REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

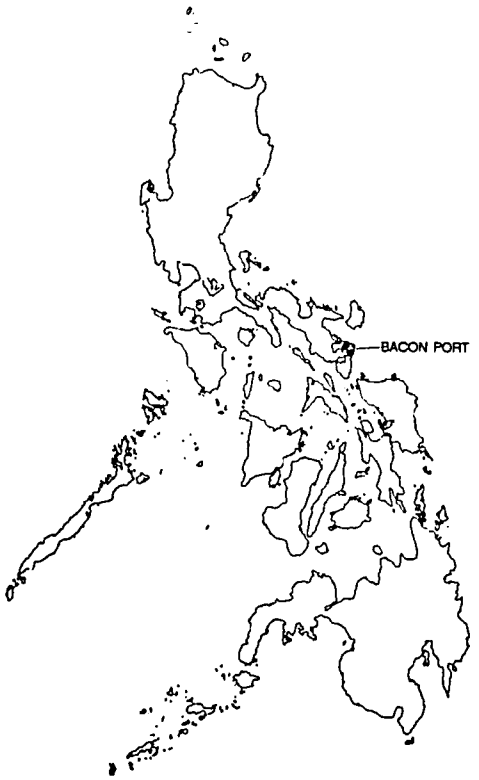
RURAL INFRASTRUCTURE FUND PROJECT

(AID PROJECT NO. 492-0420)

FEASIBILITY REPORT

THE PORT OF
BACON
LUZON ISLAND

SEPTEMBER 1990



LOUIS BERGER INTERNATIONAL, INC.
100 Halsted Street, East Orange, NJ, 07019, U.S.A.

in joint venture with

TCGI ENGINEERS
150 Legazpi St., Legazpi Village, Makati, Metro Manila, Philippines

TABLE OF CONTENTS

I. SUMMARY

A. INTRODUCTION I-1

B. EXISTING PORT I-1

C. ECONOMIC OVERVIEW I-1

D. PROPOSED PORT SUBPROJECT I-1

E. COST CONSIDERATIONS I-1

F. SOCIAL SOUNDNESS I-4

G. ECONOMIC EVALUATION I-4

H. ENVIRONMENTAL ASSESSMENT I-4

II. ECONOMIC OVERVIEW

A. PROFILE OF PROVINCE AND HINTERLAND II-1

B. TRANSPORT SYSTEM PROFILE II-3

C. SOCIO-ECONOMIC CHARACTERISTICS OF THE ZONE OF INFLUENCE II-3

III. PORT THROUGHPUT

A. INTRODUCTION III-1

B. THROUGHPUT FORECAST III-1

1. FISH TRAFFIC III-1
2. CARGO TRAFFIC III-2
3. PASSENGER TRAFFIC III-2
4. VESSEL THROUGHPUT III-2

IV. ENGINEERING DESIGN

A. DATA COLLECTION IV-1

1. RECONNAISSANCE SURVEY IV-1
2. EXISTING FACILITIES IV-1
3. METEOROLOGICAL AND HYDROLOGICAL CONDITIONS IV-1
4. SITE TOPOGRAPHY AND HYDROGRAPHY IV-3
5. AVAILABILITY OF CONSTRUCTION MATERIALS IV-3
6. SOIL AND SUBSURFACE CONDITIONS IV-3

7. SEISMIC CONDITIONS IV-3

B. PRELIMINARY DESIGN IV-4

V. COST ESTIMATES

A. COST OF PROPOSED PORT FACILITIES V-1

B. UNIT RATES V-1

C. REMOTENESS FACTOR V-1

D. CONTINGENCIES AND OTHER COSTS V-1

E. ECONOMIC AND FINANCIAL COST ESTIMATE V-2

F. CONSTRUCTION PERIOD V-2

VI. ECONOMIC EVALUATION

A. INTRODUCTION VI-1

B. SUBPROJECT BENEFITS VI-1

1. DIRECT BENEFITS VI-1
2. DEVELOPMENT BENEFITS VI-1

C. RECOMMENDATION VI-2

VII. FINANCIAL ANALYSIS VII-1

VIII. SOCIAL SOUNDNESS ANALYSIS VIII-1

IX. ENERGY ANALYSIS IX-1

X. ENVIRONMENTAL ASSESSMENT

A. SUBPROJECT DESCRIPTION X-1

B. EXISTING ENVIRONMENT X-1

1. PHYSICAL ENVIRONMENT X-1
2. NATURAL RESOURCES X-1
3. CULTURAL AND SOCIO-ECONOMIC RESOURCES X-4

C. IMPACT ASSESSMENTS X-6

1. PHYSICAL ENVIRONMENT X-6
2. NATURAL RESOURCES X-6

3. CULTURAL AND SOCIO-ECONOMIC RESOURCES X-8

D. ALTERNATIVE CONSTRUCTION ACTION X-9

1. NO ACTION ALTERNATIVE X-9
2. ALTERNATIVE CONSTRUCTION ACTION X-9

APPENDIX A. FIGURES

APPENDIX B. EXHIBITS

APPENDIX C. PHOTOGRAPHS

APPENDIX D. SOCIAL SOUNDNESS OVERVIEW

LIST OF TABLES

TABLE	TITLE
2-1	FAMILIES BY MAIN SOURCE OF INCOME AND TOTAL FAMILY INCOME FOR SORSOGON
3-1	BACON PORT THROUGHPUT PROJECTIONS
5-1	COST ESTIMATE SUMMARY
6-1	ECONOMIC ANALYSIS
9-1	REPRESENTATIVE VESSELS

LIST OF FIGURES

FIGURE	DESCRIPTION
1-1	LOCATION MAP
1-2	PORT AREA MAP
2-1	BACON PORT - REGION V LOGISTIC NETWORK
4-1	PROPOSED PORT FACILITIES
9-1	ASSUMED FUEL CONSUMPTION
10-1	SCHEMATIC CROSS-SECTION OF BACON LITTORAL ZONE
10-2	LAND COVER MAP
A-1	KEY MAP
A-2	ROAD INFRASTRUCTURE MAP
A-3	REGIONAL HYDRO MAP
A-4	REGIONAL TOPO MAP
A-5	EXISTING ROCK CAUSEWAY
A-6	LOCATION OF CONSTRUCTION MATERIALS
A-7	SIGNIFICANT PHILIPPINE EARTHQUAKES: 1960 - 1965
A-8	DEVELOPMENT PLAN
A-9	PROPOSED ROCK CAUSEWAY EXTENSION
A-10	PROPOSED VEHICLE MANEUVERING AREA
A-11	PROPOSED REINFORCED CONCRETE PIER APPROACH
A-12	PROPOSED REINFORCED CONCRETE PIER
A-13	PROPOSED REINFORCED CONCRETE PIER
A-14	PORT BUILDING PLAN
A-15	PORT BUILDING SECTION
A-16	PORT BUILDING SECTION

LIST OF EXHIBITS
(IN APPENDIX B)

EXHIBIT NUMBER	TITLE
1	PORT SHIPPING STATISTICS
2	SOCIO-ECONOMIC DATA
3	PORT OPERATION INVENTORY
4	POPULATION BY PROVINCE
5	PER CAPITA INCOME GROWTH RATES
6	GROWTH RATE FOR PASSENGER TRAVEL DEMAND, BY PROVINCE
7	GROSS REGIONAL DOMESTIC PRODUCT
8	VALUE OF PASSENGER TIME BY REGION
9	LAGONOY GULF LOGISTICS NETWORK
10	SUMMARY OF UNIT RATES
11	REPRESENTATIVE VESSEL COST MODEL
12	PORT TARIFFS AND CHARGES
13	CLIMATOLOGICAL NORMALS - LEGAZPI
14	CLIMATOLOGICAL NORMALS - LEGAZPI
15	ENVIRONMENTAL CONTACT LIST

LIST OF PHOTOGRAPHS

PLATE	PHOTO	DESCRIPTION
1-1	1	AERIAL VIEW OF BACON PORT; TO THE EAST
1-1	2	CAUSEWAY AT BACON PORT; M/V SEAWIND AT BERTH
10-1	3	SEAGRASS ZONE OF BACON REEF FLAT
10-1	4	EXISTING ROCK CAUSEWAY AT BARRIO GATBO
C-1	5	RIGHT SIDE OF BACON CAUSEWAY FROM VEHICLE TURN-AROUND
C-1	6	ARMOUR ROCKS AND VEHICLE TURN-AROUND
C-2	7	UNFINISHED END OF CAUSEWAY
C-2	8	SIDE OF ROCK CAUSEWAY, LOOKING SHOREWARD
C-3	9	CAUSEWAY FROM ACCESS ROAD
C-3	10	ACCESS ROAD TO BACON PORT

I.
SUMMARY

I. SUMMARY

A. INTRODUCTION

The Port of Bacon is situated on Albay Bay in Barangay Salvacion in Bacon Municipality. Bacon is located in the northeastern portion of the Province of Sorsogon at the extreme southern end of Luzon Island in Region V. Figures 1-1 and 1-2 locate and detail the port site.

B. EXISTING PORT

The Port of Bacon comprises a 208 meter long rock causeway. Except for some loss of material at the offshore end, the causeway is in good condition. There are no other port facilities at the site.

The 500-meter approach road, connecting the port to the main provincial road, is badly deteriorated and overgrown. Plates 1-1 and 1-2 show aerial views of the port site and vicinity.

C. ECONOMIC OVERVIEW

Bacon Port currently sees little use. No significant passenger movement to or from the port have been identified. Only fishing bancas are active at the Port of Bacon.

If improved to handle large inter-island vessels, Bacon Port could become important to the industrial park development proposed for Sorsogon. However, the causeway now only serves as a breakwater for marginal fisherman who typically land there catch on the beach.

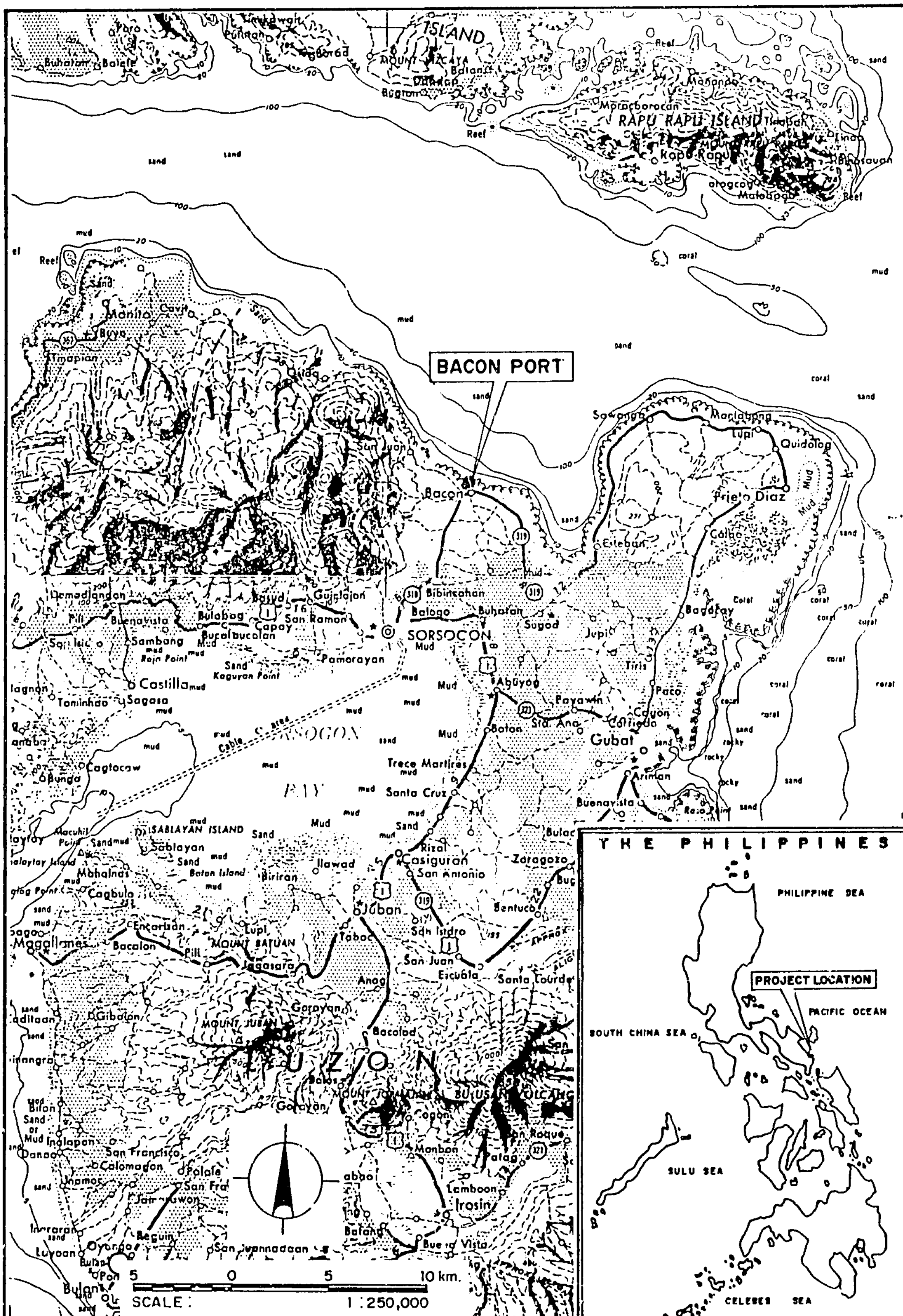
D. PROPOSED PORT SUBPROJECT

The proposed port subproject will consist of a 100-meter extension to the existing causeway. A concrete pier approach to a T-shaped concrete pier berth would be constructed at the end of the causeway extension. The 500-meter approach road for the port would be repaved with an asphalt overlay.

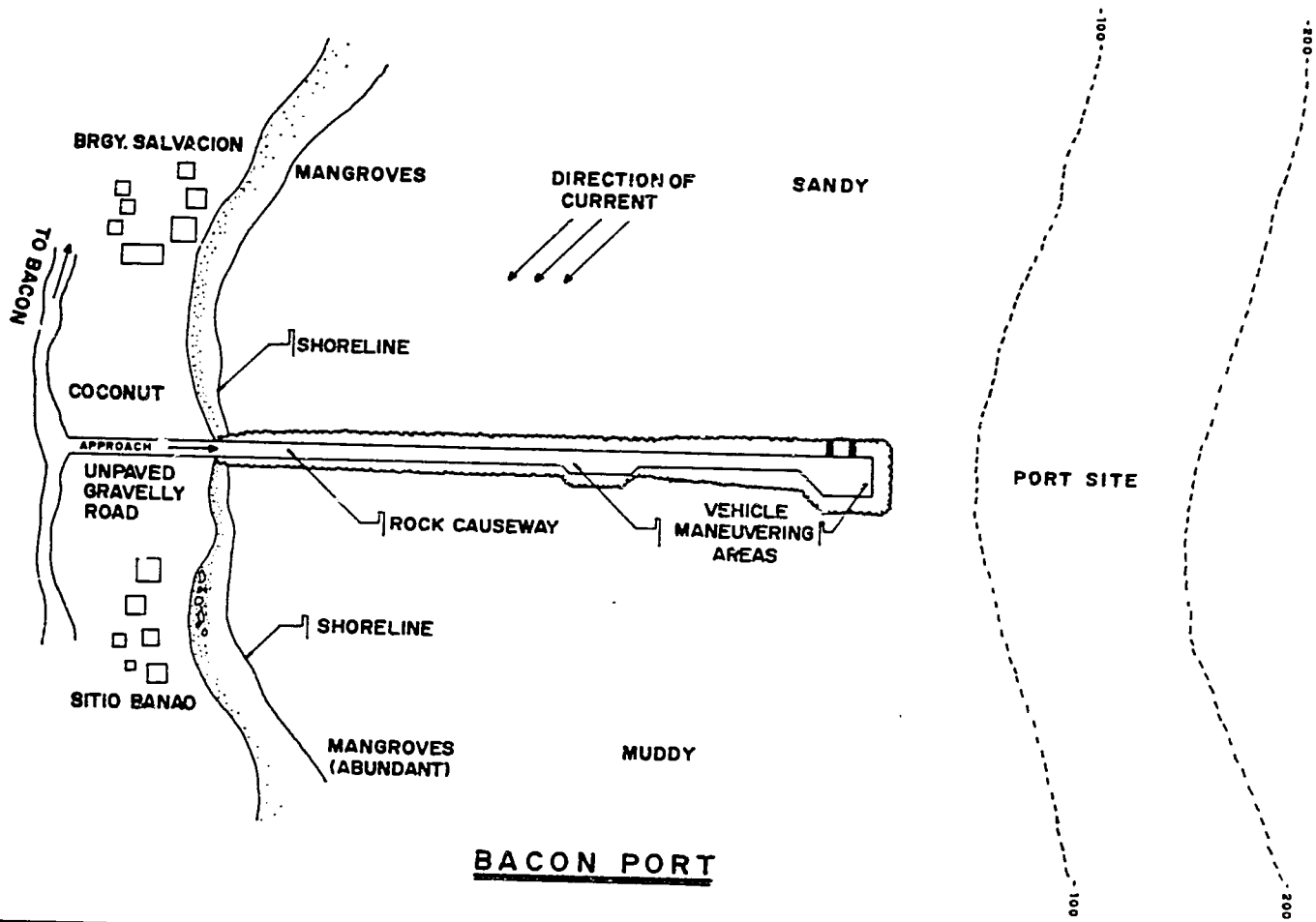
E. COST CONSIDERATIONS

The cost of constructing the proposed port upgrades is estimated at ₱8,387,000.

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.



RURAL INFRASTRUCTURE FUND PROJECT	AID PROJECT NO. 492 - 0420	FIGURE 1 - 1
LOCATION MAP		



RURAL INFRASTRUCTURE FUND PROJECT

AID PROJECT NO. 492 - 0420.

PORT AREA MAP

FIGURE 1 - 2

F. SOCIAL SOUNDNESS

The proposed port improvement is unlikely to result in substantial social benefits for the area residents. Local market access is primarily by land transportation and traffic diversion as a result of the subproject is not anticipated.

The port improvement will not result in any significant in-migration to the area.

There are no vulnerable cultural minorities in the area that might be adversely affected by the proposed construction.

G. ECONOMIC EVALUATION

The development proposed for the Port of Bacon is not economically feasible at an EIRR of -8.46%.

Therefore, the Consultant does not recommend constructing the proposed subproject at Bacon.

H. ENVIRONMENTAL ASSESSMENT

Construction activities proposed for the Bacon Port subproject will not result in the significant disruption of the physical or natural environment. Approximately 2,000 square meters of seagrass, algae and coral reef area will be directly displaced by the causeway and pier extension. The described port subproject will not directly displace or relocate any existing structures, inhabitants or livelihood.

The completed port facilities will improve access to the relatively isolated Bacon Port area and may contribute to secondary environmental impacts related to anticipated economic development and population growth. The mitigation of secondary impacts associated with improved port access could include implementation of existing GOP laws and regulations and introduction of community-based education programs emphasizing sustainable development and resource management.

The site where the port improvements are proposed has been subjected to human disturbances in the past, such as construction excavation, and is unlikely to include archaeological or culturally significant features.

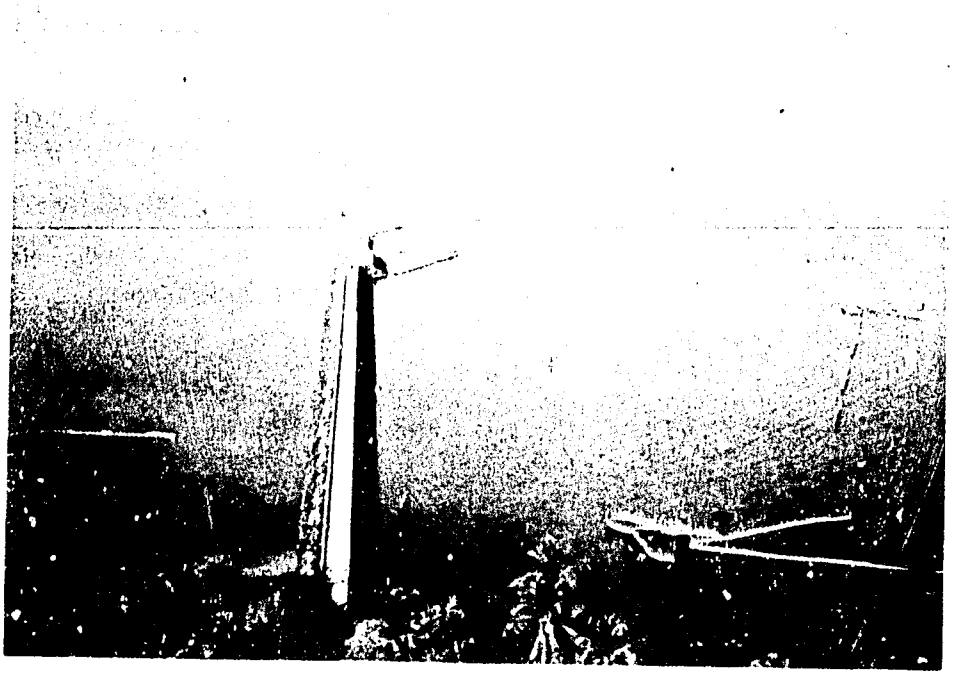


PHOTO 1: AERIAL VIEW OF BACON PORT; TO THE EAST

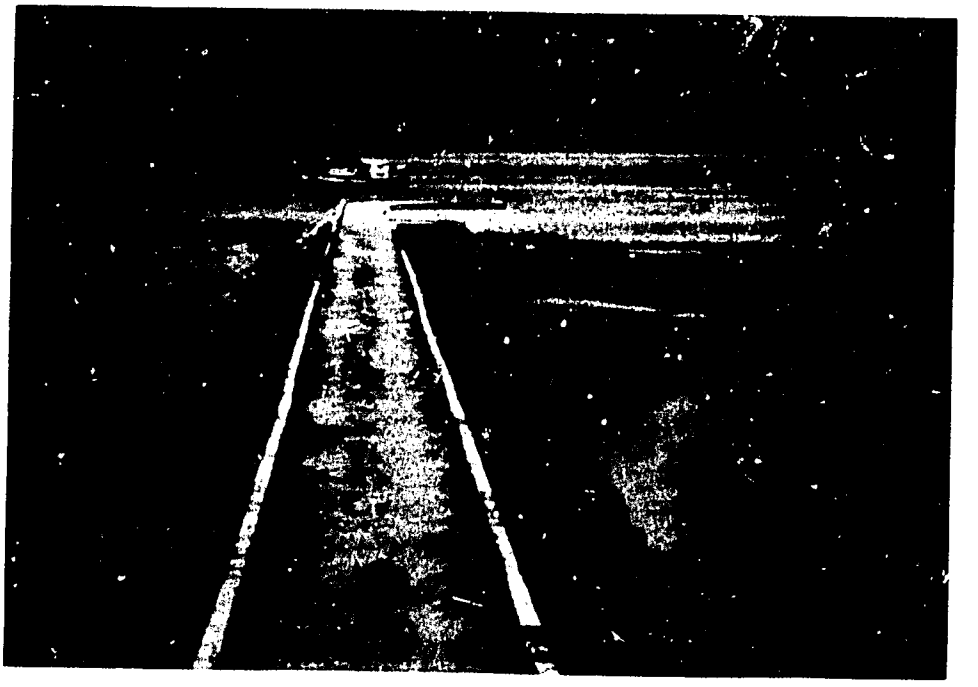


PHOTO 2: CAUSEWAY AT BACON PORT; M/V SEAWIND AT BERTH

RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420	
REPRESENTATIVE VIEWS OF THE SUB-PROJECT AREA	PLATE I-1

II.
ECONOMIC OVERVIEW

II. ECONOMIC OVERVIEW

A. PROFILE OF PROVINCE AND HINTERLAND

The proposed feeder port improvement is located at Sitio Banao in Barangay Salvacion in Bacon Municipality. Bacon is one of the sixteen municipalities which comprise the Province of Sorsogon on Luzon Island in Region V. The port is located at Latitude 13°03' N and Longitude 124°02' E.

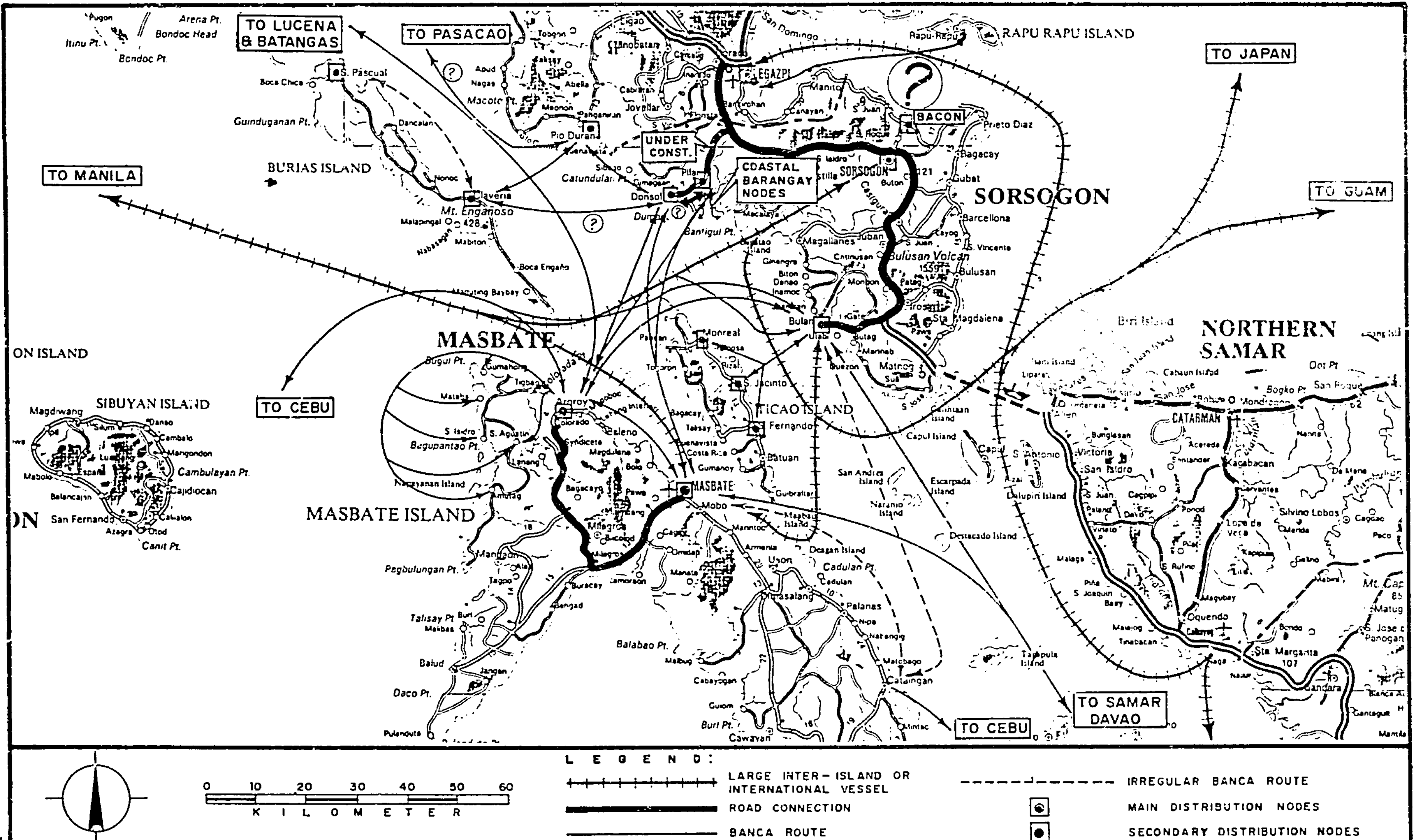
The Port of Bacon is an inactive port within the Albay Gulf network that also includes the Ports of Preito Diaz, Manito, Legazpi City, San Domingo and Rapu-Rapu Island (Figure 2-1).

The **importance** of Bacon Port has declined over the years. Today, the port is best described as inactive and apparently redundant to the needs of the region. Constructed in the 1960s, Bacon was a port of call for inter-island vessels throughout the 1970s, a role now apparently dominated by the inter-island Port of Sorsogon and the international Port of Legazpi. This decline was in part the result of the construction of new highway links between the major communities on Luzon and in particular between Legazpi and Sorsogon. This decline is also in part the result of a lack of commitment to maintain the road to Bacon Port.

The **future role** of the port is dependent upon the regional objective of designating Bacon as the industrial development center for Sorsogon City. Currently, a very large geothermal plant is under construction in the municipality. Other major development projects are under study but are as yet uncommitted. However, the development strategy as outlined by Bacon officials includes the current construction of the new large scale geothermal plant, the reactivation of a local airport at Gabao and the construction of a new road between Bacon to Manito as well as other important additions to the local infrastructure.

The improvement of Bacon Port and the access road will materially enhance the economic growth of Bacon Municipality. However, while the National Power Corporation is presently erecting a geothermal plant at the northern part of Bacon, the proposed resumption of production at a local marble quarry and renewed coal mining at Barangays Bato and Gatbo are likely dependent upon the proposed improvement of this port.

The **existing facility** of Bacon Port is comprised of a four meter wide by 208 meter long rock causeway with two vehicle maneuvering areas. The causeway itself is in good condition with some damage evident at the seaward end. Depths at the end of the causeway are too shallow to accommodate large bancas. The approach road to the port is in extremely poor condition. The area has electricity and a good local source of fresh water (Figure 1-2).



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

FIGURE 2-1

BACON PORT – REGION V LOGISTIC NETWORK

The immediate **zone of influence** for Bacon Port is the Municipality of Bacon. The total hinterland extends east to the Municipalities of Preito Diaz and Bagacay, southwest to the capital city of Sorsogon and northwest to the Island of Rapu-Rapu (Figure 2-1).

The Municipality of Bacon is comprised of twenty-eight barangays, eighteen of which lie on the coast of Albay Bay. The total **population** is in excess of 43,300 (1990) including 1,330 families dependent upon fishing for their livelihood within a total land area of 12,354 hectares.

B. TRANSPORT SYSTEM PROFILE

The proposed feeder port subproject is connected with the road to Bacon by a 500 meters long gravel road with a deteriorated asphalt road overlay. The highway between this junction and the town of Bacon is a six-kilometer gravel and asphalt road, two kilometers of which needs immediate repairs.

Bacon is connected to the capital city of Sorsogon and to the Pan Philippine National Highway by a fifteen-kilometer asphalt road in good condition.

The inter-town and inter-barangay transport requirements are well serviced by bus, jeepney and tricycles. From Sorsogon, there are frequent bus schedules south to the ferry connection to Samar at Matnog and north to Legazpi, Naga and Manila.

Philippine National Railways (PNR) will recommence services between Legazpi and Manila later this year and Philippine Airlines (PAL) currently operates services from Legazpi to Manila twice daily.

Finally, there are proposals to resume operations at nearby Gabao Barangay Airport.

C. SOCIO-ECONOMIC CHARACTERISTICS OF THE ZONE OF INFLUENCE

Sorsogon is a predominantly (80%) rural province whose residents are Bicolano. With a family income of ₱17,116 in 1985, the province is below average for the Philippines. The main source of income is agriculture-related for about half of Sorsogon families (47%), compared with 48% for Region V (Bicol) and 38% for the Philippines as a whole. As shown in Table 2-1, the poor are primarily small farmers or recipients of assistance from domestic sources, while the affluent residents are non-agricultural wage earners or recipients of crops shares from other households.

The educational level in Sorsogon falls below the Philippine average. In 1980, five out of six residents (84%) were literate but only one-fourth (24%) entered high school. For the Philippines as a whole, one-third (33%) entered high

school. Employment was only slightly below the Philippine average. It was considerably higher for men (31%) than for women (14%). Four-fifths (79%) of the men and 18% of the women who were employed were working in agriculture.

TABLE 2-1

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

Main Source Of Income	Total	Family Income (Pesos) Under 10K	10K-14K	15K-19K	20K-29K	30K-39K	40K-59K	60K & Over
		Percent of Families						
Agricultural Wages/Salaries	13.8%	9.4%	23.7%	17.8%	0.0%	0.0%	0.0%	0.0%
Non-Agricultural Wages/Salaries	19.9	5.2	10.0	26.3	54.2	34.6	22.0	0.0
Agricultural Entrepreneurial	33.6	28.0	51.8	23.0	20.1	31.5	0.0	0.0
Non-Agricultural Entrepreneurial	12.4	9.4	3.6	18.9	14.6	27.1	22.0	66.6
Other	20.3	48.0	7.9	14.0	11.1	6.8	56.0	33.4
	100%	100%	100%	100%	100%	100%	100%	100%
Total Families (Thousands)	96.6	22.7	32.1	18.6	12.4	6.8	2.1	1.4

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

Most families (57% urban and 47% rural) owned the land where they lived. Four out of seven (57%) urban homes and 11% of rural homes had electricity. The piped water supply was above Philippine standards. Five out of eight (64%) of urban homes (compared with 58% for the Philippines) and 24% of rural homes (compared with 15% for the national average) obtained drinking water from a faucet. Five out of six (85%) of urban households and 93% of rural households cooked with charcoal or wood. Five out of eight urban homes (64%) and 56% of rural homes had radios.

In Sorsogon, there were thirty commercial fishing operators in 1980 who hired a total of 213 fishermen. Most commercial

fishermen (96%) worked over 150 days per year. These operators ran thirty-two boats totalling 134 tons and caught a total of 116 tons of fish. In addition, there were 10,204 municipal fishing operators who caught 15,968 tons of fish using 7,449 fishing craft for an average of 180 days each.

In 1980, there were 3,100 farms in Bacon Municipality. One out of seven (15% compared with 18% for Sorsogon) were over five hectares. More than half (57% versus 52% for Sorsogon) were fully owned and 44% (compared with 40% for Sorsogon) were sharecropped.

In 1980, 5% of the population of Bacon (1,704 people) lived in fishing households. Some 560 household members fished at least occasionally while 180 were fulltime fishermen. There were 167 fishing craft which operated for an average of 272 days each. A total of 298 municipal fishing operators reported a total catch of 415 tons of fish or an average of 1.39 tons. This is slightly below the 1.49 tons average for the Bicol Region.

III.
PORT THROUGHPUT

18

III. PORT THROUGHPUT

A. INTRODUCTION

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

Appendix B displays the data base used to forecast port throughput. The port is virtually inactive and, consequently, this data base, except for marginal fish landings, is non-existent (Exhibits 4 through 9).

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

If improved to handle international and the largest inter-island vessels, the Port of Bacon would serve as an important contributor towards the proposed development of Bacon Municipality as an industrial development park for the City of Sorsogan. Currently, however, it only serves marginal fishermen, who, for the most part, are more comfortable landing their catches on the beach rather than out on the causeway.

In any case, such a development should only be considered as part of a major developmental strategy, which is outside of the terms of reference of this subproject feeder port feasibility study.

B. THROUGHPUT FORECAST

Existing throughput was finalized only after a comprehensive survey and analysis of the interactive network that encompasses Manila, Cebu and the Lagonoy Gulf. The network analysis covering the Lagonoy Gulf is presented in Exhibit 9.

No significant passenger and cargo movements to and from the Port of Bacon were identified. Such diverted traffic as might occur in the event the port was improved would be either new cargos developed by the proposed new economic development zone or small parcel traffic and passengers diverted from the Ports of Legaspi and Sorsogon.

1. FISH TRAFFIC

Fishermen were surveyed to determine the fish landed from marginal (inner-coastal) and commercial (deep-sea) activities. Commercial or marginal fish landing statistics are not available for the Port of Bacon.

However, 10% of the identified motorized fishing vessels were found to have a capacity exceeding three DWT and consequently are considered to be commercial fishing vessels by the Department of Fisheries and Aquatic Resources. Other subproject analysis suggest that commercial fish landings by small motorized commerical vessels are on the order of three times the average landing by motorized marginal fishing vessels. Consequently, it has been assumed that one-third of the reported fish landings are commercial fish for markets outside the Barangay and two-thirds of the reported fish landings are marginal fish for local markets.

In the absence of definitive fish stock estimates or other positive indications of surplus fish stocks, fish landings are not projected to increase over the forecast period.

2. CARGO TRAFFIC

Only occasional chartered movements of small cargos were identified by the economic survey team.

3. PASSENGER TRAFFIC

Only weekend, small-party charters were identified by the economic survey team.

4. VESSEL THROUGHPUT

Only fishing bancas were identified as active at the Port of Bacon.

Only motorized bancas are considered to be active recipients of potential benefits from causeway, pier and stairlanding improvements.

At the Port of Bacon, only three commercial bancas are considered to be active users of the existing or proposed pier.

Fish landings and fishing vessels are not projected to increase over the forecast period.

Table 3-1 displays the aforementioned combined fish landing and vessel throughput data.

TABLE 3-1

BACON PORT THROUGHPUT PROJECTIONS

COMMODITY	1989/90 SURVEY	1992 PROJECTED	2001 PROJECTED	2011 PROJECTED
FISH (tons per year)				
1 Commercial (33%) (i)	802	802	802	802
2 Marginal (66%) (ii)	1,538	1,538	1,538	1,538
3 Ipon	0	0	0	0
4 Bangus	0	0	0	0
5 Transhipped	0	0	0	0
Total:	2,340	2,340	2,340	2,340
% of 1992:	100%	100%	100%	100%
CARGO (tons per year)				
1 Rice	0	0	0	0
2 Consumables	0	0	0	0
3 Bagged Cargos	0	0	0	0
4 Bottled Cargoes	0	0	0	0
5 Fuels & Oils	0	0	0	0
6 Others	0	0	0	0
Total:	0	0	0	0
% of 1992:	0%	0%	0%	0%
PASSENGERS (per year)				
1 Local	0	0	0	0
2 Regional	0	0	0	0
3 Inter Island	0	0	0	0
Total:	0	0	0	0
% of 1992:	0%	0%	0%	0%
VESSELS (per day)				
1 Marginal Fishing Vessels	31	31	31	31
2 And/Or Unscheduled	0	0	0	0
3 Commercial Fishing Vessels	3	3	3	3
4 And/Or Unscheduled	0	0	0	0
(iii) Total:	34	34	34	34
% of 1992:	100%	100%	100%	100%

SOURCE: Consultant's Surveys

Basis: (1992)

(i) 1,538 tons marginal fish not projected to increase and
(ii) 802 tons commercial fish not projected to increase.
(iii) 34 vessels per day not projected to increase.

IV.
ENGINEERING DESIGN

22

IV. ENGINEERING DESIGN

A. DATA COLLECTION

1. RECONNAISSANCE SURVEY

The reconnaissance survey for the Port of Bacon was conducted on February 19 and 20, 1990 (Appendix C, Plates C-1 through C-3).

On February 19, the survey team met with the following officials in Sorsogon:

Engr. Romeo Panganiban	-	District Engineer
Engr. Mariano Saret	-	Asstistant District Engineer
Engr. Frank Magnaye	-	Planning Section Chief
Engr. Alex Barios	-	Quality Control Section Chief

In addition, on February 20, 1990, the team met with the following Municipal Officials in Bacon:

Mr. Elias M. Garcia	-	Municipal Mayor
Ms. Paciencia G. Esico	-	Municipal Planning and Development Coordinator
Engr. Raden Dimaano	-	Assistant Municipal Planning and Development Coordinator

The District Engineer of Sorsogon indicated the location of the subproject port site and recommended the proposed upgrades.

2. EXISTING FACILITIES

The Port of Bacon comprises a 208 meter long rock causeway. The 3.5 meter wide deck atop the causeway is concrete paved for the full length and complete with curbs (Appendix A, Figure A-5). There are two turn-around areas on the causeway. There are no other port amenities at the site.

The causeway is in good condition, with the exception of the unfinished, offshore end. There is some material loss caused by Typhoon Sisang (Plate C-2, Photo 7).

An approach road of approximately 500 meters connects the port to the main provincial road. The road's asphalt overlay is deteriorated, is overgrown and apparently sees relatively little or no use.

3. METEOROLOGICAL AND HYDROLOGICAL CONDITIONS

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

a. **Climate**

The climate at Bacon can be categorized as tropical with heavy rains. Bacon has no dry season but there is a pronounced rainy period in winter.

b. **Rainfall**

Rainy days are distributed throughout the year and range from an average monthly minimum of fourteen days in May to a maximum of twenty-three days in December. There are an average of 225 rainy days per year.

The average monthly rainfall ranges from a minimum of 152 millimeters in April to a maximum of 484 millimeters in November. The total average annual rainfall is 3,300 millimeters.

The greatest daily rainfall recorded for Legazpi was 484.6 millimeters, which occurred on November 3, 1967.

c. **Temperature**

The annual mean temperature is 26.9°C. The warmest month is June with maximum temperature averaging 32.2°C. January is the coolest month with minimum temperatures averaging 22.1°C.

The maximum temperature ever recorded at Legazpi is 37.7°C. The minimum temperature recorded is 13.9°C.

d. **Winds**

Wind velocities throughout the year are typically three to four meters per second except during the passage of a typhoon. The prevailing winds are out of the northeast from October to June. Winds are from the west or southwest during the remainder of the year.

The maximum wind speed ever recorded in Legazpi was fifty-seven meters per second coming from the south.

e. **Waves**

The significant wave height calculated for Bacon during the southwest monsoon is approximately two meters. During a typhoon, however, wave heights can increase to over three meters.

f. **Tides**

No tide readings are taken at the port site.

The tidal data for the Port of Bacon, as referred from the National Mapping and Resource Information Authority (NAMRIA), is as follows:

Tidal Type:	Semi-Diurnal
Mean Range (MLW-MHW):	1.22 meters
Diurnal Range (MLLW-MHHL):	1.43 meters

4. SITE TOPOGRAPHY AND HYDROGRAPHY

The Port of Bacon is located on the southwestern shore of Sucot Bay. The causeway extends offshore from the edge of a small hill. The slope of the seabed for the full length of the causeway is relatively gentle. However, at a distance just over 100 meters from the end of the existing causeway, water depths increase abruptly from -2.0 meters to -5.0 meters, MLLW, from the pier. Regional hydro data is presented in Appendix A, Figure A-3.

The port is located on rolling terrain. The average elevation just inland from the port is ten meters. The 500-meter approach road also passes through rolling terrain. Regional topo data is shown in Figure A-4.

5. AVAILABILITY OF CONSTRUCTION MATERIALS

Materials required from the immediate area for the construction of the port facilities include sand, gravel and rock. Sand is available in Balete River eight kilometers from port site. Gravel is available in Rangas and Salog Rivers eight kilometers from port site. Armour rocks in the form of volcanic bombs are available in various sizes along the coastline seventeen kilometers from the port site. Figure A-6 locates these construction material sites.

Other construction materials, such as cement, timber or marine hardware, can be obtained from Legaspi City, Sorsogon or Manila.

6. SOIL AND SUBSURFACE CONDITIONS

The port site is a hilly area with the causeway built in a moderately sloping coastline. Soils at the port site consist of yellowish brown clayey terrace gravel deposits. The shoreline is generally overlain by thin layer of coarse to fine sand with some gravels.

No soil investigation has been conducted at the port site.

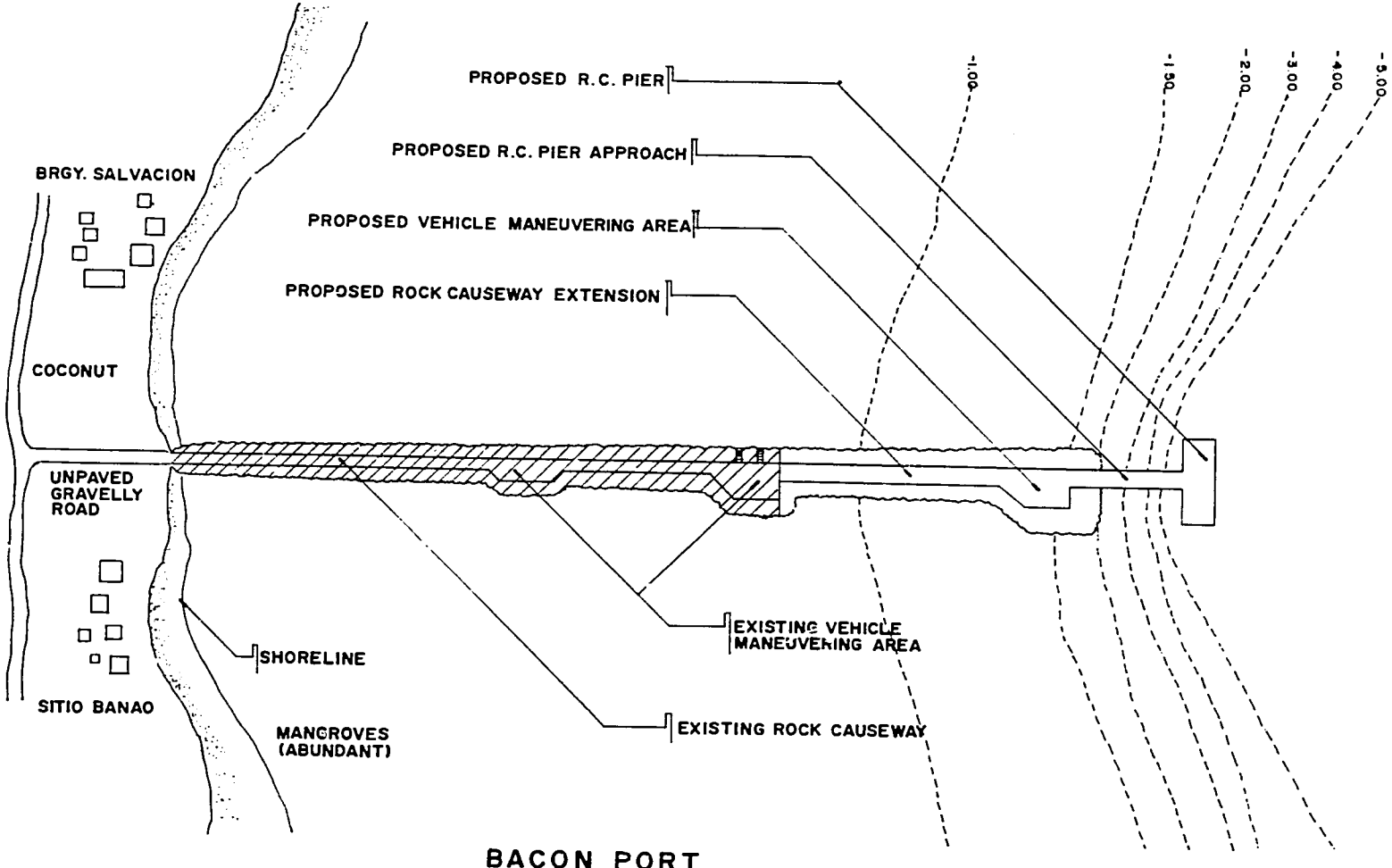
7. SEISMIC CONDITIONS

The Philippines is located along the peripheral boundary of the Pacific earthquake belt. The Bicol Region where Bacon is located experiences an average of four perceptible seismic shocks each year. Earthquake intensities of over 5.0 on the Richter Scale are not uncommon in the Philippines (Figure A-7). 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 Bacon will take into account earthquake forces.

B. PRELIMINARY DESIGN

The proposed improvements for the Port of Bacon (Figures 4-1 and A-8 through A-16) include the following:

- A 100-meter extension of the four meter wide rock causeway
- A third turn-around area to be constructed at the offshore end of the new causeway addition
- A reinforced concrete pier approach, six meters wide by thirty-nine meters long, at the end of the causeway addition
- A reinforced concrete T-head pier berth, eleven meters wide by thirty meters long, constructed at the end of the pier approach
- An asphalt overlay on the deteriorated 500-meter by four-meter approach road
- A port building



BACON PORT

RURAL INFRASTRUCTURE FUND PROJECT

AID PROJECT NO. 492 - 0420

PROPOSED PORT FACILITIES

FIGURE 4-1

V.
COST ESTIMATES

V. COST ESTIMATES

A. COST OF PROPOSED PORT FACILITIES

The proposed port facilities are shown in Appendix A, Figures A-8 through A-16. The construction cost of the proposed port is estimated at ₱8,232,000. The construction cost of the proposed access road is estimated at ₱155,000. Therefore, the total construction cost for the proposed upgrades at the Port of Bacon estimated at ₱8,387,000.

B. UNIT RATES

The construction costs were determined by applying unit rates to the quantities. Unit rates are presented in Appendix B, 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 the Bacon Port area is readily accessible by roadway from Manila and no above-normal construction costs are anticipated, the remoteness factor for Bacon 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 uncertainly or contingency is reflected in higher unit rates for in-water construction instead of a separate, higher contingency factor. The unit rates presented in Appendix B, Exhibit 10 are derived in keeping with this method.

The following additional costs are tabulated in the manner shown in the Cost Estimate Summary (Tables 5-1A and 5-1B):

o 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%

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

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

E. ECONOMIC AND FINANCIAL COST ESTIMATE

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

F. CONSTRUCTION PERIOD

The estimated construction time required for the proposed port improvement is between sixteen and eighteen months, provided that the required equipment is on site or can be readily mobilized from Manila or other urban centers. Construction of the causeway and pier should be started during the period of least wave action, between the months of January and June.

TABLE 5-1A - COST ESTIMATE SUMMARY
THE PORT OF BACON
PORT FACILITIES
(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. CONCRETE INTER-ISLAND PIER								
73	Berthing Dolphins (7-Timbar Piles)	EA.	40000	4	80 (50%)	56 (35%)	24 (15%)	136	160
75	Mooring Cleat	EA.	8000	4	13 (40%)	14 (45%)	5 (15%)	27	32
140	Concret Pier	SQ.M.	9500	330	1,285 (41%)	1,379 (44%)	470 (15%)	2,664	3,134
	TOTAL				1,378 (41%)	1,449 (44%)	499 (15%)	2,827	3,326
	II. PIER APPROACH TRESTLE								
50	Reinforcing Steel	KG	21	29,200	276 (45%)	270 (44%)	67 (11%)	546	613
60	Precast Concrete Piles, Furnished (40 x 40cm)	L.M.	820	344	116 (41%)	124 (44%)	42 (15%)	240	282
61	Precast Concrete Piles, Driven (40 x 40cm)	L.M.	660	344	102 (45%)	91 (40%)	34 (15%)	193	227
64	Structural Concrete, Class A (over water)	CU.M.	3300	162	187 (35%)	267 (50%)	80 (15%)	454	534
	TOTAL				681 (41%)	752 (45%)	223 (13%)	1,433	1,656
	III. PASSENGER CARGO LANDING PLATFORM								
9	Compacted Fill, Select Material, Borrow	CU.M.	70	910	30 (47%)	18 (28%)	16 (25%)	48	64
22	Crushed Aggregate Base Course	CU.M.	240	47	6 (52%)	2 (22%)	3 (26%)	8	11
33	Portland Cement Concrete Pavement	SQ.M.	400	154	31 (50%)	19 (31%)	[illegible] (19%)	50	62
80	Building w/ Comfort Room, Office	S.M.	4,000	100	164 (41%)	176 (44%)	60 (15%)	340	400
64	Structural Concrete, Class A (over water)	CU.M.	3300	76	88 (35%)	125 (50%)	38 (15%)	213	251
	TOTAL				319 (40%)	340 (43%)	129 (16%)	659	788

SUBTOTAL		4,919	5,770
Remoteness Factor :	1.00	0	0
SUBTOTAL		4,919	5,770
Contingencies (10%)		492	577
SUBTOTAL		5,4[illegible]	6,347
Site Costs (9%)		487	571
SUBTOTAL		5,898	6,918
Overhead & Profit (19%)		1,121	1,314
TOTAL COST		7,019	8,232

31

TABLE 5-1B - COST ESTIMATE SUMMARY
THE PORT OF BACON
ACCESS ROAD
(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. A.C. PAVED ACCESS ROAD								
22	Crushed Aggregate Base Course	CU.M.	240	220	27 (52%)	12 (22%)	14 (26%)	39	53
27	Single Bituminous Surface Treatment	SQ.M.	25	2,200	30 (54%)	13 (24%)	12 (22%)	43	55
	TOTAL				57 (53%)	25 (23%)	26 (24%)	82	108

SUBTOTAL	82	108
Remoteness Factor : 1.00	0	0
SUBTOTAL	82	108
Contingencies (10%)	8	11
SUBTOTAL	90	119
Site Costs (9%)	8	11
SUBTOTAL	98	130
Overhead & Profit (19%)	19	25
TOTAL COST	117	155

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 abbreviated economic analysis for port investments under $500,000
- an economic evaluation with a cut-off of 15% economic internal rate of return (EIRR) for port investments over $500,000

The **economic evaluation** of feeder port subprojects is performed by using a Port Evaluation Model. 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.

At the direction the client and with the concurrence of USAID, only a an abbreviated evaluation need be undertaken for proposed feeder port subprojects under $500,000 so as to not expend disproportionate study resources.

The subproject at Bacon is eligible for such an abbreviated procedure, although a supporting economic (EIRR) evaluation was undertaken and is included at the end of this chapter as Table 6-1.

B. SUBPROJECT BENEFITS

1. DIRECT BENEFITS

The evaluation, following a review of the existing throughput, recommended upgrades and cost estimate, concludes that the proposed improvements and upgrades are not feasible. Fish is the only currently measurable throughput and, with the exception of the proposed new port building, no other significant benefits have been identified.

2. DEVELOPMENT BENEFITS

Currently, there are inter-island and RO/RO facilities at Sorsogon and Legazpi to the west and north of the Port of Bacon. Sorsogon and Legazpi are also the industrial and urban centers of the provinces of Sorsogon and Albay respectively. However, the proposed development of the Municipality of Bacon as an industrial park for the City of Sorsogon would be enhanced if the Port of Bacon was reactivated as an inter-island port.

The port improvement would increase the port's capacity. But since the port area is served by an existing road, the proposed port development is not expected to significantly influence the marble mining and processing in the hinterland, although the industry may decide to use the port facilities in the future. In addition, the recent infrastructure development and the implementation of the provincial government's strategy towards the development of Bacon and Bulan as the industrial center of Sorsogon will contribute largely to the development of the hinterland. Hence, no development benefits have been quantified for this port subproject.

C. RECOMMENDATION

After reviewing the existing throughput, recommended upgrades and construction cost estimates, it is the Consultant's opinion that the proposed improvements at the Port of Bacon are not economically feasible and should not be undertaken.

TABLE 6-1

ECONOMIC ANALYSIS
(1000 Pesos)

PORT: Bacon LOCATION: Sorsogon

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	6,500.0	(6,500.0)
1992	15.5	0.0	11.7	468.0	130.0	0.0	365.2
1993	15.8	0.0	11.7	468.0	141.1	0.0	354.5
1994	16.1	0.0	11.7	468.0	153.0	0.0	342.8
1995	16.5	0.0	11.7	468.0	166.0	0.0	330.1
1996	16.8	0.0	11.7	468.0	180.2	0.0	316.3
1997	17.1	0.0	11.7	468.0	195.5	0.0	301.3
1998	17.5	0.0	11.7	468.0	212.1	0.0	285.1
1999	17.8	0.0	11.7	468.0	230.1	0.0	267.4
2000	18.2	0.0	11.7	468.0	249.7	0.0	248.2
2001	18.5	0.0	11.7	468.0	270.9	0.0	227.3
2002	18.9	0.0	11.7	468.0	293.9	0.0	204.7
2003	19.3	0.0	11.7	468.0	318.9	0.0	180.1
2004	19.6	0.0	11.7	468.0	346.0	0.0	153.3
2005	20.0	0.0	11.7	468.0	375.4	0.0	124.3
2006	20.4	0.0	11.7	468.0	407.3	0.0	92.8
2007	20.8	0.0	11.7	468.0	442.0	0.0	58.6
2008	21.2	0.0	11.7	468.0	479.5	0.0	21.4
2009	21.7	0.0	11.7	468.0	520.3	0.0	(18.9)
2010	22.1	0.0	11.7	468.0	564.5	0.0	(62.7)
2011	22.5	0.0	11.7	468.0	612.5	0.0	(110.3)
TOTAL	376.5	0.0	234.0	9,360.0	6,289.0	6,500.0	(2,818.5)

TOTAL BENEFITS: 9,970 COSTS: 12,789

RESULTS: (1000 Pesos)

	Proposed Improvement	Building Only
Net Present Value (15%)	(4,764.2)	2,503.30
Benefit/Cost Ratio	0.27	6.01
EIRR (%)	-8.46%	96.92%

VII.
FINANCIAL ANALYSIS

VII. FINANCIAL ANALYSIS

The terms of reference require a 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 much 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.

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.

The economic analysis are review of the Port of Bacon clearly indicate that the proposed upgrades are not economically feasible. As a result, a Financial Analysis has not been undertaken.

VIII.
SOCIAL SOUNDNESS ANALYSIS

VIII. SOCIAL SOUNDNESS ANALYSIS

Social soundness analyses evaluate the effect of construction projects from the perspective of the intended beneficiaries, local residents and institutions in the zone of influence. This analysis focuses on effects on income, population movements, and cultural minorities.

The subproject site is an inactive port with few facilities in a remote, underpopulated area approximately six kilometers southeast of the town of Bacon. Residents of the surrounding Barangay of Salvacion are relatively low income farmers and subsistence fishermen. Fishing activities are primarily for local consumption, involving the use of non-motorized bancas and shallow water fish corral structures. Local agricultural products, including copra and abaca, are transported by land to the principal market outlets of Sorsogon and Legazpi.

Minimal throughput is defined for the existing Bacon Port as it lies outside the active Lagonoy Gulf transport network. The proposed upgrade of the facility (extending the causeway into deeper water) may benefit a marble mining operation proposed for the area. Coal mining was previously conducted in nearby Barangay Gatbo and may be restarted. The few motorized bancas now plying the inter-island and coastal routes to and from Bacon are shallow draft and do not require the additional access depth provided by the proposed subproject. Local residents of Barangay Salvacion would prefer improvement of the market road network to Sorsogon and Legaspi rather than continual extension of the port causeway.

In the absence of an improved road infrastructure, the upgrading of the Bacon Port will not result in any significant population migration.

There are no vulnerable cultural minorities in the area that might be adversely affected by the proposed construction.

In conclusion, the poor condition of the arterial road network is the prime constraint to the economic development of the area. With the possible exception of the proposed mining operations, the additional port facilities will not substantially enhance existing market linkages or provide significant social benefits to the residents of the area. The provision for deeper draft port access would primarily serve the privileged group of mine operators. Thus, the subproject is socially unsound.

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%)

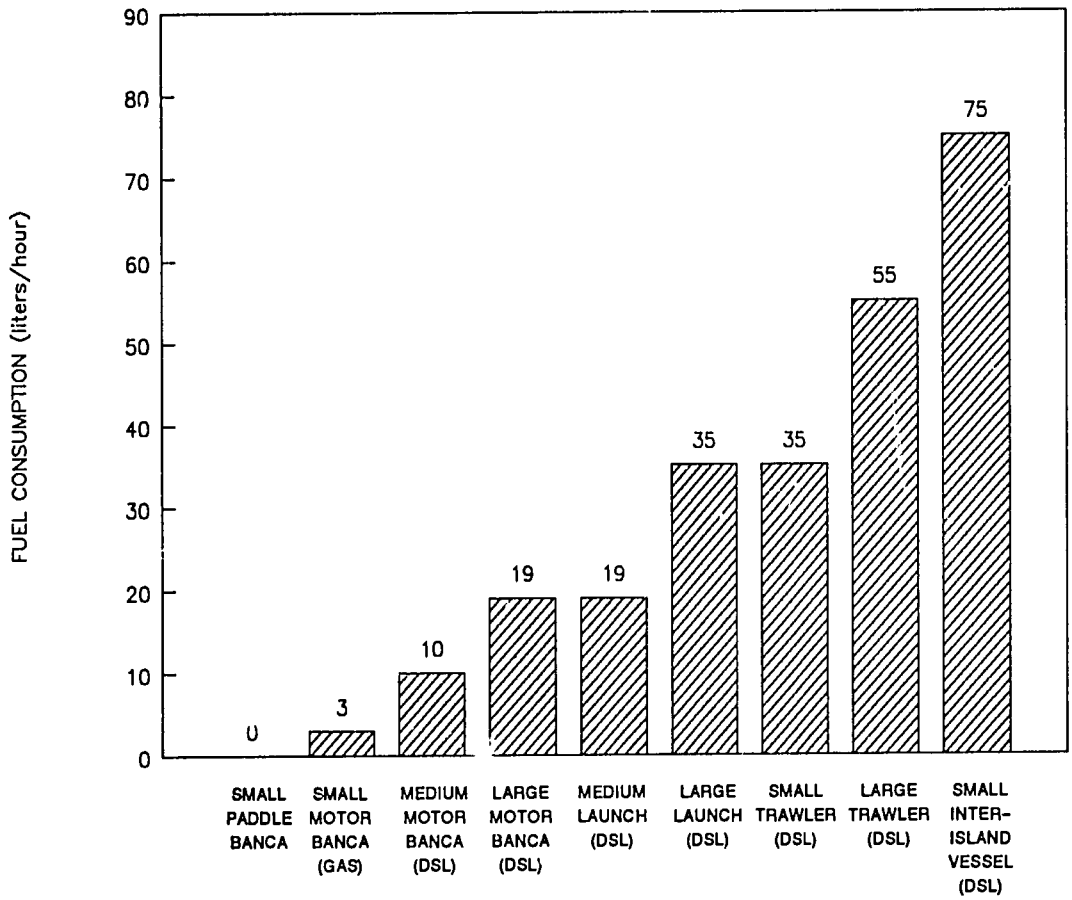
TABLE 9-1
(CONTINUED)

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 2400 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

45

X.
ENVIRONMENTAL ASSESSMENT

X. ENVIRONMENTAL ASSESSMENT

A. SUBPROJECT DESCRIPTION

Improvements proposed for the Port of Bacon are described in detail in Chapter IV of this report. Construction involves extension of the existing port facility with a rock causeway and reinforced-concrete, T-pier structure, repair of the deteriorated access road and provision of a port building (Figure 4-1). No other construction or dredging activities are proposed for the coastal or offshore environment.

B. EXISTING ENVIRONMENT

1. PHYSICAL ENVIRONMENT

The subproject site is located in Sitio Banao, Barangay Salvacion, approximately six kilometers southeast of the town of Bacon (Figures 1-1). The existing facility, which consists of a 208 meter long rock causeway (Figure 1-2) is on the north coast of the Sorsogon Peninsula and borders the Albay Gulf. Situated in the southern extreme of Sucot Bay, Bacon Port is relatively sheltered from Pacific Ocean swells and northeast monsoon winds by the offshore islands of Batan and Rapu-Rapu and the shallow reef formations of Sucot Bay.

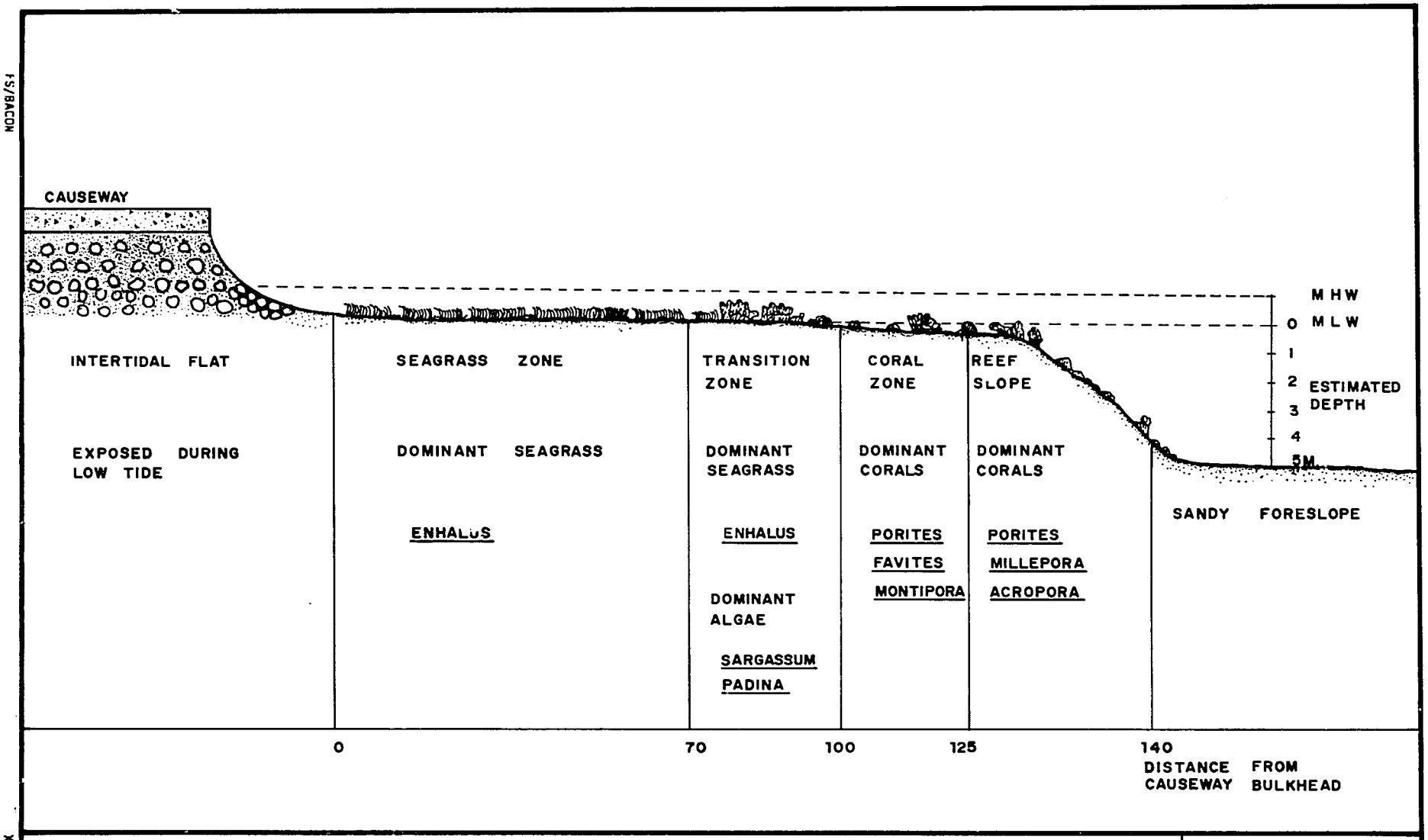
The adjacent littoral area is silted and shallow with an underlining rocky pavement. The mud flat adjoining the existing rock causeway is exposed at low tide. Water quality at the site was relatively clear, with a vertical visibility of approximately five meters. The gradual slope extends approximately 140 meters offshore of the existing causeway bulkhead to reach the sandy foreslope and depths greater than four meters (Figure 10-1).

The terrestrial topography of Bacon includes a broad coastal plain extending to Sorsogon, bordered to the west by a mountainous area (Figure A-4). The coastal plain ends in a rugged, steep shoreline composed of coarse sand and gravel interspersed with large basaltic rocks and boulders.

There are no major rivers near the subproject site. The absence of substantial shoaling near existing causeway suggests that significant littoral drift patterns and strong coastal currents are not prevalent at the site.

2. NATURAL RESOURCES

Open canopy forest cover remains on the higher slopes of the mountainous area ten kilometers west of the port site (Figure 10-2). The lower slopes and coastal plains are dominated by coconut plantations with a thick undergrowth that includes an abundance of abaca plantings (Plate C-3, Photo 10).

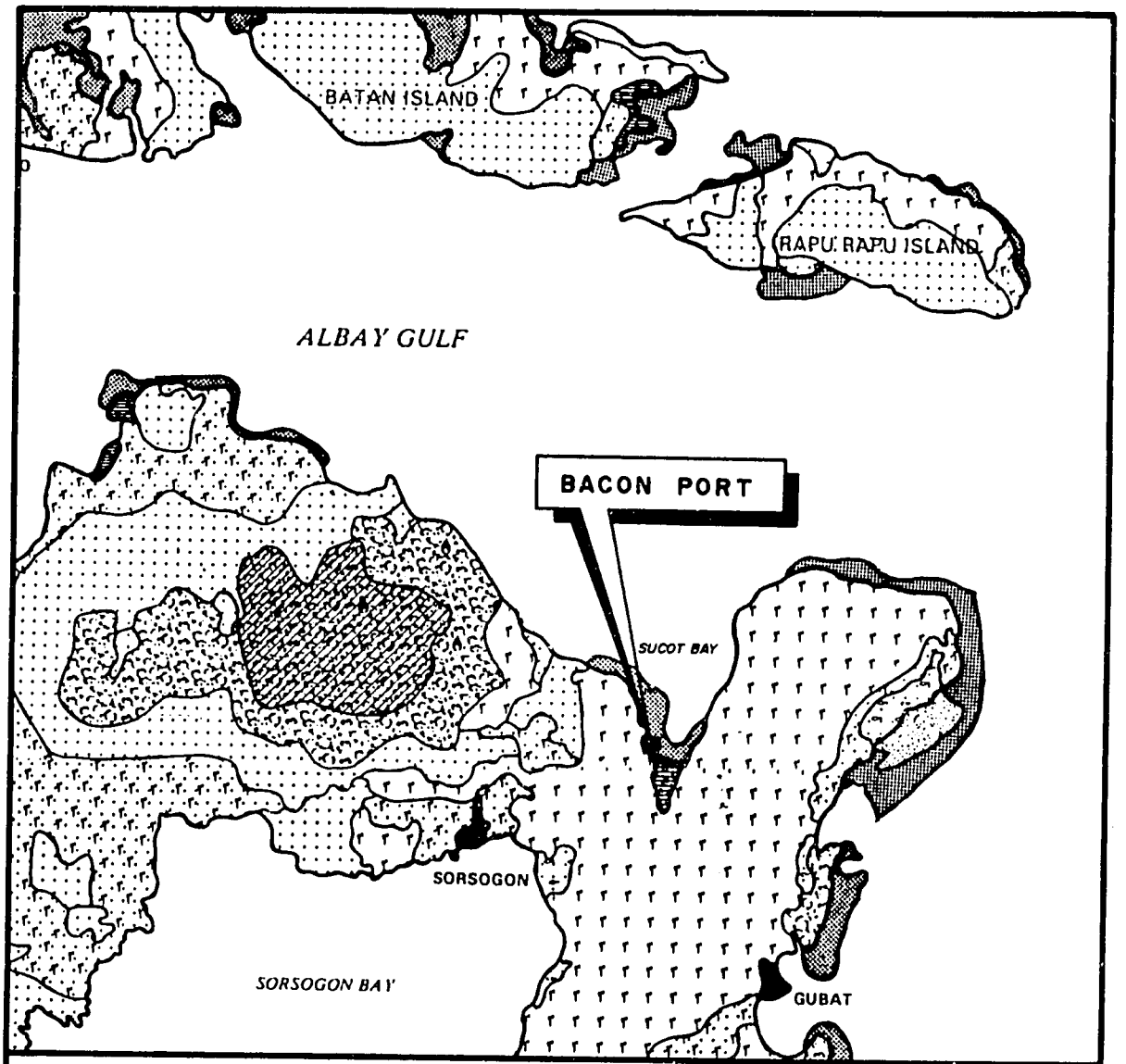


RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492 - 0420

SCHEMATIC CROSS-SECTION OF BACON LITTORAL ZONE

FIGURE 10-1

15/BACON



LEGEND:

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

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

SOURCE: PCGS 2816
National Mapping and Resource Information Authority, 1987

BACON PORT

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

LAND COVER MAP

FIGURE 10-2

The local coastline is extensively fringed by secondary growth mangroves (**Rhizophora** and **Avicenia**), particularly the shallow southeast extreme of Sucot Bay. The wide, largely barren intertidal flat extends seaward to a seagrass (**Enhalus**, Plate 10-1, Photo 3) dominated reef flat. In the progressive transition to the deeper reef slope, **Sargassum** algae and hard corals are present but limited by the availability of hard substrate to an estimated coverage of ten to twenty percent (Figure 10-1). Shallow, coral fringed patch reefs and ridges extend into Sucot Bay along a maze of deeper channels leading towards the port site (Figure A-6). Observed fish life in the surveyed areas was minimal, though a curious phenomenon was the abundance of jellyfish of the genus **Mastigias** (Plate 10-1, Photo 3).

3. CULTURAL AND SOCIO-ECONOMIC RESOURCES

a. Human Settlements and Livelihood

The subproject involves an inactive port facility with few facilities in a relatively remote and unpopulated area approximately six kilometers southeast of the town of Bacon. Most of the 150 families of Sitio Banao are engaged primarily in agriculture. Their principal market products are copra and abaca. Secondary income is generated through the cottage-level production of handicrafts, including hats and sleeping mats (banig) made from locally grown pandan (**Pandanus simplex**) material. Fishing activities are primarily for local consumption and involve the extensive use of fish corral structures in the shallow waters and shoals of Sucot Bay (Plate 1-1, Photo 1). No motorized bancas capable of offshore fishing were noted in the area.

b. Transportation

A description of the transportation network serving the Bacon area is also provided in Chapter II. The existing port facility is linked to the gravel coastal road by a 500 meter long deteriorated access road (Plate C-3, Photo 10). No reported shipping use has been made of the port facility to date. The remnant causeway and wooden pier structure in nearby Barangay Gatbo (Plate 10-1, Photo 4; referred to as Esteban on most charts) was apparently used up to three years ago for the shipping of locally-mined coal. This mining was apparently discontinued due to a deteriorating peace and order situation.

Most passenger and cargo traffic relies upon land transportation to reach the nearest major city, Sorsogon, and the Pan Philippine National Highway (Figure A-2). Land transportation is handicapped by the poor condition of the coastal road leading to Bacon town and the limited availability of public utility vehicles.

PHOTO 3: SEAGRASS ZONE OF BACON REEF FLAT; A LINE TRANSECT TECHNIQUE WAS USED TO DETERMINE POPULATION DISTRIBUTION OF MARINE ORGANISMS; NOTE MASTIGIAS JELLYFISH IN FOREGROUND

PHOTO 4: [illegible] BARRIO [illegible] THREE KILOMETERS EAS[illegible] BACON SUB-PROJECT SITE; NOTE WOO[illegible] PILING WHERE WATER IS ABO[illegible] DEEP FOUR METERS FROM [illegible]

RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420	PLATE 10-1
REPRESENTATIVE VIEWS OF THE SUB-PROJECT AREA	

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 National Museum did report that Ming Dynasty porcelain and burial jar materials were excavated in 1978 from Barangay San Juan in Bacon Municipality. This previous finding and archaeological finds elsewhere in the Bicol Region increase the possibility that additional archaeological resources may be located in the general area.

C. IMPACT ASSESSMENTS

1. PHYSICAL ENVIRONMENT

The improvement of the subproject site involves the renovation and extension of an existing port facility. Field observations indicate that significant coastal currents and littoral drift patterns are not prevalent at the subproject site and will not be negatively impacted by the designed causeway and pier addition. Sediment and sand accretion or erosion are not apparent near the existing port facility.

Identified sources of construction materials are listed in Chapter IV and include several river sources for sand and gravel, and the coastline source of armour rocks. 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 formulation 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.

2. NATURAL RESOURCES

The marine ecosystem, represented by the component mangrove, seagrass and coral communities is the most significant natural resources identified in the immediate subproject area. The ecological importance of these natural resources includes interrelated physical, biological and socio-economic parameters:

58

- o Physical : hydrodynamic buffers that moderate wave action, coastal erosion and siltation
- o Biological : biologically diverse ecosystems that are critically important as the habitat for breeding and spawning of numerous coastal and pelagic species and provided important components of the littoral nutrient cycle,
- o Socio-Economic : marine resources provided a traditional source of livelihood, sustenance, building materials and fuel.

Improving Bacon Port by extending the existing causeway into deeper water is predicted to have insignificant impact on the marine ecosystem and these interrelated parameters.

Past port construction activities at the Bacon site have not resulted in the discernable alteration of the dominant marine communities. The actual construction of the causeway and pier extension will displace an estimated 2,000 square meters of existing seagrass, algae and coral reef area (Figure 10-1) while creating new substrate for subsequent reef colonization. The use of living coral, or coral rock, for construction purposes is prohibited under GOP Presidential Decree 1219 (1977), as amended by P.D. 1698 (1980).

The improved utility and capacity of the completed port facility may contribute to secondary environmental impacts related to infrastructure and economic development. For example, in-migration and increased settlement of the coastal area may occur during construction and subsequent operation of the Bacon Port. Improved sea and land accessibility to the relatively isolated area combined with additional human population demands on limited natural resources may increase exploitation of these resources to nonsustainable levels. While no rare or endangered species have been reported or observed in the subproject area, excessive exploitation of the identified basic marine communities (mangrove, seagrass, corals) would negatively affect the biological as well as physical and socio-economic value of these resources. For example, the capacity and yield of the Sucot Bay fishery resources might decline as a result of incidental degradation of the mangrove spawning grounds of respective fish species or increased catch effort.

Secondary impacts resulting from the subproject improvement of the transportation network and potential economic development could be mitigated through implementation of existing GOP laws and regulations (e.g., DENR Administrative Order Fifteen, 1990; regulations governing the utilization, development and management of mangrove resources). In addition, community-based

education programs emphasizing sustainable development and resource management could be initiated through concerned government and non-government organizations.

3. CULTURAL AND SOCIO-ECONOMIC RESOURCES

a. Human Settlements and Livelihood

The described port 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 local population of the relatively isolated Bacon Port area will foreseeably increase. An influx of new residents and industries to the Bacon Port area could disrupt existing subsistence lifestyles and traditional community structures and displace existing squatters or titleless farmers.

b. Transportation

Bacon is situated on the narrowest section of the rugged Bicol Peninsula, which divides the inland Sibuyan Sea from the Pacific Ocean (Figure A-2). The fourteen kilometer distance from the town of Bacon to Sorsogon is basically level and crossed by a good asphalted road (Chapter II).

According to the local residents of Barangay Salvacion, the most pressing transportation problem is the poor condition of the coastal road linking the port site (Sitio Banao) and the settlements to the east (Barangay Gatbo) to Bacon and the improved road to Sorsogon.

The proximity of a major market and port city (Sorsogon) limits the anticipated local requirement for a deeper-draft port facility at the Bacon subproject site. Projected throughput and diversion of shipping to the proposed Bacon Port is minimal under the existing terms of reference (Chapter III). The numerous coral fringed shoals and patch reefs of the southern Sucot Bay present significant navigational hazards to potential shipping activity.

c. Archaeological and Historical Sites

The immediate vicinity where the port improvement are proposed has been subjected to human disturbances in the past and is not known to include archeological sites, historical monuments or culturally significant features. According to National Museum officials, the archeological findings in Barangay San Juan were located far inland from the Sitio Banao port site and are not threatened by the proposed construction activities.

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

D. ALTERNATIVE CONSTRUCTION ACTION

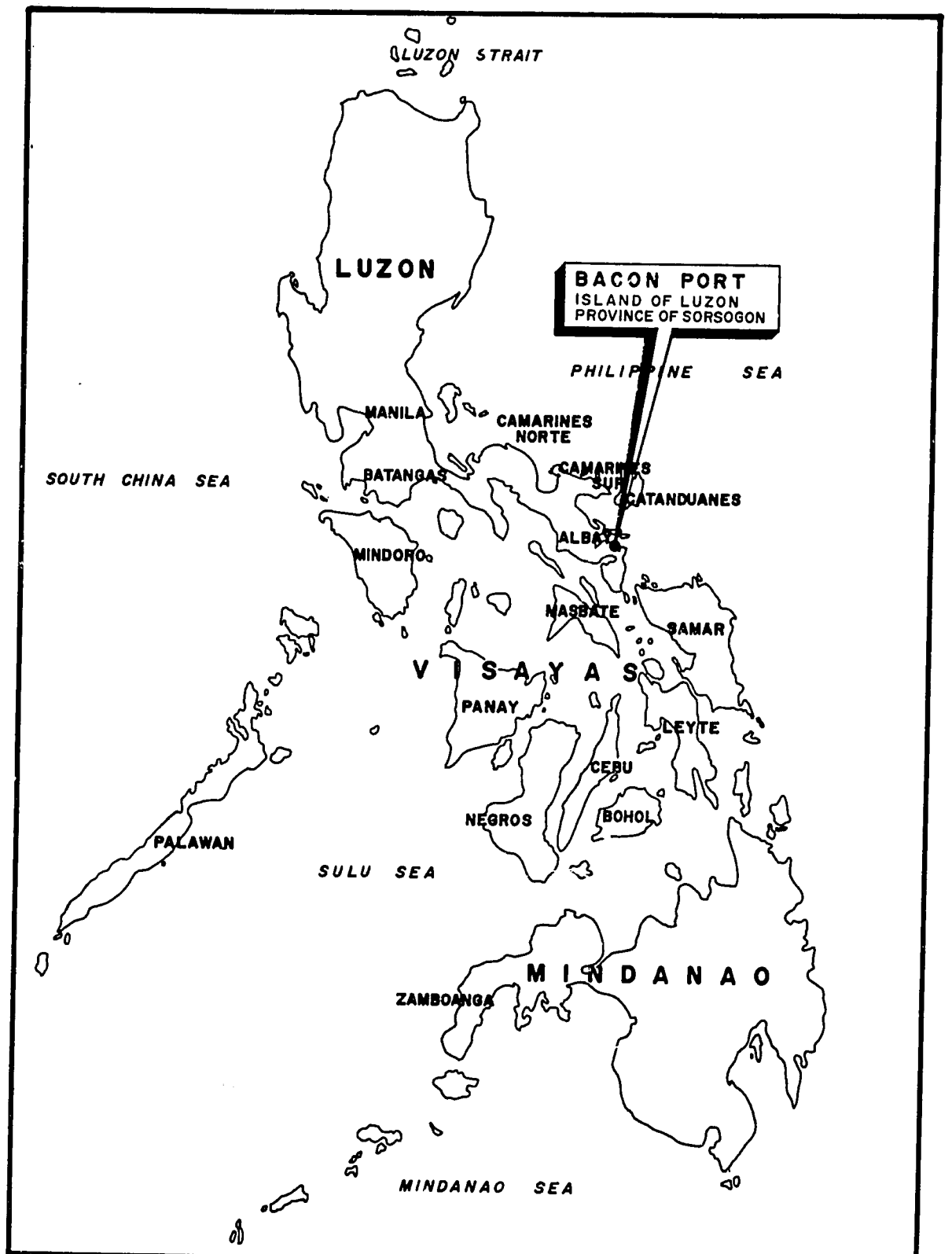
1. NO ACTION ALTERNATIVE

The no action alternative would not improve the utility or correct the noted deficiencies of the transportation infrastructure for the subproject area. Consequently, the no action alternative is considered unacceptable.

2. ALTERNATIVE CONSTRUCTION ACTION

The improvement of the Bacon coastal road, linking the study area to the improved highway network and Sorsogon, is proposed as an alternative construction action to extending the inactive Bacon causeway.

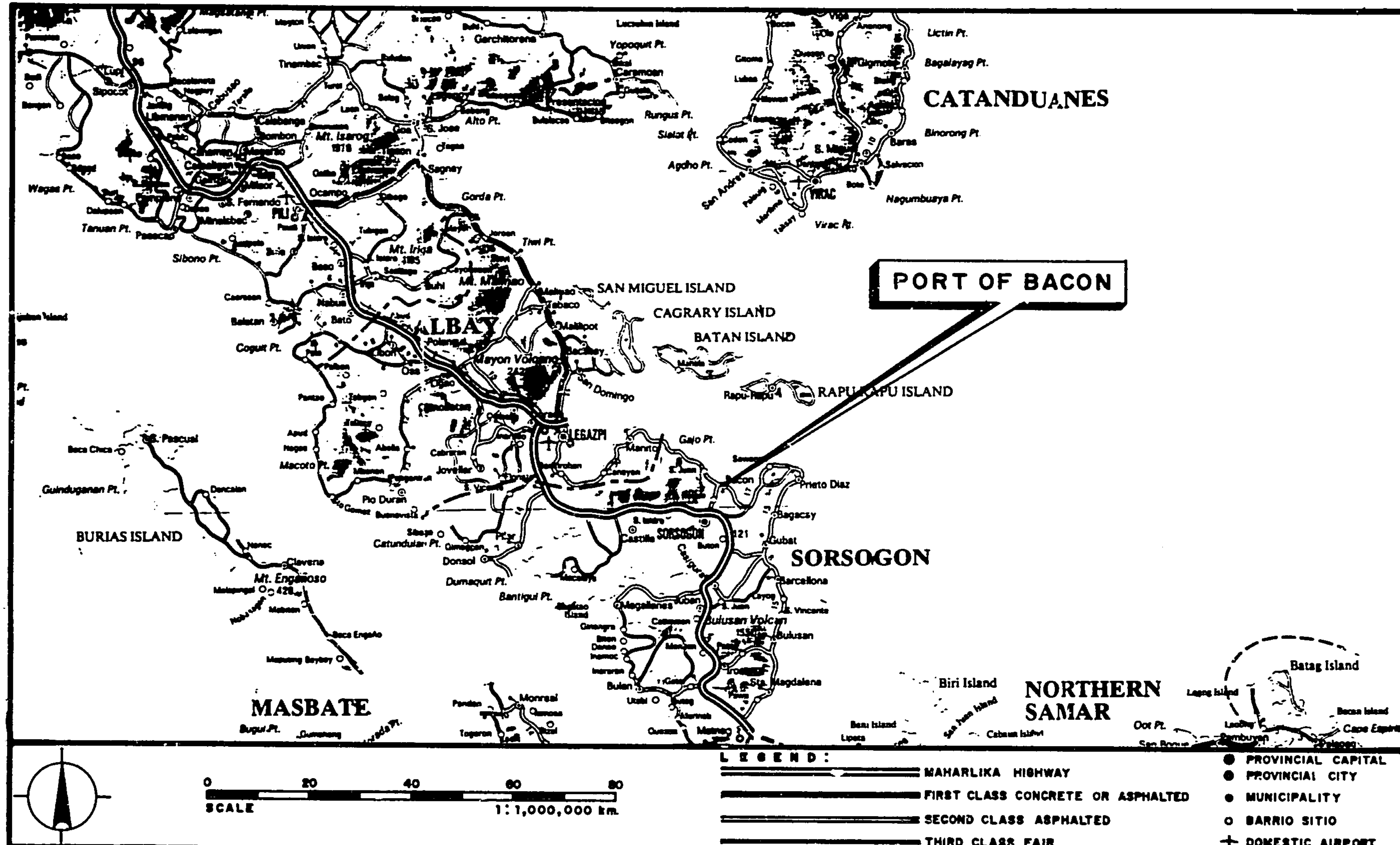
APPENDIX A
FIGURES



RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420

K E Y M A P

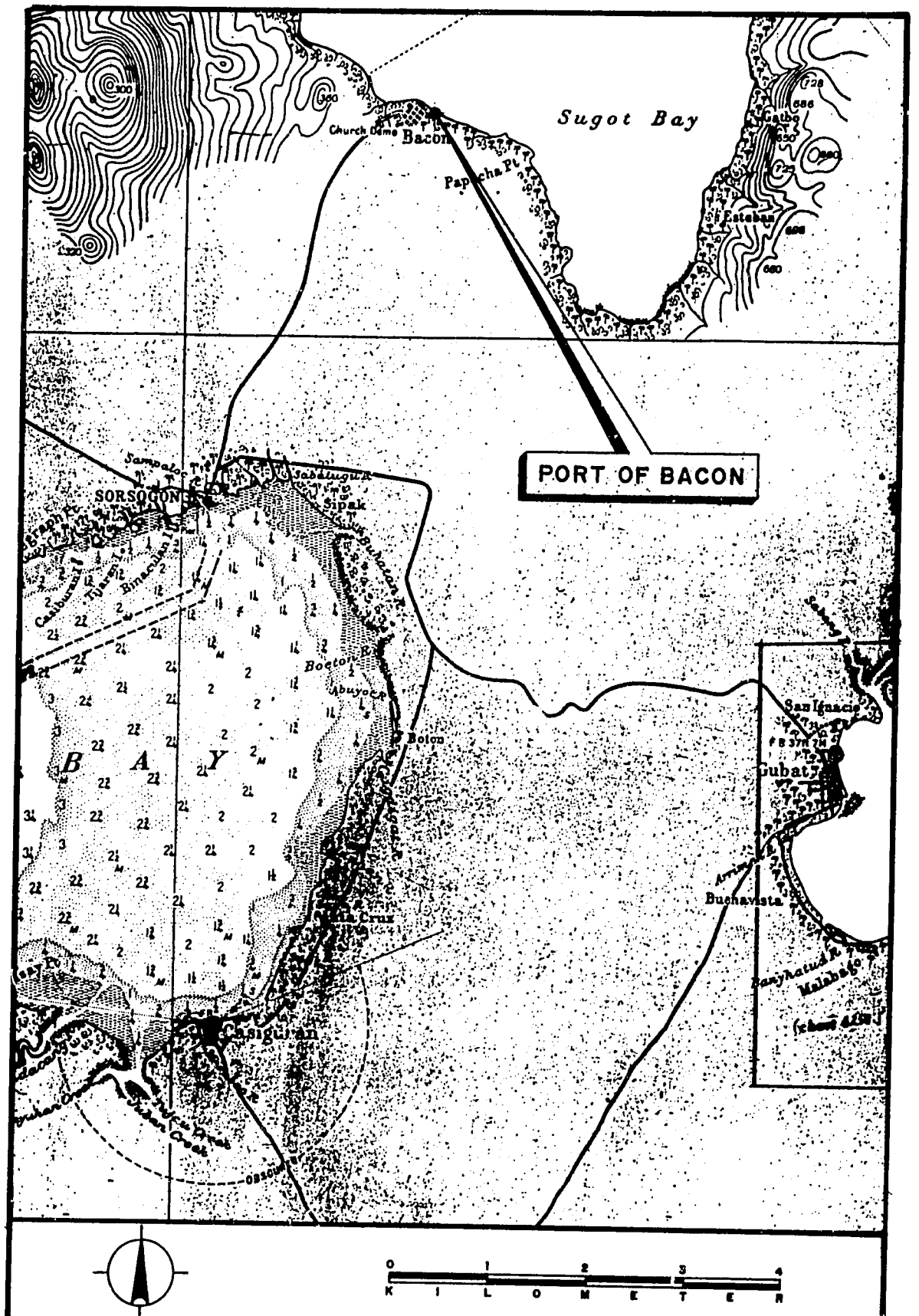
FIGURE A-1



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

ROAD INFRASTRUCTURE MAP

FIGURE A-2

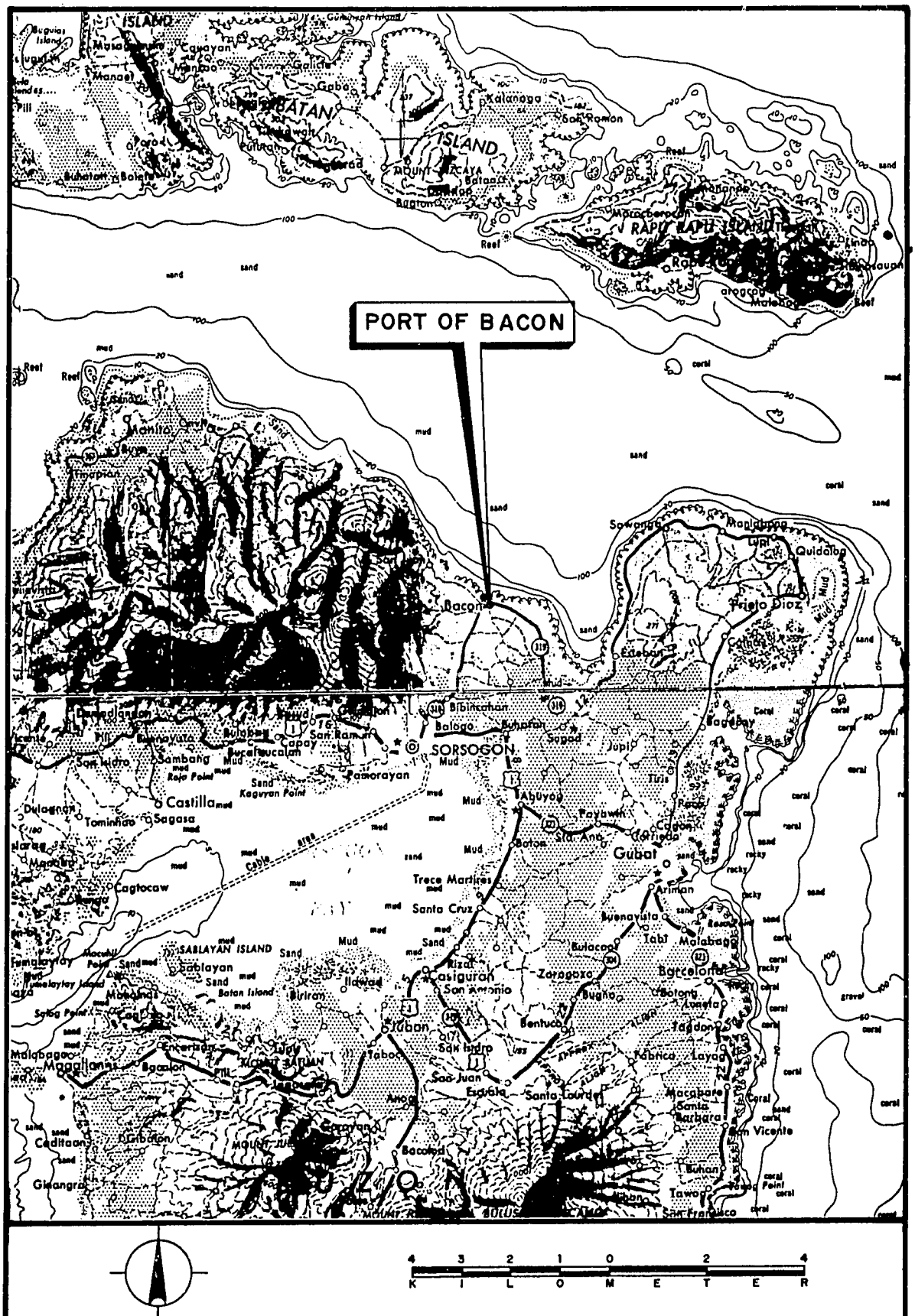


0 1 2 3 4
KILOMETER

RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420

REGIONAL HYDRO MAP

FIGURE A-3

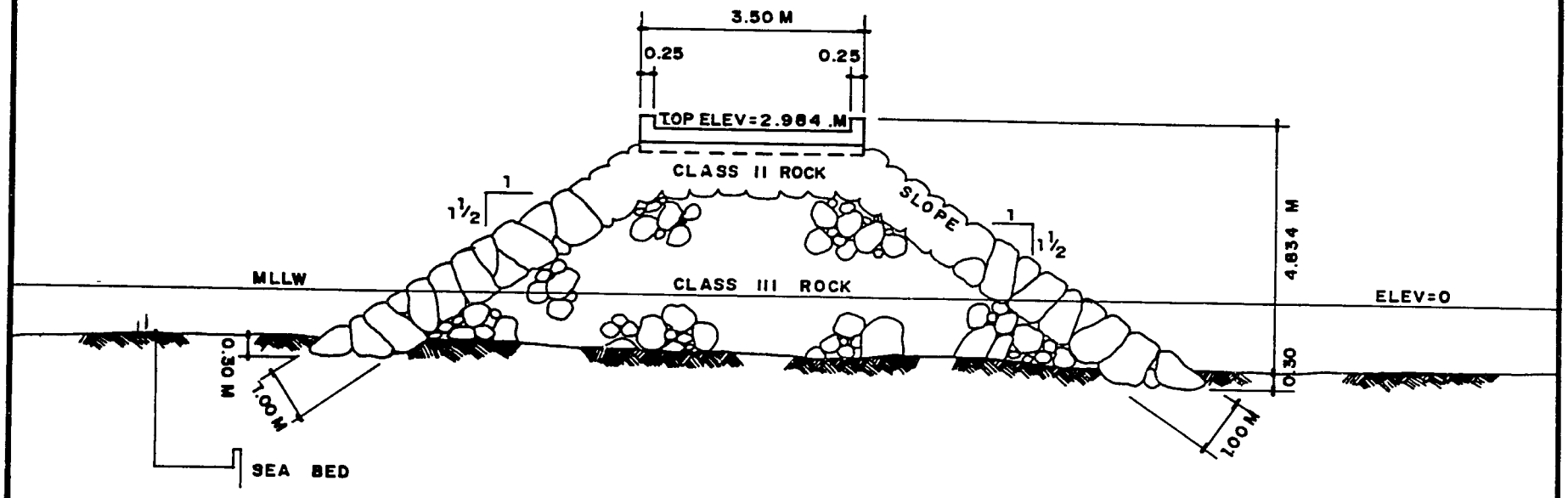


RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492 - 0420

REGIONAL TOPO MAP

FIGURE A-4

60



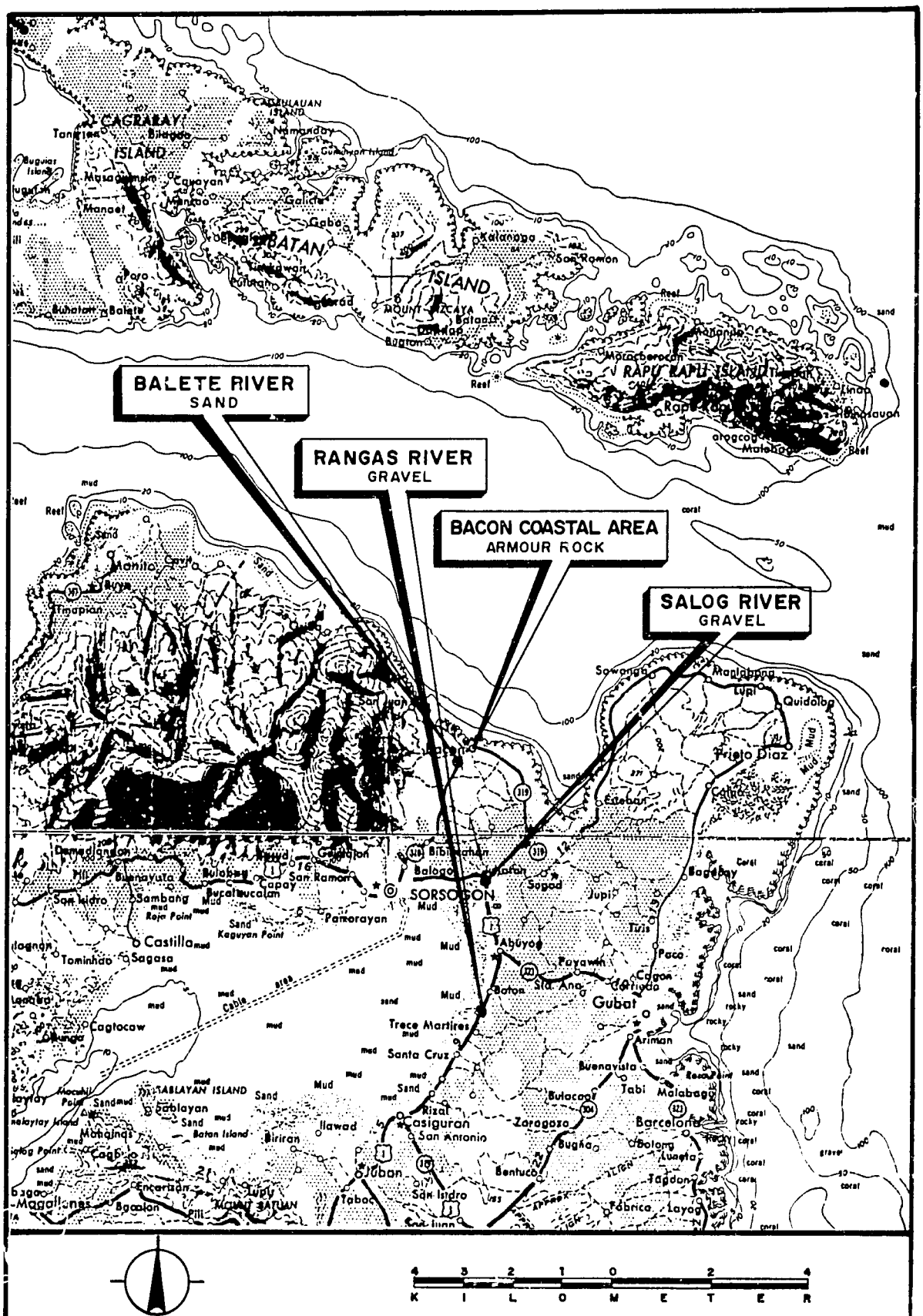
SECTION
SCALE 1:100

RURAL INFRASTRUCTURE FUND PROJECT

AID PROJECT NO. 492 - 0420

EXISTING ROCK CAUSEWAY

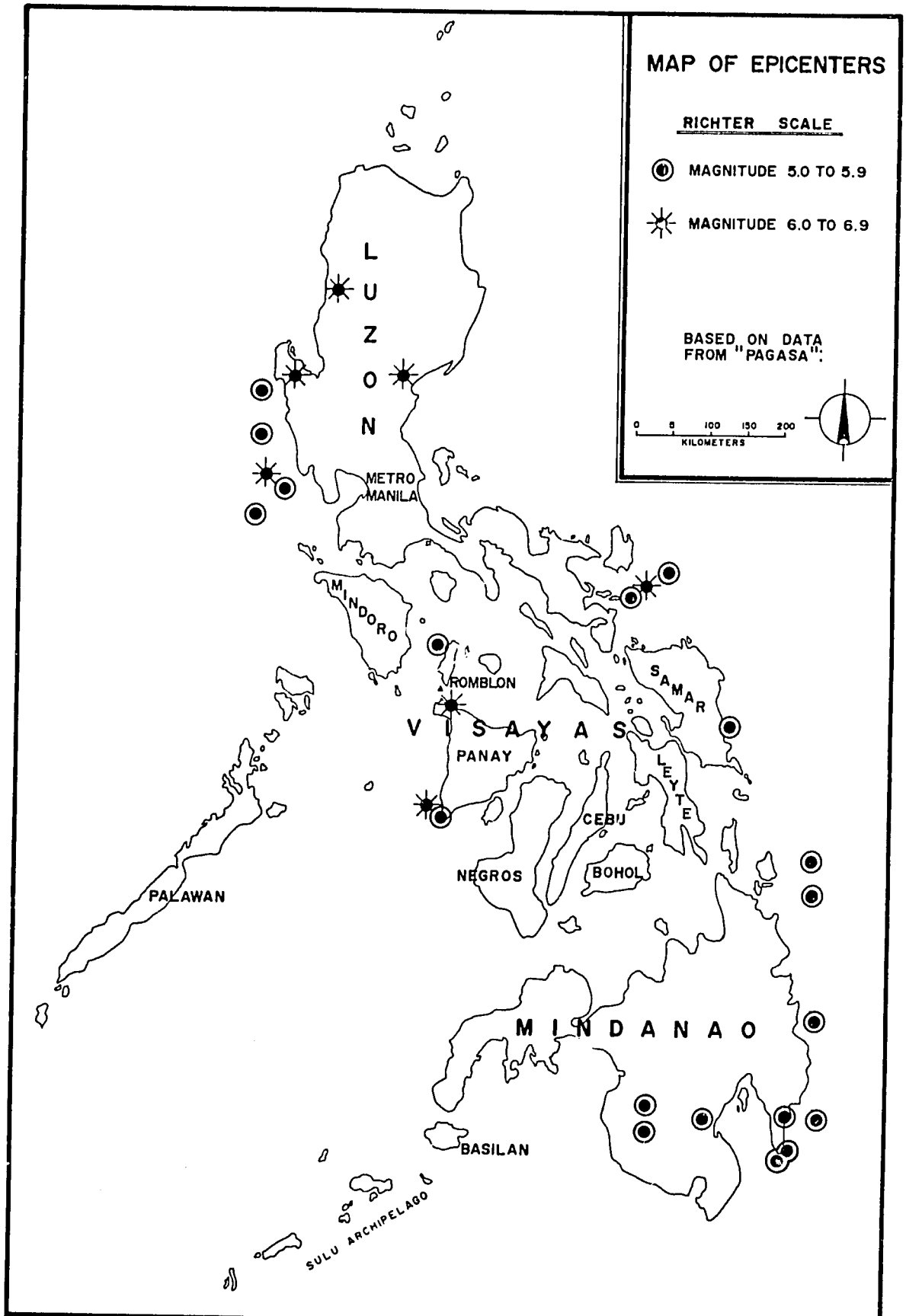
FIGURE A - 5



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

LOCATION OF CONSTRUCTION MATERIALS

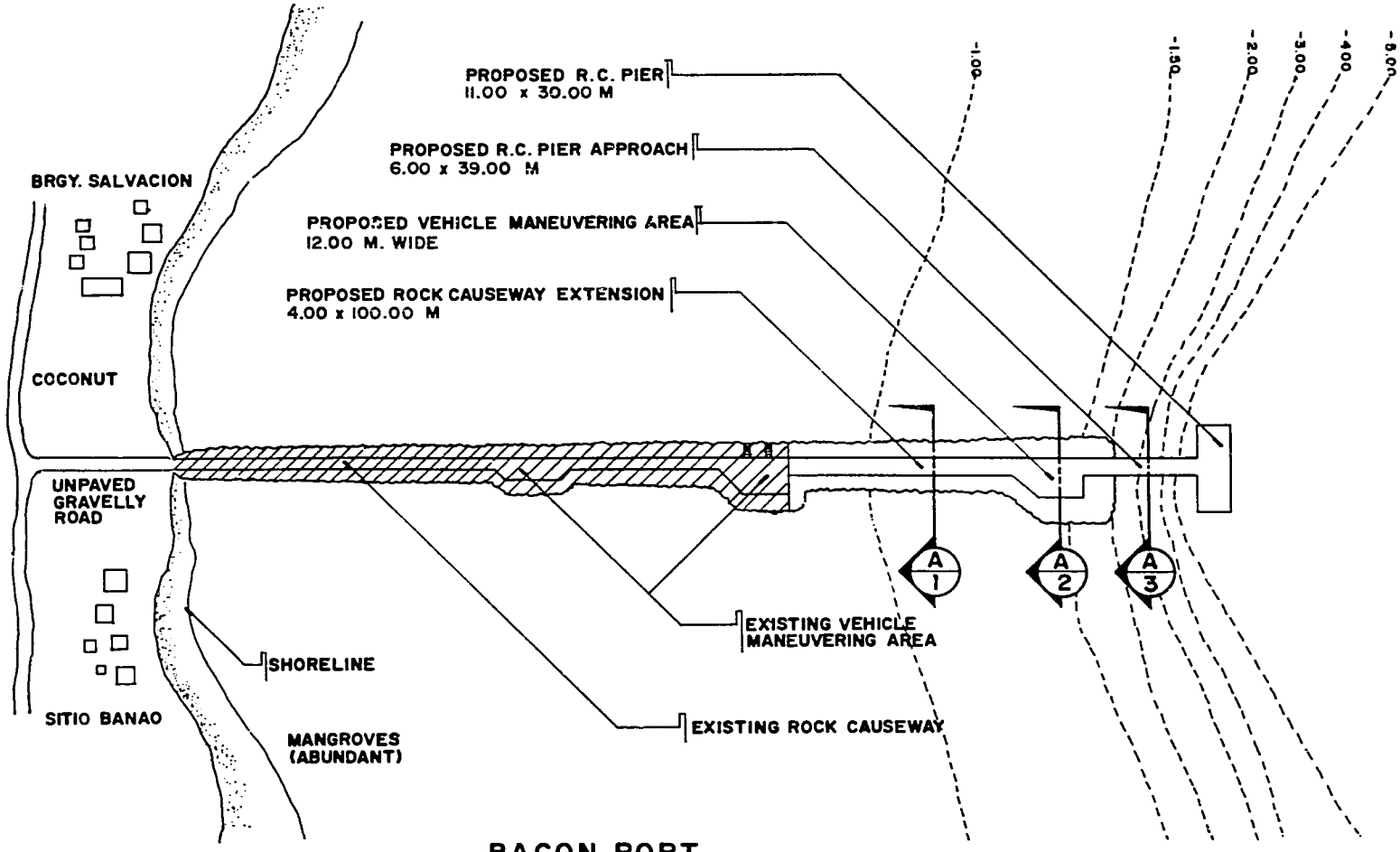
FIGURE A - 6



RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT 492 - 0420

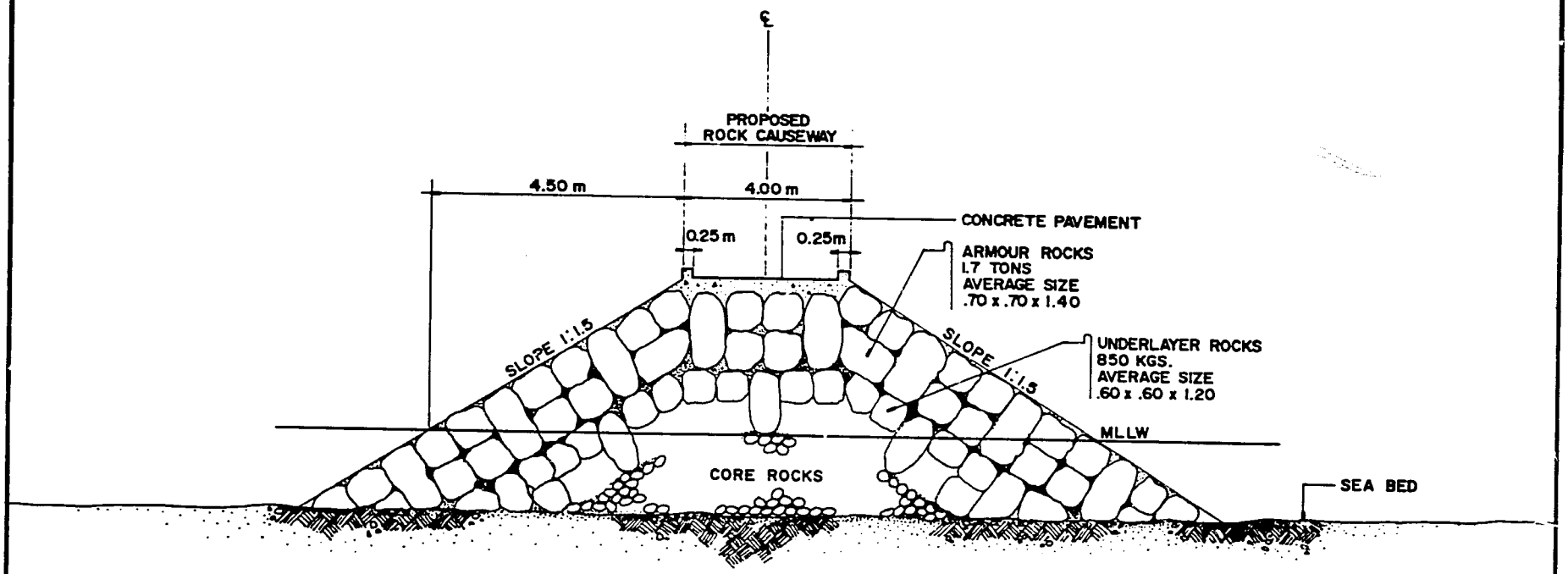
SIGNIFICANT PHILIPPINE EARTHQUAKES : 1960 - 1965

FIGURE A - 7



BACON PORT

RURAL INFRASTRUCTURE FUND PROJECT	AID PROJECT NO. 492 - 0420	FIGURE A - 8
DEVELOPMENT PLAN		

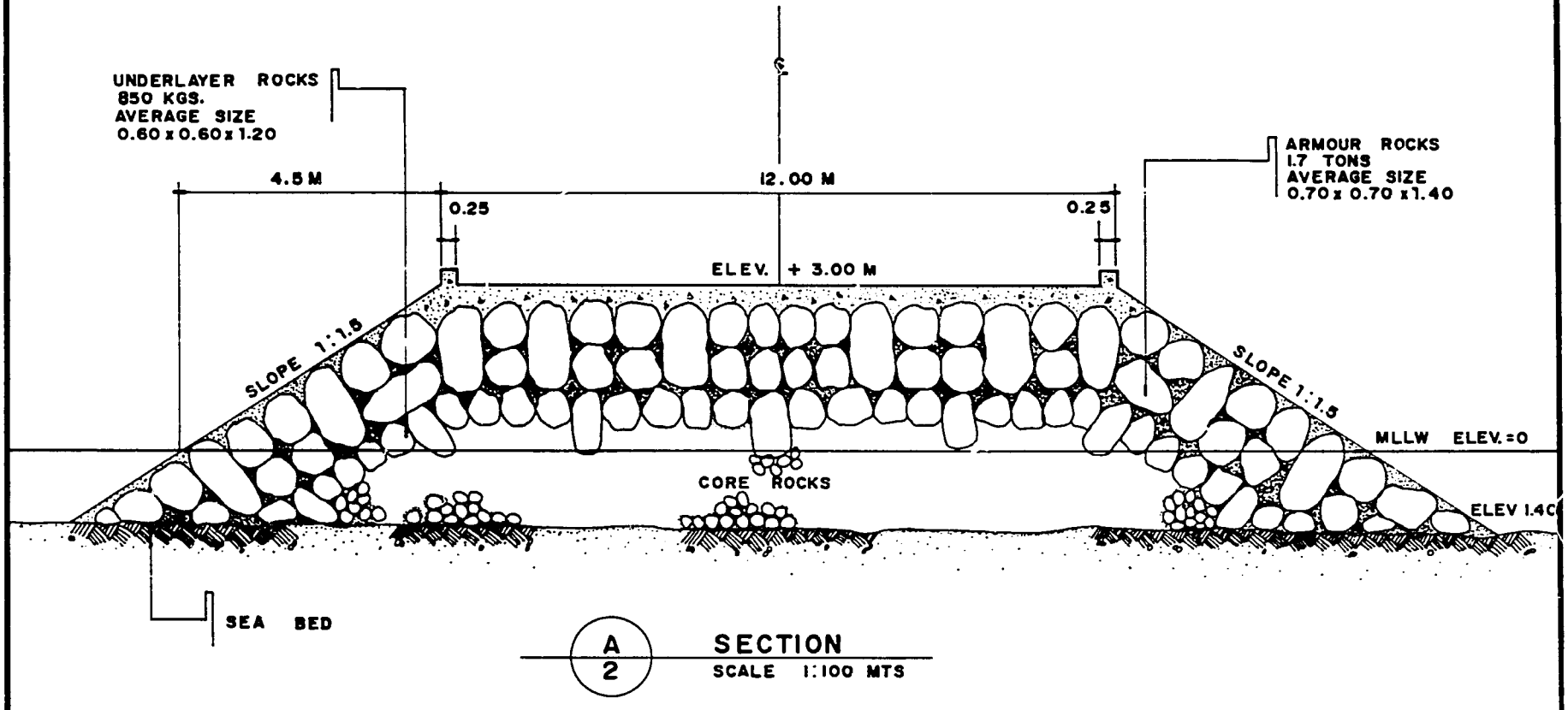


A/1 **SECTION**
SCALE 1:100 MTS

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

PROPOSED ROCK CAUSEWAY EXTENSION

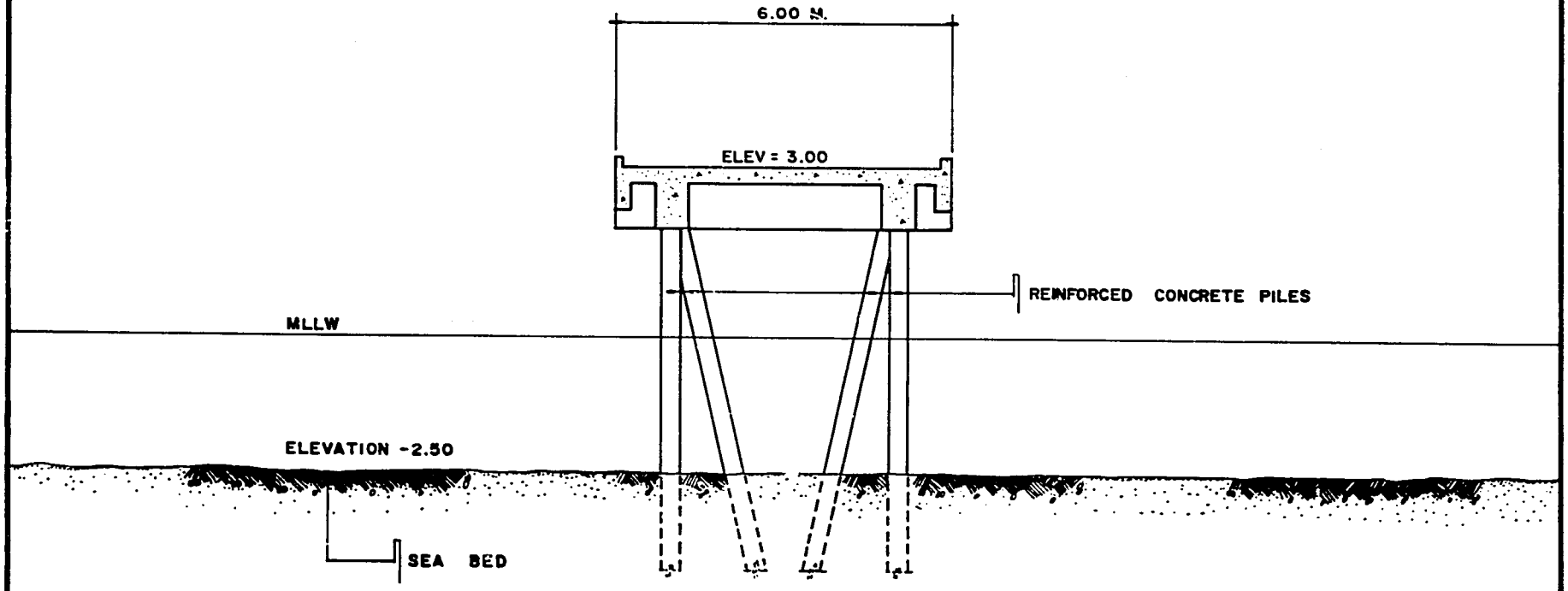
FIGURE A – 9



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

PROPOSED VEHICLE MANEUVERING AREA

FIGURE A-10



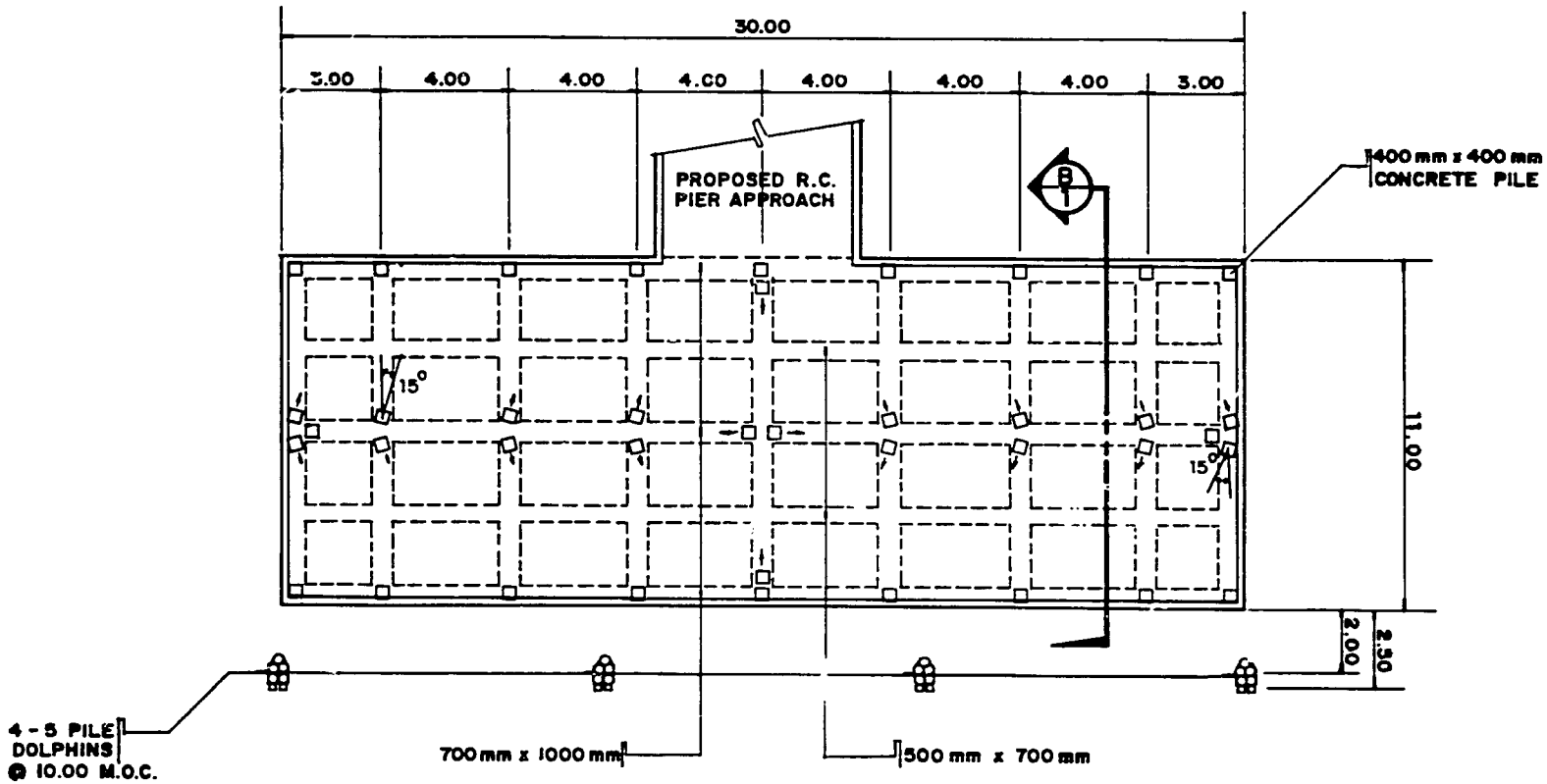
A/3 SECTION
SCALE 1:100 MTS.

RURAL INFRASTRUCTURE FUND PROJECT

AID PROJECT NO. 492 - 0420

PROPOSED REINFORCED CONCRETE PIER APPROACH

FIGURE A-11



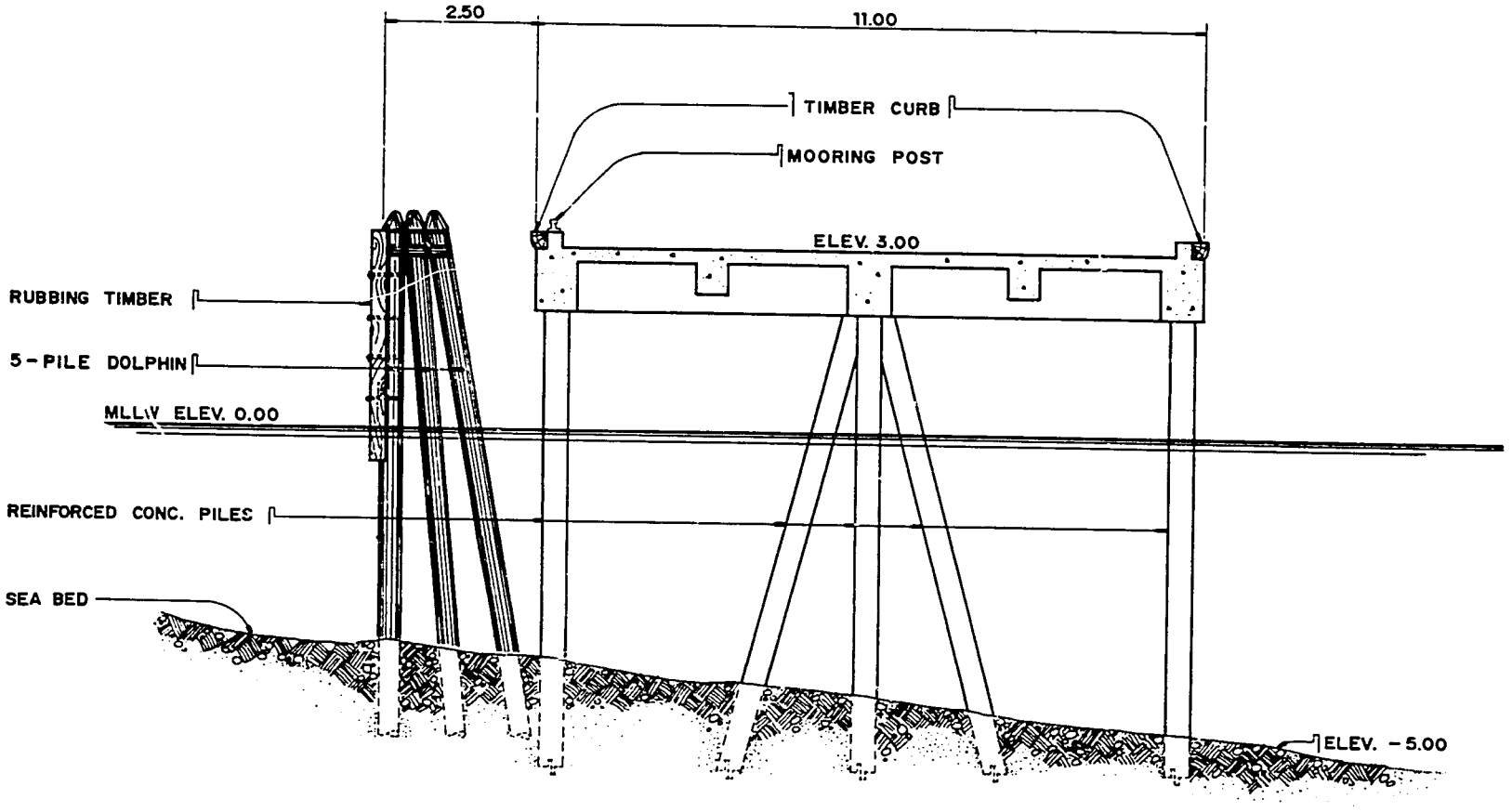
BEAM AND PILING PLAN

SCALE 1:100 MTS.

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

PROPOSED REINFORCED CONCRETE PIER

FIGURE A - 12



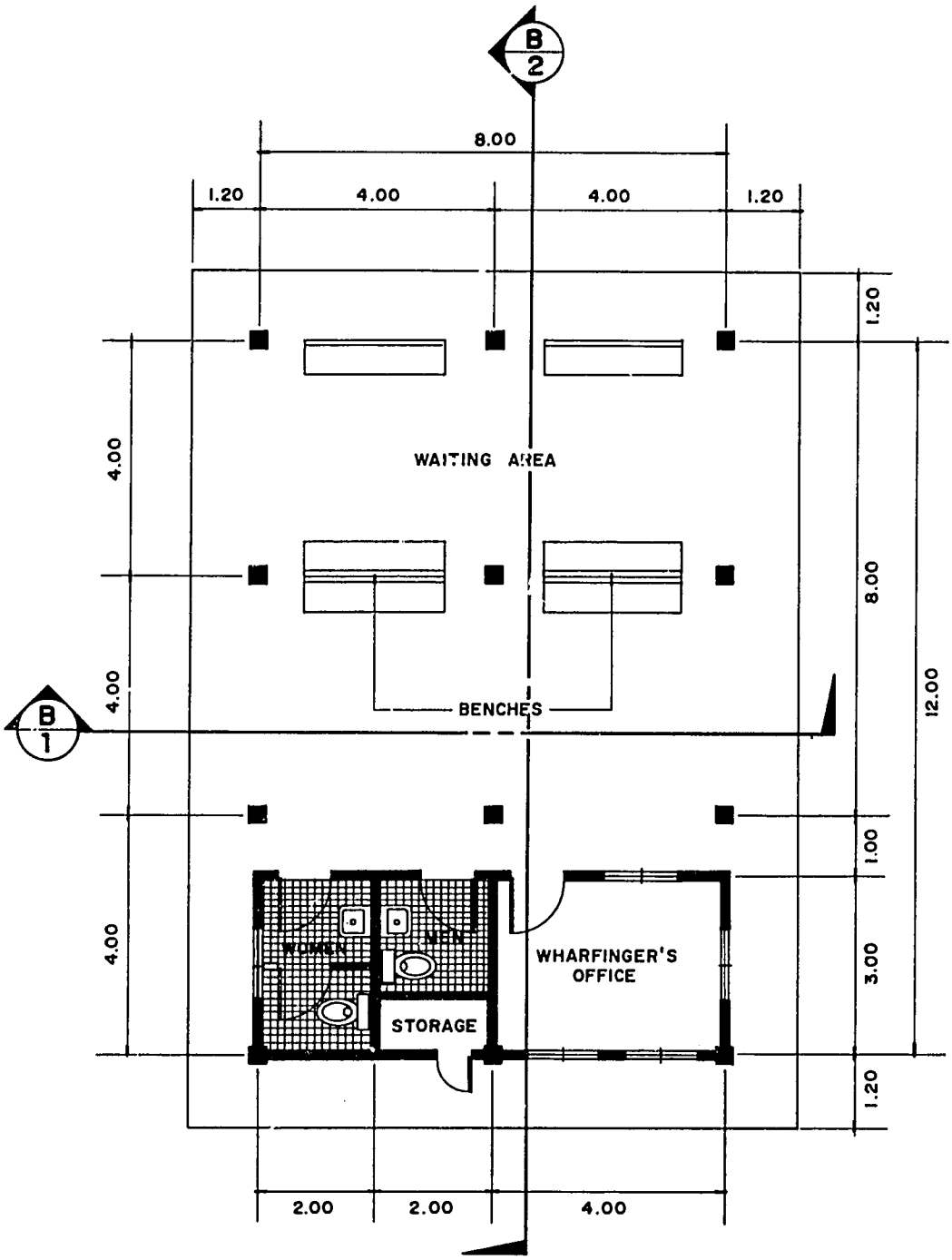
B/1 SECTION
SCALE 1:100 MTS.

RURAL INFRASTRUCTURE FUND PROJECT

AID PROJECT NO. 492 - 0420

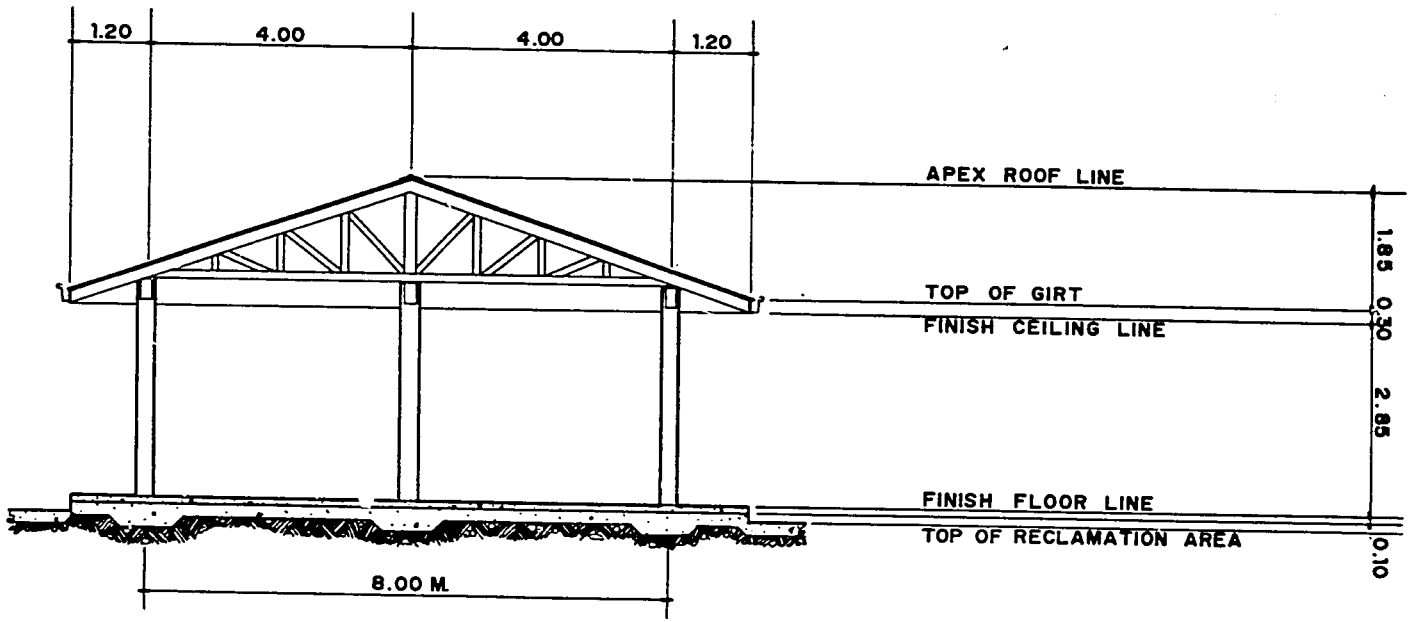
PROPOSED REINFORCED CONCRETE PIER

FIGURE A-13



FLOOR PLAN
SCALE 1:100 M

RURAL INFRASTRUCTURE FUND PROJECT	AID PROJECT NO. 492 - 0420	FIGURE A - 14
PORT BUILDING PLAN		



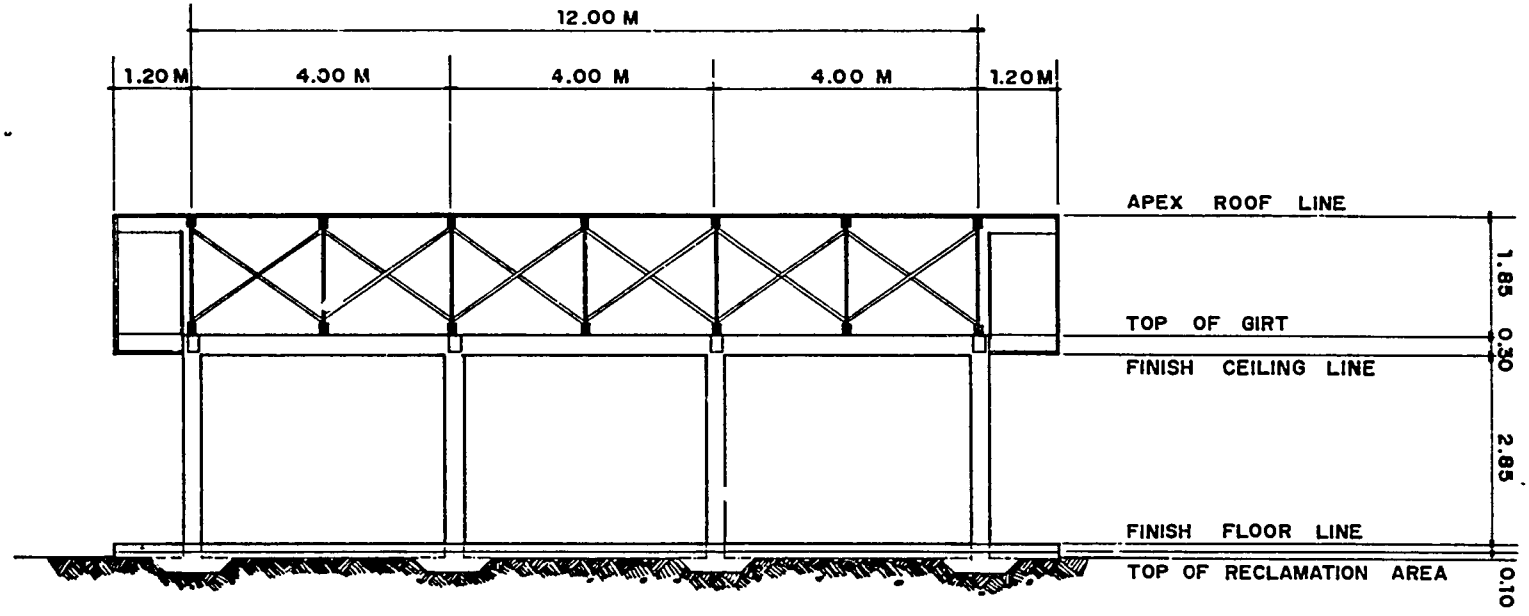
B/1 SECTION
SCALE 1:100 M

RURAL INFRASTRUCTURE FUND PROJECT

AID PROJECT NO. 492 - 0420

PORT BUILDING SECTION

FIGURE A-15



B/2 SECTION
SCALE 1:100 M

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

PORT BUILDING SECTION

FIGURE A-16

APPENDIX B
EXHIBITS

EXHIBIT I
PORT SHIPPING STATISTICS

PORT : BACON
PROVINCE : SORSOGON
ISLAND : LUZON
REGION : V

DATE : JULY 02, 1990
REPORTED BY: CD / MB

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

COMMODITY	INBOUND/ OUTBOUND (Check one)		TONS PER YEAR	TYPE OF VESSEL	TONS PER VESSEL	PESOS VALUES per/kg	ORIGIN or DESTINATION	TARIFF or FARE
	In	Out						
FISH/MARINE PRODUCTS	✓		2,330				Marginal	
VEGETABLES								
RICE								
FUEL								
CEMENT	(No	Port	Shipping		Activities)			
COPRA								
BOTTLED CARGO								
CORN								
ICE								
SUGAR								
ANIMAL FEED								
LUMBER								
MEAT								
SALT								

PASSENGERS	VESSELS/		PASSENGERS PER YEAR	TYPE OF YEAR	PASSENGERS PER VESSEL	FARE	DEST.
	WEEK	DAY					
IN							
OUT							

VESSELS:

TYPE OF VESSEL	NO. OF VESSELS BOATS PER WEEK or DAY	MAX. TONNAGE	AVE. LENGTH (m)	MAX. DRAFT (m)	ORIGIN OF VESSEL	TRA-VEL TIME	DIS-DIS-TANCE (km)	FUEL CONSP PER HOUR
Note: Municipal Fishing Boats:								
2 - Fishing boat (commercial)	3 tons				Bacon			
31 - Motorized Fishing boat	under 3 tons				Bacon			
780 - Non- motorized					Bacon			

EXHIBIT 2

SOCIO - ECONOMIC DATA

MUNICIPALITY OF : BACON DATE : JULY 02, 1990

REPORTED BY: CD/MB

ANNUAL PRODUCTION

NAME OF PRODUCTS	YEAR (1986)	YEAR
Agriculture		
rice	7,102.45 M.T. cavans/year	cavans/year
copras	1339.1 M.T. sacks/year	sacks/year
corn	cavans/year	cavans/year
	kilos/year	kilos/year
Fishing		
fish marine catch	2,330 M.T./year	M.T./year
fish cultures	9,647 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		
Coconut		
Abaca 15 M.T.		
Marple		
Rattan		

LAND TRAFFIC DATA (1990)

FROM: _____ TO: _____

VEHICLE			PASSENGER/DAY		CARGO (KILOS/DAY)	
TYPE	NO.	NO. OF TRIPS	INCOMING	OUTGOING	INCOMING	OUTGOING

EXHIBIT 2
(CONTINUED)

SOCIO - ECONOMIC DATA

MUNICIPALITY OF : Bacon DATE : JULY 02, 1990

REPORTED BY: CD/MB

LOCATION OF PORT SITE	DISTANCE TO NEAREST ROAD/TOWN/ BARRIO	AREA OF INFLUENCE	HINTERLAND TOPOGRAPHY
a. it is located at sitio b. Banao, barangay c. Salvacion	it is 5.7 kilometers from Bacon proper or about 15.0 kilometers away from Sor-Sogon, the prov'l capital	non-operational	irrigular terrain with rolling hills, mountains and small mountain ranges, and scattered plains

DEMOGRAPHY: PRESENT POPULATION BARRIO: Bacon mun. POPULATION: 31,963

PROVINCE: Sorsogon 536,033 (1987)

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.

- road concreting of Bacon-Manito road
- geothermal plant construction
- upgrading of municipal/barangay roads

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

- to improve the existing port facilities
- as long as the port developed and reactivate, it will enhance economic development in the municipality

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

As long as Bacon port operates, percentage of traffic from Rapu-Rapu and Virac will most likely divert to Bacon port.

NAMES OF LOCAL OFFICIALS:

Municipal mayor - Elias M. Garcia
MPDC - Paciencia G. Esico
MPDC Asst. - Raden Dimaano
District Engr. - Romeo Panganiban

EXHIBIT 3

NAME OF PORT: BACON					PORT OPERATION INVENTORY									ISLAND: LUZON	PROVINCE: SORSOGON	
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
(No Port Operation Inventory)																

(1986) Municipal Fishing Boats:

2- Fishing boat (3 tons)
31- Motorized Fishing boat (under 3 tons)
780- Non - motorized

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 2011
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	Orientzi 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 2011
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 2011
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 (inter-island)	0.80

		AVERAGE ANNUAL GROWTH RATE					
		1990 to 2000			2000 to 2011		
REGION	PROVINCE	CAR	JEEPNEY (BANCA)	BUS (I-I)	CAR	JEEPNEY (BANCA)	BUS (I-I)
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%	5.89%	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 2011		
REGION	PROVINCE	CAR	JEEPNEY (BANCA)	BUS (I-I)	CAR	JEEPNEY (BANCA)	BUS (I-I)
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	8.02%	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%	9.9[illegible]%	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 2011
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	2.764
III	4.778 x 10^10	6.1[illegible] 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

LAGONOY GULF LOGISTICS NETWORK
BACON PORT
(1000 Tons)

FROM/ TO	SAGNAY (NATO)	SABANG	PRESEN- TACION	CARA- MOAN	CABCAB	TABACO	OTHERS	TOTAL
NATO								
%/passengers	50	0	6	7	5	5	16	9
passengers	51	1	5	20	10	5	10	102
fish, etc.	75							75
rice	140	140						280
fuel	42	42						84
consumables	95	95						189
bag cargo	207	207						413
bottle cargo	537	280		257				1,073
others	1,032	32					1,000	2,063
SABANG								
%/passengers	1	50	35	27	12	5	24	27
passengers	1	152	29	30	22	5	15	304
fish, etc.		540	90					630
rice	6	6						12
fuel	6	6						12
consumables	12	12						25
bag cargo	4	954	950					1,909
bottle cargo	3	1,031		1,028				2,062
others	2	272	270					543
PRESENTACION								
%/passengers	5	10	50	2	0	1	2	7
passengers	5	29	41	5	0	1	1	82
fish, etc.			360					360
rice	30	382	412					825
fuel	29	115	144					288
consumables	61	258	319					637
bag cargo	22	563	585					1,170
bottle cargo	15	764	844	65				1,687
others	7	86	93					186
CARAMOAN								
%/passengers	20	47	6	50	16	9	5	26
passengers	20	80	5	148	30	10	3	296
fish, etc.				660				660
rice	122	932		1,054				2,108
fuel	118	280		802		404		1,603
consumables	243	629		872				1,744
bag cargo	86	1,375		1,461				2,922
bottle cargo	59	1,864		3,823		1,900		7,646
others	29	210		239				478

EXHIBIT 9
(CONTINUED)

FROM/ TO	SAGNAY (NATO)	SABANG	PRESEN-TACION	CARA-MOAN	CABCAB	TABACO	OTHERS	TOTAL
CABCAB								
%/passengers	10	7	0	10	50	28	0	16
passengers	10	22	0	30	92	30	0	184
fish, etc.								0
rice	141	290			431			862
fuel	59	87			146			292
consumables	122	196			318			635
bag cargo	43	428			461			932
bottle cargo	29	580		386	995			1,990
others	15	65			80			160
TABACO								
%/passengers	5	2	1	3	16	50	3	9
passengers	5	5	1	10	30	53	2	106
fish, etc.								0
rice	30	66				96		193
fuel	29	20				49		98
consumables	61	45				106		211
bag cargo	22	97	360			479		958
bottle cargo	15	132		129		276		552
others	7	15	70	125		217		434
OTHERS								
%/passengers	10	5	1	1	0	2	50	6
passengers	10	15	1	3	0	2	31	62
fish, etc.								0
rice	61	198					259	518
fuel	59	59					118	236
consumables	122	134					256	511
bag cargo	43	292					335	670
bottle cargo	29	396		38			425	888
others	15	45					60	119
TOTAL:								
passengers	102	304	82	296	184	106	62	1,136
%	9	27	7	26	16	9	6	100
fish	75	540	450	660	0	0	0	1,725
%	4	31	26	38	n/a	n/a	n/a	100
rice	530	2,014	412	1,054	431	96	259	4,797
fuel	342	608	144	802	146	453	118	2,613
consumables	715	1,368	319	872	318	106	256	3,953
bag	427	3,916	1,895	1,461	461	479	335	8,974
bottle	687	5,047	844	5,725	995	2,176	425	15,898
others	1,107	723	433	364	80	217	1,060	3,984
TOTAL CARGO	3,806	13,677	4,047	10,278	2,431	3,527	2,453	40,219
Percent	10	34	10	26	6	9	6	100

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	Common Excavation	CU.M.	65	100	47	30.6			47	30.6	28	18.2	25	16.3	75	48.8
(20 - 39)	II. PAVEMENT															
20	Aggregate Subbase Course	CU.M.	140	100	48	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	[illegible]
23	Soil Aggregate Shoulder	CU.M.	150	100	48	72.0			48	72.0	27	40.5	25	37.5	75	[illegible]
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	18.7
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	80.0	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	VIII. LAND ACQUISITION	KM	300000	100							90	270000	10	30000	90	270000
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 - LEGAZPI

STATION : LEGASPI
COORDINATES: 13'09' N 123°43' 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	296.9	20	28.6	22.1	25.3	25.1	23.0	22	84	1012.9	NE	4	6	1	0
FEB	195.6	17	29.1	22.2	25.6	25.4	23.1	22	82	1013.1	NE	4	6	0	0
MAR	192.6	17	29.9	22.8	26.3	26.1	23.7	23	82	1012.8	NE	4	5	0	0
APR	152.1	16	31.1	23.5	27.3	27.2	24.7	24	81	1011.6	NE	4	5	2	1
MAY	181.3	14	32.1	24.1	28.1	28.0	25.4	25	81	1009.8	NE	3	5	7	9
JUN	240.9	16	32.2	24.0	28.1	27.8	25.4	25	82	1009.1	NE	3	5	11	12
JUL	251.3	19	31.8	23.7	27.7	27.3	25.1	24	84	1008.6	SW	3	6	10	10
AUG	264.2	20	31.6	23.7	27.6	27.2	25.1	24	84	1008.2	SW	3	6	10	8
SEP	259.9	20	31.5	23.5	27.5	27.0	25.0	24	85	1008.9	W	3	6	11	11
OCT	325.5	21	31.1	23.3	27.2	26.8	24.7	24	84	1009.4	NE	3	6	9	10
NOV	483.7	22	30.1	23.1	26.6	26.4	24.4	24	85	1010.2	NE	4	6	6	5
DEC	456.0	23	29.0	22.9	25.9	25.7	23.8	23	85	1011.7	NE	4	6	2	2
ANNUAL	3300.0	225	30.7	23.2	26.9	26.7	24.5	24	83	1010.5	NE	4	6	69	68

EXHIBIT 14

CLIMATOLOGICAL EXTREMES - LEGAZPI
(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	32.7	24'12	17.0	12'79	239.0	9'04	23/N	8'72	1020.7	6'58	996.2	9'72
FEB	33.7	18'12	16.7	19'14	185.1	24'35	26/ENE	13'80	1021.0	1'62	996.2	25'70
MAR	33.9	29'50	17.0	25'13	209.2	11'71	18/NE	16'62	1020.9	12'64	1004.5	22'82
APR	36.1	29'48	16.7	4'63	193.0	6'35	21/NE	24'68	1018.2	7'65	1002.1	21'56
MAY	37.7	27'68	17.1	7'72	202.7	5'51	41/ENE	26'71	1016.0	9'57	985.8	26'71
JUN	37.6	11'63	18.9	14'71	377.9	3'23	57/S	24'72	1017.2	15'53	961.7	25'60
JUL	36.6	5'15	15.8	20'71	239.4	15'83	29/ENE	14'71	1015.5	7'53	969.2	14'83
AUG	36.9	7'39	19.4	8'71	178.3	13'63	28/SW	13'63	1015.0	11'69	990.0	24'67
SEP	36.0	1'08	19.0	13'75	216.3	2'29	29/SSW	18'79	1015.5	5'53	984.1	26'76
OCT	35.3	3'30	17.2	31'69	263.9	28'58	49/WSW	13'70	1016.4	20'79	972.0	6'60
NOV	34.4	3'13	17.9	1'69	484.6	3'67	41/N	3'67	1019.2	30'78	938.4	3'67
DEC	33.2	18'04	13.9	28'71	458.6	26'75	36/SSW	31'79	1019.8	1'78	984.8	31'59
OVERALL	37.7	5/27/ 1968	13.9	12/28/ 1971	484.6	11/3/ 1967	57/S	6/24/ 1972	1021.0	2/1/ 1962	938.4	11/3/ 1967
PERIOD OF RECORDS		1903-1918, 1947-1986		1930-1939		1902-194 1949-1986		1950-1986		1949-1986		

NOTE: DOUBLE APOSTROPHE ('') MEANS FOR YEAR 1800

EXHIBIT 15

ENVIRONMENTAL CONTACT LIST

Melchor L. Aguilera, Jr., Archaeologist
Archaeology Division
National Museum of the Philippines
P. Burgos St., Manila
47-77-97

Alma R. Ballesfin
Supervising Ecosystems Management Specialist
Wildlife Regulation Section, Wildlife Division
Department of Environment and Natural Resources
Protected Areas and Wildlife Bureau
Quezon Avenue, Diliman, Quezon City
97-85-11 to 15

Amelia F. Brillantes, Chief
Environmental Management Bureau
Environmental Impact Assessment Section
6th Flr. PHCA Building
East Avenue, Diliman, Q.C.
98-04-21 loc. 2621/2671

Porfirio Castaneda, Program Director
Fisheries Sector
Environmental Management Bureau
OLD NPCC Bldg.
Pedro Gil St. Taft Avenue
Manila
50-47-05

Wilbur Dee, Project Director
Integrated Protected Area System
Parks and Wildlife Bureau
Quezon Blvd., Quezon City
97-85-11

EXHIBIT 15

(CONTINUED)

Jose Dones
Barangay Treasurer
Sitio Banao, Barangay Salvacion
Bacon, Sorsogon

Robert S. Jara
Foreign Assisted and Special Projects Office
Department of Environment and Natural Resources
Visayas Avenue, Diliman
Quezon City
99-09-70

Michael I. Kingery, Project Manager
Rural Infrastructure Fund Project
USAID
Manila

Albert A. Magalang
Environmental Management Bureau
Department of Environment & Natural Resources
6th Floor, Phil. Heart Center Bldg.
East Avenue, Diliman, Quezon city
98-04-21 loc. 3630

Perla M. Magsalay, National Coordinator
Asian Wetland Bureau Philippines Foundation, Inc.
4th Floor Albulario Bldg.
Gen. Maxilom Avenue
Cebu City
21-06-04

Ramon J. Miclat, Fishery Biologist
Bureau of Fisheries & Aquatic Resources
Department of Agriculture
2nd Floor, Arcadia Building
Quezon Avenue, Quezon City
96-5428, 99-12-69

EXHIBIT 15

(CONTINUED)

Virgilio P. Palaganas, Marine Park Specialist
Protected Areas and Wildlife Bureau
Department of Environment & Natural Resources
Quezon Avenue, Diliman
Quezon City
97-85-11 to 15

Eduardo D. Ramas
Local Resident
Sitio Banao, Barangay Salvacion
Bacon, Sorsogon

APPENDIX C
PHOTOGRAPHS

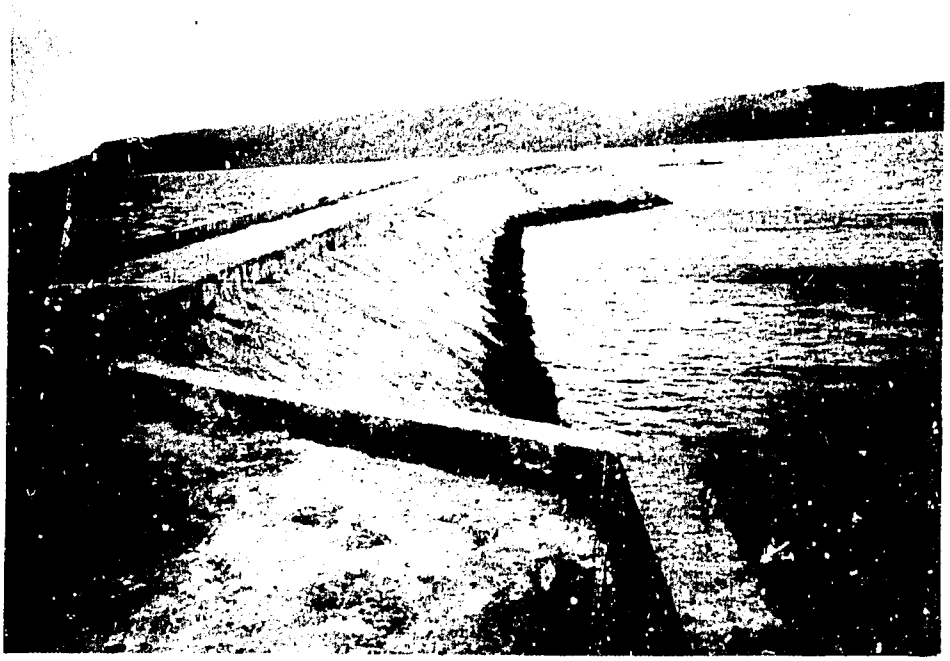


PHOTO 5: RIGHT SIDE OF BACON CAUSEWAY, FROM VEHICLE TURN-AROUND

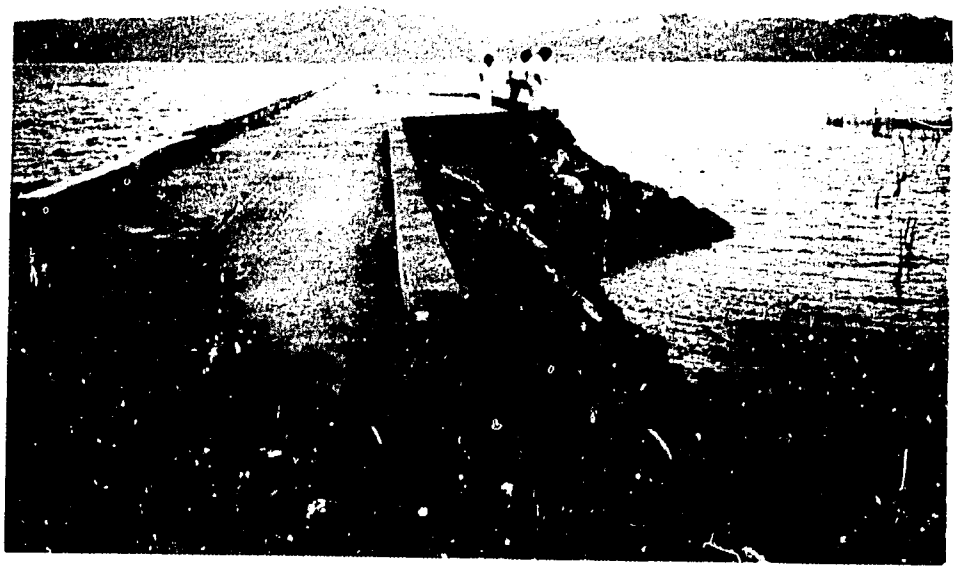


PHOTO 6: ARMOUR ROCKS AND VEHICLE TURN-AROUND

PHOTO 7: UNFINISHED END OF ROCK CAUSEWAY, NOTE APPARENT UNDERSIZING OF ROCK

PHOTO 8: SIDE OF ROCK CAUSEWAY, LOOKING SHOREWARD

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

PHOTO 9: CAUSEWAY FROM ACCESS ROAD

PHOTO 10: ACCESS ROAD TO BACON PORT; NOTE APPARENT LACK OF USE

RURAL INFRASTRUCTURE FUND PROJECT AID PROJECT NO. 492-0420

REPRESENTATIVE VIEWS OF THE SUB-PROJECT AREA

PLATE C-3

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.

BIBLIOGRAPHY

Agoncillo, Teodoro and Oscar Alfonso, 1961. A Short History of the Filipino People. Quezon City: University of the Philippines.

Andres, Tomas D., 1981. Understanding Filipino Values: A Management Approach. Quezon City: New Day.

Jocano, F. Landa, 1971. "Filipino Social Structure and Value System" in J.B.M. Kassaryian and Robert A. Stringer (eds) Management of Men.

Kikuchi, Yasushi (ed), 1989. Philippine Kinship and Society. Quezon City: New Day Publishers.

Lynch, Frank, 1964. Four Readings on Philippine Values. Quezon City: Ateneo de Manila University Press.

Golay, Frank H., 1961. The Philippines: Public Policy and National Economic Development. Ithaca, NY: Cornell University Press.

Gutherie, George M. (ed), 1971. Six Perspectives on the Philippines. Manila: Bookmark.

Teodosio, V.A., P.B. Bandayrel, and G.L. Labastilla, 1989. Labor and the Transport Industry in the Philippines. Manila: Wyncor Printers.