
IV-A	Aurora	138,273	172,004	193,963	2.21%	2.21%
IV-A	Batangas	1,466,451	1,767,352	1,992,987	1.88%	1.88%
IV-A	Cavite	1,076,137	1,399,737	1,578,439	2.66%	2.66%
IV-A	Laguna	1,260,610	1,551,619	1,749,711	2.10%	2.10%
IV-A	Marinduque	218,707	264,552	298,327	1.92%	1.92%
IV-A	Rizal	782,340	1,020,032	1,150,258	2.69%	2.69%
IV-B	Occidental Mindoro	315,536	419,919	473,529	2.90%	2.90%
IV-B	Oriental Mindoro	606,444	782,611	882,526	2.58%	2.58%
IV-B	Palawan	511,706	664,917	749,806	2.65%	2.65%
IV-B	Quezon	1,491,434	1,864,838	2,102,919	2.26%	2.26%
IV-B	Romblon	236,994	280,440	316,243	1.70%	1.70%
V	Albay	1,017,294	1,236,032	1,393,835	1.97%	1.97%
V	Camarines Norte	397,583	496,280	559,639	2.24%	2.24%
V	Camarines Sur	1,360,206	1,620,670	1,827,578	1.77%	1.77%
V	Catanduanes	225,575	282,818	318,925	2.29%	2.29%
V	Masbate	745,100	917,834	1,035,012	2.11%	2.11%
V	Sorsogon	642,377	801,182	903,467	2.23%	2.23%

EXHIBIT 4

(CONTINUED)

REGION	PROVINCE	POPULATION 1990	POPULATION 2000	POPULATION 2010	AVERAGE ANNUAL GROWTH RATE 1990 to 2000	AVERAGE ANNUAL GROWTH RATE 2000 to 2012
VI	Aklan	402,849	481,163	542,593	1.79%	1.79%
VI	Antique	434,893	525,447	592,530	1.91%	1.91%
VI	Capiz	627,494	766,587	864,455	2.02%	2.02%
VI	Iloilo	1,787,316	2,129,918	2,401,841	1.77%	1.77%
VI	Negros Occidental	2,419,758	2,896,811	3,266,642	1.82%	1.82%
VII	Bohol	893,359	967,868	1,091,434	0.80%	0.80%
VII	Cebu	2,655,417	3,229,110	3,641,365	1.98%	1.98%
VII	Negros Oriental	986,764	1,152,772	1,299,945	1.57%	1.57%
VII	Siguijor	80,498	90,847	102,445	1.22%	1.22%
VIII	Leyte	1,542,354	1,783,671	2,011,390	1.46%	1.46%
VIII	Southern Leyte	356,458	419,255	472,781	1.64%	1.64%
VIII	Eastern Samar	405,427	505,846	570,426	2.24%	2.24%
VIII	Northern Samar	465,235	567,231	639,648	2.00%	2.00%
VIII	Samar	590,960	696,994	785,978	1.66%	1.66%
IX-A	Basilan	252,894	304,018	342,832	1.86%	1.86%
IX-A	Sulu	437,994	504,300	568,683	1.42%	1.42%
IX-A	Tawi-Tawi	250,984	304,187	343,022	1.94%	1.94%
IX-B	Zamboanga del Norte	741,645	902,260	1,017,450	1.98%	1.98%
IX-B	Zamboanga del Sur	1,511,286	1,859,045	2,096,386	2.09%	2.09%
X	Agusan del Norte	452,794	542,951	612,269	1.83%	1.83%
X	Agusan del Sur	369,390	487,739	550,008	2.82%	2.82%
X	Bukidnon	826,513	1,033,392	1,165,324	2.26%	2.26%
X	Camiguin	67,356	78,157	88,135	1.50%	1.50%
X	Misamis Occidental	469,098	548,476	618,499	1.58%	1.58%
X	Misamis Oriental	947,529	1,238,810	1,396,966	2.72%	2.72%
X	Sorigao del Norte	482,934	610,398	688,326	2.37%	2.37%
XI	Davao	959,373	1,209,064	1,363,423	2.34%	2.34%
XI	Davao del Sur	1,465,011	1,808,583	2,039,481	2.13%	2.13%
XI	Davao Oriental	422,778	507,920	572,766	1.85%	1.85%
XI	South Cotabato	989,440	1,217,472	1,372,904	2.10%	2.10%
XI	Surigao del Sur	497,094	620,771	700,024	2.25%	2.25%
XII	Lanao del Norte	570,714	692,697	781,132	1.96%	1.96%
XII	Lanao del Sur	525,437	655,021	738,646	2.23%	2.23%
XII	Maguindanao	684,360	842,815	950,415	2.10%	2.10%
XII	North Cotabato	738,625	925,411	1,043,557	2.28%	2.28%
XII	Sultan Kudarat	423,122	559,363	630,776	2.83%	2.83%
Total		53,508,155	65,329,031	73,671,484	2.02%	2.02%

Source: NEDA

EXHIBIT 5

PER CAPITA INCOME GROWTH RATES

REGION	PROVINCE	AVERAGE ANNUAL GROWTH RATE 1990 to 2000	AVERAGE ANNUAL GROWTH RATE 2000 to 2012
I	Abra	5.25%	5.75%
I	Benguet	5.25%	5.75%
I	Ilocos Norte	5.25%	5.75%
I	Ilocos Sur	5.25%	5.75%
I	La Union	5.25%	5.75%
I	Mountain Province	5.25%	5.75%
I	Pangasinan	5.25%	5.75%
II	Batanes	5.15%	5.65%
II	Cagayan	5.15%	5.65%
II	Ifugao	5.15%	5.65%
II	Isabela	5.15%	5.65%
II	Kalinga Apayao	5.15%	5.65%
II	Nueva Vizcaya	5.15%	5.65%
II	Quirino	5.15%	5.65%
III	Bataan	4.90%	5.35%
III	Bulacan	4.90%	5.35%
III	Nueva Ecija	4.90%	5.35%
III	Pampanga	4.90%	5.35%
III	Tarlac	4.90%	5.35%
III	Zambales	4.90%	5.35%
IV-A	Aurora	4.50%	5.05%
IV-A	Batangas	4.50%	5.05%
IV-A	Cavite	4.50%	5.05%
IV-A	Laguna	4.50%	5.05%
IV-A	Marinduque	4.50%	5.05%
IV-A	Rizal	4.50%	5.05%
IV-B	Occidental Mindoro	4.50%	5.05%
IV-B	Oriental Mindoro	4.50%	5.05%
IV-B	Palawan	4.50%	5.05%
IV-B	Quezon	4.50%	5.05%
IV-B	Romblon	4.50%	5.05%
V	Albay	5.00%	5.00%
V	Camarines Norte	5.00%	5.00%
V	Camarines Sur	5.00%	5.00%
V	Catanduanes	5.00%	5.00%
V	Masbate	5.00%	5.00%
V	Sorsogon	5.00%	5.00%
VI	Aklan	5.05%	5.35%
VI	Antique	5.05%	5.35%
VI	Capiz	5.05%	5.35%
VI	Iloilo	5.05%	5.35%
VI	Negros Occidental	5.05%	5.35%
VII	Bohol	5.00%	5.35%
VII	Cebu	5.00%	5.35%
VII	Negros Oriental	5.00%	5.35%
VII	Siguijor	5.00%	5.35%
VIII	Leyte	5.65%	5.95%
VIII	Southern Leyte	5.65%	5.95%
VIII	Eastern Samar	5.65%	5.95%
VIII	Northern Samar	5.65%	5.95%
VIII	Samar	5.65%	5.95%
IX-A	Basilan	5.25%	5.65%
IX-A	Sulu	5.25%	5.65%
IX-A	Tawi-Tawi	5.25%	5.65%
IX-B	Zamboanga del Norte	5.25%	5.65%
IX-B	Zamboanga del Sur	5.25%	5.65%
X	Agusan del Norte	4.90%	5.35%
X	Agusan del Sur	4.90%	5.35%
X	Bukidnon	4.90%	5.35%
X	Camiguin	4.90%	5.35%
X	Misamis Occidental	4.90%	5.35%
X	Misamis Oriental	4.90%	5.35%
X	Sorigao del Norte	4.90%	5.35%
XI	Davao	4.60%	5.20%
XI	Davao del Sur	4.60%	5.20%
XI	Davao Oriental	4.60%	5.20%
XI	South Cotabato	4.60%	5.20%
XI	Surigao del Sur	4.60%	5.20%
XII	Lanao del Norte	4.70%	5.15%
XII	Lanao del sur	4.70%	5.15%
XII	Maguindanao	4.70%	5.15%
XII	North Cotabato	4.70%	5.15%
XII	Sultan Kudarat	4.70%	5.15%

Source: Family Income & Expenditures Survey 1985 (FBS), NEDA

EXHIBIT 6

GROWTH RATE FOR PASSENGER TRAVEL DEMAND, BY PROVINCE

T = P + I * E where:

T is annual growth rate for passenger travel demand
P is annual growth rate of population in province
I is annual growth rate of income per capita in province
E is elasticity of passenger travel demand to change in income per capita:

private vehicle	1.40
jeepney (banca)	0.50
bus	0.80

		AVERAGE ANNUAL GROWTH RATE					
		1990 to 2000			2000 to 2012		
REGION	PROVINCE	CAR	JEEPNEY	BUS	CAR	JEEPNEY	BUS
I	Abra	8.97%	4.25%	5.82%	9.67%	4.50%	6.22%
I	Benguet	9.95%	5.22%	6.80%	10.65%	5.47%	7.20%
I	Ilocos Norte	8.64%	3.91%	5.49%	9.34%	4.16%	5.89%
I	Ilocos Sur	8.91%	4.19%	5.76%	9.61%	4.44%	6.16%
I	La Union	9.23%	4.51%	6.08%	9.93%	4.76%	6.48%
I	Mountain Province	9.18%	4.46%	6.03%	9.88%	4.71%	6.43%
I	Pangasinan	8.87%	4.14%	5.72%	9.57%	4.39%	6.12%
II	Batanes	8.94%	4.31%	5.85%	9.64%	4.56%	6.25%
II	Cagayan	9.13%	4.49%	6.04%	9.83%	4.74%	6.44%
II	Ifugao	9.12%	4.49%	6.03%	9.82%	4.74%	6.43%
II	Isabela	9.35%	4.71%	6.26%	10.05%	4.96%	6.66%
II	Kalinga Apayao	9.54%	4.91%	6.45%	10.24%	5.16%	6.85%
II	Nueva Vizcaya	9.67%	5.04%	6.58%	10.37%	5.29%	6.98%
II	Quirino	10.19%	5.55%	7.10%	10.89%	5.80%	7.50%
III	Bataan	10.11%	5.70%	7.17%	10.74%	5.92%	7.53%
III	Bulacan	8.83%	4.42%	5.39%	9.46%	4.65%	6.25%
III	Nueva Ecija	8.80%	4.39%	5.86%	9.43%	4.61%	6.22%
III	Pampanga	8.86%	4.45%	5.92%	9.49%	4.68%	6.28%
III	Tarlac	8.69%	4.28%	5.75%	9.32%	4.50%	6.11%
III	Zambales	8.85%	4.44%	5.91%	9.48%	4.66%	6.27%
IV-A	Aurora	8.51%	4.46%	5.81%	9.28%	4.73%	6.25%
IV-A	Batangas	8.18%	4.13%	5.48%	8.95%	4.41%	5.92%
IV-A	Cavite	8.96%	4.91%	6.26%	9.73%	5.19%	6.70%
IV-A	Laguna	8.40%	4.35%	5.70%	9.17%	4.62%	6.14%
IV-A	Marinduque	8.22%	4.17%	5.52%	8.99%	4.45%	5.96%
IV-A	Rizal	8.99%	4.94%	6.29%	9.76%	5.21%	6.73%
IV-B	Occidental Mindoro	9.20%	5.15%	6.50%	9.97%	5.42%	6.94%
IV-B	Oriental Mindoro	8.88%	4.83%	6.18%	9.65%	5.11%	6.62%
IV-B	Palawan	8.95%	4.90%	6.25%	9.72%	5.18%	6.69%
IV-B	Quezon	8.56%	4.51%	5.86%	9.33%	4.78%	6.30%
IV-B	Romblon	8.00%	3.95%	5.30%	8.77%	4.22%	5.74%
V	Albay	8.97%	4.47%	5.97%	8.97%	4.47%	5.97%
V	Camarines Norte	9.24%	4.74%	6.24%	9.24%	4.74%	6.24%
V	Camarines Sur	8.77%	4.27%	5.77%	8.77%	4.27%	5.77%
V	Catanduanes	9.29%	4.79%	6.29%	9.29%	4.79%	6.29%
V	Masbate	9.11%	4.61%	6.11%	9.11%	4.61%	6.11%
V	Sorsogon	9.23%	4.73%	6.23%	9.23%	4.73%	6.23%

EXHIBIT 6

(CONTINUED)

		AVERAGE ANNUAL GROWTH RATE					
		1990 to 2000			2000 to 2012		
REGION	PROVINCE	CAR	JEEPNEY	BUS	CAR	JEEPNEY	BUS
VI	Aklan	8.86%	4.32%	5.83%	9.28%	4.47%	6.07%
VI	Antique	8.98%	4.43%	5.95%	9.40%	4.58%	6.19%
VI	Capiz	9.09%	4.55%	6.06%	9.51%	4.70%	6.30%
VI	Iloilo	8.84%	4.29%	5.81%	9.26%	4.44%	6.05%
VI	Negros Occidental	8.89%	4.34%	5.86%	9.31%	4.49%	6.10%
VII	Bohol	7.80%	3.30%	4.80%	8.29%	3.48%	5.08%
VII	Cebu	8.98%	4.48%	5.98%	9.47%	4.65%	6.26%
VII	Negros Oriental	8.57%	4.07%	5.57%	9.06%	4.24%	5.85%
VII	Siguijor	8.22%	3.72%	5.22%	8.71%	3.89%	5.50%
VIII	Leyte	9.37%	4.29%	5.98%	9.79%	4.44%	6.22%
VIII	Southern Leyte	9.55%	4.46%	6.16%	9.97%	4.61%	6.40%
VIII	Eastern Samar	10.15%	5.06%	6.76%	10.57%	5.21%	7.00%
VIII	Northern Samar	9.91%	4.83%	6.52%	10.33%	4.98%	6.76%
VIII	Samar	9.57%	4.49%	6.18%	9.99%	4.64%	6.42%
IX-A	Basilan	9.21%	4.48%	6.06%	9.77%	4.68%	6.38%
IX-A	Sulu	8.77%	4.04%	5.62%	9.33%	4.24%	5.94%
IX-A	Tawi-Tawi	9.29%	4.57%	6.14%	9.85%	4.77%	6.46%
IX-B	Zamboanga del Norte	9.33%	4.60%	6.18%	9.89%	4.80%	6.50%
IX-B	Zamboanga del Sur	9.44%	4.72%	6.29%	10.00%	4.92%	6.61%
X	Agusan del Norte	8.69%	4.28%	5.75%	9.32%	4.51%	6.11%
X	Agusan del Sur	9.68%	5.27%	6.74%	10.31%	5.49%	7.10%
X	Bukidnon	9.12%	4.71%	6.18%	9.75%	4.93%	6.54%
X	Camiguin	8.36%	3.95%	5.42%	8.99%	4.17%	5.78%
X	Misamis Occidental	8.44%	4.03%	5.50%	9.07%	4.25%	5.86%
X	Misamis Oriental	9.58%	5.17%	6.64%	10.21%	5.39%	7.00%
X	Sorigao del Norte	9.23%	4.82%	6.29%	9.86%	5.04%	6.65%
XI	Davao	8.78%	4.64%	6.02%	9.62%	4.94%	6.50%
XI	Davao del Sur	8.57%	4.43%	5.81%	9.41%	4.73%	6.29%
XI	Davao Oriental	8.29%	4.15%	5.53%	9.13%	4.45%	6.01%
XI	South Cotabato	8.54%	4.40%	5.78%	9.38%	4.70%	6.26%
XI	Surigao del Sur	8.69%	4.55%	5.93%	9.53%	4.85%	6.41%
XII	Lanao del Norte	8.54%	4.31%	5.72%	9.17%	4.53%	6.08%
XII	Lanao del Sur	8.81%	4.58%	5.99%	9.44%	4.80%	6.35%
XII	Maguindanao	8.68%	4.45%	5.86%	9.31%	4.68%	6.22%
XII	North Cotabato	8.86%	4.63%	6.04%	9.49%	4.86%	6.40%
XII	Sultan Kudarat	9.41%	5.18%	6.59%	10.04%	5.41%	6.95%

Source: Consultant's calculations from (5 & 8)

EXHIBIT 7

GROSS REGIONAL DOMESTIC PRODUCT (GRDP)

REGION	PROVINCE	AVERAGE ANNUAL GROWTH RATE 1990 to 2000	AVERAGE ANNUAL GROWTH RATE 2000 to 2012
I	Abra	6.80%	6.80%
I	Benguet	6.80%	6.80%
I	Ilocos Norte	6.80%	6.80%
I	Ilocos Sur	6.80%	6.80%
I	La Union	6.80%	6.80%
I	Mountain Province	6.80%	6.80%
I	Pangasinan	6.80%	6.80%
II	Batanes	7.25%	7.05%
II	Cagayan	7.25%	7.05%
II	Ifugao	7.25%	7.05%
II	Isabela	7.25%	7.05%
II	Kalinga Apayao	7.25%	7.05%
II	Nueva Vizcaya	7.25%	7.05%
II	Quirino	7.25%	7.05%
III	Bataan	6.80%	6.80%
III	Bulacan	6.80%	6.80%
III	Nueva Ecija	6.80%	6.80%
III	Pampanga	6.80%	6.80%
III	Tarlac	6.80%	6.80%
III	Zambales	6.80%	6.80%
IV-A	Aurora	6.80%	6.80%
IV-A	Batangas	6.80%	6.80%
IV-A	Cavite	6.80%	6.80%
IV-A	Laguna	6.80%	6.80%
IV-A	Marinduque	6.80%	6.80%
IV-A	Rizal	6.80%	6.80%
IV-B	Occidental Mindoro	6.80%	6.80%
IV-B	Oriental Mindoro	6.80%	6.80%
IV-B	Palawan	6.80%	6.80%
IV-B	Quezon	6.80%	6.80%
IV-B	Romblon	6.80%	6.80%
V	Albay	6.80%	6.80%
V	Camarines Norte	6.80%	6.80%
V	Camarines Sur	6.80%	6.80%
V	Catanduanes	6.80%	6.80%
V	Masbate	6.80%	6.80%
V	Sorsogon	6.80%	6.80%
VI	Aklan	6.40%	6.20%
VI	Antique	6.40%	6.20%
VI	Capiz	6.40%	6.20%
VI	Iloilo	6.40%	6.20%
VI	Negros Occidental	6.40%	6.20%
VII	Bohol	6.85%	6.60%
VII	Cebu	6.85%	6.60%
VII	Negros Oriental	6.85%	6.60%
VII	Siguijor	6.85%	6.60%
VIII	Leyte	6.80%	6.80%
VIII	Southern Leyte	6.80%	6.80%
VIII	Eastern Samar	6.80%	6.80%
VIII	Northern Samar	6.80%	6.80%
VIII	Samar	6.80%	6.80%
IX-A	Basilan	6.80%	6.80%
IX-A	Sulu	6.80%	6.80%
IX-A	Tawi-Tawi	6.80%	6.80%
IX-B	Zamboanga del Norte	6.80%	6.80%
IX-B	Zamboanga del Sur	6.80%	6.80%
X	Agusan del Norte	6.80%	6.80%
X	Agusan del Sur	6.80%	6.80%
X	Bukidnon	6.80%	6.80%
X	Camiguin	6.80%	6.80%
X	Misamis Occidental	6.80%	6.80%
X	Misamis Oriental	6.80%	6.80%
X	Sorigao del Norte	6.80%	6.80%
XI	Davao	6.85%	7.00%
XI	Davao del Sur	6.85%	7.00%
XI	Davao Oriental	6.85%	7.00%
XI	South Cotabato	6.85%	7.00%
XI	Surigao del Sur	6.85%	7.00%
XII	Lanao del Norte	6.80%	6.70%
XII	Lanao del Sur	6.80%	6.70%
XII	Maguindanao	6.80%	6.70%
XII	North Cotabato	6.80%	6.70%
XII	Sultan Kudarat	6.80%	6.70%

Source: NEDA

EXHIBIT 8

VALUE OF PASSENGER TIME BY REGION

REGION	INCOME		POPULATION (IN THOUSANDS)		PROPORTION OF ADULTS (A)	UNADJUSTED PASSENGER TIME (V*)	ADJUSTED PASSENGER TIME (V)
	1988 INCOME	FEBRUARY 1988 INCOME (Y)	1988	FEBRUARY 1990			
I	2.086 x 10^10	2.656 x 10^10	4,099	4,236	0.593	2.843	2.001
II	1.435 x 10^10	1.847 x 10^10	2,689	2,806	0.570	3.954	2.784
III	4.778 x 10^10	6.144 x 10^10	5,816	6,065	0.580	6.014	4.234
IV	5.454 x 10^10	7.052 x 10^10	7,623	7,992	0.579	5.219	3.674
V	1.969 x 10^10	2.524 x 10^10	4,158	4,323	0.542	3.670	2.584
VI	2.909 x 10^10	3.721 x 10^10	5,387	5,588	0.578	3.945	2.777
VII	2.270 x 10^10	2.917 x 10^10	4,411	4,599	0.594	3.657	2.574
VIII	1.499 x 10^10	1.907 x 10^10	3,216	3,317	0.557	3.534	2.488
IX	1.727 x 10^10	2.211 x 10^10	3,033	3,150	0.546	4.402	3.100
X	2.089 x 10^10	2.695 x 10^10	3,408	3,567	0.560	4.620	3.252
XI	2.707 x 10^10	3.489 x 10^10	4,096	4,275	0.557	5.012	3.528
XII	1.706 x 10^10	2.197 x 10^10	2,778	2,902	0.534	4.856	3.420

Source:

NSCB, "1989 Philippine Statistical Yearbook", Manila, October 1989
1988 Income - Table 2.4, pp. 2-12 - pp. 2-13
February 1990 Population - Table 1.7, pp. 1-48 - pp. 1-59
1988 Population - Table 1.7, pp. 1-48 - pp. 1-59
Proportion of Adults in Population - Table 1.4, pp. 1-20 - pp. 1-42

EXHIBIT 9
CENTRAL PALAWAN INTERACTIVE NETWORK
PANTALANG BATO PORT

FROM/ TO	PANTALANG BATO	BRGY. LIBERTY	POBLACION	ARACELI & DUMARAN IS.	CUYO ISLAND	NARRA	CEBU	MINDORO	OTHERS	TOTAL
PANTALANG BATO										
%/passengers	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.3
passengers	30,000	30,000	0	0	0	0	0	0	0	60,000
fish, etc.	80	0								80
rice	200	200								400
fuel	330	330								660
consumables	360	360 *								720
bag cargo	100	100								200
bottle cargo	0									0
others	1,440	1,440								2,880
BRGY. LIBERTY										
%/passengers	100.0	100.0	0	0	0	0	0	C	0	30
passengers	30,000	30,000	0	0	0	0	0	0	0	60,000
fish, etc.	0	0						0		0
rice	1,500	1,500								3,000
fuel	0	0								0
consumables	1,428	1,428								2,856
bag cargo	2,240	2,240								4,480
bottle cargo	50	50								100
others	520	520								1,040
POBLACION										
%/passengers	0.0	0.0	100.0	80.0	15.0	0.0	0	0	5.0	200.0
passengers	0	0	20,000	16,000	3,000	0	0	0	1,000	40,000
fish, etc.			1,500	450	300				750	3,000
rice			0							0
fuel			0							0
consumables			3,450	690	345	1,035			1,380	6,900
bag cargo(copra)			525	105	50	160			210	1,050
bottle cargo			0							0
others			2,520	504	252	1,008			756	5,040
ARACELI/DUMARAN IS. ISLAND										
%/passengers	0.0	0.0	100.0	100.0	0.0	0.0	0	0	0.0	16.2
passengers	0	0	16,000	16,000	0	0			0	32,000
fish, etc.				0						0
rice				0						0
fuel			500	500						1,000
consumables			440	440						880
bag cargo				0						0
bottle cargo				0						0
others			620	620						1,240

EXHIBIT 9
(CONTINUED)

FROM/ TO	PANTALANG BATO	BRGY. LIBERTY	POBLACION	ARACELI & DUMARAN IS.	CUYO ISLAND	NARRA	CEBU	MINDORO	OTHERS	TOTAL
CUYO ISLAND										
%/passengers	0.0	0.0	100.0	0.0	100.0	0.0	0		0.0	3.0
passengers	0	0	3,000	0	3,000	0			0	6,000
fish, etc.					0					0
rice					0					0
fuel			200		200					400
consumables			220		220					440
bag cargo					0					0
bottle cargo					0					0
others			310		310					620
NARRA										
%/passengers	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
passengers	0	0	0	0	0	0			0	0
fish, etc.						3,610				3,610
rice						0				0
fuel			10			10				20
consumables			440			440				880
bag cargo						12,000	6,000	1,350	4,650	24,000
bottle cargo						0				0
others			620			620				1,240
CEBU										
%/passengers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
passengers	0	0	0	0	0	0	0	0	0	0
fish, etc.						0				0
rice						0				0
fuel						0				0
consumables						0				0
bag cargo						0				0
bottle cargo						0				0
others						1,680				1,680
MINDORO										
%/passengers	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
passengers	0	0	0	0	0	0				0
fish, etc.										0
rice										0
fuel										0
consumables										0
bag cargo										0
bottle cargo										0
others						1,680				1,680

EXHIBIT 9
(CONTINUED)

FROM/ TO	PANTALANG BATO	BRGY. LIBERTY	POBLACION	ARACELI & DUMARAN IS.	CUYO ISLAND	NARRA	CEBU	MINDORO	OTHERS	TOTAL
OTHERS										
%/passengers	0.0	0.0	100.0	0.0	100.0	0.0	0.0	0.0	100.0	1.5
passengers	0	0	1,000	0	1,000	0	0	0	1,000	3,000
fish, etc.									0	0
rice									0	0
fuel			490						490	980
consumables			366						366	732
bag cargo						2,500			2,500	5,000
bottle cargo									0	0
others			516			1,780			2,296	4,592
TOTAL										
passengers	60,000	60,000	39,000	32,000	6,000	0	0	0	1,000	198,000
%	30	30	20	16	3	0	0	0	1	100
fish	80	0	1,500	450	300	3,610	0	0	750	6,690
%	1	0	22	7	4	54	0	0	11	100
rice	1,700	1,700	0	0	0	0	0	0	0	3,400
fuel	330	330	1,200	500	200	10	0	0	490	3,060
consumables	1,788	1,788	4,916	1,130	565	1,475	0	0	1,746	13,408
bagged cargo	2,340	2,340	525	105	50	14,660	6,000	1,350	7,360	34,730
bottled cargo	50	50	0	0	0	0	0	0	0	100
others	1,960	1,960	4,586	1,124	562	6,768	0	0	3,052	20,012
TOTAL CARGO	8,168	8,168	11,227	2,859	1,377	22,913	6,000	1,350	12,648	74,710
Percent	11%	10.9%	15%	3.83%	2%	31%	8%	2%	17%	100%

* indicates 20% of others

EXHIBIT 10 - SUMMARY OF UNIT RATES

(Sheet 1 of 3)

SUMMARY OF UNIT RATES RURAL INFRASTRUCTURE FUND PROJECT			FINANCIAL COST		FOREIGN COMPONENT DIRECT		FOREIGN COMPONENT INDIRECT		FOREIGN COMPONENT TOTAL		LOCAL COMPONENT		TAXES		ECONOMIC COST	
PAY ITEM NO.	DESCRIPTION	UNIT	UNIT COST (Pesos)	%	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)
(0 - 19)	I. EARTHWORK															
1	Clearing & Grubbing	SQ.M.	1.76	100	49	0.9			49	0.9	19	0.3	32	0.6	68	1.2
2	Tree Removal, Small	EA.	250	100	46	115.0			46	115.0	29	72.5	25	62.5	75	187.5
3	Demolition of Structures & Obstructions	L.S.	1	100	49	0.5			49	0.5	19	0.2	32	0.3	68	0.7
4	Unsuitable Excavation	CU.M.	40	100	46	18.4			46	18.4	23	9.2	31	12.4	69	27.6
5	Surplus Rock Excavation	CU.M.	150	100	28	42.0			28	42.0	54	81.0	18	27.0	82	123.0
6	Structure Excavation	CU.M.	50	100	47	23.5			47	23.5	22	11.0	31	15.5	69	34.5
7	Foundation Fill	CU.M.	56	100	47	26.3			47	26.3	28	15.7	25	14.0	75	42.0
8	Excavation Below Water Elevation	CU.M.	190	100	16	30.4	18	34.2	34	64.6	52	98.8	14	26.6	86	163.4
9	Compacted Fill, Select Material, Borrow	CU.M.	70	100	47	32.9			47	32.9	28	19.6	25	17.5	75	52.5
10	Cut and Fill	CU.M.	95	100	47	44.7			47	44.7	28	26.6	25	23.8	75	71.3
(20 - 39)	II. PAVEMENT															
20	Aggregate Subbase Course	CU.M.	140	100	43	67.2			48	67.2	27	37.8	25	35.0	75	105.0
21	Aggregate Base Course	CU.M.														
22	Crushed Aggregate Base Course	CU.M.	240	100	52	124.8			52	124.8	22	52.8	26	62.4	74	177.6
23	Soil Aggregate Shoulder	CU.M.	150	100	48	72.0			48	72.0	27	40.5	25	37.5	75	112.5
24	Gravel Surface Course	CU.M.														
25	Bituminous Prime Coat, MC-70	SQ.M.	11	100	5	0.6	50	5.5	55	6.1	25	2.8	20	2.2	80	8.8
26	Bituminous Tack Coat, CRS-2	SQ.M.	8	100	8	0.6	47	3.8	55	4.4	24	1.9	21	1.7	79	6.3
27	Single Bituminous Surface Treatment	SQ.M.	25	100	5	1.3	49	12.3	54	13.5	24	6.0	22	5.5	78	19.5
28	Double Bituminous Surface Treatment	SQ.M.	49	100	5	2.5	48	23.5	53	26.0	25	12.3	22	10.8	78	38.2
29	Bituminous Concrete Wearing Course	CU.M.	2740	100	31	849.4	21	575.4	52	1424.8	22	602.8	26	712.4	74	2027.6
30	Bituminous Concrete Binder Course	CU.M.	2600	100	31	806.0	21	546.0	52	1352.0	22	572.0	26	676.0	74	1924.0
32	Bituminous Concrete Leveling Course	MT	1130	100	31	350.3	21	237.3	52	587.6	22	248.6	26	293.8	74	836.2
33	Portland Cement Concrete Pavement	SQ.M.	400	100	18	72.0	32	128.0	50	200.0	31	124.0	19	76.0	81	324.0

EXHIBIT 10 - SUMMARY OF UNIT RATES

(Sheet 2 of 3)

SUMMARY OF UNIT RATES RURAL INFRASTRUCTURE FUND PROJECT			FINANCIAL COST		FOREIGN COMPONENT DIRECT		FOREIGN COMPONENT INDIRECT		FOREIGN COMPONENT TOTAL		LOCAL COMPONENT		TAXES		ECONOMIC COST	
PAY ITEM NO.	DESCRIPTION	UNIT	UNIT COST (Pesos)	%	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)
(40 - 59)	III. CONCRETE STRUCTURES - ON LAND															
40	Precast Concrete Piles, Furnished (40 x 40cm)	L.M.	820	100	15	123.0	26	213.2	41	336.2	44	360.8	15	123.0	85	697.0
41	Precast Concrete Piles, Driven (40 x 40cm)	L.M.	626	100	14	87.6	32	200.3	46	288.0	38	237.9	16	100.2	84	525.8
42	Precast Concrete Piles, Furnished (45 x 45cm)	L.M.	1290	100	15	193.5	26	335.4	41	528.9	44	567.6	15	193.5	85	1096.5
43	Precast Concrete Piles, Driven (45 x 45cm)	L.M.	790	100	14	110.6	32	252.8	46	363.4	38	300.2	16	126.4	84	663.6
44	Prestressed Conc. Sheet Piles, Furn. (25 x 60cm)	L.M.	1180	100	15	177.0	26	306.8	41	483.8	44	519.2	15	177.0	85	1003.0
45	Prestressed Conc. Sheet Piles, Driven (25 x 60cm)	L.M.	590	100	14	82.6	32	188.8	46	271.4	38	224.2	16	94.4	84	495.6
46	Pile Transportation per 100 Kilometers, On Land	L.M.	250	100	30	75.0	20	50.0	50	125.0	30	75.0	20	50.0	80	200.0
47	Pile Transportation per 100 Kilometers, By Sea	L.M.	300	100	30	90.0	20	60.0	50	150.0	30	90.0	20	60.0	80	240.0
48	Test Pile, Concrete (40 x 40cm)	L.M.		100									100			
49	Test Pile, Concrete (45 x 45cm)	L.M.		100									100			
50	Reinforcing Steel	KG	21	100			45	9.5	45	9.5	44	9.2	11	2.3	89	16.7
51	Structural Concrete, Class A	CU.M.	2100	100	15	315.0	26	546.0	41	861.0	44	924.0	15	315.0	85	1785.0
52	Structural Concrete, Class B	CU.M.	2090	100	15	313.5	26	543.4	41	856.9	44	919.6	15	313.5	85	1776.5
(60 - 79)	IV. MARINE STRUCTURES OVER/IN WATER															
60	Precast Concrete Piles, Furnished (40 x 40cm)	L.M.	820	100	15	123.0	26	213.2	41	336.2	44	360.8	15	123.0	85	697.0
61	Precast Concrete Piles, Driven (40 x 40cm)	L.M.	660	100	25	165.0	20	132.0	45	297.0	40	264.0	15	99.0	85	561.0
62	Precast Concrete Piles, Furnished (45 x 45cm)	L.M.	1290	100	15	193.5	26	335.4	41	528.9	44	567.6	15	193.5	85	1096.5
63	Precast Concrete Piles, Driven (45 x 45cm)	L.M.	835	100	25	208.8	20	167.0	45	375.8	40	334.0	15	125.3	85	709.8
64	Structural Concrete, Class A (over water)	CU.M.	3300	100	15	495.0	20	660.0	35	1155.0	50	1650.0	15	495.0	85	2805.0
65	Structural Concrete, Class B (over water)	CU.M.	3280	100	15	492.0	20	656.0	35	1148.0	50	1640.0	15	492.0	85	2788.0
66	Structural Concrete, Class A (under water)	CU.M.	5300	100	15	795.0	20	1060.0	35	1855.0	50	2650.0	15	795.0	85	4505.0
67	Structural Concrete, Class B (under water)	CU.M.	5200	100	15	780.0	20	1040.0	35	1820.0	50	2600.0	15	780.0	85	4420.0
68	Core Rock for Causeway or Breakwater	CU.M.	260	100	50	130.0			50	130.0	30	78.0	20	52.0	80	208.0
69	Underlayer Rock	CU.M.	450	100	50	225.0			50	225.0	30	135.0	20	90.0	80	360.0
70	Armor Rock , Small (up to 1 ton)	CU.M.	575	100	50	287.5			50	287.5	30	172.5	20	115.0	80	460.0
71	Armor Rock, Large (larger than 1 ton)	CU.M.	690	100	50	345.0			50	345.0	30	207.0	20	138.0	80	552.0
72	Berthing Dolphins (5 Timber Piles)	EA.	30000	100	30	9000.0	20	6000.0	50	15000.0	35	10500.0	15	4500.0	85	25500.0
73	Berthing Dolphins (7 Timber Piles)	EA.	40000	100	30	12000.0	20	8000.0	50	20000.0	35	14000.0	15	6000.0	85	34000.0
74	Mooring Bollard	EA.	13000	100	40	5200.0			40	5200.0	45	5850.0	15	1950.0	85	11050.0
75	Mooring Cleat	EA.	8000	100	40	3200.0			40	3200.0	45	3600.0	15	1200.0	85	6800.0
76	Mooring Ring	EA.	450	100	40	180.0			40	180.0	45	202.5	15	67.5	85	382.5

Note: Items 40,42,44,60 and 62 are ex plant.

EXHIBIT 10 - SUMMARY OF UNIT RATES

(Sheet 3 of 3)

SUMMARY OF UNIT RATES RURAL INFRASTRUCTURE FUND PROJECT			FINANCIAL COST		FOREIGN COMPONENT DIRECT		FOREIGN COMPONENT INDIRECT		FOREIGN COMPONENT TOTAL		LOCAL COMPONENT		TAXES		ECONOMIC COST	
PAY ITEM NO.	DESCRIPTION	UNIT	UNIT COST (Pesos)	%	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)	%	UNIT COST (Pesos)
(80 - 99)	V. STANDARD PORT BUILDINGS															
80	Building w/ Comfort Room, Office	S.M.	4000	100	15	600.0	26	1040.0	41	1640.0	44	1760.0	15	600.0	85	3400.0
81	Open Building	S.M.	3070	100	15	460.5	26	798.2	41	1258.7	44	1350.8	15	460.5	85	2609.5
82	Comfort Rooms, incl. Walls (no foundation, no roof)	S.M.	1500	100	15	225.0	26	390.0	41	615.0	44	660.0	15	225.0	85	1275.0
(100 - 119)	VI. DRAINAGE/EROSION WORKS															
100	Backfill Material, Pipe Culvert	CU.M	136	100	47	63.9			47	63.9	27	36.7	26	35.4	74	100.6
101	RCPC, 61cm Diameter	L.M.	886	100	18	159.5	22	194.9	40	354.4	42	372.1	18	159.5	82	726.5
102	RCPC, 91cm Diameter	L.M.	1500	100	16	240.0	26	390.0	42	630.0	42	630.0	16	240.0	84	1260.0
103	RCPC, 107cm Diameter	L.M.	2000	100	14	280.0	28	560.0	42	840.0	42	840.0	16	320.0	84	1680.0
104	RCPC, 122cm Diameter	L.M.	3000	100	14	420.0	28	840.0	42	1260.0	42	1260.0	16	480.0	84	2520.0
105	Structural Concrete for Pipe Headwalls	CU.M.	2090	100	15	313.5	26	543.4	41	856.9	44	919.6	15	313.5	85	1776.5
106	Reinforcing Steel for Pipe Headwalls	KG	23	100			45	10.4	45	10.4	44	10.1	11	2.5	89	20.5
107	Removal, Cleaning, Replacement, Salvaged Pipe Culverts	L.M.														
108	Grouted Riprap	CU.M.	1000	100	8	60.0	13	130.0	21	210.0	67	670.0	12	120.0	88	880.0
109	Concrete Slope Protection	SQ.M.	400	100	18	72.0	32	128.0	50	200.0	31	124.0	19	76.0	81	324.0
110	Gabions	CU.M.														
(120 - 129)	VII. INCIDENTAL WORKS															
120	Metal Beam Guardrail	L.M.	786	100	40	314.4			40	314.4	25	196.5	35	275.1	65	510.9
121	Warning Signs	EA.	2825	100	42	1186.5			42	1186.5	23	649.8	35	988.8	65	1836.3
122	Regulatory Signs	EA.	2825	100	42	1186.5			42	1186.5	23	649.8	35	988.8	65	1836.3
123	Informatory Signs	EA.	10800	100	44	4752.0			44	4752.0	21	2268.0	35	3780.0	65	7020.0
124	Sodding	SQ.M.	5	100	51	2.6			51	2.6	16	0.8	33	1.7	67	3.4
(130-135)	VIII. LAND ACQUISITION, DEMOLITION, AND REPLACEMENT															
130	Land Acquisition	KM	300000	100							90	270000	10	30000	90	270000
131	Demolition of Nipa House	EA.	10000	100	15	1500.0	25	2500.0	40	4000.0	40	4000.0	20	2000.0	80	8000.0
132	Nipa House Replacement	EA.	15000	100	20	3000.0	15	2250.0	35	5250.0	45	6750.0	20	3000.0	80	12000.0
133	Demolition of Concrete House	SQ.M.	1000	100	15	150.0	25	250.0	40	400.0	40	400.0	20	200.0	80	800.0
134	Replacement of Concrete House	SQ.M.	2000	100	20	400.0	15	300.0	35	700.0	45	900.0	20	400.0	80	1600.0
140	IX. CONCRETE PIER (w/ Prestressed Conc. Piles)	SQ.M.	9500	100	15	1425	26	2470	41	3895	44	4180	15	1425	85	8075

EXHIBIT 11

REPRESENTATIVE VESSEL COST MODEL

CLASS OF BOAT	(1) Paddle Banca	(2) Small Banca	(3) Medium Banca	(4) Large Banca	(5) Medium Launch	(6) Large Launch	(7) Small Trawler	(8) Large Trawler	(9) Small Inter-Island	(10) Medium Inter-Island	(11) Large Inter-Island
ROLE I (40-60%)	Catch Fish	Catch Fish	Trnspt Fish	Trnspt Cargo	Trnspt Psngrs	Trnspt Psngrs	Catch Fish	Catch Fish	Trnspt Psngrs	Trnspt Psngrs	Trnspt Psngrs
ROLE II (20-40%)	Catch Fish	Trnspt Psngrs	Catch Fish	Trnspt Fish	Trnspt Psngrs	Trnspt Psngrs	Trnspt Fish	Trnspt Fish	Trnspt Cargo	Trnspt Cargo	Trnspt Cargo
ROLE III (10-20%)	Catch Fish	Trnspt Cargo	Trnspt Cargo	Trnspt Psngrs	Trnspt Cargo	Trnspt Cargo	Catch Fish	Catch Fish	Trnspt Produce	Trnspt Produce	Trnspt Produce
FIXED COSTS											
DWT	0.75	1.5	4	9	10	20	20	40	80	1,000	2,000
HP	n/a	16	85	165	165	250	250	300	450	1,800	2,400
New building	10,000	25,000	100,000	200,000	220,000	440,000	1,600,000	2,800,000	1,600,000	16,000,000	30,000,000
10% Deprec.	1,000	2,500	10,000	20,000	22,000	44,000	160,000	280,000	160,000	1,600,000	3,000,000
15% Maint.	1,500	3,750	15,000	30,000	33,000	66,000	240,000	420,000	240,000	2,400,000	4,500,000
30% Other	3,000	7,500	30,000	60,000	66,000	132,000	480,000	840,000	480,000	4,800,000	9,000,000
Tot/yr;Fin	5,500	13,750	55,000	110,000	121,000	242,000	880,000	1,540,000	880,000	8,800,000	16,500,000
Tot/yr;Econ	4,675	11,688	46,750	93,500	102,850	205,700	748,000	1,309,000	748,000	7,480,000	14,025,000
CREW COSTS											
# Crewmen	2	2	4	6	10	20	20	40	80	160	200
Crew costs	20,000	40,000	120,000	180,000	310,000	615,000	625,000	1,240,000	2,450,000	4,850,000	6,050,000
FUEL COSTS											
Liters/hour	n/a	3	10	19	19	35	35	55	75	300	400
Km/hour	3	15	20	20	20	20	15	15	20	20	20
Liters/km	n/a	0	1	1	1	2	2.33	3.67	3.75	15.00	20.00
Km/day	5	15	30	45	60	60	30	40	80	80	80
%/days/year	1	1	1	1	1	1	0.6	0.7	0.9	0.9	0.9
Km/year	913	2,738	6,570	11,498	13,140	15,330	6,570	10,220	26,280	26,280	26,280
Fuel;Fin	n/a	7	5	5	5	5	4.96	4.96	4.96	4.96	4.96
Fuel;Econ	n/a	4	4	4	4	4	4.18	4.18	4.18	4.18	4.18
Fuel/yr;Fin	n/a	3,663	16,294	54,176	61,916	133,064	76,037	185,868	488,808	1,955,232	2,606,976
Fuel/yr;Econ	n/a	1,933	13,731	45,657	52,179	112,139	64,079	156,639	411,939	1,647,756	2,197,008
TOTAL COSTS											
Tot/yr;Fin	25,500	57,413	191,294	344,176	492,916	990,064	1,581,037	2,965,868	3,818,808	15,605,232	25,156,976
Tot/yr;Econ	24,675	53,620	180,481	319,157	465,029	932,839	1,437,079	2,705,639	3,609,939	13,977,756	22,272,008
Hours/yr	2,190	2,190	2,628	3,066	2,628	3,066	2,628	3,066	3,942	3,942	3,942
Cost/hr;Fin	12	26	73	112	188	323	601.61	967.34	968.75	3,958.71	6,381.78
Cost/hr;Econ	11	24	69	104	177	304	546.83	882.47	915.76	3,545.85	5,649.93

EXHIBIT 11
(CONTINUED)

CLASS OF BOAT	(1) Paddle Banca	(2) Small Banca	(3) Medium Banca	(4) Large Banca	(5) Medium Launch	(6) Large Launch	(7) Small Trawler	(8) Large Trawler	(9) Small Inter-Island	(10) Medium Inter-Island	(11) Large Inter-Island
FISHING COSTS											
% Avail/day	1	1	0	0			0.7	0.7			
Avg/catch	0	0	0	0			2	3.5			
Avg/day/yr	183	128	44	26			153	179			
Tons/year	3	5	7	8			306.60	625.97			
Cost/kgm;Fin	9	8	6	4			3.61	3.32			
Cost/kgm;Eco	9	7	5	4			3.28	3.03			
FISH TRANSPORT COSTS											
% Avail/day	0	0	0	0			0.3	0.3			
Tons/trip	0	0	2	5			15	30			
Trips/year	0	0	88	77			66	77			
Tons/year	0	0	175	345			986	2,300			
Cost/kgm;Fin	0	0	0	0			0.48	0.39			
Cost/kgm;Eco	0	0	0	0			0.44	0.35			
Cost/tkm;Fin	0	0	29	13			32.09	19.35			
Cost/tkm;Eco	0	0	27	12			29.16	17.65			
PASSENGER TRANSPORT COSTS											
% Avail/day	0	0	0	0	1	1			0.6	0.6	0.6
#/Roundtrip	0	30	60	120	150	300			800	3500	6000
Trips/year	0	37	44	51	153	179			197	197	197
Psgrs/year	0	1,095	2,628	6,132	22,995	53,655			157680	689850	1182600
Cost/psgr;Fi	0	10	15	11	15	13			14.53	13.57	12.76
Cost/psgr;Ec	0	10	14	10	14	12			13.74	12.16	11.30
Cost/pkm;Fin	0	1	0	0	1	0			0.36	0.34	0.32
Cost/pkm;Eco	0	1	0	0	0	0			0.34	0.30	0.28
CARGO TRANSPORT COSTS				CARGO TRANSPORT							
% Avail/day	0	0	0	0	0	0			0.4	0.4	0.4
Tons/day	0	1	2	5	5	10			40	400	800
Days/year	0	18	44	102	44	51			131	131	131
Tons/year	0	18	88	460	219	511			5256	52400	104800
Cost/ton;Fin	0	315	437	299	450	388			291	119	96
Cost/ton;Eco	0	294	412	278	425	365			275	107	85
Cost/tkm;Fin	0	42	29	13	15	13			7.27	2.98	2.40
Cost/tkm;Eco	0	39	27	12	14	12			6.87	2.67	2.13

SOURCE: Consultant's survey.

BASIS:
1. New building costs from field surveys.
2. Depreciation over 10 years at straight line.
3. Ordinary maintenance at 15% per year in lieu of 10% first year increasing at 8% per year.
4. Other and extrordinary costs at 15% per year for tri-annual hull rehabilations, lost and damaged nets and gear as well as excessive wear and tear due cargo and passenger overloads.

EXHIBIT 12

PORT TARIFFS AND CHARGES

Municipal ports do not, for the most part, collect dues, rates or charges for the use of ports located in their municipalities.

The following basis for determining probable revenues levels at municipal ports which might elect to assess charges is derived from current Philippine Port Authority (PPA) tariffs or from particular municipal ports who do currently assess rates or charges.

Most current PPA and municipal port charges are by vessel, crate, sack, bag, can, piece or commodity and have been converted herein to approximate per ton or kilogram equivalents for purposes of comparative evaluation.

A. Docking and Landing Fee (per trip)

Small-inter island vessels <100 DWT	P. 100.00
Pump boats & larger bancas >3 DWT	P. 20.00
Small motor bancas <3 DWT	n/c
Paddle and sail bancas <1 DWT	n/c

B. Port Charges (per day)

Small inter-island vessels <100 DWT	P. 100.00
Pump boats & larger bancas >3 DWT	P. 20.00
Small motor bancas <3 DWT	n/c
Paddle and sail bancas <1 DWT	n/c

C. Cargos (per ton equivalent)

Storage (2 days free, average stay 5 days)	P. 1.00
Dried fish @ P. 0.05 per box & P. 0.20 per sack	P. 5.00
Cement @ P. 0.10 per bag	P. 2.00
Other bagged cargo @ P. 0.20 sack	P. 4.00
Hogs @ P. 1.0 per head	P. 4.00
Cattle @ P. 2.0 per head	P. 4.00
Bottled cargo @ P. 0.05 per case	P. 5.00
Petroleum Products @ P. 0.05 per liter	P. 50.00
Other items not otherwise itemized by name	P. 4.00

D. Passengers

Passenger amenity fee (per passenger)	P. 0.50
Baggage and parcels (per package)	P. 2.00
Bagged cargos (per sack)	P. 2.00
Other cargos (per ton)	P. 50.00

SOURCES: Consultant's surveys and Philippine Port Authority

EXHIBIT 13

CLIMATOLOGICAL NORMALS - PUERTO PRINCESA

STATION : PUERTO PRINCESA
COORDINATES: 11°15'N 125°00'E

PERIOD OF RECORDS: 1951 - 1985

MONTH	RAIN FALL (mm)	RAINY DAYS	TEMPERATURE (deg C) MAX-IMUM	MIN-IMUM	MEAN	DRY BULB	WET BULB	DEW PT.	RH (%)	MEAN SEA LEVEL PRESSURE (mbs)	PREVAILING WIND DIREC-TION	SPEED (mps)	CLOUD (octa)	DAYS WITH TSTM	LGHT
JAN	30.7	4	30.7	22.7	26.8	26.1	23.9	23	83	1011.8	NE	2	5	0	1
FEB	16.7	2	31.2	22.6	26.9	26.4	23.9	23	81	1011.8	NE	2	5	0	0
MAR	37.2	4	32.0	23.2	27.7	27.1	24.3	23	79	1011.7	NE	2	5	1	1
APR	42.4	5	32.9	24.2	28.6	27.9	25.1	24	80	1010.6	NE	2	4	3	5
MAY	142.4	12	32.5	24.5	28.5	27.9	25.5	25	82	1009.7	W	1	6	9	13
JUN	184.2	15	31.3	23.9	27.6	27.0	25.0	24	85	1009.7	S	1	6	17	8
JUL	177.6	16	30.9	23.4	27.2	26.5	24.7	24	86	1009.5	S	1	6	6	6
AUG	183.6	17	30.9	23.4	27.2	26.6	24.7	24	86	1009.5	S	1	6	6	7
SEP	196.4	16	30.9	23.4	27.2	26.4	24.6	24	86	1009.9	S/W	1	6	6	6
OCT	210.0	16	31.0	23.4	27.2	26.4	24.7	24	87	1010.1	W	1	6	6	9
NOV	205.2	14	30.9	23.4	27.2	26.5	24.7	24	86	1010.2	NE	2	6	5	8
DEC	137.4	9	30.7	23.3	27.1	26.4	24.5	24	86	1012.9	NE	2	6	2	5
ANNUAL	1563.8	130	31.3	23.5	27.4	26.8	24.6	24	84	1010.5	NE	2	6	51	69

EXHIBIT 14

CLIMATOLOGICAL EXTREMES - PUERTO PRINCESA
(AS OF 1986)

MONTH	TEMPERATURE (deg. C)				GREATEST DAILY RAINFALL (mm)		HIGHEST WIND (mps)		SEA LEVEL PRESSURE (mbs)			
	HIGH	DATE	LOW	DATE	AMOUNT	DATE	SPD/DIR	DATE	HIGH	DATE	LOW	DATE
JAN	33.5	18'77	18.3	20'61	57.6	19'65	19/E	19'85	1018.7	17'59	1002.2	1'50
FEB	34.3	17'78	19.2	19'73	57.4	12'56	18/E	26'82	1018.8	1'63	1003.8	7'85
MAR	34.9	15'59	19.2	15'67	116.3	5'54	18/SE	21'82	1018.7	29'58	989.1	24'49
APR	35.7	24'69	20.9	16'71	92.7	25'71	11/E	2'80	1017.2	8'69	989.8	4'49
MAY	35.6	14'68	21.3	24'61	121.7	8'54	12/E	6'85	1015.8	16'58	1002.7	8'54
JUN	35.6	12'68	19.6	23'61	194.1	29'80	12/W	23'84	1015.8	9'71	1001.3	30'64
JUL	35.2	13'75	20.6	11'61	93.6	8'81	15/W	26'82	1014.8	7'53	1002.3	15'83
AUG	34.6	17'75	20.6	20'67	137.5	21'82	15/NW	22'82	1017.8	25'79	1001.2	23'82
SEP	34.4	10'16	20.6	8'67	226.0	30'83	18/ESE	4'83	1015.4	20'65	1002.7	28'78
OCT	36.0	16'77	20.9	2'67	134.1	2'49	22/W	10'83	1016.4	27'77	999.6	14'70
NOV	34.0	17'77	19.2	19'84	202.4	28'55	49/NW	25'68	1017.5	24'57	989.2	25'68
DEC	34.0	8'57	19.2	30'86	269.3	29'75	24/N	22'86	1018.3	26'72	1002.4	29'75
OVERALL	36.0	10/16/ 1977	18.3	1/20/ 1961	269.3	12/29/ 1975	49/NW	11/25/ 1968	1018.8	2/1/ 1962	989.1	3/24 1949
PERIOD OF RECORDS	1951-1986				1949-19		1950-1986		1949-1986			

EXHIBIT 15

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APPENDIX C
PHOTOGRAPHS

PHOTO 4: VIEW OF ROCK CAUSEWAY OF PANTALANG BATO, LOOKING NORTH FROM SHORE

PHOTO 5: ROCK CAUSEWAY AT PANTALANG BATO, LOOKING SOUTH TOWARD SHORE

PHOTO 6: ROCK CAUSEWAY AT PANTALANG BATO, LOOKING SOUTH TOWARDS SHORE

RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420	
REPRESENTATIVE VIEWS OF THE SUB-PROJECT AREA	PLATE C - 2

PHOTO 7: SQUATTER COLONY ALONG PUERTO PRINCESA COASTLINE

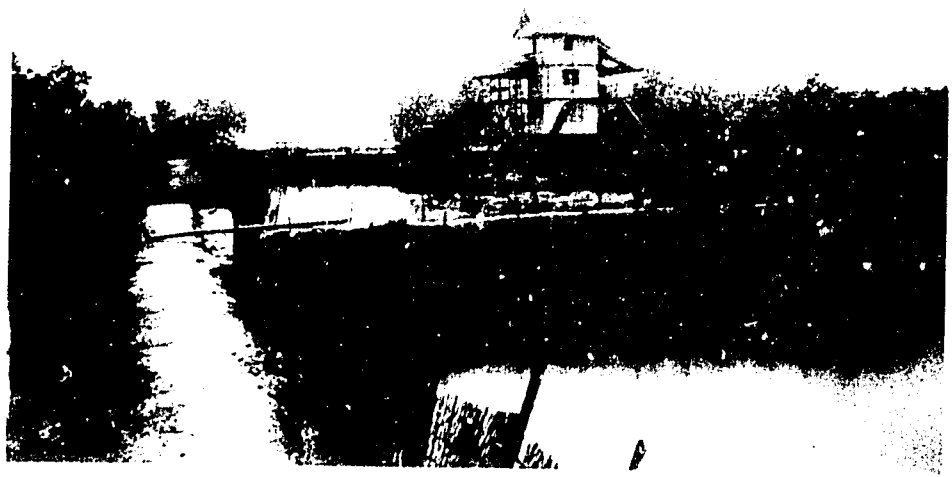

PHOTO 8: CRAB CULTIVATION FACILITY NEAR PANTALANG BATO PORT SITE

PHOTO 9: ALTERNATE SITE AT TABUNTABUN POINT IN BARANGAY MANGINGISDA; NOTE EXISTING WOODEN PIER STRUCTURE AT SITIO SAMPALOC

RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420

REPRESENTATIVE VIEWS OF THE SUB-PROJECT AREA

PLATE C - 4

PHOTO 10: STEEP SHORELINE AREA ON PROPOSED ACCESS ROAD ALIGNMENT

PHOTO 11: STEEP GRADE ON PROPOSED ACCESS ROAD ALIGNMENT

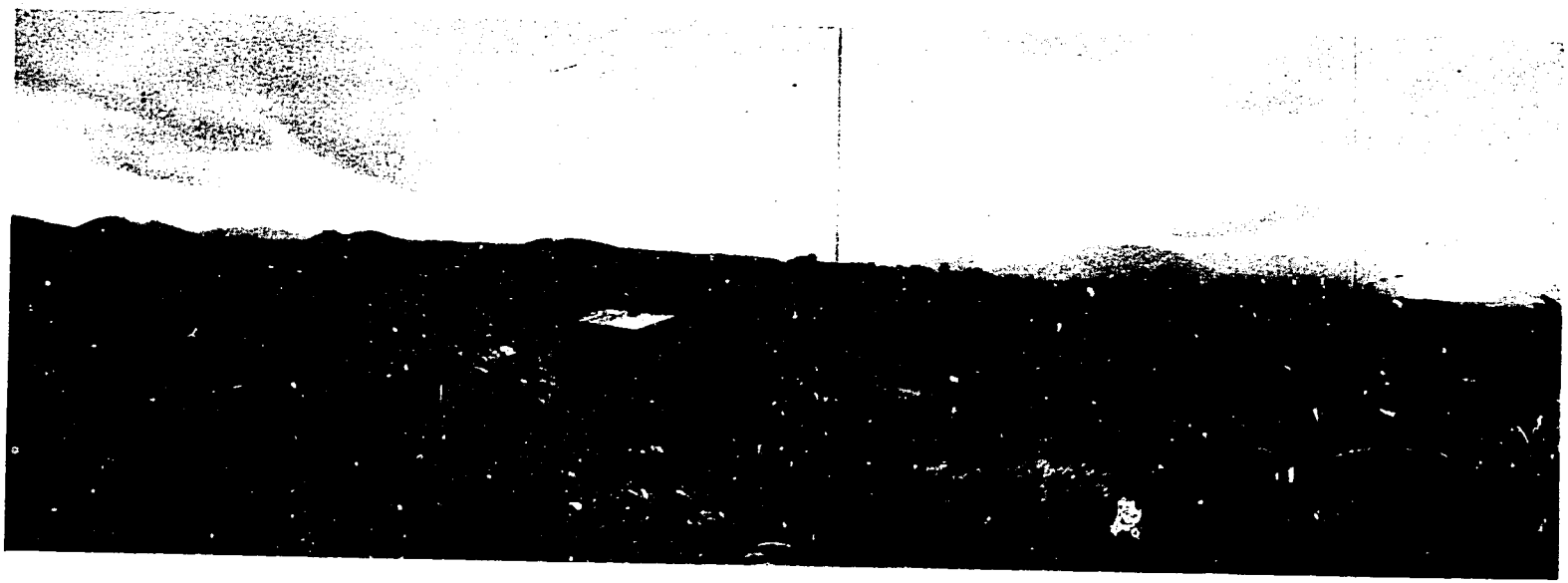

PHOTO 12: TYPICAL TOPOGRAPHY ON PROPOSED ACCESS ROAD ALIGNMENT ABOVE THE SHORELINE TERRACE

APPENDIX D
SOCIAL SOUNDNESS OVERVIEW

APPENDIX D

THE SOCIAL SOUNDNESS OF PORT IMPROVEMENTS: AN OVERVIEW

A. INTRODUCTION

Social soundness analysis evaluates the effect of rural port projects from the perspective of the intended beneficiaries: users, residents and local institutions. It considers project adaptability, social participation, spread of benefits, and equity of benefit distribution. Social sensitivity in feasibility analysis can improve understanding of real needs, projection of future usage, and anticipation of negative social impacts. Social consideration in project design can help in mitigating or compensating for negative impacts and developing community capabilities for self-directed and self-sustained growth.

Social soundness analysis involves five steps:

- Identifying and describing potential port users (individuals and organizations)
- Evaluating potential benefits and/or negative social impacts for these users
- Analyzing socio-economic institutions influencing port usage
- Assessing overall social soundness
- Identifying design and implementation considerations to improve social soundness.

This report provides general social soundness analysis for Philippine port projects, common to many of the proposals. It emphasizes five important aspects of social impact:

- Influences on family income for various social groups
- Implications for population movements
- Potential effects on vulnerable cultural minorities
- Institutional effects
- Design and implementation considerations.

B. THE PHILIPPINE CONTEXT

Many social analysts have recognized the importance of the family as the basic element underlying Filipino social structure. Jocano (1971;410) notes "It is through this structural unit of society that much local authority, rights and obligation and

modes of interactions are expressed, defined, ordered and systematized."

Andres (1981;21) concludes "Structurally speaking the social system in the Philippines is the kinship system. Philippine society is markedly segmented into subgroups with which the members identify themselves to exclusion of others....The most important and highly valued segment in the Philippine society is the family and the kinship system. Obligations to the family are of the highest order. For the Filipino, the concept 'blood is thicker than water' is highly regarded. Within the network of his alliance system which consists of relatives, friends, or followers, status age-grading, generation, authority and power differentials are ranked and observed."

In the family, the father rules, but the mother governs. She is the educator, financial officer, laundry woman and cook (Agoncillo and Alfonso 1961;7). Traditionally, Filipino parents exercise almost absolute powers over their children. It is unthinkable for a Filipino to undertake something important without consulting his parents. When the parents are absent, the eldest sibling takes on the parental role. Grandparents are also consulted and their recommendations carry considerable weight. There is a deeply ingrained respect for elders (Andres 1981;22).

Ritual kinship extension through inclusion of compadre and comadre (ninong and ninang) in baptism, confirmation and wedding services is the immediate linkage between family and community. Ninong are sought from upper income social and political elites to solidify social support networks which are expected to ultimately result in concrete benefits such as granting employment and promotion, providing money in times of need, lending a vehicle, or arranging medical care.

From the family and the local community, allegiances are eventually extended as far as the region sharing a common language and religion. Regionalism generally overshadows nationalism in the Filipino value system. As Agoncillo and Alfonso (1961;9) note: "Regionalism is an extension of the closeness of family ties. Invariably, the Filipino believes that the person known to him, no matter how bad, is better than the one unknown to him."

Inherent Filipino Regionalism has been reinforced historically by Spanish "divide and rule" policies and American "democratic" values. Andres (1981;24) says: "Filipinos have the natural tendency to band together segregating themselves according to regions and home towns. Social status, sex, age and other differences seem to break their barriers at the mention of magkababayan (compatriot) and a closer interpersonal relationship, carried almost to the degree of kinship, is expected mutually of both parties at this point of time."

It is within this social context that Philippine port projects are proposed. Political leaders, loyal to their kin, barangay, and kababayan followers, naturally seek construction projects for their home communities. It is the role of feasibility studies to ensure that approved proposals also meet

rational economic and engineering criteria.

C. PHILIPPINE PORT PROJECTS

The Philippines consists of over 7,000 islands (about 700 of which are inhabited), and is dominated economically by two major cities, Manila and Cebu. Thus, ports play an extremely important role in linking small communities into the economic life of the country. In addition to inter-island traffic, ports play an important role in coastal transportation where roads are either lacking or only seasonally passable. This section summarizes lessons from social soundness analyses of previous Philippine port projects.

For coastal communities, travel by banca often fulfills the same social functions as road transport serves inland. These include moving goods to market, going shopping, visiting relatives, attending high school, and emergency dashes to hospitals or clinics. Such trips are necessary even where bancas must simply land on the beach. Improved port facilities make these journeys easier, faster and safer, and can cause travel to become feasible under previously unnavigable weather conditions.

In general, socio-economic benefits are much more dramatic where new facilities are added than where an existing port is repaired or enlarged. Most proposed RIF sub-projects involve a simple combination of repairing typhoon damage and extending existing piers. For such sub-projects, social benefits are incremental rather than striking. When passenger or marketing sheds, ice plants and cold storage, marine gas stations, or comfort rooms are added, the advantages to the user are much more impressive. Projects which include breakwaters or dredging and land reclamation can have a dramatic impact, sometimes providing year-round access to larger vessels.

Most proposed port sub-projects concern small municipal landings, primarily in rural areas, where users tend to be relatively poor. There are four major types of port users: fishermen, passengers, merchants, and companies. Fishermen may represent family or commercial enterprises. Passengers are local or inter-island. Merchants may be wholesale or retail, and companies reflect various concerns such as trading, agribusiness, and mining. Most port users are individuals from lower and middle income categories. Deep-water ocean ports, which accommodate inter-island vessels, also service large companies.

Fishermen, usually the poorest coastal residents, use the ports regularly and will benefit most. Passengers and merchants, improved port facilities can considerably speed and facilitate travel and cargo shipments. At Morong, Bataan, for example, motorized bancas come from Olongapo in 40-60 minutes, but require an additional 40 minutes to ferry passengers and their goods ashore in the shallow cove where no docking facilities exist. The transport operators and merchants benefitted are usually small operators, but cannot be considered really poor.

Socio-economic benefits from port development projects are generally reflected in:

- Better access through more regular and frequent departures
- Time savings through more rapid loading and unloading
- Added comfort through easier boarding/landing and new facilities
- Increased safety through protection of passengers and boats during inclement weather
- Reduced costs through the landing of larger craft, protection of cargo, reduced spoilage, and less ice consumption

In short, travel and transport become more convenient, faster, more comfortable, safer, and less expensive. This, in turn, can result in higher income and improved access to medical and educational facilities, especially where roads are lacking.

D. INCOME EFFECTS

Speedier travel, faster turnaround times and reduced spoilage translate into reduced transportation expenses. Given a fixed market price in Manila, this will result in lower prices for goods from the capital and higher prices for commodities exported by the port community. Both factors imply a higher effective disposable income available to community residents.

For the many small farmers in the rural port hinterlands, this can mean reduced costs for farm inputs and higher farm-gate prices for crop exports. In practice, capitalizing on this opportunity requires a road network linking the hinterland to the port and no alternative access to markets. However, most RIF sub-project ports have alternative port or road access to markets.

The most direct economic benefits accrue to fishermen, who usually represent the poorest social class. Port improvements can decrease costs, lessen spoilage, and improve marketing. A clear understanding of fishermen's needs can easily multiply such benefits. For example, an ice plant or cold storage facility will often be of greater utility than repairing a cracked market structure. Similarly, sensitivity to functional needs might be reflected in provision of a marine fueling facility where gas stations are far away.

E. POPULATION MOVEMENT

Voluntary migration effects are less likely for port development than for road projects where the value of the land

along the road increases dramatically. It would be unusual for a port to improve access to the point where it would influence a family's decision to move. Involuntary displacement, however, remains a significant concern, especially where squatters line the coast and may have to be moved for port construction.

One pair of ports has been designed with the objective of resettling squatters. A docking facility will provide access to a previously remote peninsula where small house plots have been laid out. Another will serve as a market landing, providing access to the area from which the squatters are being moved. One fisherman/ squatter noted that "resettling" usually means provision of farmland. Fishermen who wish to continue with their livelihood are provided only with a little hardware for rebuilding. In the RIF case, the new area is a peninsula and the operation should satisfy all, if properly implemented. Until now, however, the project has been planned without either consulting or informing the squatters.

F. CULTURAL MINORITIES

A special social soundness consideration is to protect tribal and cultural minorities from unfair exploitation resulting from construction projects. This is a significant consideration where roads are planned through or near ancestral tribal lands. Such considerations are less likely for port projects where less land is involved and non-existent for the large majority of the proposed projects which involve only extension of an existing port.

Historically, however, such events have occurred. In Panacan Port (Narra, Palawan), for example, the Tagbanwa formerly occupied the area where the port was constructed. They were relocated to a mountainside reservation to facilitate the development. Only about three of the original Tagbanwa residents held title to their lands. These three still hold their titles and can legally reap some of the development benefits through the increased value of their property.

Thus, the most significant step in protecting tribal minorities is ensuring them title to their lands. This is feasible in the coastal areas applicable to port projects. (Land titles are not permitted in forest reserves where many tribes live, but communal stewardship arrangements provide some protection.) Where vulnerable minorities are involved, the social soundness of development projects can be increased by including in the project provisions for assisting these people to obtain titles for their property. The Offices of Northern and Southern Communities in the President's Office are currently charged with the task of protecting tribal minorities. Outsiders wishing to purchase land from such minorities are required to obtain approval from these offices.

Appropriate consideration of minority communities's needs in port project planning could be facilitated by more pro-active consultation with them during early project planning. As with other local residents, they too often learn about development

projects when the bulldozers arrive.

G. DESIGN AND IMPLEMENTATION CONSIDERATIONS

Appropriate design considerations can be identified for individual ports by including the intended beneficiaries in the planning process. Most simply, this requires only a few interviews with representative port users. Local leaders could reap political recognition as well as economic gains by expanding the process to include public meetings. People almost always react more positively towards projects in which they are involved.

Consultation with port users can also avoid serious negative consequences. For example, the fishermen a port is intended to aid are often squatters living in huts built on stilts at the waters edge. If construction of a landing requires destruction of their houses and dislocation of their families, their net benefit will be strongly negative.

Land tenure considerations deserve special attention. Wherever private land is involved, port projects should provide assistance in obtaining titles to ensure equitable distribution of benefits.

Labor-intensive construction methods employing local labor should be considered wherever feasible. The Philippine context is characterized by extensive under-employment, and the temporary boost to the economy through provision of temporary employment opportunities can be significant.

In addition, port projects can make permanent contributions to the economy. Kiosks in newly constructed passenger sheds, for example, represent added entrepreneurial ventures. Port maintenance activities may require regular laborers. And, where municipal ports collect docking fees, local institutions will be strengthened through income generation.

Institution-strengthening efforts linked to port improvements can include support for fishermen's cooperatives. Ice plants and cold storage facilities, for example, are often a major concern of fishermen. These plants could be owned and managed through such cooperatives. Government projects could provide credit to local cooperatives, linked with appropriate management training, rather than paying for such facilities outright. DPWH could design small, inexpensive cold storage facilities appropriate for rural fishing ports, in place of the larger plants now available. Appropriate development of such interventions can be pursued effectively if fishermen are involved and consulted from the beginning.

Educational efforts can also be utilized to facilitate the development of local capacity. Municipal port personnel, for example, might benefit from management training including the collection and management of funds and port maintenance. In areas with coral reefs, workshops could be conducted for port users on appropriate practices for maintaining the integrity and

beauty of the reefs while fishing, diving or conducting normal port operations. Such seminars would be especially useful in tourist locations.

H. Conclusions

In general, the proposed port sub-projects will make transportation more convenient, faster, more comfortable, safer, and less expensive. Most port sub-projects will tend to improve real income slightly in the port communities and will not adversely affect cultural minorities or result in significant population movements.

This appendix has presented general analysis common to all port projects. Considerations specific to each case are analyzed in the main body of the report. Socio-economic characteristics of port users are summarized in Chapter II and social soundness analysis is presented in Chapter VIII.

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