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# **PROJECT PAPER**

**PHILIPPINES : Libmanan/Cabusao  
Integrated Area Development Project**

**Food and Nutrition Category**

**May 1975**

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INTEGRATED AREA DEVELOPMENT PROJECT

FOOD AND NUTRITION CATEGORY

MAY 1975

PROJECT DEVELOPMENT TEAM

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LIBMANAN/CABUSAO AREA DEVELOPMENT PROJECT

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## PART I

### SUMMARY AND RECOMMENDATIONS

#### A. Project Summary

The Libmanan/Cabusao Integrated Area Development Project, which is outlined and appraised in this report, represents an attempt by the GOP's Bicol River Basin Council to further refine and extend to the municipality level the basic policy, planning and management principles which underlie the 312,000-hectare Bicol River Basin Development Program, now in its second year of operation.

##### 1. Project Purpose

The purpose of the project is to:

- develop a management system and organizational structure which will enable municipal leaders and residents of Libmanan/Cabusao, along with national and provincial level agencies, to meaningfully participate in the planning and execution of the Bicol River Basin programs which affect the socio-economic structure of the two municipalities over time, and working through this management system;
- implement an Integrated Area Development Project covering 3,873 hectares in the municipalities of Libmanan and Cabusao. The project will increase cropping intensity to at least two (2) rice crops per year and will measurably increase yields per hectare through the systematic interaction of improved irrigation, drainage, and water management facilities, and through improvements in farm level organization, farm practices, extension services, transport, land tenure arrangements of project farmers, and marketing services.

##### 2. Project Description

The project involves the concurrent and tightly coordinated implementation of five major sub-projects within the 3,873 hectare project area. A sixth project, involving the consolidation of farm lands, will be implemented as part of the project's second phase which will begin upon completion of the project's basic infrastructure. The implementation of these various activities, under the unified management of an interagency Area Development Team, is expected to raise rice

productivity from the current average of 1.5 m.t. per hectare/season to 4.25 m.t. per hectare/season over a six-year period. By the sixth year of the project, net farm household income is projected to reach ₱4,000 (\$571) for 513 farm families and ₱5,000 (\$714) per annum for 1820 farm families in the project area. To achieve these production and income targets, a total project cost of ₱53 million (\$ 7.5 million) will be required. As proposed, A.I.D. would provide a loan of \$3.5 million, representing 47% of the total project costs and a grant of \$275,000.

B. Borrower and Executing Agency

The borrower will be the Government of the Philippines (GOP). The Executing Agency will be the Bicol River Basin Council (BRBC) through its Program Office. The Bicol River Basin Council was created by Executive Order 412 on May 7, 1973 (see Annex A).

C. Guaranty

This section does not apply.

D. Loan and Grant

1. Total Project Cost (see Table 1)

2. Amount of AID Assistance

a. Loan

(1) Foreign Exchange	\$2,547,000	
(2) Local Cost	<u>\$ 953,000</u>	
(3) Loan Total		\$3,500.00

b. Grant Technical Assistance

(1) Final A&E Consultancy	\$ 75,000	
(2) Rice Technology Contract	<u>\$ 200,000</u>	
(3) Grant Total		<u>\$ 275,000</u>

c. Total New AID Obligations \$3,775,000

TABLE 1: PROJECT INPUTS

A. Total Project Cost <u>1/</u> (P000)	Total (in P)	Total (\$ equivalent in \$000) <u>3/</u>	YEAR						Total
			1	2	3	4	5	6	
1. Irrigation, Drainage, and Service Roads									
- investment	45,730	6,533	27,913	11,206	5,773	838			45,730
- O&M <u>2/</u>	-	-					(770)	(770)	
2. Land Reform									
- investment	170	24	170						170
- O&M	153	22	38	23	23	23	23	23	153
3. Compact Farm and Extension Service Development									
- investment	444	63	444						444
- O&M	779	111	175	179	179	82	82	82	779
4. Applied Research									
- investment	441	63	441						441
- O&M	568	81	87	86	89	100	103	103	568
5. Organization and Management									
- investment	641	92	641					100	741
- O&M	191	27	36	30	30	30	30	35	191
- overhead	3,277	468	482	559	559	559	559	559	3,277
6. Total									
- investment	47,426	6,775	29,609	11,206	5,773	838	-	-	47,426
- O&M	1,691	242	336	318	321	235	238	243	1,691
- overhead	3,277	468	482	559	559	559	559	559	3,277
Grand Total			30,427	12,083	6,653	1,632	797	802	52,394

1/ Aggregate summation of initial six-year costs

2/ Non-add costs to be shouldered by Irrigators Association

3/ Exchange Rate: ₱7.00 = \$1.00

3. GOP Contribution

The Government input would aggregate P27.9 million (\$ equivalent = \$3.98 million) over a six-year time frame. Table 2 presents the itemized GOP inputs.

Table 2

Libmanan/Cabusao Integrated Area Development Project  
(GOP Contribution in P000)

Item	1	2	3	4	5	6	Total
Investment	8,260	8,056	5,773	838	-	100	23,027
O&M	336	318	321	235	238	243	1,691
Overhead	482	559	559	559	559	559	3,277

- E. Recommendation: It is recommended that a loan of \$3.5 million and a Technical Assistance Grant of \$275,000 be authorized and approved for implementation over a three-year period beginning July, 1975.

PART II

PROJECT JUSTIFICATION, DESCRIPTION, AND APPRAISAL

A. Project Background and Justification

1. Background: The Planning and Management Context

The original development plan prepared by the GOP for the Bicol River Basin, articulated a number of planning precepts which have come to form the foundation of the Bicol River Basin Program's planning and management philosophy. These precepts were originally articulated by Government planners in the course of defining and subsequently justifying the Government's approach to integrated area development in agriculturally based rural areas. Over the past twenty months, Bicol River Basin Council planners have refined these precepts and extended their application to the planning of sub-regions of the Bicol River Basin. The Libmanan/Cabusao Integrated Area Development Project represents the initial attempt by the BRBC to give concrete effect to these planning and management precepts at the sub-basin level. The success or failure of the Libmanan/Cabusao Integrated Area Development Project, therefore, will have ramification beyond the delimited boundaries of the project itself, to the Bicol River Basin Program as a whole. The Libmanan/Cabusao Integrated Area Development Project is considered a pilot project by both the GOP and AID in the sense that the project will serve as a test case where the Basin's basic planning and management precepts will be substantiated or, if required, modified in the course of project execution.

These precepts are:

- a. That development efforts targeted on the rural sector should focus on delimited geographic areas of high growth potential and recognized socio-economic need, where incremental investments in infrastructure, agricultural and social services will yield maximum social and economic benefits.

The Bicol River Basin was selected by the GOP as the initial area for execution of an integrated, agriculturally oriented, area development project given the Basin's high growth prospects in a regional setting otherwise

characterized for its acute poverty and generally depressed economy relative to other regions of the country. 1/

In turn, the Libmanan/Cabusao area was in large part selected as the pilot site for the Basin's initial municipality based integrated area development effort given the fact that the area constitutes the largest contiguous area of first class (IR), but largely underdeveloped, rice hectarage within the River Basin watershed area. The Libmanan/Cabusao area accounts for twelve per cent (12%) of the 105,000 hectares planted to rice within the Basin's 39 municipalities.

Notwithstanding its potential, agricultural productivity is low (average rice yield = 1.5 metric tons per hectare) and poverty is acute (average annual family income = ₱3,090) relative to the rest of the River Basin because present government and private development efforts have been inadequate to tap the natural potential of the area. The BRBC plans to address these problems by concentrating resources in the area to the extent that they are economically justified.

- b. That development planning within the defined geographic areas of high growth potential should be integrated, cross-sectoral and interagency in nature.

The Bicol River Basin Council, through its management arm, is attempting to rationalize and integrate the planning and program activities of the different sectoral agencies of government operating within the geographic boundaries of the River Basin. This integration of sectoral programs is considered by the BRBC to be essential, since rural and agricultural development is a complex process requiring major simultaneous inputs in several sectors before significant changes in productivity and income can be affected.

Furthermore, the meshing of these sectoral plans and activities must take place at all levels of government. The Bicol River Basin Council has effectively brought

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1/ For a discussion of regional income disparities and the relative economic position of the Bicol Region vis-a-vis other regions of the country, see: "Current Economic Position and Prospect of the Philippines"; Report No. 568-PH; IBRD; Nov. 7, 1974, pp. 26-31.

the various agencies responsible for rural and agricultural development together at the sub-regional or basin level; the BRBC Libmanan/Cabusao Integrated Area Development Project will bring these sectoral agencies together at the field level into a permanent working relationship. In the last analysis, this field level relationship is where integration is most essential if the Government's objectives of increased agricultural productivity and increased income of the rural poor are to be achieved.

The failure to achieve performance goals of the Government's major agricultural program in the Bicol - Masagana 99 - can, in large part be attributed to the ineffective coordination at the field level and bears out the need to more effectively integrate government services in the field. This opinion is summarized by the BRBC's Social Survey Research Unit (SSRU) which conducted an evaluation of ongoing government sponsored programs in the River Basin Area. The SSRU concluded:

"Beyond and above the production-technician question, there is what we consider an even more comprehensive problem. This is the way in which the government's rural programs are viewed relative to one another. With the one very significant, but vaguely conceived, exception of land reform, these programs (notably Masagana 99, compact farming and the Samahang Nayon) are perceived either as ends in themselves, on one hand, or as mere helping hands for other programs, on the other. The evidence we collected indicates that the government agents most closely involved in a program tend to exaggerate its importance, while those whose official commitment is elsewhere, are likely to play it down. The result is parallel, unfocused activity, and a defending of programs because they are there and they are ours." 2/

The Bicol River Basin Council, composed of all major sectoral agencies, was created in order to establish

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2/ Lynch, Frank, S.J. and Barrameda, J.V.; "The Masagana 99 Delivery System; How well does it work in Camarines Sur"; SSRU Research Report Series, No. 3; Feb. 1974; pp. 38-39.

the development objectives for the Bicol River Basin and to mesh the various government agencies into the permanent working relationship necessary to achieve these common development objectives and in so doing avoid the problems reported by the SSRU. This working relationship is now operational at the Basin-wide planning level. The Libmanan/Cabusao Integrated Area Development Project is the BRBC's concerted initial attempt to develop concepts, techniques and organizational forms required to harmonize the government's agricultural and infrastructure oriented efforts at the field level.

- c. That project planning and management should be decentralized to the greatest extent possible in order to maximize participation from all sectors in the development of the area.

This last premise - that of decentralized planning and management - is closely related to the second. Not only must the various governmental agency staff members learn to work together and reinforce one another's program in the field, they must also actively solicit the involvement and participation of local leaders and residents in the development process. This requires a basic psychological shift away from the concept that the government implements projects for the people of a given area rather than with the people. The Libmanan/Cabusao Project is an attempt by the Council to develop the organization and management structure and communication process required to maximize public participation in development.

In short, the general justification for extending the proposed AID technical and financial support to this BRBC project is based on the importance of the project as a GOP test case in developing and refining planning and management techniques which effectively reach and involve the rural poor in the development process. In this sense the significance of this project to AID and to the GOP is not that approximately 2,330 small farm families will directly benefit from the project, but that a field level organizational structure and management system will be created and tested which, if found successful, will be applied throughout the Basin in support of similar projects ultimately affecting the lives of the majority of the Basin's 1,000,000 residents.

## 2. Project Justification

The unifying objective of the Bicol River Basin Program and in turn the Libmanan/Cabusao Integrated Area Development Project is to increase per capita income in the region. In particular, however, the Government in all its programs is not only concerned with increasing aggregate consumption but is also guided by the social objective of redistributing income from more favored to less favored groups within the society. The Bicol River Basin, located as it is in one of the more economically depressed regions of the country, is itself a manifestation of the government's interest in addressing the socio-economic disparity that exists between social classes and geographic regions of the country.

Accordingly, in evaluating projects for financing, Basin planners have recognized that the choice of a project on exclusively economic grounds may not be the best use of the country's limited resources if it perpetuates or does not significantly correct existing income disparities between regions and between social groups.

In this context, the area chosen for a project takes on added significance. To guide Basin planners in targeting those areas and population within the River Basin with greatest need, the Basin has arranged with its Social Survey Research Unit (SSRU) to generate data to enable, within the Basin watershed area, comparison of income, income distribution and employment levels and "quality of life" measures among different sub-regions of the Basin.

Outlined below is a brief agricultural and comparative socio-economic profile of the Libmanan/Cabusao sub-region of the Bicol River Basin which provides the justification, based on income, equity and employment considerations for implementing the project at this time.

### a. Agriculture

#### (1) Current situation

Although rice yields per hectare are low (average yield - 1.5 metric tons) the area has been a traditional rice surplus area given the extensive hectarage (approximately 12,000 hectares) devoted to rice production. Traditionally, 40% of the areas production has been exported to neighboring

market centers in Camarines Sur, Camarines Norte and Quezon Province. In 1960, the palay (rough rice) production of Libmanan/Cabusao topped all municipalities in the Bicol River Region. Historically, the Libmanan area has been known as the "Rice Bowl of the Bicol". However, by 1970 Libmanan had been displaced as the top rice producing municipality within the Basin by the municipalities of Bula and Pili.

Libmanan's prominence as a rice producing area has diminished for a number of reasons. These reasons are closely associated with the largely unplanned infusion of public and private sector investment in the Basin area. Most of these investments, if technically appraised at all, were analyzed only in terms of their localized impact and not in terms of their Basin wide impact. As a result, the Libmanan area, because of its location astride San Miguel Bay and the Bicol River Estuary, has been adversely affected. The major causative factors for Libmanan's economic decline are discussed in the following paragraphs.

Perhaps the single most important factor affecting rice production in the area has been the combined effect of the construction of two flood control channels along the Bicol River and the dramatically increased upstream use of pumps for irrigation purposes south of Naga City. The net impact of these developments has been a marked increase in saline intrusion in the Bicol Estuary and Libmanan River which has actually taken an existing irrigation pump out of operation in the Libmanan area and precluded further low cost development of pump irrigation to serve the area.

Secondly, the Sipocot/Barceloneta/Cabusao road which traverses the heart of the Libmanan/Cabusao rice-producing area was constructed without adequate cross-drainage facilities and over the years, the combined effect of poor drainage and the intrusion of salt water into the Bicol River Estuary and Libmanan River, as noted above, has exacerbated the rice production situation in the Libmanan area.

(2) Land Classification

Insofar as the immediate project area is concerned the BRBC commissioned the National Irrigation Administration, The Bureau of Public Works, and the Basin's Social Survey Research Unit, with the Bureau of Soils as the implementing agency, to conduct an economic land classification of the project area. U.S. Bureau of Reclamation standards for determining the irrigability suitability of the project lands were applied. Identification of arable lands was based on the degree and extent of flooding hazards and its effect on the yield of paddy rice. Estimates of these relationships were determined based on the design standards for drainage and irrigation proposed by the National Irrigation Administration for the project area.

Table 3 and Map 1 present the results of the land classification study for the adopted project facilities. 3/

In summary, with the adopted project facility scheme, the project area will contain 3,020 hectares of class 1R lands, 833 hectares of 2R land and 20 hectares of 3R land; 208 hectares will be required for right-of-way for project facilities.

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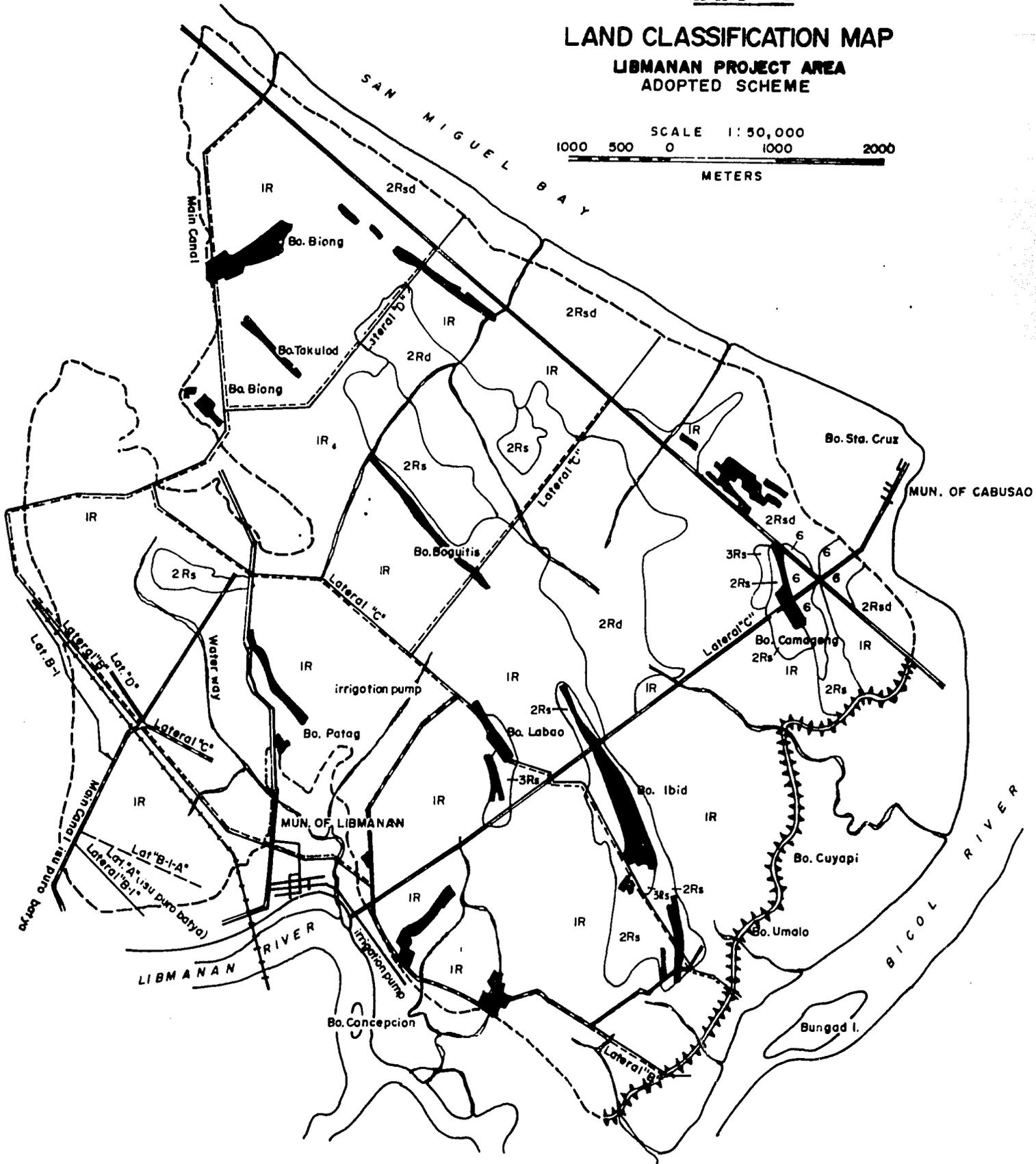
3/ Actually project lands were classified according to three alternative project engineering designs in order to determine the most economically viable irrigation and drainage package.

Table 3. Land classes under adopted scheme.

	LAND CLASS	GROSS AREA	NET AREA	YIELD REDUCTION (in percent)
	1R	3507.4	3000	7.5 during wet season
	1R	21	20	10 during wet season
	2Rs	114.2	89	15 during wet & dry season
	2Rsd	349	347	30 during wet season
	3Rs	23.3	20	30 during wet & dry season
	2Rd	434.9	397	30 during wet season
<b>TOTAL IRRIGABLE ARABLE LAND</b>		<b>4449.8</b>	<b>3873</b>	
Non-Arable Lands	6sd	54		
	6std	27		
	"H" lands	104.2		
	Road & Railroad	29.0		
<b>Total Area Surveyed</b>		<b>4664.0</b>	<b>3873</b>	

M A P 1

**LAND CLASSIFICATION MAP  
LIBMANAN PROJECT AREA  
ADOPTED SCHEME**



b. Population and Employment

There were in April 1974 929,000 people living within the Bicol River Basin (see Table 4). About two-thirds were at least 10 years of age, and hence, technically eligible for work. However, only 53% of those eligible were actually members of the labor force and of this sub-population, 7.7% (about 25,000) reported themselves as unemployed. Underemployment constituted 20.6% of the labor force or approximately 67,000 persons.

Looking specifically at the Libmanan/Cabusao area there was a combined population of 76,387 as of April 1974 (Table 4). Approximately, 63% of the population were at least 10 years of age, hence, technically eligible for work. However, only 52% of those eligible were actually members of the labor force and of this sub-population, 12% (about 2,970) reported themselves as unemployed. Sixty percent (60%) of the total active labor force was employed in agriculture. Underemployment figures were only available from the SSRU's Sipocot district which is comprised of six municipalities including Libmanan and Cabusao. The underemployment rate for the Sipocot district, a suitable surrogate for the Libmanan/Cabusao area in the absence of municipality specific data, was 18.7% or approximately 4,634 persons in the Libmanan/Cabusao area. Considering the objective of the River Basin Program to increase employment opportunities, Libmanan/Cabusao was given priority consideration given its high unemployment rate of 12% when compared to the Basinwide average of 7.7% and the large number of underemployed in the project area.

c. Income and Income Distribution

Table 5 amplifies the need for increased economic activity in the Libmanan/Cabusao area.

As of April 1974, the average annual family income in the Bicol River Basin was ₱3,828 (US\$547) compared with ₱3,089 (US\$441) for the Libmanan/Cabusao Area. As shown in Table 5, 83% of Libmanan/Cabusao households earned less than ₱5,000 per annum as compared with 80% for River Basin households in general. Relative to the rest of the Basin, residents of Libmanan/Cabusao are, income wise, less well off.

As expected the pattern of income distribution in the Basin correlates directly with other measures used by the SSRU to gauge socio-economic status. In particular,

Table 4. Estimated population of the Bicol River Basin and selected areas, by labor-force categories (Camarines Sur, April 1974)

Population and Sub-population	Bicol		Municipalities of		
	River Basin	Sipocot District	Libmanan	Cabusao	Libmanan & Cabusao
a. Total population <u>a/</u>	929,900	139,404	66,090	10,297	76,387
b. Population 10 years of age and older <u>b/</u>	312,393	123,912	41,562	6,538	48,100
c. Population in the labor force	326,028	67,650	20,544	4,312	24,856
Labor force participation rate	52.8%	54.5%	49.4%	66%	51.7%
d. Population employed	127,037	63,350	17,764	4,120	21,884
Employment rate	92.3%	93.6%	86.5%	95.5%	88.0%
e. Population unemployed	24,843	4,300	2,780	192	2,972
Unemployed rate	7.7%	6.4%	13.5%	4.4%	12.0%
f. Population under-employed	67,334	12,650	3,844	790	4,634
Underemployed rate	20.6%	18.7%	18.7%	18.7% <u>c/</u>	18.7% <u>c/</u>

Source: Bicol River Basin SSRU, Annual Panel Survey, April, 1974

a/ Total population estimates were derived by calculating the annual growth rate for the municipalities involved during the intercensal period 1960-70 and assuming the same rate prevailed in the years 1970-74.

b/ Estimated of all populations other than the total population were derived by first determining the API sampling fraction by barrio and poblacion (1/64 and 1/22, respectively) for Sipocot district and then applying these figures to the appropriate sample findings.

c/ The underemployment rate used here is that of the SSRU's Sipocot district which include Libmanan and Cabusao.

Table 5. Annual household income of residents (farmers and nonfarmers combined) of the Bicol River Basin, the Sipocot district, the Libmanan and Cabusao municipalities, by income class (Camarines Sur, April 1974)<sup>c</sup>

INCOME CLASS	BICOL RIVER BASIN					SIPOCOT DISTRICT					LIBMANAN/CABUSAO				
	$\bar{X}_Y$	N	C%	Total Income	C%	$\bar{X}_Y$	N	C%	Total Income	C%	$\bar{X}_Y$	N	C%	Total Income	C%
0 - 999	434.01	826	29	358,494.10	3	514.52	136	25	69,974.60	3.71	450.86	42	21	18,936.30	3.11
1000 - 2999	1,865.26	983	63	1,833,547.00	20	1,814.47	189	60	342,934.40	21.90	1,787.58	82	62	146,581.80	27.19
3000 - 4999	3,878.73	489	80	1,896,700.30	37	3,827.99	96	78	367,487.00	41.39	3,771.91	41	83	154,648.20	52.60
5000 - 6999	5,831.63	228	88	1,329,612.50	49	5,801.05	45	87	261,047.20	55.24	5,885.87	15	91	88,288.90	67.10
7000 - 8999	7,938.92	125	92	992,365.30	58	7,911.27	24	91	189,870.40	65.31	7,980.00	7	94	55,860.00	76.28
9000 - 9999	9,430.69	47	94	443,242.60	62	9,452.74	11	93	103,980.20	70.82	9,381.00	2	95	18,762.20	79.36
10000 - 10999	10,466.23	52	95	334,919.30	65	10,432.53	10	95	104,325.30	76.36	10,534.78	4	97	42,139.10	86.28
10000 & Above	26,172.19	146	100	3,821,139.50	100	19,376.54	23	100	445,660.40	100.00	20,865.08	4	100	83,460.30	100
<b>TOTAL</b>	<b>3,828.24</b>	<b>2876</b>		<b>11,010,020.60</b>		<b>3,530.49</b>	<b>534<sup>a</sup></b>		<b>1,885,279.50</b>		<b>3,089.73</b>	<b>197<sup>b</sup></b>		<b>608,676.80</b>	

Six respondents have incomplete data.

Two respondents have incomplete data.

Annual household income includes income from all sources--farm, nonfarm, and off-farm--and of all categories, including pensions, rentals, gifts, and the like. The Bicol River Basin is here defined as the two cities (Naga and Iriga) and all municipalities of Camarines Sur except Caramoan, Garchitorea, Presentacion, and Siruma.

The source of these data is the Annual Panel Survey 1 (April 1974), for which the total sample was 3240.

the SSRU has determined that it is legitimate to infer socio-economic status from the combination of house construction materials and the status of home repair. SSRU has concluded, based on the information provided in Table 6, that the majority of residents (87%) in the Libmanan/Cabusao project area belong to the lower class and only 12 percent to the upper class, with 1% being of elite status. The socio-economic structure of these municipalities relative to that of the Basin area is also presented in Table 6. Finally, as might be expected, these indices of income and income distribution and socio-economic status correlate directly with perceived quality of life indicators which measure people's reactions to their own level of living. The perceived quality of life for respondents in the project area is discussed in the following section.

c. Perceived Quality of Life

Along with the "objective" measures being gathered by the SSRU for purposes of evaluating the impact of BRBC programs on the Basin population overtime, the SSRU has initiated a program to gather "quality-of-life" data which measure the people's feelings as to their own level of living. These data, as well as the "objective" data being gathered by the SSRU, are useful as well as a guide to planners in identifying areas where additional investment or programs are warranted both on economic as well as social grounds.

Table 6. SOCIO-ECONOMIC STATUS AS DERIVED FROM HOUSE CONSTRUCTION AND STATE OF REPAIR INFORMATION

Walls	Roof	Repair	Social Class	P E R C E N T A G E S	
				Libmanan/Cabusao	Basin Area
Concrete or wood	GI or alum.	Good	Upper-elite	1	5
		Poor		3 )	7 )
				) 12%	) 23%
Wood	Nipa or Cogon	Good		9 )	11 )
		Poor		16 )	21 )
				) 87%	) 77%
Nipa or Bamboo	Nipa or Cogon	Good	<u>Lower</u>	27 )	26 )
		Poor		44 )	30 )

Source: SSRU, Annual Panel Survey; April, 1974

Table 7 presents the results of an SSRU survey conducted in April 1974, where respondents were asked how they felt about their life as a whole - whether they were happy, unhappy, or somewhere in between-and were shown a seven point scale where they could place themselves, at the "very happy" end (score 1), at the "very unhappy" end (score 7), or at some intermediate point (score 2-6). Several questions were asked about fifteen particular aspects of life. Another measure also used was the "self-anchoring striving scale". This is a ladder with 11 steps (0-10) where the top represents the best possible life the respondent can imagine, and the bottom the worst possible one. The respondents were asked to place themselves on the ladder in terms of their present life.

In terms of the ladder rating the results show that all river basin residents have a rather bleak outlook on life (see Table 7). The residents of the project area have, however, a relatively less optimistic outlook on life than the Basin as a whole. Basin residents were on the average only marginally satisfied with the various domains of their life. On the other hand, Libmanan/Cabusao residents consistently fell below the Basin average and are particularly dissatisfied, relative to Basin residents as a whole, in such key areas as income, jobs, housing, education and prices.

The preceding section was presented to reflect the current situation - the agricultural potential as well as the socio-economic problems - in the Libmanan/Cabusao area as compared with the Basin as a whole. It was for these collective considerations along with other technical factors that the Libmanan/Cabusao area was justified for selection by the BRBC as the logical area for the initiation of the Basin's first major development effort on a sub-regional municipality oriented basis.

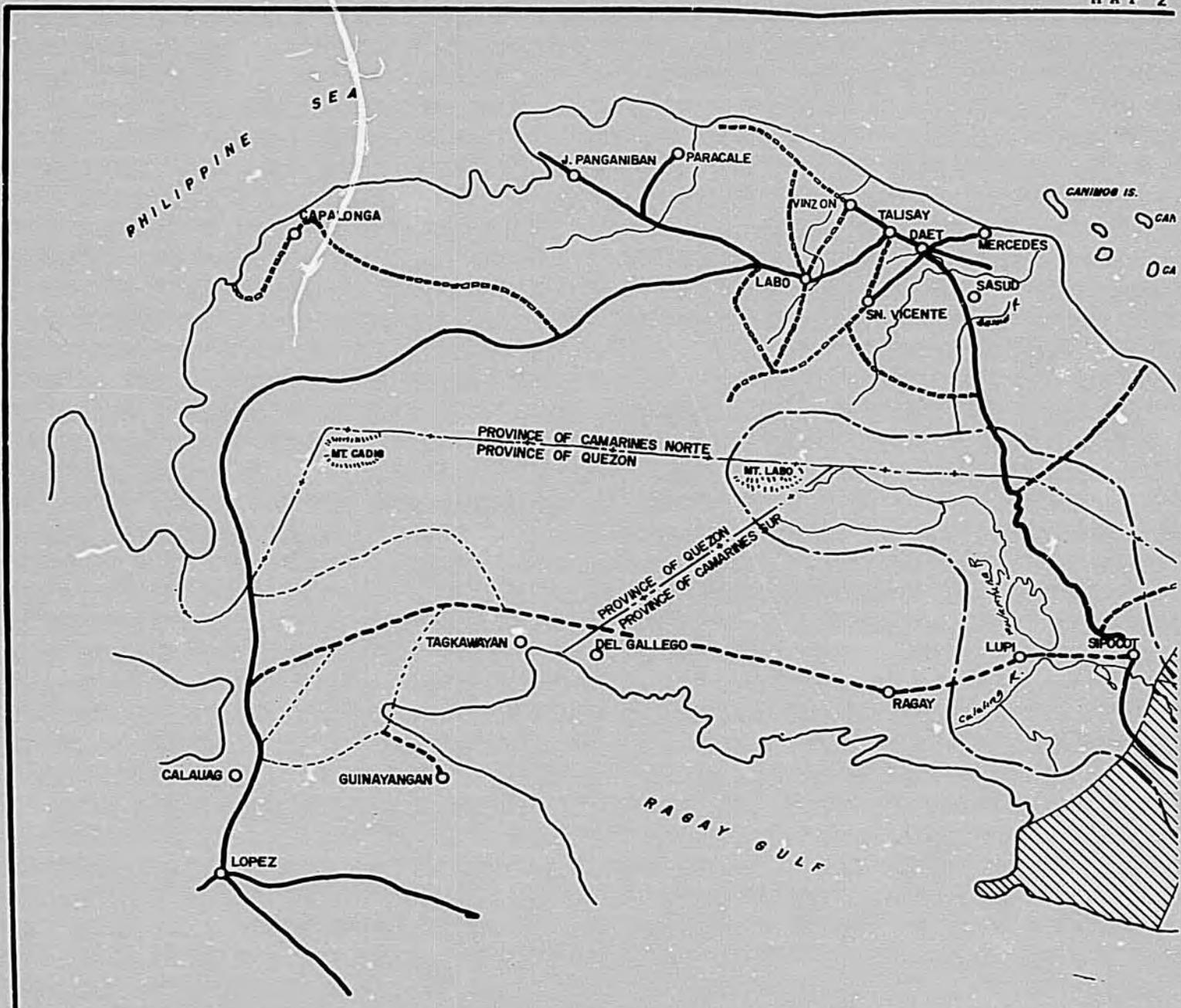
Table 7. Means of ladder ratings and of satisfaction scores for life and for selected domains, by area (Bicol River Basin, Camarines Sur, April 1974)

	BASIN AREA	SIPOCOT DISTRICT	LIBMANAN/CABUSAO
1. Ladder rating <sup>a/</sup>	3.93 (976)	3.71 (537)	3.59 (199)
2. Overall Life	3.72 (976)	3.89 (540)	4.04 (191)
3. Informal groups (participation)	3.24 (976)	3.53 (362)*	3.70 (139)
4. Position in Life	3.32 (976)	3.44 (529)	3.80 (194)
5. Food/Drink	3.38 (976)	3.60 (530)*	3.78 (193)
6. Barrio/Poblacion	3.39 (976)	3.59 (526)*	3.49 (190)
7. Organizational Participation	3.39 (976)	3.48 (328)*	3.66 (127)
8. Health/Physical Condition of R and family	3.40 (976)	3.60 (535)*	3.75 (196)
9. Traveling	3.46 (976)	3.63 (520)	3.63 (192)
10. Children's Education	3.50 (976)	3.75 (453)	3.81 (177)
11. Job	3.50 (976)	3.86 (529)*	4.07 (195)
12. Health Services	3.62 (976)	3.56 (522)	3.46 (194)
13. Present house	3.64 (976)	3.88 (537)*	4.06 (197)
14. Income	3.92 (976)	4.15 (532)*	4.34 (197)
15. R's Education	3.98 (976)	4.18 (530)*	4.40 (196)
16. Furniture	4.25 (976)	4.54 (478)*	4.68 (170)
17. Prices	5.53 (976)	5.59 (539)*	5.85 (197)

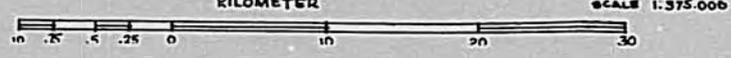
<sup>a/</sup> Ladder rating refers to the step chosen by the respondents in the "self-anchoring' striving scale" developed by Cantril (1965)

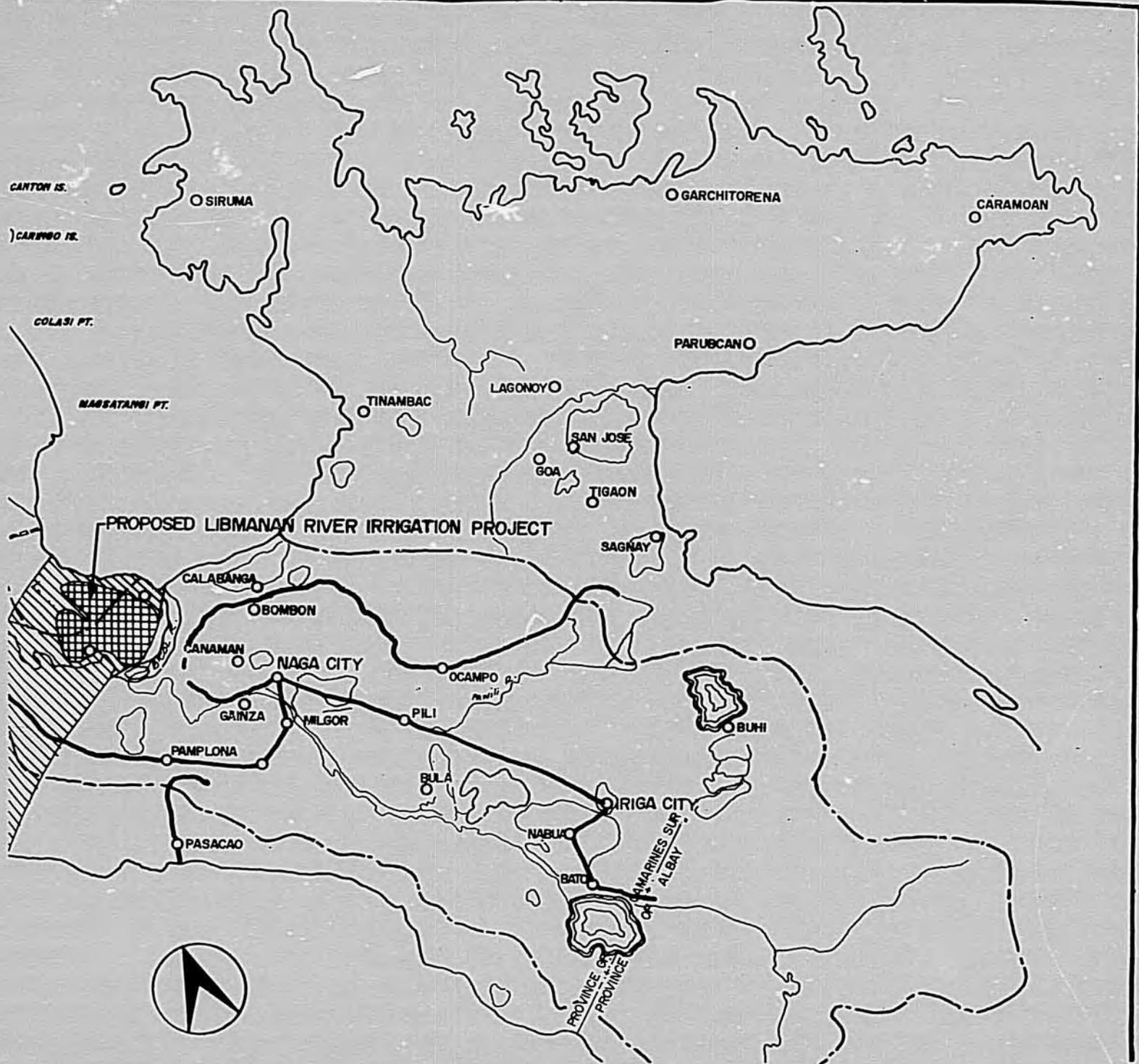
\* District value found to be significantly different from (less happy than) one or more of the other district values, either at 0.05 or 0.01 level.

Source: Bicol River Basin, Social Survey Research Unit



**LOCATION OF INTEGRATED AREA DEVELOPMENT  
BICOL RIVER BASIN  
PROVINCE OF CAMARINES SUR**





## B. DESCRIPTION OF PROJECT

### 1. Purpose

The Libmanan/Cabusao Integrated Area Development Project represents an attempt by the Bicol River Basin Council to further refine and extend to the municipality level the basic policy, planning and management principles which underly the 312,000 hectare Bicol River Basin Development Program, now in its second year of operation. The project also signals the start of a continuing effort by the BRBC to develop on an integrated basis sub-regional areas within the Bicol River Basin. If successful, this pilot project would serve as a model for replication in 5 to 6 other sub-regional areas of the River Basin. The pilot features of the project which form the basis of the project purpose are:

- a. the establishment of a permanent, area specific, decentralized management structure which by virtue of its authority, presence, membership and mode of operation would bring line agencies, local governments and residents of the area into a structured and sustained working relationship focused on the achievement of collectively determined development objectives of the area, and, working through this management system.
- b. implement a 3,873 hectare, agriculturally oriented, integrated area development project which provides for necessary and non-physical inputs in a systematic and integrated fashion. In short, the project would provide for major sectoral inputs in irrigation, drainage, credit transport, technology, land reform, farm and farmer organizational structure, etc., rather than concentrating on a single sectoral input (such as irrigation), and then, as is the common practice, assume that the remaining elements of the agricultural system will be in place upon completion of the specific sectoral activity. The Libmanan/Cabusao Integrated Area Development Project is an attempt by the BRBC to control as many of the key input variables as possible in the project area which have a direct bearing on production and in turn farm income.

Other development activities will be or are already underway in the project area which will contribute to achievement of the objectives of the project. Examples are rural electrification, small industry promotion and highway and rail improvements.

The objective of the project, increasing average net farm household income to ₱4,000 per annum for 523 farm families and to ₱5,000 per annum for 1820 families would only be achieved after full output from project facilities and farmer organization efforts have been realized. Maximum yields and therefore income are expected to be achieved six years after project initiation (FY 1981). The

institutional structure of the project, including both the organization and management structure and development of the farmer organization component, would be laid down beginning year one and is expected to be operating effectively by the end of the project's second year.

## 2. Project Location

The area to be served by the Libmanan/Cabusao Area Development Council/Area Development Team which will serve as the BRBCs area management structure is shown on Map 2. The area covers 38,000 hectares located in the northern portion of the Bicol River Basin. The area is bounded on the east by the San Miguel Bay; on the south by the Bicol Estuary; on the west by the Ragay Gulf and the north by the Sierra Madre mountains. The pilot project for which A.I.D. financing is being sought (see Map 2), covers 3,873 hectares, representing approximately 32% of the total area planted to rice in the Libmanan/Cabusao area.

## 3. Project Components

The project involves the concurrent and tightly coordinated implementation of five major activities or sub-projects within the 3,873 hectare project area (see Logical Framework, Annex B). The implementation of these various activities, under the unified management of an Area Development Team, is expected to raise rice productivity from the current average of 1.5 M.T. per hectare to 4.25 M.T. per hectare over a six-year period. Project implementation will be under the overall supervision of the BRBC Program Office (BRBC-PO) and the Libmanan/Cabusao Area Development Council and Team which would be staffed on an interagency basis according to project needs. Each component of the project is briefly outlined in the following sections.

Volume II of this Project Paper contains the GOP feasibility report of the project.

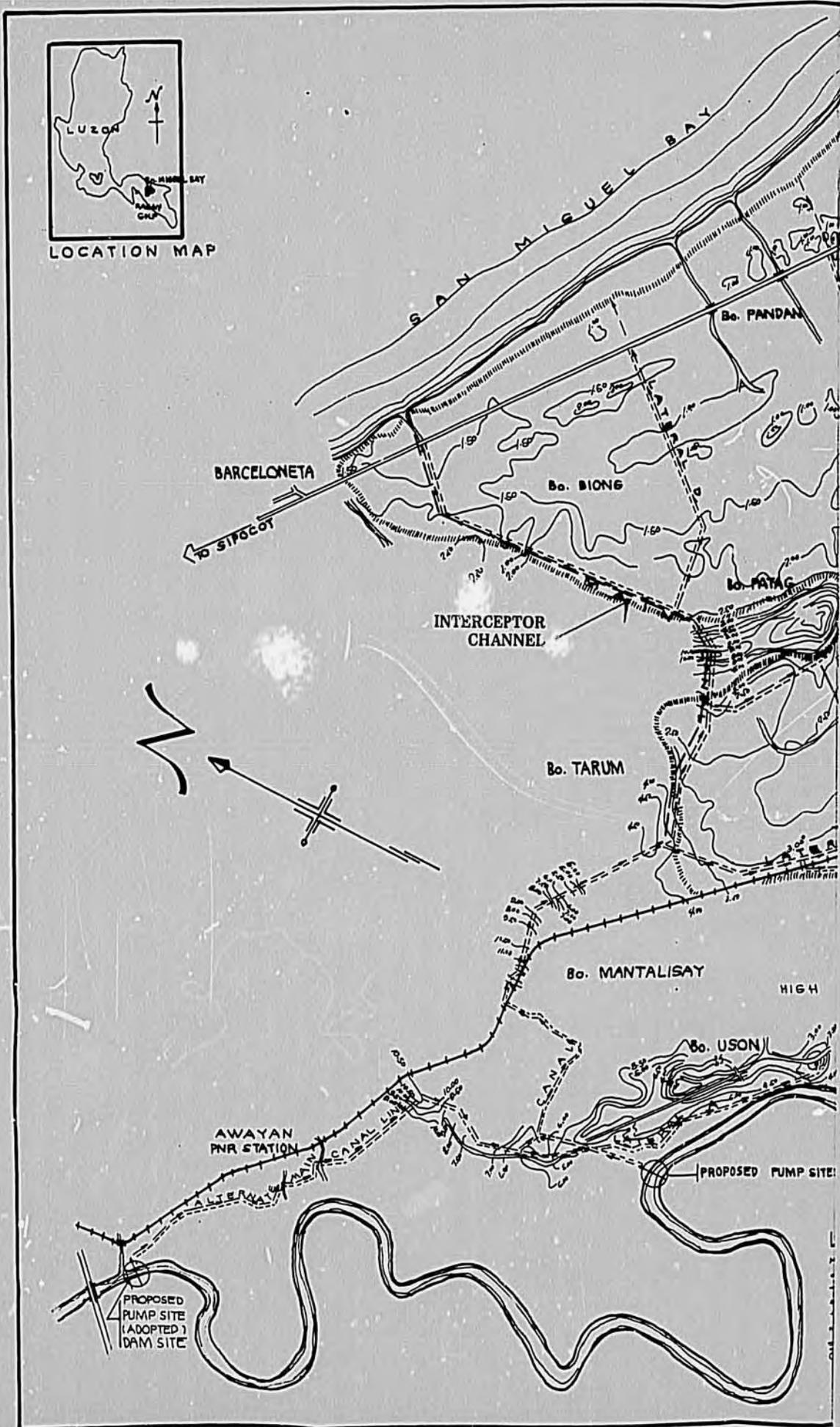
### a. Irrigation, Drainage and Service Roads

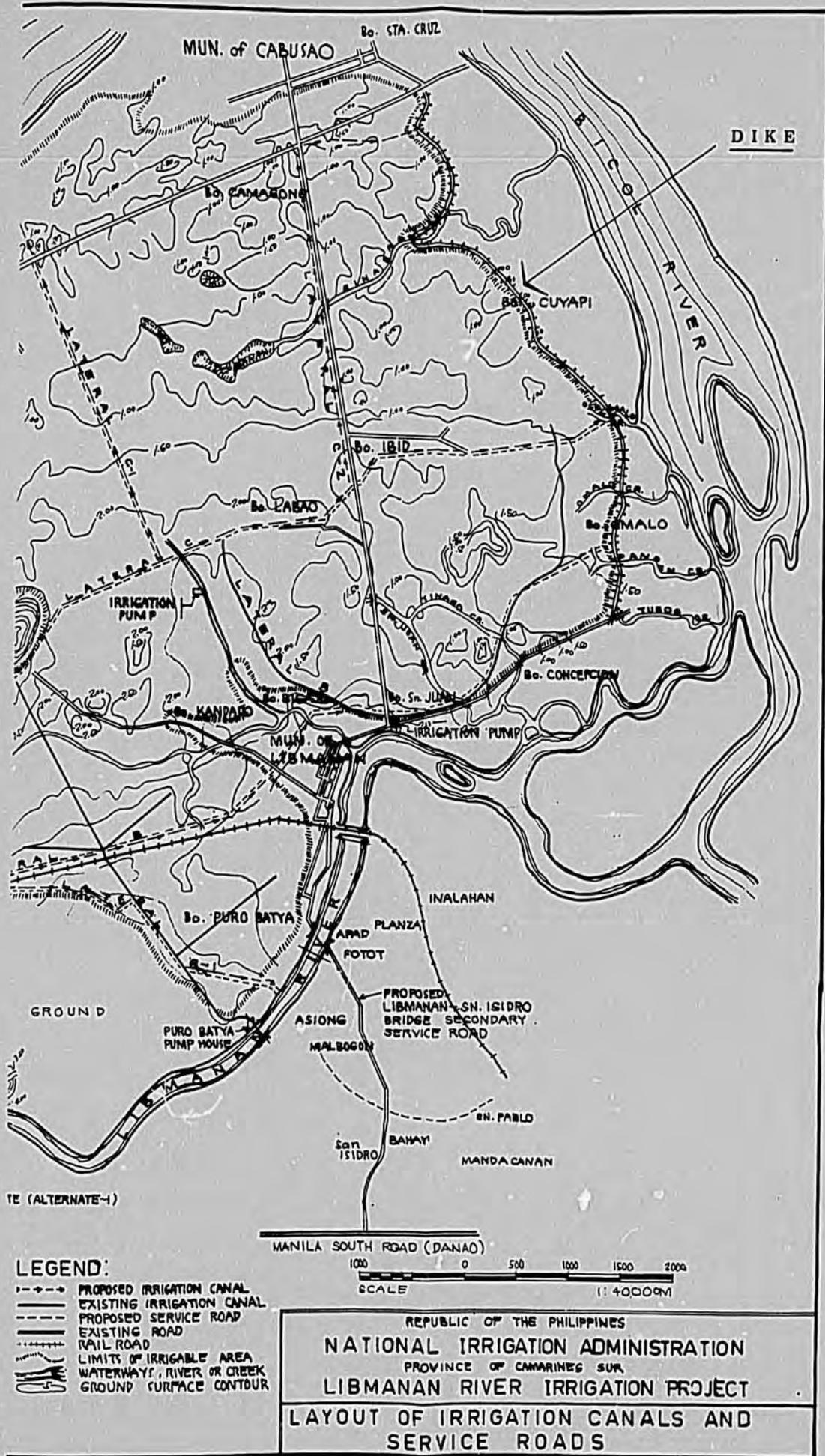
#### (1) Introduction

The 3,873 hectares covered by the Libmanan/Cabusao Integrated Area Development Project suffers from two water related problems. First, due to its low ground surface elevation and high rainfall intensity, the project area is susceptible to periodic flooding. Secondly, due to the geographic proximity of the project area to San Miguel Bay and the Bicol River

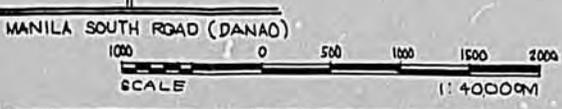


LOCATION MAP





- LEGEND:**
- - - - - PROPOSED IRRIGATION CANAL
  - EXISTING IRRIGATION CANAL
  - - - - - PROPOSED SERVICE ROAD
  - EXISTING ROAD
  - RAIL ROAD
  - ..... LIMITS OF IRRIGABLE AREA
  - ~~~~~ WATERWAYS, RIVER OR CREEK
  - GROUND SURFACE CONTOUR



REPUBLIC OF THE PHILIPPINES  
 NATIONAL IRRIGATION ADMINISTRATION  
 PROVINCE OF CAMARINES SUR  
 LIBMANAN RIVER IRRIGATION PROJECT  
 LAYOUT OF IRRIGATION CANALS AND  
 SERVICE ROADS

Estuary, the area is affected by astronomical tides (and consequently saline intrusion), which fluctuates between 1.2 and 1.5 meters above mean sea level. To effectively counteract these natural conditions which retard the areas' development, an 8.4 kilometer Flood-Interceptor Channel and a 6.7 kilometer Tide Protection Dike are proposed to be constructed along the northern and southern boundaries of the project area, respectively. (See Map 3). In between these flood control and saline intrusion prevention measures, an intensive irrigation and drainage system would be constructed, consisting of main canals, laterals and farm ditches. Given the low ground surface elevation of the service area with respect to mean sea level and high water table conditions, the irrigation and drainage components would be developed basically for rice mono-culture. Technical considerations dictate that the project will require more than normal irrigation and drainage facilities. Nonetheless, the project as a whole is economically justified (see page 53).

## (2) Proposed Scheme of Development

In arriving at the technically and economically most viable irrigation and drainage scheme for the project area, three alternative development schemes were evaluated. The adopted scheme would utilize electrically driven pumps to divert water from the Libmanan River to the service area. The adopted scheme is described below.

### (a) Diversion Works

A pumping station for water diversion would be installed on the left bank of the Libmanan River about 400 meters downstream of the highway bridge serving Sipocot municipality. The pumping station would have four (4) sets of 36" propeller-type pumps each capable of delivering 1,450 L/S (23,000 GPM) at 6.5 meter TDH utilizing four 200 HP, 3-phase, 60-cycle electric motors. A reinforced concrete pump sump and motor foundation, together with a pump house, would be constructed for the station. Electric current for the motors would be provided by National Electrification Administration distribution lines from NPC transmission lines that are planned to be installed and operational by mid-1977.

(b) Canal Networks

The proposed canal system of the project would consist of a main canal 15.2 kilometers long having an initial capacity of 5.8 cms and terminal capacity of 0.58 cms along with laterals and sub-laterals with an aggregate length of 34.6 kilometers. The canal system relative to the irrigable area would have a density of approximately 10.25 meters/hectare, and would have capacities ranging from 3.98 cms to 0.14 cms.

(c) Canal Structures

Canal structures to be constructed would consist of headgates, road crossings, siphons, and other related structures. The density of these structures would be about 2-1/2 structures per kilometer of canal.

(d) Turnouts and Farm Ditches

There would be about 90 turnouts using 12" or 18" R.C. pipes to be constructed for water distribution to the service area, or an average density of one turnout for about every 50 hectares.

Farm ditches would be located as practically as possible on boundaries of cadastral lots. These farm ditches (main and supplementary) were designed for rotational irrigation that would carry a water duty of 2.5 L/S/ha. One main farm ditch would serve an average of 50 hectares of land while supplementary ditches would serve areas varying from 7.85 hectares to 13.5 hectares.

(e) Drainage Facilities

78 kilometers of farm drains and 16 kilometers of lateral drains would be constructed. Also, about 25 kilometers of existing drainage-ways would be improved. The capacities of the drainage channels would range from 112 L/S to 11,220 L/S.

(f) Service Roads

Service roads would be constructed on one bank of the entire length of the main canal and all other canals except lateral C-2 which turns

parallel and close to an existing road. These roads would be 5.00 meters wide on the main canal and 3.50 meters on the laterals and sub-laterals and would have an aggregate length of 45.5 kilometers. Together with the existing roads of 25.8 kilometers which would be improved, the road network in the service area would have a density of about 1 kilometer for every 55 hectares of service area.

(g) Drainage Channel and Flood Tide Protection Dike

An interceptor channel for localized flood control would be constructed along the left bank of the main canal from the pump site down to San Miguel Bay. The canal would intercept the sizeable storm flood run-off from a water-shed area of about 23 sq. kms. in the north. The channel would have a bottom width ranging from 3.00 meters to 3.3 meters and would have an expected capacity of 34.55 cubic meters per second at the outlet.

An earth dike with top elevation at El 2.2 meters and a 2.5 meters wide berm and 6.7 kilometers long would also be constructed along the lower reaches of the Bicol River, from the municipality of Cabusao up to Barrio Concepcion, Libmanan, to serve as a tidal barrier. Flap gates would be installed at the mouths of the main drainageways to prevent salt intrusion during high tides. Supplementary steel slide-gates would also be installed beside the flap gates to facilitate the evacuation of excessive surface run-off generated within the project area during storm periods.

A high flood protection dike about 2.00 meters high, with a 1.50 meters wide berm and 200.0 meters long to about high grounds at El 15.00 meters above the pump site would be constructed. This structure would protect the pump site from floodwaters rising to as high as 13.92 meters.

(3) Construction Schedule

The project is scheduled to be started in FY 1976 and is expected to be completed in three years. Pre-construction activities would be undertaken during the first six months and would continue with construction activities up to the end of the second year of project implementation. Actual construction

would start on the seventh month of the implementation schedule, coinciding with the period of relatively low rainfall beginning January 1976.

(4) Investment Cost

The total investment cost includes the direct and indirect construction cost, and construction equipment and spare parts costs. This amounts to approximately ₱46 million, of which A.I.D. has been requested to provide \$3.3 million which would cover all foreign exchange costs plus a portion of the peso costs of the project.

(5) Annual Operation, Maintenance, Repair and Replacement Cost

The completed project would be operated and maintained by the National Irrigation Administration for the initial one year (i.e., the third and fourth years of the project). An operation and maintenance staff would be organized to be headed by an Irrigation Superintendent and assisted by a group of technical men, skilled personnel, administrative and clerical personnel. By the fourth year of the project an Irrigators Association would have been organized and a staff trained under the Federation of Samahang Nasyon in the project area which would take over operation and maintenance responsibilities fully by the fifth year of the project. The National Irrigation Administration would set water fees at a level sufficient to enable the Irrigators Association (see page 35 ) to cover operation and maintenance cost and to recover (without interest) the total investment over not more than the 50-year life of the system taking into account the farmer's capacity to pay. Section B.3.b.(3) discusses in more detail the plans for organizing the Irrigators Association in the project area.

b. Institutional and Agriculture Development Components

(1) Introduction

With increased per hectare yield as the main target of the project, the BRBC proposes to complement the physical infrastructure inputs with four component programs, namely: compact farm and extension services development; organization of an Irrigators Association; acceleration of the government's land tenure improvement program; and an applied agricultural research and demonstration project. With the exception of the costs associated with formation and development of the Irrigators Association, all project costs have been assigned to the Libmanan/Cabusao Integrated Area Development Project. The development cost of the Irrigators Association has been incorporated under the existing budget of the Basin's On-Farm Water Management Project. Each program is briefly discussed below.

(2) Compact Farm and Extension Services Development

(a) General Description and Objectives

The overall BRBC effort in the field of farmer organization development is directed toward the institutionalization of the compact farm concept throughout the Bicol River Basin area. Within the Basin, 2,500 compact farming units are programmed to be organized by 1979.

As envisioned, compact farms are basic production units composed of 8-10 farmers tilling contiguous farm holdings, which would function as:

- channels for the introduction and dissemination of recommended farming technology;
- units to systematize and consolidate farm operations through cooperative and reciprocal group action;
- an institutional mechanism to facilitate improvement of on-farm water management practices;
- basic production units to purchase and operate small scale farm machinery; and
- liability and guarantee groups for the acquisition of production and marketing credit.

As production units, compact farms are being formed under the umbrella of the government's cooperative development program; i.e., under the Barrio Associations (Samahang Nayon) which are in turn being federated and organized into Area Marketing Cooperatives.

To improve the skills of the government technicians as well as the compact farm leaders in organizing and assisting compact farm units, the BRBC, in coordination with the Department of Local Government and Community Development (DLGCD), the Department of Agrarian Reform (DAR) and the Department of Agriculture (DA), is conducting a compact farm development training program. Approximately 140 interagency technicians and 300 compact farm leaders have been trained over the past several months.

Within the context of the Libmanan/Cabusao Integrated Area Development Project, the objective of the compact farm program would be to give a geographic focus to this organizational effort and to further test and develop the compact farm concept as advanced by the BRBC.

Parallel with the development and expansion of the compact farms, the BRBC, through the Area Development Team, proposes to improve the efficiency of the extension services in the project area by unifying and then integrating extension efforts into the overall compact farm development effort in the project area.

(b) The Program

To insure that the compact farms develop and assume the major functions as outlined above, an intensive compact farm and extension services improvement project would be carried out as a central element of the Libmanan/Cabusao Integrated Area Development Project. The various components of the Program are outlined below.

(i) Training

Thirty-three (33) interagency technicians would be assigned to the project area under the management of the Area Development Team. The technicians would be trained under the Basin's Compact Farm Training Program in crop technology, management and extension skills, and techniques of compact farm organization and management.

2,333 potential compact farm members and leaders would be trained with the objective of:

- developing the technical knowledge, managerial and operational skills of the duly elected compact farm leaders in the project area;
- providing compact farm members the basic orientation of the managerial and technical aspects which underlie the compact farm program;
- developing the skills of compact farm ditch tenders in the operation and maintenance of

the project's rotational irrigation scheme and the role of the compact farm as the basic field unit of the Irrigators Association; and

providing compact farm machinery operators the technical knowledge and skills necessary to operate and maintain small scale farm machinery (e.g., power tillers and axle flow threshers) which would be demonstrated and then marketed in the area under the auspices of the project (see Agricultural Research and Demonstration Project).

All these training activities would be carried out by the BRBC Interagency Task Force on Compact Farm Development over a three-year period and would closely parallel the expansion of compact farms in the project area as discussed in the organization section below. The training targets and costs are presented in the output and input sections, respectively, of the Logical Framework (see Annex 2).

(ii) Compact Farm Organization and Development

Within the 3,783 hectare-project area, 37 existing irrigated compact farms would be restructured and used as demonstration units during the first two years while construction of the irrigation and drainage system is underway. Concurrently, new compact farms would be organized. By the end of the third year, 220 additional compact farms would be organized involving approximately 2,330 farms.

By the end of the third year, however, all compact farming units would be federated into the barrio level farmers' associations (Samahang Nayan) which are existing in the area. All targets and costs of the compact farm expansion program are summarized in the output and inputs sections, respectively, of the Logical Framework (see Annex B).

(iii) Extension Support Services

To bridge the gap between knowledge and practice of the farmers in the area, a total of 33 farm management technicians, drawn from the Bureau of Agricultural Extension (BAE) and the Bureau of Plant Industry (BPI) of the Department of Agriculture (DA); the Department of Agrarian Reform (DAR); and the Department of Local Government and Community Development (DLGCD) would be assigned full time to the project area. The technicians would work under the overall supervision of the Area Development Team Coordinator. They would be supported by "progressive farmers" who would be fielded as farmer-technicians in the area. This strategy would result in a technician-farmer ratio of 1:80, or approximately one technician for every eight compact farms by the end of the third year. The targets of the extension effort are presented in the output section of the Logical Framework. (see Annex 2). The extension program cost are subsumed under the Compact Farm Program section of the Logical Framework (see Annex 2).

(3) Irrigators Association

(a) General Description and Objectives

One of the first programs to be initiated by the BRBC after formal organization was a pilot on-farm water management project. The purpose of the project is to introduce modern on-farm water management practices to irrigated farms in the Basin. Early on it became apparent that before water management technology could be effectively applied to irrigated agriculture in the Basin, a farmer based water management project to include the organization of Irrigators Associations on a pilot basis in three selected sites covering an aggregate of 7,000 hectares. A contract was executed between the BRBC and the Development Academy of the Philippines (DAP), wherein the DAP will handle the actual organization of the Irrigators Association, including the installation of the required management systems and the training of farmers and technicians to manage the association and operate and maintain the irrigation facilities. USAID has agreed to provide a water management technician to assist the GOP team; the USAID technician will arrive in July, 1975. Given the existence of the

BRBC on-farm water management project, the GOP plans to expand the project coverage to the Libmanan/Cabusao Project Area where an Irrigators Association would be organized as a integral part of the project to handle the operation and maintenance of the irrigation facilities to be financed under the project. The irrigation facilities would be operated by the National Irrigation Administration only during the initial year when the system is being tested. Thereafter, the Irrigators Association would gradually take over all operation and maintenance responsibilities as well as collection of water charges.

(b) The Program

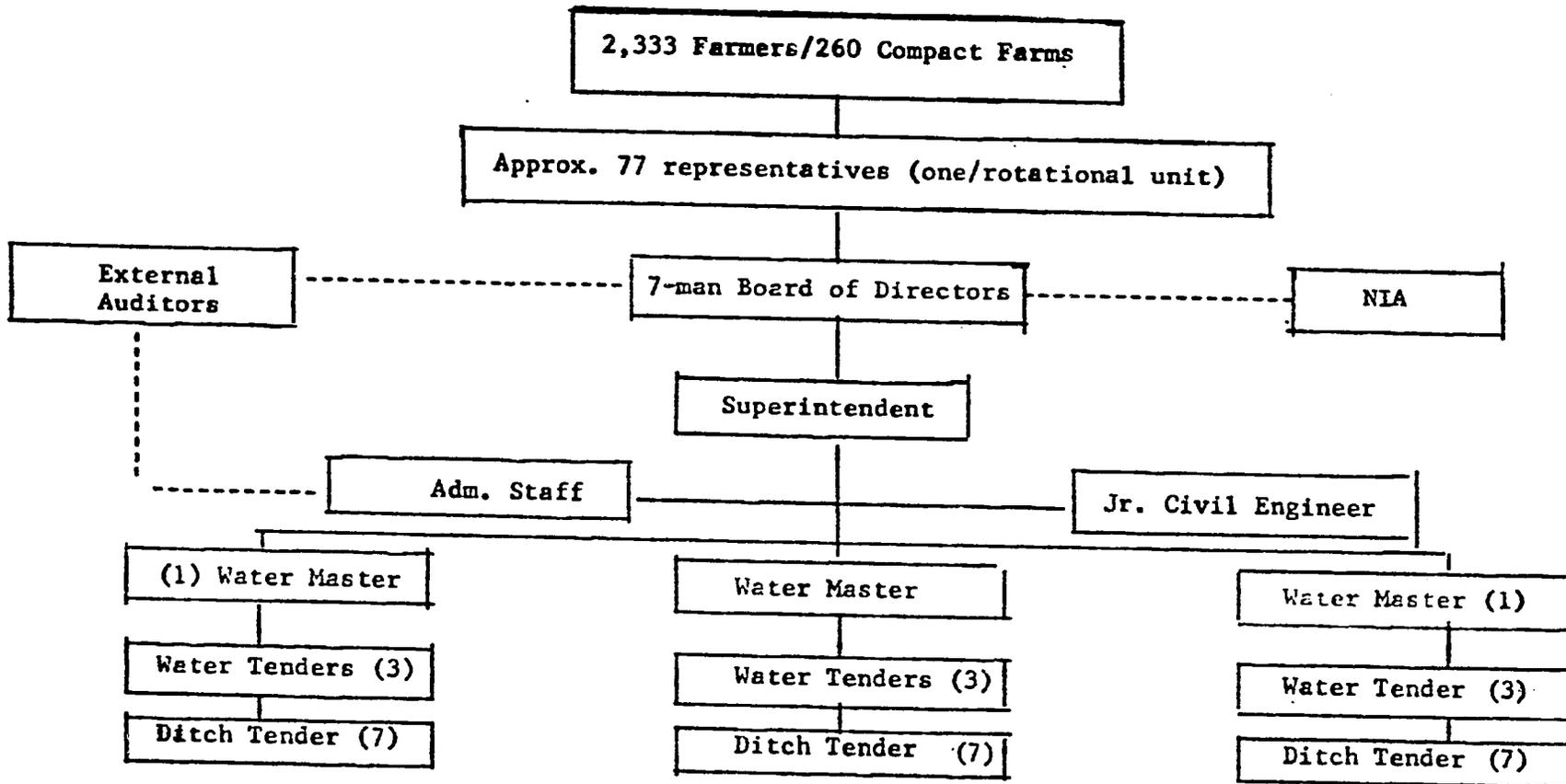
(i) Organization

An Irrigators Association (IA) would be organized in the project area by the BRBC's water management staff during the initial year of the project. IA members and staff at all levels would be trained and prepared to take over the system from the 2nd to the 4th year of the project.

The Association (see Chart 1) would be composed wholly of farmer-tillers whose farms are located within the system. The association would be organized from the bottom-up. That is, compact farms would form the lowest level water management unit. Compact farm units would in turn be combined to form rotational irrigation units of which 77 are planned in the project area. Through the compact farms in each rotational unit, a 7-man Board of Director would be elected, each representing a specific "zone" of the irrigation system.

The Association's Charter, duly registered with the Securities and Exchange Commission, would empower the Board to contract, either individually or through a professional A&E firm, an Irrigation Superintendent, engineers and other professional personnel required to manage the Association and maintain the major project facilities, especially the pumps. Ditch-tenders and possibly water masters would be drawn from the compact farm units. Provision for the training of these lower level water management personnel would be handled under the auspices of the compact farm training program.

CHART 1  
 PROPOSED IRRIGATORS' ASSOCIATION  
 ORGANIZATION CHART



At present there is a Presidential Decree which directs the National Irrigation Administration to transfer operations and maintenance of irrigation systems to farmer organizations. Administratively, however, the NIA has limited this transfer process to systems covering 1,000 hectares or less. Given the integral and important role of the Irrigators Association in the overall Libmanan/Cabusao Integrated Area Development Project, the BRBC will seek and expects to receive without difficulty an exception to this policy.

(ii) Water Fees, Financing System Operation and Maintenance and Amortizing Project Investment

By Presidential Decree water fees charged for pump irrigation systems by NIA are fixed at 3 cavans for the wet season, 5 for the dry and 5 for the 3rd crop. Based on these rates and on 30% repayment rate during the initial years of the project, the Association would collect over ₱1.6 million pesos annually which would be used to cover O&M, system amortization, and Association overhead.

(iii) Operation and Maintenance

The feasibility Task Force has determined that pump operation and maintenance would cost approximately ₱462,000 (\$66,000.00) annually and maintenance of irrigation facilities approximately ₱308,000 (\$44,000.00) annually or a total O&M cost of approximately ₱770,000.00 annually. The overhead costs of the IA are expected to run to approximately ₱77,000 annually. This leaves approximately ₱49,000 to be applied against system amortization and the establishment of a sinking fund to provide spare parts and replace equipment at periodic intervals. Based on preliminary financial analysis, the Task Force has been able to determine that the IA can amortize the investment cost (without interest) over a 40-year period as well as meet all expenses required to run the Association and maintain the system.

The cost of establishing the IA and training its staff will be borne by the Basin's water management project; accordingly none of the costs associated with this organization process are reflected in the input section of the Logical Framework (See Annex B).

(4) Land Reform

(a) General Description and Objectives

Within the BRBC's current area of jurisdiction which covers only that portion of the River Basin located in the Province of Camarines Sur, the GOP is committed to converting approximately 19,500 rice and corn sharetenants to amortizing owners as provided under Presidential Decree No. 27. These 19,500 sharetenants are working lands currently in the hands of landowners owning more than 7 hectares. The GOP has authorized direct land transfer only on land holdings above 7 hectares. For those tenants working land owned by small landowners (i. e., landowners holding an aggregate of 7 hectares or less), tenants will be converted from the standard 50-50 sharing arrangement to a fixed leasehold arrangement. Under this arrangement, the farmer tiller pays the landowner a fixed share, commonly 25%, of the annual crop production based on the average annual production over the preceding three normal crop years. Under this arrangement where the share amount is fixed, all future incremental production resulting from application of improved technology and farm management practices, accrues directly to the farmer. Thus, the incentive to produce, which is absent in traditional sharing arrangements, is incorporated by law under Philippine leasehold arrangements. Within the Basin's current area of jurisdiction, approximately 15,500 sharetenants are to be converted to leasehold status by 1977. In sum, 35,000 rice and corn farms will improve their tenurial status within the Bicol River Basin area.

(b) The Program

Within the context of the Libmanan/Cabusao Integrated Area Development Project, the land transfer and/or leasehold process will be accelerated. Within the project area 958 tenants are eligible under the current law to become amortizing owners of the land they till. Out of this total, 693 have already

received Land Transfer Certificates (LTC). An additional 265 tenants are targeted under the project to receive their Land Transfer Certificates by July 1976. There are as well 558 tenants eligible to become recipients of written fixed leasehold contracts in the project area. Of this total, 354 have already negotiated leasehold arrangements and by July 1976 the final 204 would receive fixed leasehold contracts. By the second year of the project (1977), all 958 Land Transfer Certificate recipients would be completely processed prior to issuance of final land titles and all 558 leasehold farmers would hold written leasehold contracts.

The importance of early completion of the land transfer process in the project area is readily apparent. Land values must be assessed, and transfer completed prior to the infusion of public capital as planned under the project. If this process is not completed early in the project development cycle, it is entirely possible that the benefits to accrue from the project would flow in part to the former landowners, by way of higher negotiated sales price of the land to the tenant occupants which reflects the value of the land after the public investment in irrigation and drainage facilities.

The Libmanan/Cabusao Task Force has built into the project budget the funds necessary to complete the LTC and written leasehold process (See Logical Framework, Annex B). During loan negotiations, USAID will secure assurances that the land transfer process will be given priority in the Libmanan/Cabusao areas and will be completed according to the project development schedule prepared by the BRBC-Libmanan/Cabusao Task Force.

(5) Applied Research and Demonstration Project

(a) General Description and Objective

The BRBC has initiated a Basin-wide applied crop research and demonstration program in conjunction with the Bureau of Plant Industry. The objective of this program is to increase agricultural production by developing improved systems of crop management for several major crops as well as area specific recommendations as to proper inputs and cultivation practices for these crops. The applied research component of the Libmanan/Cabusao Integrated Area Development Project would intensify this effort for rice, which is the single most important agricultural crop in the River Basin.

(b) The Program

Currently, rice yields are low in the Libmanan/Cabusao area. While low yields are indicative of lack of water in the dry season and flooding during the wet season, there are other factors involved as well, such as the identified low level of fertilizer usage; inadequate use of insecticides; poor weed and rodent control; improper scheduling of planting, etc. The Applied Research Project would field test and demonstrate to farmers, using actual farms as models, the appropriate technology and practices for the Libmanan/Cabusao area. Likewise, the project would seek solutions to problems (crop scheduling, etc.) that would inevitably arise when the irrigation system is operational. As part of this applied research and demonstration effort, USAID would provide a grant of \$200,000 to the BRBC to finance a contract with the International Rice Research Institute (IRRI) or another appropriate institution to develop and test in the project area, with the BRBC, a total package of extendable technology for rice covering on-farm water management, mechanization as well as the "traditional" package of inputs, (i.e., HYV seeds, fertilizer, pesticides, etc.) appropriate adapted to the Bicol area. The proposed dollar and peso support for this component project is reflected in the input section (See Logical Framework, Annex B).

#### 4. Organization and Management

To implement the project, the BRBC proposes to establish in the project area, two permanent organizations designed on the one hand to insure efficient and fully integrated implementation of the project and on the other to assure maximum local participation in the planning and management process. The establishment and successful development and operation of the decentralized management structure proposed by the BRBC is at least as important as construction of the actual project facilities. This organization and management structure is shown in Chart II

As mentioned, the BRBC -Program Office would be designated by the Council and the NEDA as the executing agency. To actually carry out the project the BRBC would in turn create an Area Development Council (ADC) and an Area Development Team (ADT) with jurisdiction throughout the two municipalities. The creation of the Libmanan/Cabusao ADT/ADC was approved by the Council and the first years operational budget provided in December 1974.

The principal functions of the ADC/ADT organization have been defined by the BRBC. The ADC/ADT are to serve as:

- an intensive project management body at the field level.
- an organization for maximizing community participation in BRBC and other projects of government in the area.
- a body to stimulate interest in and/or foster development of local institutions (e.g., Irrigators Associations) to continue the task of project management and operation of project facilities once government transfers project management responsibilities to local organizations.

##### a. Area Development Council (ADC)

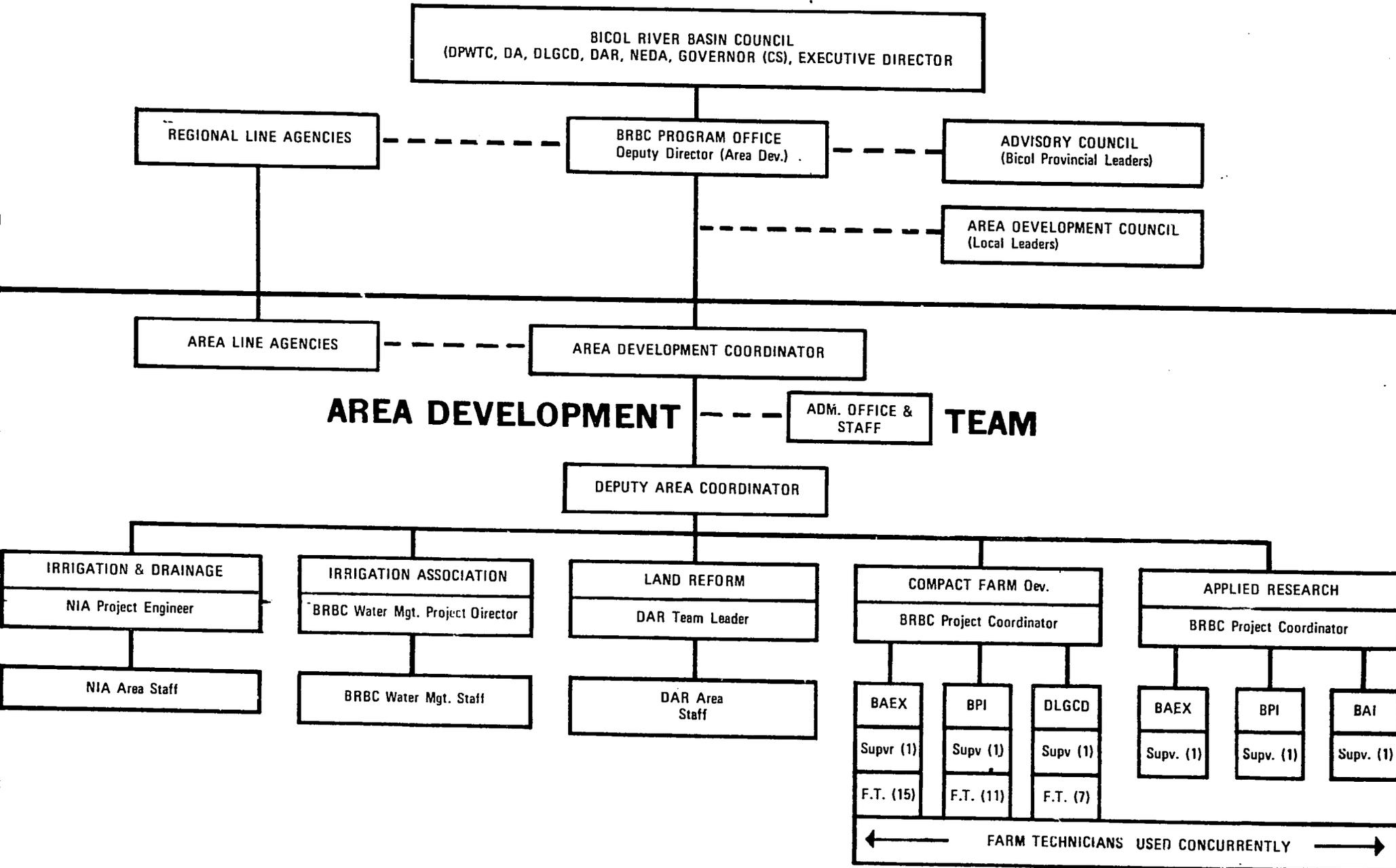
The Area Development Council would be composed of local leaders, including at a minimum the mayors of municipalities within the jurisdiction of the ADC, a representative of the Provincial Government and a BRBC representative.

Through this mechanism local leaders as well as the private sector would be mobilized to promote the project, help resolve

# Chart II

## PROPOSED ORGANIZATION

### Libmanan/Cabusao Area Development Team and Area Development Council



problems that may arise and otherwise facilitate mobilization of community resources in support of the various activities of the project. The chairman of the ADC would be elected annually from the Council membership. The Area Development Coordinator, chief of the Area Development Team (ADT), would be Vice-Chairman of the ADC and would provide its permanent secretariat. The appointment of the Area Development Coordinator, although hired by the BRBC Program Office, would be approved by the ADC.

b. Area Development Team

Project management and execution would be the responsibility of the Area Development Team (see Chart I) under the leadership of an Area Development Coordinator and a Deputy Coordinator. The Area Development Coordinator would:

- (1) assume general management responsibilities of the ADT;
- (2) be responsible for drawing out public participation by establishing a sustained working relationship with local leaders and organizations through the Area Development Council, and
- (3) maintain a close working relationship with BRBC Program Office and Provincial officials by regularly interacting with appropriate management and planning staff at these levels.

The Deputy Coordinator would concentrate on project implementation by coordinating and supervising the activities of the five component projects of the Libmanan/Cabusao Integrated Area Development Project, each of which would be managed in the field by the appropriate line agency or a BRBC sub-project coordinator.

The irrigation and drainage component of the project would be under the immediate supervision of the National Irrigation Administration Project Engineer. Actual project construction however would be executed under contract.

The Irrigators Association would be organized in the project area by the BRBC's water management project staff. Any technician detailed to the project area for this purpose would work in the field as members of the Area Development Team.

Responsibility for accomplishing the Land Reform objective in the area would be the direct responsibility of the Department of Agrarian Reform Team Leader assigned to the Libmanan/Cabusao area. In the project area the DAR Team would be directly responsible to the Deputy Coordinator.

Given the interagency make-up of the technical staff of both the Compact Farm and Extension Development Project and the Applied Research and Demonstration Project, a BRBC Project Coordinator would be assigned to head-up each of these activities under the direct supervision of the Deputy Coordinator. Each of the participation line agencies would have their own respective supervisor, responsible for their own field men, but would report directly to the BRBC Project Coordinator for effective integration of activities.

The annual project budget for the Libmanan/Cabusao Integrated Area Development Project would be prepared by the ADT and submitted to the BRBC-PO for approval. All approved project funds would be released through the Area Development Team. The ADT would also be responsible for preparing the monthly status report of the project for inclusion in the BRBC's management information system (MIS) and for distribution to the Area Development Council, the Provincial Government, and provincial and regional offices of participating line agencies.

The proposed budget of the Area Development Council Area Development Team can be found in the input section of the Logical Framework (See Annex B).

## C. PROJECT BACKGROUND

### 1. History and Development of Proposal

In the mid-sixties planning for a Libmanan River Project was initiated by the National Irrigation Administration. Topographic mapping of the project area was completed and a start was made on collecting the necessary water resource data. Given other priorities, project study work was suspended in the late sixties and was not initiated again until the Bicol River Basin Council joined forces with the National Irrigation Administration and the Mayors of the two Municipalities in late 1974. At that time, Basin planners were in the process of developing criteria for dividing the River Basin into logical sub-regions for planning purposes. On all the indices developed, the Libmanan/Cabusao area stood out as a major sub-region of the Basin, albeit a sub-region with pronounced socio-economic problems. The Libmanan/Cabusao area was on paper, at least, an ideal area to test out the Basin's concept of integrated area development at the sub-basin level. Several meetings were held with BRBC, NIA officials and with the Mayors of Libmanan/Cabusao in late 1974. On behalf of their respective municipalities, the mayors pledged their full support and cooperation to any study effort that would be organized by the BRBC. Accordingly, the BRBC organized an interagency task force to carry out the feasibility appraisal in December 1974. Over the six month period from December 1974 to May 1975, personnel from ten different agencies, including municipal government officials, contributed to the development of the project study under the overall coordinative leadership of the Bicol River Basin Council Program Office.

## 2. Prior AID Assistance in Related Areas

During the early 60's USAID provided the services of a BuRec team under a PASA for completing surveys, studies, and reports on seven major river basins, namely: the Central Luzon (Agno and Pampanga), Cagayan, Bicol, Cotabato, Agusan and Ilog-Hilabangan River Basins. In addition, hydrologic data gathering instrumentation and materials were supplied by USAID to NIA and to the Bureau of Public Works (BPW). Prior to that, the USAID assisted the GOP with a massive irrigation rehabilitation program during the 1950's.

Recent direct assistance by AID for irrigation in the Philippines has been the financing of feasibility studies and consultancies for the Angat-Magat Irrigation Project, the Comprehensive Water Resources study for the Bicol River Basin Project, and Laguna de Bay project. In 1972, following the typhoon flood disaster, AID provided a \$50 million special grant for rehabilitation of a scheduled list of extensively damaged irrigation and flood control facilities.

In FY 1975, AID expects to provide \$6.5 million loan to support the program of a recently created government corporation, the Farm System Development Corporation (FSDC). The FSDC has as its purpose the development and efficient utilization of water resources through small scale irrigation systems to be built, owned, operated and managed by farmer organizations called Irrigators' Service Association (ISA).

In addition to the above support to irrigation development in the Philippines, AID has provided and is currently providing technical assistance to the GOP in support of the nation's land reform program, food production, rural electrification, rural roads and related agricultural research and education programs. All of these programs have, however, in the past been supported on a sectoral basis. The dollar and grant funds proposed as the A.I.D. input into the Libmanan/Cabusao Integrated Area Development Project represent the initial experience, outside of USAID's continuing support to the Bicol River Basin Program, where A.I.D. has become an active participant in an integrated multi-sectoral agricultural development project. The project presents an excellent opportunity for A.I.D. to support an effort designed to test an alternative, and hopefully, improved system for applying capital, technology and management in support of small farmer development programs in the Philippines.

### 3. Other Donor Assistance

Assistance in irrigation from other donors aggregates over \$115 million. The preponderance or 71% of this comes from IBRD, 21% come from ADB, 6% from the Japanese Government, and 2% from UNDP. None of this assistance is being used directly for small scale irrigation. However, the Spanish Government and the Danish Government have made contributions through small loans for diesel engines as well as the Japanese Government through the 17th Reparations Agreement also for diesel engines and small pumps to be used in small scale irrigation development.

With regard to the Bicol River Basin Program generally and the Libmanan/Cabusao project specifically, USAID as well as the BRBC coordinate closely with other donors regarding their participation in the Bicol River Basin Program. In the particular instance of the Libmanan/Cabusao Integrated Area Development Project, a close working relationship has existed between the Basin, USAID and the UNDP. The UNDP is directly supporting the Bureau of Soils, which conducted the land classification study for the project area. The Bureau of Soils and United Nations technicians worked closely with the National Irrigation Administration and USAID's Irrigation Advisor in developing the appropriate land classification methodology for determining the irrigability suitability of project lands.

At present, there are no water resource oriented projects in the Basin financed by external donors. However, the Basin and USAID are keeping the IBRD and the Asian Development Bank appraised of the water resource planning work now underway in the Basin. The IBRD has expressed to the GOP their interest in supporting the major water resource projects of the Basin, the feasibility studies for which are being financed by USAID. Given the anticipated large capital requirements necessary to implement the Bicol River Basin's flood control and irrigation development program, it is imperative that the GOP keep other donors appraised of the planning now underway. The Government has clearly recognized this need and has taken several ADB and IBRD missions on field trips to the project area.

4. Host Country Activity in the Bicol River Basin

The Libmanan/Cabusao Integrated Area Development Project is a direct extension of previous planning work of the Bicol River Basin Council's Program Office. The Council and its Program Office was created by Executive Order 412 in May of 1973, after an interagency committee, consisting of national, provincial and private agencies, drew up and successfully sold to policy makers an integrated area development program for the Bicol River Basin, a 312,000-hectare center of agricultural activity in the Bicol Region.

The Council Program Office was officially opened in July, 1973. In the 22 months since the Program's initiation a complex of feasibility appraisals, data generation programs and pilot projects have been initiated and in some cases completed. The major programs of the Basin are summarized in Table 8.

In addition to the on-going projects presented in Table 8, the Basin has initiated a number of supporting projects designed to strengthen the BRBC Program Office as a sub-regional planning and development coordinating agency. In this regard, the Basin has established in conjunction with a local university a Social Survey Research Unit, which is responsible for designing and conducting agriculture and socio-economic sample surveys for the Basin in support of project feasibility analysis or project evaluation. The SSRU has completed its first year's work and published 14 reports on various subject matter requested by the BRBC. Currently, the SSRU is deeply involved in conducting Basinwide agro-economic surveys in support of the Basin's land classification study program. The SSRU maintains a 35-man professional staff of which approximately one-half are earning, though a mix of on-the-job and classroom training, master's degrees in sociology and anthropology.

To improve its personnel and management information systems, the BRBC has recently contracted a local consulting firm to design and install an improved personnel management system and a management information system to enable the Basin to properly monitor the progress of its various projects.

Finally, USAID and GOP are currently conducting the first in a series of biennial evaluations of the Program. The results of this comprehensive program evaluation will be available by the end of June.

5. Views of the Country Team

The country team recommends approval of the loan.

TABLE 8 : BICOL RIVER BASIN PROGRAM  
(Project Status)

Title	Nature of Project	Area of Coverage	Source of Funding	Executing Agency(ies)	Status and Completion Date
<u>Water Resources and Land Development</u>					
a. Flood Control Simulation Study	hydraulic simulation model of River Basin	Basinwide	AID	AIT/BRBC	Completed January, 1975
b. Saline Intrusion Study	to determine saline intrusion impact of various proposed flood control measures	Basinwide	AID	AIT/BRBC	Underway Estimated completion date: July 1975
c. Surface Water Supply Study	to determine quality and quantity of surface water for irrigation in Basin	Basinwide	AID	AIT/BRBC	Contract under negotiation Estimated completion date: August 1975
d. Hydrometeoro Data Collection Program	water resources data generation	Basinwide	GOP	BRBC	Continuous
e. Geological Investigation	dam site geological investigation project	selected sites	AID GOP	BM, USBR, BRBC	Reconnaissance program complete. Detailed investigation to be completed by December, 1976

Table B: Bicol River Basin Program (Cont'd)  
(Project Status)

Title	Nature of Project	Area of Coverage	Source of Funding	Executing Agency(ies)	Status and Completion Date
f. Topographic Mapping	Contour maps of flood plan and irrigable areas	166,000 hectares	AID GOP	BCGS/BRBC	on-going (behind schedule) Estimated completion date June 1976
g. Land Classification	irrigability suitability classification	121,000 hectares	AID GOP	BS/NIA/BPW BRBC	on-going Estimated completion date June 1976
h. Comprehensive Water Resource Study	Basinwide water resource plan (reconnaissance grade)	Basinwide	AID GOP	BRBC/TAMAS Eng. (New York)	Contract negotiated Estimated completion date July 1976
i. On-farm Water Management Project	irrigation system upgrading to enable adoption of improved water management practices and formation of Irrigators Association to handle O&M	4 systems 7,000 hectares	AID GOP	BRBC/NIA/ DAP	Organization and training design and final engineering designs completed. Estimated completion date June 1978
j. Land Consolidation Pilot Project	consolidation of fragmented small farmer holdings and provision of irrigation, drainage and access roads	2,300 hectares	AID GOP	DAR/NIA/ BRBC	First 300 hectare section under construction Total project to be completed by June 1977

Table 8: Bicol River Basin Program (Cont'd)  
(Project Status)

Title	Nature of Project	Area of Coverage	Source of Funding	Executing Agency(ies)	Status and Completion Date
k. Libmanan/Cabusao Integrated Area Development Project	: Integrated irrigated agricultural project	: 3,870 hectares	: Proposed AID GOP	: BRBC/NIA/DA/DAR	: Project feasibility study completed; proposed for AID financing. Completion of construction June, 1978
l. Pilot Potable Water Project	: Barrio potable water supply system	: 3 Barrios	: AID	: DLGCD/DPH/SEATEC	: Contract signed. Completion June, 1976
<u>Agriculture &amp; Human Resource Development</u>					
a. Pilot Livestock Project	: Barrio based swine and cattle production and marketing project	: 14 Barrios	: GOP	: BRBC/BAI/DAR	: Over 2,000 head in place Continuous
b. Crop Demonstration Project	: various crop field trials	: Basinwide	: GOP	: BRBC/BPI	: Final planning (behind schedule) Continuous
c. Compact Farm Development	: Training of government tech and farm leaders in compact farm, organization and management	: Basinwide	: GOP	: BRBC/BAE/DAR/DLGCD	: 160 Tech. trained 300 farm leaders trained Continuous

Table 1: Bicol River Basin Program (Cont'd)  
(Project Status)

Title	Nature of Project	Area of Coverage	Source of Funding	Executing Agency(ies)	Status and Completion Date
d. Fish Production	Pilot projects in aquaculture	Selected sites	GOP	BRB/BFAR	On-going Estimated completion date December 1975
e. Camarines Sur Agriculture College Feasibility Study	Plan for upgrading agricultural and vocational education in Bicol	Pili, Camarines Sur	AID GOP	BRBC/DEC	Estimated completion date December 1975
f. Agribusiness Feasibility Appraisal	Off-farm agribusiness development	Basinwide	AID GOP	BRBC/NGA/ DLGCD	Behind schedule Estimated completion date June 1976
<u>Transportation</u>					
a. Bicol River Basin Secondary and Feeder Road Feasibility Study	Feasibility study for 450 kms. of secondary and feeder roads	Basinwide	Proposed AID GOP	BRBC/DPH/ PEO/DPWTC	Feasibility Study completed; proposed for FY 1976 AID financing Completion of construction FY 1979
b. Intermodal Transport Study	Second phase transport feasibility	Basinwide	AID GOP	BRBC/DPH/ PEO/CAA/PNR DPWTC	Estimated Completion date June 1976

D. Project Analysis

1. Economic and Financial

a. Assumptions

The BRBC project feasibility study was premised on several basic assumptions. These assumptions have been reviewed by the Mission and are judged to be reasonable. In fact, the net impact of these assumptions has introduced a strong conservative basis into the appraisal, leading, in the Mission's opinion, to an understatement of the economic and financial viability of the project. The major assumptions are discussed below.

(1) Planning Period

Given that engineering plans contain a maintenance program for project facilities, a 50-year life span for the capital infrastructure envisioned with the project is realistic. Therefore, the 25-year planning period used in the study is an adequate time frame for analysis of the project.

(2) Salvage Value

The salvage value of the project at the end of the 25-year planning period was predicated on a project life span of 50 years. A straight line type of valuation is not possible since most investment costs for land reform, compact farms, applied research, and project organization (see Vol. II BRBC Project Feasibility Study, Libmanan/Cabusao Integrated Area Development Project, Table 29, page 132) are unrecoverable. Therefore, the estimated salvage value as determined appears to be both realistic and conservative.

(3) Farm production estimates

The estimates of production of palay were based on the Bureau of Soils analysis of land class production levels within the project area after project completion. The estimated yield levels were reduced by coefficients to allow for the expected periodic flooding during the wet season in the project area. It was assumed that the project area would experience a 10-year flood frequency which would cause heavy damage to crops. The yield reduction coefficients of 7.5%, 10% and 30% respectively for 1R, 2R and 3R lands during the wet season were derived by the Bureau of Soils on the assumption that there would

be equal probability of flooding every year within a 10-year period. The area that would experience the corresponding yield reductions was identified in the land classification study.

The resulting yield/hectare estimates are judged by the Mission to be extremely conservative and well below the targeted yields of 99 cavans per hectare under the current Masagana 99 program of the national government. The BRBC feasibility study assumes a 2.5 cropping intensity or five croppings in two years. This cropping intensity level is considered sound in that the designed facilities should be capable of supplying irrigation water to meet this level of production intensity. A final production assumption was that the necessary conditions in the form of the supporting project components would be sufficiently and properly identified and would be of the appropriate intensity to satisfy production targets. This assumption of necessary conditions (compact farms, technical advice, etc.) to meet estimated production levels are judged sound in that the cost of these necessary services has been properly entered into the investment cost of the project.

(4) Farm Production Costs

The farm production costs estimates were determined by a series of pattern farm plans based upon land class and yield growth/hectare through time. The resulting cost structure is considered to be accurate. To cover unforeseen events, a contingency cost figure was entered into cost constructions for each pattern farm plan. Therefore, the additional net revenue projections from additional production due to project implementation is considered by the Mission to be highly conservative.

(5) Build-up Period

The build-up period required to reach and stabilize target production levels was estimated at 6 years after initial implementation of the project. This assumption appears to be sound in that adequate time is allowed for introduction and demonstration of applied research and expansion of extension services which will be required in addition to the planned physical infrastructure, if targeted yields are to be reached.

(6) Shadow Prices of Palay

The shadow price developed for output is extremely valid in that it reflects the economic costs of making rice available through alternative methods, i.e., importation. The Philippines is currently importing rice and subsidizing some inputs of production. If other factors remain constant, then import volumes may be reduced by the amount of increased production attributable to the project. Therefore, the reduction of imports would reduce government subsidy encountered in importing rice and placing it into retail distribution. The shadow price determination, based as it was on the international market price for rice, enabled realistic determination of the actual peso value of production as well as the savings induced by reduction in importation of rice.

b. Economic Viability of Project

The economic viability of the project was determined through the use of BRBC Agribusiness Computer Program feasibility analysis. The primary objective of feasibility analysis for any project is to measure the economic potential of the project, normally defined as the expected return on capital investment. In order to accomplish the primary objective of measuring the economic potential of a project, feasibility analysis must estimate this potential as accurately as possible. The analysis must closely approximate reality. The accuracy, and therefore the value, of feasibility analysis depends primarily on two factors. These factors are:

- (1) The accuracy of the technical and economic data used in the analysis.
- (2) The precision with which the data are analyzed to evaluate the feasibility of the project.

In this case, Item (1) has been addressed in Section a. It is the judgment of the Mission that the assumptions and data, both on the benefit and cost side of the equation, presented in the feasibility study are sound and accurate as is currently possible to construct. Item (2) is addressed by the use of BRBC Agribusiness Computer Program for measuring the internal rate of return (IRR) of the project. The IRR is a measure of the potential return on capital investment in a project based on the time flow of money into and out of a project.

The results of the IRR analysis of this project are presented in the following pages. A detailed listing is presented below to itemize the categories of the program:

- (1) Period: Annual basis, 25-year planning period.
- (2) Investment, Facilities: Investment cost of all physical and social infrastructure associated with the project.
- (3) Investment, Working Capital: No working capital has been defined for the project.
- (4) Total Revenue: Revenue in the project case is the value of added production of paddy attributable to project implementation. The value of this production is based upon the determined shadow price to reflect both the actual cash value of production plus savings accruing to the national government due to reduction in imported rice requirements.
- (5) Operating Expenses: Operating expenses are drawn from Vol. II (i.e., the GOP Project Feasibility Study); Table 29, page 182.
  - (a) Overhead and maintenance costs to initiate and service all components of project.
  - (b) Overhead costs attributable to project organization.
  - (c) Added farm costs attributable to factors of production necessary to generate increased production.
  - (d) Irrigation fees deducted from operating expenses to prevent double counting as irrigation fees are part of added farm costs that would be applied directly back to overhead and maintenance cost of the project.

The results of IRR analysis are presented as follows. In this analysis, the adopted BRBC plan of action and several alternatives were tested. The results are presented as follows:

- (1) Table 9. Adopted plan as per feasibility study report (base case). The results indicate an economically viable plan.

- (2) Table 10. Alternative to base case where cropping intensity is reduced to 2.0 crops annually from 2.5 annually as expressed in the feasibility study report. The results indicate that if a cropping intensity of 2.0 crops annually is reached instead of the 2.5 cropping intensity as projected, the project would still be economically viable.
- (3) Table 11. Alternative to base case where 10 percent larger yields were estimated to check significance of extremely conservative yields projected in the BRBC feasibility study report.
- (4) Table 12. Alternative to base case to test sensitivity of project within a 40 percent range of error. Accordingly, all costs have been increased 20 percent and revenues decreased 20 percent. The results of this sensitivity test show that IRR on capital is still positive, although low. Any type of project that approaches a 10 percent IRR with the introduction of this error range is considered to be economically viable since this is a "worst case" test.
- (5) Table 13. Alternative to base case. This analysis assumes that the project is constructed without the protection dike and interceptor channel. While the IRR of this case is slightly higher than the base case, the difference is not sufficient to pass judgement. Since the difference is small, judgment among the two alternatives should be based on the project alternative which does the most good for greatest number of people and which would generate the greatest production of rice. Following this logic, the choice is clearly the adopted plan as presented in the BRBC feasibility study report.
- (6) Table 14. Diesel versus electric powered pumps in base case. Results show no significant difference.
- (7) Tables 15 and 16. Electric rates and usage greater than illustrated in the BRBC feasibility study report. The results indicate that even with higher electric rates and power consumption, the economic viability of the project is not affected.

In summary, the data as tested indicate that this project is economically viable. Based upon these results and the beneficiaries involved, the project is highly recommended.

TABLE 9

INVESTMENT FEASIBILITY ANALYSIS

LIBMANAN/CABUSC INTEGRATED AREA DEVELOPMENT PROJECT  
ADOPTED PLAN

BRBC AGRI-BUS

INTERNAL RETURN ON TOTAL CAPITAL 28.375 PERCENT

PERIOD NO.	PERCENT	INVESTMENT ( 1000 ₱ )			OPERATING ( 1000 ₱ )			PRESENT VALUE FACTOR	PRESENT VALUE	
		FACILITIES	WORKING CAPITAL	TOTAL	TOTAL REVENUE	OPERATING EXPENSES **	NET REVENUE		INVESTMENT	NET REVENUE
1		28061.	0.	28061.	321.	832.	-511.	1.0000	28061.	-511.
2		11420.	0.	11420.	2675.	2785.	-110.	0.7790	8896.	-86.
3		5773.	0.	5773.	16834.	13420.	3414.	0.6068	3503.	2072.
4		838.	0.	838.	25453.	10129.	9324.	0.4727	396.	4407.
5		-7921.	0.	-7921.	40290.	26961.	21329.	0.3682	-2917.	7853.
6		35.	0.	35.	33498.	18657.	14841.	0.2868	10.	4257.
7		0.	0.	0.	54259.	29882.	24377.	0.2234	0.	5446.
8		0.	0.	0.	33498.	18485.	15013.	0.1740	0.	2613.
9		0.	0.	0.	54259.	29942.	24317.	0.1356	0.	3297.
10		0.	0.	0.	33498.	20205.	13293.	0.1056	0.	1404.
11		58.	0.	58.	54259.	31622.	22637.	0.0823	5.	1862.
12		0.	0.	0.	33498.	18525.	14973.	0.0641	0.	959.
13		0.	0.	0.	54259.	29750.	24509.	0.0499	0.	1223.
14		0.	0.	0.	33498.	18525.	14973.	0.0389	0.	582.
15		0.	0.	0.	54259.	29750.	24509.	0.0303	0.	742.
16		850.	0.	850.	33498.	18717.	14781.	0.0236	20.	349.
17		0.	0.	0.	54259.	31430.	22829.	0.0184	0.	420.
18		0.	0.	0.	33498.	20397.	13101.	0.0143	0.	188.
19		0.	0.	0.	54259.	29750.	24509.	0.0112	0.	273.
20		0.	0.	0.	33498.	18525.	14973.	0.0087	0.	130.
21		58.	0.	58.	54259.	29750.	24509.	0.0068	0.	166.
22		0.	0.	0.	33498.	18528.	14970.	0.0053	0.	79.
23		0.	0.	0.	54259.	29942.	24317.	0.0041	0.	100.
24		0.	0.	0.	33498.	20205.	13293.	0.0032	0.	43.
25		-16674.	0.	-16674.	54259.	28173.	26086.	0.0025	-42.	65.
TOTAL		22458.	0.	22498.	971143.	550887.	420256.		37933.	37933.

INTEREST  
PER CENT

BENEFIT/COST  
RATIO

PRESENT VALUE IN 1000 ₱  
REVENUE    OUTLAY    BALANCE

6.500  
14.000  
15.000  
16.000  
17.000  
18.000

5.431  
2.523  
2.326  
2.152  
1.997  
1.858

190836.  
95469.  
88250.  
81796.  
76008.  
70798.

35135.  
37835.  
37936.  
38010.  
38061.  
38095.

155701.  
57634.  
50314.  
43787.  
37946.  
32703.

\*\*EXCLUDING DEPRECIATION, INTEREST, AND INCOME TAX

ALTERNATIVE:

TABLE 10

INVESTMENT FEASIBILITY ANALYSIS

LIBMANAN/CABUSC INTEGRATED AREA DEVELOPMENT PROJECT  
 ADOPTED PLAN

BRBC AGRI-BUS

INTERNAL RETURN ON TOTAL CAPITAL 24.023 PERCENT

PERIOD NO.	IDENT.	INVESTMENT (1000 P.)		OPERATING (1000 P.)			PRESENT VALUE FACTOR	PRESENT VALUE		
		FACILITIES	WORKING CAPITAL	TOTAL REVENUE	OPERATING EXPENSES **	NET REVENUE		INVESTMENT	NET REVENUE	
1		28061.	0.	28061.	257.	799.	-543.	1.0000	28061.	-543.
2		11420.	0.	11420.	2140.	2372.	-232.	0.8063	9208.	-187.
3		5773.	0.	5773.	13467.	10880.	2587.	0.6501	3753.	1682.
4		838.	0.	838.	20362.	12989.	7374.	0.5241	439.	3865.
5		-7921.	0.	-7921.	38632.	21538.	17094.	0.4226	-3347.	7224.
6		35.	0.	35.	26798.	15011.	11788.	0.3407	12.	4016.
7		0.	0.	0.	43407.	23991.	19416.	0.2747	0.	5334.
8		0.	0.	0.	26798.	14839.	11960.	0.2215	0.	2649.
9		0.	0.	0.	43407.	24012.	19395.	0.1786	0.	3464.
10		0.	0.	0.	26798.	16223.	10576.	0.1440	0.	1523.
11		58.	0.	58.	43407.	25356.	18051.	0.1161	7.	2096.
12		0.	0.	0.	26798.	14879.	11920.	0.0936	0.	1116.
13		0.	0.	0.	43407.	23859.	19548.	0.0755	0.	1475.
14		0.	0.	0.	26798.	14879.	11920.	0.0608	0.	725.
15		0.	0.	0.	43407.	23859.	19548.	0.0491	0.	959.
16		850.	0.	850.	26798.	15032.	11766.	0.0396	34.	465.
17		0.	0.	0.	43407.	25203.	18204.	0.0319	0.	581.
18		0.	0.	0.	26798.	16376.	10422.	0.0257	0.	268.
19		0.	0.	0.	43407.	23859.	19548.	0.0207	0.	405.
20		0.	0.	0.	26798.	14879.	11920.	0.0167	0.	199.
21		58.	0.	58.	43407.	23859.	19548.	0.0135	1.	263.
22		0.	0.	0.	26798.	14881.	11917.	0.0109	0.	129.
23		0.	0.	0.	43407.	24012.	19395.	0.0088	0.	170.
24		0.	0.	0.	26798.	16223.	10576.	0.0071	0.	75.
25		-16674.	0.	-16674.	43407.	22597.	20810.	0.0057	-95.	119.
TOTAL		22498.	0.	22498.	776914.	442407.	334507.		38071.	38071.

INTEREST PER CENT	BENEFIT/CCST RATIO	PRESENT VALUE IN 1000 P.		
		REVENUE	QUILAY	BALANCE
6.500	4.317	151690.	35135.	116555.
14.000	2.001	75711.	37835.	37876.
15.000	1.844	65961.	37936.	32025.
16.000	1.705	64821.	38010.	26811.
17.000	1.582	60211.	38061.	22149.
18.000	1.472	56062.	38095.	17967.

\*\*EXCLUDING DEPRECIATION, INTEREST, AND INCOME TAX

ALTERNATIVE: ALTERNATIVE 1, 2.0 CROPPING INTENSITY

TABLE 11

INVESTMENT FEASIBILITY ANALYSIS

LIBMANAN/CABUSC INTEGRATED AREA DEVELOPMENT PROJECT  
ACCEPTED PLAN

BRBC AGRI-BUS

INTERNAL RETURN ON TOTAL CAPITAL 30.401 PERCENT

PERIOD NO.	INVESTMENT (1000 P.)			OPERATING (1000 P.)			PRESENT VALUE FACTOR	PRESENT VALUE		
	ICENT.	FACILITIES	WORKING CAPITAL	TOTAL REVENUE	OPERATING EXPENSES **	NET REVENUE		INVESTMENT	NET REVENUE	
1		28061.	0.	28061.	353.	848.	-495.	1.0000	28061.	-495.
2		11420.	0.	11420.	2943.	2991.	-49.	0.7669	8758.	-37.
3		5773.	0.	5773.	18517.	14690.	3827.	0.5881	3395.	2251.
4		838.	0.	838.	27998.	17699.	10299.	0.4510	378.	4645.
5		-7921.	0.	-7921.	53119.	29673.	23447.	0.3458	-2739.	8109.
6		35.	0.	35.	36848.	20480.	16368.	0.2652	9.	4341.
7		0.	0.	0.	59685.	32828.	26857.	0.2034	0.	5462.
8		0.	0.	0.	36848.	20308.	16540.	0.1560	0.	2580.
9		0.	0.	0.	59685.	32907.	26778.	0.1196	0.	3203.
10		0.	0.	0.	36848.	22196.	14652.	0.0917	0.	1344.
11		58.	0.	58.	59685.	34755.	24930.	0.0703	4.	1754.
12		0.	0.	0.	36848.	20348.	16500.	0.0539	0.	890.
13		0.	0.	0.	59685.	32696.	26989.	0.0414	0.	1116.
14		0.	0.	0.	36848.	20348.	16500.	0.0317	0.	523.
15		0.	0.	0.	59685.	32696.	26989.	0.0243	0.	657.
16		850.	0.	850.	36848.	20559.	16289.	0.0187	16.	304.
17		0.	0.	0.	59685.	34544.	25141.	0.0143	0.	360.
18		0.	0.	0.	36848.	22407.	14441.	0.0110	0.	158.
19		0.	0.	0.	59685.	32696.	26989.	0.0084	0.	227.
20		0.	0.	0.	36848.	20348.	16500.	0.0065	0.	106.
21		58.	0.	58.	59685.	32696.	26989.	0.0049	0.	134.
22		0.	0.	0.	36848.	20351.	16496.	0.0038	0.	63.
23		0.	0.	0.	59685.	32907.	26778.	0.0029	0.	78.
24		0.	0.	0.	36848.	22196.	14652.	0.0022	0.	33.
25		-16674.	0.	-16674.	59685.	30961.	28724.	0.0017	-29.	42.
TOTAL		22498.	0.	22498.	1068257.	605127.	463130.		37853.	37853.

INTEREST  
PER CENT  
6.500  
14.000  
15.000  
16.000  
17.000  
18.000

BENEFIT/COST  
RATIO  
5.989  
2.784  
2.567  
2.375  
2.205  
2.052

PRESENT VALUE IN 1000 P.  
REVENUE    OUTLAY    BALANCE  
210409.    35135.    175274.  
105348.    37835.    67512.  
97394.    37936.    59458.  
90284.    38010.    52274.  
83906.    38061.    45845.  
78166.    38095.    40071.

\*\*EXCLUDING DEPRECIATION, INTEREST, AND INCOME TAX

ALTERNATIVE: ALTERNATIVE 2, 10 PERCENT LARGER TARGETED YIELDS

TABLE 12

INVESTMENT FEASIBILITY ANALYSIS

LIBMANAN/CARUSC INTEGRATED AREA DEVELOPMENT PROJECT  
ADOPTED PLAN

BRBC AGRI-BUS

INTERNAL RETURN ON TOTAL CAPITAL 7.652 PERCENT

PERIOD NO.	INVESTMENT ( 1000 P )			OPERATING ( 1000 P )			PRESENT VALUE FACTOR	PRESENT VALUE		
	ICENT.	FACILITIES	WORKING CAPITAL	TOTAL REVENUE	OPERATING EXPENSES **	NET REVENUE		INVESTMENT	NET REVENUE	
1		33673.	0.	33673.	257.	998.	-742.	1.0000	33673.	-742.
2		13704.	0.	13704.	2140.	3342.	-1202.	0.9289	12730.	-1117.
3		6928.	0.	6928.	13467.	16104.	-2637.	0.8629	5978.	-2275.
4		1006.	0.	1006.	20362.	19355.	1008.	0.8016	806.	808.
5		-9505.	0.	-9505.	38632.	32353.	6279.	0.7446	-7077.	4675.
6		42.	0.	42.	26798.	22388.	4410.	0.6916	29.	3050.
7		0.	0.	0.	43407.	35858.	7549.	0.6425	0.	4850.
8		0.	0.	0.	26798.	22182.	4616.	0.5968	0.	2755.
9		0.	0.	0.	43407.	35930.	7477.	0.5544	0.	4145.
10		0.	0.	0.	26798.	24246.	2552.	0.5150	0.	1314.
11		70.	0.	70.	43407.	37946.	5461.	0.4784	33.	2612.
12		0.	0.	0.	26798.	22230.	4568.	0.4444	0.	2030.
13		0.	0.	0.	43407.	35700.	7707.	0.4128	0.	3181.
14		0.	0.	0.	26798.	22230.	4568.	0.3834	0.	1752.
15		0.	0.	0.	43407.	35700.	7707.	0.3562	0.	2745.
16		1020.	0.	1020.	26798.	22460.	4338.	0.3309	337.	1435.
17		0.	0.	0.	43407.	37716.	5691.	0.3073	0.	1749.
18		0.	0.	0.	26798.	24476.	2322.	0.2855	0.	663.
19		0.	0.	0.	43407.	35700.	7707.	0.2652	0.	2044.
20		0.	0.	0.	26798.	22230.	4568.	0.2464	0.	1125.
21		70.	0.	70.	43407.	35700.	7707.	0.2288	16.	1764.
22		0.	0.	0.	26798.	22234.	4565.	0.2126	0.	970.
23		0.	0.	0.	43407.	35930.	7477.	0.1975	0.	1476.
24		0.	0.	0.	26798.	24246.	2552.	0.1834	0.	468.
25		-20009.	0.	-20009.	43407.	33808.	9600.	0.1704	-3409.	1636.
TOTAL		26998.	0.	26998.	776914.	661064.	115850.		43116.	43116.

INTEREST PER CENT	BENEFIT/COST RATIO	PRESENT VALUE IN 1000 P		
		REVENUE	QUILAY	BALANCE
6.500	1.169	49283.	42163.	7121.
14.000	0.490	22244.	45402.	-23158.
15.000	0.444	20235.	45523.	-25288.
16.000	0.404	18446.	45612.	-27166.
17.000	0.369	16848.	45673.	-28826.
18.000	0.337	15416.	45714.	-30298.

\*\*EXCLUDING DEPRECIATION, INTEREST, AND INCOME TAX

ALTERNATIVE: ALTERNATIVE 4, SENSITIVITY FOR RANGE OF + OR - 20 PERCENT

TABLE 13

INVESTMENT FEASIBILITY ANALYSIS

LIBMANAN/CABUSC INTEGRATED AREA DEVELOPMENT PROJECT  
WITHOUT PRODUCTION DIKE AND INTERCEPTOR CHANNEL

BRBC AGRI-BUS

INTERNAL RETURN ON TOTAL CAPITAL 31.099 PERCENT

PERIOD NO.	INVESTMENT (1000 P.)			OPERATING (1000 P.)			PRESENT VALUE FACTOR	PRESENT VALUE	
	FACILITIES	WORKING CAPITAL	FIXED CAPITAL	TOTAL REVENUE	OPERATING EXPENSES **	NET REVENUE		INVESTMENT	NET REVENUE
1	18649.	0.	18649.	321.	832.	-511.	1.0000	18649.	-511.
2	11420.	0.	11420.	1092.	1822.	-730.	0.7628	8711.	-557.
3	5773.	0.	5773.	13719.	11504.	2215.	0.5818	3359.	1289.
4	838.	0.	838.	21888.	13933.	7955.	0.4438	372.	3531.
5	-7921.	0.	-7921.	42293.	23355.	18938.	0.3385	-2682.	6411.
6	35.	0.	35.	28658.	15686.	12972.	0.2582	9.	3350.
7	0.	0.	0.	49292.	26835.	22457.	0.1970	0.	4423.
8	0.	0.	0.	28658.	15514.	13144.	0.1502	0.	1975.
9	0.	0.	0.	49292.	26895.	22397.	0.1146	0.	2567.
10	0.	0.	0.	28658.	17228.	11430.	0.0874	0.	999.
11	58.	0.	58.	49292.	28575.	20717.	0.0667	4.	1381.
12	0.	0.	0.	28658.	15554.	13104.	0.0509	0.	667.
13	0.	0.	0.	49292.	26703.	22589.	0.0388	0.	876.
14	0.	0.	0.	28658.	15554.	13104.	0.0296	0.	388.
15	0.	0.	0.	49292.	26703.	22589.	0.0226	0.	510.
16	850.	0.	850.	28658.	15746.	12912.	0.0172	15.	222.
17	0.	0.	0.	49292.	28383.	20909.	0.0131	0.	275.
18	0.	0.	0.	28658.	17426.	11232.	0.0100	0.	113.
19	0.	0.	0.	49292.	26703.	22589.	0.0076	0.	173.
20	0.	0.	0.	28658.	15554.	13104.	0.0058	0.	76.
21	58.	0.	58.	49292.	26703.	22589.	0.0044	0.	100.
22	0.	0.	0.	28658.	15557.	13101.	0.0034	0.	44.
23	0.	0.	0.	49292.	26895.	22397.	0.0026	0.	58.
24	0.	0.	0.	28658.	17234.	11424.	0.0020	0.	23.
25	-11968.	0.	-11968.	49292.	25126.	24166.	0.0015	-18.	36.
TOTAL	17792.	0.	17792.	858813.	482020.	376793.		28419.	28419.

INTEREST  
PER CENT  
6.500  
14.000  
15.000  
16.000  
17.000  
18.000

BENEFIT/COST  
RATIO  
6.352  
2.943  
2.711  
2.505  
2.322  
2.159

PRESENT VALUE IN 1000 P.  
REVENUE    QUILAY    BALANCE  
165989.    26762.    143227.  
84242.    28626.    55616.  
77765.    28688.    49076.  
71977.    28731.    43246.  
66789.    28758.    38031.  
62122.    28772.    33350.

\*\*EXCLUDING DEPRECIATION, INTEREST, AND INCOME TAX

ALTERNATIVE:

TABLE 14

INVESTMENT FEASIBILITY ANALYSIS

LIBMANAN/CABUSO INTEGRATED AREA DEVELOPMENT PROJECT  
DIESEL VERSUS ELECTRIC POWERED PUMPS

BRBC AGRI-BUS

INTERNAL RETURN ON TOTAL CAPITAL 27.966 PERCENT

PERIOD		INVESTMENT (1000 P.)			OPERATING (1000 P.)			PRESENT VALUE FACTOR	PRESENT VALUE	
NO.	IDENT.	FACILITIES	WORKING CAPITAL	ICIAL	TOTAL REVENUE	OPERATING EXPENSES **	NET REVENUE		INVESTMENT	NET REVENUE
1		28181.	C.	28181.	321.	982.	-661.	1.0000	28181.	-661.
2		11420.	C.	11420.	2675.	2935.	-260.	0.7815	8924.	-203.
3		5773.	O.	5773.	16834.	13570.	3264.	0.6107	3525.	1993.
4		838.	C.	838.	25453.	16279.	9174.	0.4772	400.	4378.
5		-7921.	C.	-7921.	48290.	27111.	21179.	0.3729	-2954.	7898.
6		35.	C.	35.	33498.	18807.	14691.	0.2914	10.	4281.
7		0.	O.	0.	54259.	30032.	24227.	0.2277	C.	5517.
8		0.	C.	0.	33498.	18635.	14863.	0.1780	C.	2645.
9		0.	O.	0.	54259.	30092.	24167.	0.1351	C.	3361.
10		0.	C.	0.	33498.	20355.	13143.	0.1087	C.	1428.
11		58.	O.	58.	54259.	31772.	22487.	0.0849	5.	1910.
12		0.	C.	0.	33498.	18675.	14823.	0.0664	C.	984.
13		0.	O.	0.	54259.	29900.	24359.	0.0519	C.	1263.
14		0.	C.	0.	33498.	18675.	14823.	0.0405	C.	601.
15		0.	O.	0.	54259.	29900.	24359.	0.0317	C.	771.
16		850.	C.	850.	33498.	18867.	14631.	0.0247	21.	362.
17		0.	O.	0.	54259.	31580.	22679.	0.0193	C.	439.
18		0.	C.	0.	33498.	20547.	12951.	0.0151	C.	196.
19		0.	O.	0.	54259.	29900.	24359.	0.0118	C.	288.
20		0.	C.	0.	33498.	18675.	14823.	0.0092	C.	137.
21		58.	O.	58.	54259.	29900.	24359.	0.0072	C.	176.
22		0.	C.	0.	33498.	18678.	14820.	0.0056	C.	84.
23		0.	O.	0.	54259.	30092.	24167.	0.0044	C.	106.
24		0.	C.	0.	33498.	20355.	13143.	0.0034	C.	45.
25		-16674.	O.	-16674.	54259.	28323.	25936.	0.0027	-45.	70.
TOTAL		22618.	O.	22618.	971143.	554637.	416506.		38068.	38068.

INTEREST PER CENT  
6.500  
14.000  
15.000  
16.000  
17.000  
18.000

BENEFIT/COST RATIO  
5.358  
2.484  
2.290  
2.117  
1.964  
1.827

PRESENT VALUE IN 1000 P.  
REVENUE    OUTLAY    BALANCE  
188888.    35255.    153632.  
94294.    37955.    56338.  
87135.    38056.    49079.  
80735.    38130.    42606.  
74996.    38181.    36814.  
69830.    38215.    31615.

\*\*EXCLUDING DEPRECIATION, INTEREST, AND INCOME TAX

ALTERNATIVE:

TABLE 15

INVESTMENT FEASIBILITY ANALYSIS

LIBMANAN/CABUSO INTEGRATED AREA DEVELOPMENT PROJECT  
ELECTRIC RATES AT 22.5/KWH VERSUS 100/KWH

BRBC AGRI-BUS

INTERNAL RETURN ON TOTAL CAPITAL 28.311 PERCENT

PERIOD		INVESTMENT (1000 ₱)			OPERATING (1000 ₱)			PRESENT VALUE	PRESENT VALUE	
NO.	CENTI.	FACILITIES	WORKING CAPITAL	FIXED CAPITAL	TOTAL REVENUE	OPERATING EXPENSES **	NET REVENUE	FACTOR	INVESTMENT	NET REVENUE
1		28061.	0.	28061.	321.	832.	-511.	1.0000	28061.	-511.
2		11420.	0.	11420.	2675.	2785.	-110.	0.7800	8907.	-86.
3		5773.	0.	5773.	16834.	13420.	3414.	0.6083	3512.	2077.
4		838.	0.	838.	25453.	16129.	9324.	0.4745	398.	4424.
5		-7921.	0.	-7921.	48290.	27151.	21139.	0.3701	-2931.	7823.
6		35.	0.	35.	33498.	18847.	14651.	0.2867	10.	4229.
7		0.	0.	0.	54259.	30072.	24187.	0.2251	0.	5446.
8		0.	0.	0.	33498.	18675.	14823.	0.1756	0.	2603.
9		0.	0.	0.	54259.	30132.	24127.	0.1370	0.	3305.
10		0.	0.	0.	33498.	20395.	13103.	0.1068	0.	1400.
11		58.	0.	58.	54259.	31812.	22447.	0.0823	5.	1870.
12		0.	0.	0.	33498.	18715.	14783.	0.0650	0.	961.
13		0.	0.	0.	54259.	29940.	24319.	0.0507	0.	1233.
14		0.	0.	0.	33498.	18715.	14783.	0.0395	0.	584.
15		0.	0.	0.	54259.	30021.	24238.	0.0308	0.	747.
16		850.	0.	850.	33498.	18907.	14591.	0.0241	20.	351.
17		0.	0.	0.	54259.	31620.	22639.	0.0188	0.	425.
18		0.	0.	0.	33498.	20587.	12911.	0.0146	0.	189.
19		0.	0.	0.	54259.	29940.	24319.	0.0114	0.	278.
20		0.	0.	0.	33498.	18715.	14783.	0.0089	0.	132.
21		58.	0.	58.	54259.	29940.	24319.	0.0069	0.	169.
22		0.	0.	0.	33498.	18718.	14780.	0.0054	0.	80.
23		0.	0.	0.	54259.	30132.	24127.	0.0042	0.	102.
24		0.	0.	0.	33498.	20395.	13103.	0.0033	0.	43.
25		-16674.	0.	-16674.	54259.	28363.	25896.	0.0026	-43.	67.
TOTAL		22498.	0.	22498.	971143.	554958.	416185.		37939.	37939.

INTEREST PER CENTI  
6.500  
14.000  
15.000  
16.000  
17.000  
18.000

BENEFIT/COST RATIO  
5.380  
2.500  
2.305  
2.133  
1.979  
1.842

PRESENT VALUE IN 1000 ₱  
REVENUE    OUYLAY    BALANCE  
189028.    35135.    153892.  
94598.    37835.    56763.  
87450.    37936.    49514.  
81059.    38010.    43049.  
75327.    38061.    37265.  
70167.    38095.    32072.

\*\*EXCLUDING DEPRECIATION, INTEREST, AND INCOME TAX

ALTERNATIVE:

TABLE 16

INVESTMENT FEASIBILITY ANALYSIS

LIBMANAN/CABUSC INTEGRATED AREA DEVELOPMENT PROJECT  
ELECTRIC RATES 22.5C/KWH WITH 1.27 LEVEL OF USE

BRBC AGRI-BUS

INTERNAL RETURN ON TOTAL CAPITAL 28.062 PERCENT

PERIOD		INVESTMENT (1000 P.)			OPERATING (1000 P.)			PRESENT VALUE	PRESENT VALUE	
NO.	IDENT.	FACILITIES	WORKING CAPITAL	ICIAL	TOTAL REVENUE	OPERATING EXPENSES **	NET REVENUE	FACTOR	INVESTMENT	NET REVENUE
1		28061.	0.	28061.	321.	832.	-511.	1.0000	28061.	-511.
2		11420.	0.	11420.	2675.	2785.	-110.	0.7809	8918.	-86.
3		5773.	0.	5773.	16834.	13420.	3414.	0.6098	3520.	2082.
4		838.	0.	838.	25453.	16129.	9324.	0.4761	399.	4440.
5		-7921.	0.	-7921.	48290.	27325.	20965.	0.3718	-2945.	7795.
6		35.	0.	35.	33498.	19021.	14477.	0.2903	10.	4203.
7		0.	0.	0.	54259.	30246.	24013.	0.2267	0.	5444.
8		0.	0.	0.	33498.	18849.	14649.	0.1770	0.	2593.
9		0.	0.	0.	54259.	30306.	23953.	0.1382	0.	3311.
10		0.	0.	0.	33498.	20569.	12929.	0.1079	0.	1396.
11		58.	0.	58.	54259.	31986.	22273.	0.0843	5.	1877.
12		0.	0.	0.	33498.	18889.	14609.	0.0658	0.	962.
13		0.	0.	0.	54259.	30114.	24145.	0.0514	0.	1241.
14		0.	0.	0.	33498.	18889.	14609.	0.0401	0.	586.
15		0.	0.	0.	54259.	30114.	24145.	0.0313	0.	757.
16		850.	0.	850.	33498.	19081.	14417.	0.0245	21.	353.
17		0.	0.	0.	54259.	31794.	22465.	0.0191	0.	429.
18		0.	0.	0.	33498.	20761.	12737.	0.0149	0.	190.
19		0.	0.	0.	54259.	30114.	24145.	0.0117	0.	281.
20		0.	0.	0.	33498.	18889.	14609.	0.0091	0.	133.
21		58.	0.	58.	54259.	30114.	24145.	0.0071	0.	172.
22		0.	0.	0.	33498.	18892.	14606.	0.0055	0.	81.
23		0.	0.	0.	54259.	30306.	23953.	0.0043	0.	104.
24		0.	0.	0.	33498.	20569.	12929.	0.0034	0.	44.
25		0.	0.	0.	54259.	28537.	25722.	0.0026	0.	68.
TOTAL		-16674.	0.	-16674.	971143.	558531.	412612.		-44.	68.
		22498.	0.	22498.					37945.	37945.

INTEREST PER CENT  
6.500  
14.000  
15.000  
16.000  
17.000  
18.000

BENEFIT/COST RATIO  
5.335  
2.480  
2.286  
2.115  
1.963  
1.827

PRESENT VALUE IN 1000 P.  
REVENUE    OUTLAY    BALANCE  
187436.    35135.    152300.  
93826.    37835.    55991.  
86739.    37936.    48803.  
80403.    38010.    42394.  
74720.    38061.    36659.  
69605.    38095.    31510.

\*\*EXCLUDING DEPRECIATION, INTEREST, AND INCOME TAX

ALTERNATIVE:

c. Beneficiaries

This project is designed primarily as a rural project to assist small farmers in an area of the Bicol River Basin which is less developed and has a lower than average per capita income than the Bicol River Basin as a whole. While the BRBC feasibility study report details these problems, no economic impact statement was produced as such. While data is limited for this appraisal to produce a detailed economic impact statement, a reasonable estimate of the economic impact of the project is presented below:

Three distinct groups would benefit economically from this project and are listed in the order of importance.

(1) Small farmers

It is estimated from data available that the level of farm income would rise from less than ₱3,000 annually to over ₱5,000 annually for approximately 75 percent (or 1,320) of the small farmers in the project area. The balance of the small farmers (513) are expected to raise their farm incomes to over ₱4,000 annually. Income distribution could not be directly calculated due to lack of data; however, it is sufficient to say that since the project would increase intensive land use by approximately 6,000 hectares across all land classes, the current disparity between small farmers income, dependent on land class and weather conditions, would be reduced. The project would undoubtedly contribute to a more even distribution of income among the small farmers in the project area.

(2) Induced Employment

Since the implementation of this project would increase yields, an increase in labor for threshing, harvesting, and other production practices will be required as well as labor for project maintenance. It was estimated from tables in the BRBC feasibility study report that induced employment due to this project should reach 3,000 man years annually for both on-farm and off-farm employment by the end of the six-year build-up period.

(3) National Government

The third beneficiary group would be the National Government. The proposed economic impact of this project upon the National Government is detailed in Volume II (BRBC Project Feasibility Report, Table 8, Appendix C, page 383).

2. Technical Analysis

The Mission has reviewed the technical aspects of the project and has determined that the GOP's engineering plans are based on accepted engineering practices and are fundamentally sound.

a. Pump Installation

The selection of electrically driven pumps to deliver the water supply to the project area is a sound decision when compared to diesel driven pump option. The economic analysis substantiates this decision.

The upstream site for the pump installation provides the best protection against pumping saline waters from the river which result from salt water intrusion up the river during periods of low flow under high tide conditions. This site also coincides with the potential gravity diversion site to service the project area under future development conditions proposed for the Pulantuna-Libmanan River complex. This same point of diversion would be utilized for gravity diversion of flood flows from the river at Sipocot to San Miguel Bay which would require the extension and enlargement of the proposed interceptor drain which is an integral part of the project. The four pump sets would be operating against a 6.5 meter TDH and would deliver 5.8 cms of water for the 3873 hectares project area. This supply of water is judged sufficient to deliver adequate water to the project lands under abnormally dry periods. Based on past available records an adequate water supply is reasonably assured within tolerable shortages;

:

however, it would be advisable to continue upgrading the stream gaging activities in the area to secure more up-to-date data on available water supply as it exists at the present time, especially during the low flow period of the year.

b. Water Quality

The quality of the water based on the results of limited testing initiated in October 1974 is good. There have been no indications of deteriorating water quality upstream from the railroad bridge at Libmanan, and the testing should continue through the low flow, high tide cycles during the summer months to verify good quality water availability at the pump site. The BRBC is currently taking monthly water quality samples at selected points along the Libmanan River.

The flood protection dike around the pumpsite should provide adequate protection for the installation.

c. Canal and Lateral System

The canal and lateral network proposed should provide adequate service to the area. Canal density is adequate and the tentative layout as checked in the field appears satisfactory. During final design and preconstruction activities some minor adjustments may be advantageous. The designs and typical sections of the canals and laterals are based on standard designs similar to those used in the U.S. and have been and are acceptable to IBRD and ADB for external financing.

The canal structure density appears adequate at this time. Final location of various types of structures should be well coordinated and located to provide optimum water control and service as well as communications access for the resident farmers of the area.

As designed the turn-out density and farm ditch system should facilitate efficient delivery of water to the land being served. The choice of 50 hectares rotational units with sub-areas of 8 to 14 hectares organized around compact farms within these larger rotational units reflects the result of research and experimentation on NIA projects since 1971. These design standards provide a near optimum balance of farmer users, lateral and farm ditch size, right-of-way utilization, and ditch tender capability. The inclusion of

constant head orifice turnouts to deliver a known quantity of water will make it possible to institute water management practices which would increase the water utilization efficiency. In addition to these turnouts, the Mission has recommended the installation of inland water measurement devices such as Parshall Flumes at key places within the system to facilitate more complete control and monitoring of water supplies and deliveries.

d. Drainage System

The proposed drainage system within the project area and the interceptor drain along the northern boundary of the project should provide adequate drainage capacity required for flood alleviation. The provision of the proposed drainage reduce the period of inundation of crop lands to a minimum. The 11.4 liters per second per hectare capacity falls within the 8 to 13 liters per second per hectare capacity that have proven satisfactory for similar areas in the Philippines. Monitoring of unconfined groundwater levels should be initiated throughout the project area to establish pre-project conditions and continue into the operation and maintenance phase after construction is completed to evaluate the changes induced by full-time irrigation in the area. Sub-surface drainage may be required in some of the lower elevation land in the northeastern part of the project in order to control a salinizing situation that could develop because of full time irrigation and possible salt intrusion into the area from San Miguel Bay or the Bicol River estuary. This situation should be monitored carefully. High water utilization efficiencies should be attainable and demanded because of the pumped supply which in turn will keep drainage requirements to a minimum, which can be aggravated by inefficient use of water and excessive operational waste.

The interceptor channel would eliminate the overland flow of the surface water from the 23 square kilometers drainage area situated upslope from the northern boundary of the project. This runoff is currently aggravating the flooding and drainage conditions in the project area, but would have no further effect on the irrigated area subsequent to the completion of this channel.

e. Tide Protection Dike

The tide protection dike together with companion flap and slide gates should eliminate the twice daily ingress and egress of saline tide water into the existing drainage channels dis-

charging from the project area. The construction of the dike to an elevation of 2.2 meters above mean sea level would also prevent small storm surges from inundating the low level, fringe areas of the project. If the side slopes of this dike can generate a grassy sod cover and luxuriant growths of brush bamboo, etc. can be established on the river side of the dike, damage to the dike and the intensity of overtopping during high storm surges can be reduced considerably. The Mission has recommended that the top of the dike be widened to about 3.5 meters to accommodate a roadway on top of the dike to facilitate inspection, maintenance and provide a means of access into and out of the area for the resident areas adjacent to the dike.

f. Operation and Maintenance of the System

The Irrigators Association (IA) O&M staff should be fully organized at the beginning of the test turn or trial run period of one year. They should work together with NIA gradually assuming more of the actual operation responsibility during this initial period so that they can in fact begin to operate the system completely after the first year. Technical assistance should continue to be available as needed from NIA after this first year of operation. A systematic method of monitoring and reporting operation data should be required from the IA to NIA and a definite schedule of review of maintenance operations by NIA should be established to insure an adequate and effective O&M program for the project. The IA should be as free from government control or close supervision as possible but must be accountable for the viability of project operations and facilities.

3. Social Analysis

This section analyzes the impact of the project on the socio-cultural milieu of the project and the role of women in development.

As a general rule, the rural Filipino has been culturally characterized as traditionalistic, religious, fatalistic and having a tendency to cling to old values and beliefs - characteristics which according to Rostow are generally prevalent in most traditional societies. From the development perspective, these conditions are generally considered as socio-cultural barriers to growth and development. Fatalism, for example, which assumes that events are determined by nature, certainly is a barrier preventing the introduction of innovative approaches unless a deliberate effort is made to change existing beliefs.

On the other hand, there are existing socio-cultural traits of the rural Filipino farmer which can be capitalized to promote development. Familism and kinship, together with the predominance of the extended family, for example, can be exploited to promote cooperativism at the farm level. This can be extended through the neighborhood or the barangay concept which stresses voluntary cooperation at the village level. This pre-Spanish tradition of cooperation is now being intensified under the New Society to strengthen basic institutions. The compact farm concept now a formal and fundamental component part of the Bicol River Basin Program began spontaneously in various areas of the Bicol and has only recently gained support from Government institutions.

Cognizant of these socio-cultural variables, the planners of the Libmanan/Cabusao Integrated Area Development Project have adopted necessary measures to effect socio-cultural change. The diffusion process considered for the project area recognizes three major variables, namely, the change (practice), the change agent (technician) and the actor (farmer). Change can be effected if it is desired, profitable and compatible with the actor's practices provided that it has been introduced properly by the change agent. The introduction of a change requires a process of creating an awareness on the part of the recipient, developing his interest which ultimately makes him adopt, on a trial basis, the change. This process is embodied in the various support services proposed to be implemented in the project area. The project will institute a program of applied research and demonstrations (the change), intensify and upgrade through training extension services (the change agent), and promote improved and more efficient farm management practices through development of compact farms (the actor).

Since modern practices under the project are to be institutionalized, the immediate effect, therefore, of the project will be a new pattern of receptiveness, innovativeness, and cooperation as against the existing pattern of fatalistic and traditionalistic behavior. As a result of the project, new work patterns, higher levels of desires and wants and new sets of practices are expected to emerge among project beneficiaries. The development or non-development of these behavioral patterns will be closely followed and analyzed by the Basin's Social Survey Research Unit and will be the subject of special analysis during the interim (3rd year) and final (6th year) evaluation of the project.

The rural farm household housewife can play a significant role in the Libmanan/Cabusao IAD Project. Castillo explained, for

example, that the pervasive influence of the Filipino wife in farm-business decisions derives from her role as the uncontested treasurer, with power to approve or veto expenditures. Women often serve as the conduit for diffusing improved farming practices in the Philippines as has been shown in the Team Approach of the Farm and Home Development Office, University of the Philippines College of Agriculture. Through the various training and promotional programs of the project women will be encouraged to take an active role in the implementation of the project.

#### 4. Policy

The goals of the Libmanan/Cabusao Integrated Area Development Project are: (1) to increase income and income distribution in the project area; (2) to increase employment opportunities; and (3) to improve the quality of life of project beneficiaries. The purpose of the project, the means by which the program goals are to be achieved, is to increase the cropping intensity in the project area to at least two (2) rice crops per year and measurably increase yield per hectare. These goals and the project purpose explicitly embody the elements of overall GOP development policy which has been articulated since the advent of Martial Law in 1972. Briefly discussed below are the central policy elements which collectively form the policy base underlying the Libmanan/Cabusao Project Plan.

##### a. Agricultural Policy

The GOP has positive policies to increase production and are reassessing these policies periodically to see that they are reaching the small farmer. National objectives are for increased food production aimed at self-sufficiency in the basic staples, rice and corn - crops produced on farms averaging 2.5 to 3.0 hectares. As evidence of this concern, a group of GOP policy makers held a three day seminar at Los Banos recently to discuss agricultural policy. National Economic and Development Authority Secretary Gerardo P. Sicat told the group as reported in Business Day (April 23, 1975) "... the government will continue to give top priority to food production as a means of insulating the country from the ill effects of the prevailing worldwide shortage of commodities and as a hedge against the threat of inflation on the already reduced buying capacity of the low income masses ..... food production programs assumed greater urgency in view of the worldwide shortages of food and the perennial deficiency of the average Filipino diet of some basic food." Dr. Sicat announced that some P3.2 billion would be channeled into food production programs in 1975 compared to P2.6 billion during the previous year.

From the policy point of view of national self-sufficiency in rice, the Philippines basic food staple, the Libmanan/Cabusao Integrated Area Development Project will make a substantial contribution by adding over 19,000 M.T. annually to national stock.

In the agriculture sector the GOP has enumerated and put into effect a range of agricultural policies and program that will directly contribute to the project's success. These programs include provision of short and medium term production and marketing credit within easy reach of the project farmers and the establishment of a floor price for rice which guarantees the farmer a reasonable return to his investment.

b. Income, Income Redistribution and Employment Policy

The overall objective of the GOP Four Year Development Plan 1974-1977 enunciates a development program stressing agricultural self-sufficiency as discussed above coupled with a major effort to mobilize the rural sector.

The central objective of this rural mobilization effort is to equitably increase incomes of the rural poor and generate widespread employment.

The chief means to increase income in the rural sector now being pursued by the GOP is a concerted multi-sectoral effort to improve the basic infrastructure of the rural areas through increased investments in irrigation, flood control, transport and an equally intensive effort to improve the quality of agriculturally related support services. These programs are now being pursued intensively by the GOP through its integrated area development projects in Bicol and in Mindoro where investments in physical infrastructure have been closely intermeshed with social input linkages to maximize their total utility.

The means adopted to achieve the policy goal of attaining a more equitable distribution of income especially in the rural sector is through land reform. This involves initially the conversion of rice and corn tenants to leasehold for farmlands below 7 hectares and the conversion of the same kind of tenants into amortizing owners for farmlands above 7 hectares. While the productive efficiency of the land reform program still remains to be validated, its income redistribution effect is unquestioned. The income redistribution effect is mainly due to size differentials between share rentals and lease rentals or amortizations which farmers pay the landowners.

The GOP has also continuously adopted a policy of promoting employment opportunities among its citizens. Currently the GOP is promoting the expansion of rural based small-scale

and medium industries and the adoption of labor-intensive construction techniques. Through its agribusiness program the BRBC is promoting and developing increased employment opportunities in the Basin. Through projects like the BRBC's land consolidation project, which is currently being constructed using labor intensive techniques, and through the Libmanan/Cabusao Integrated Area Development Project, which will provide 2,300 man years annually of project induced employment, the GOP is demonstrating its policy commitment to the welfare of the rural population.

#### 5. Administrative Analysis

The BRBC was created in May of 1973 as the GOP's first major effort in integrated river basin development. The BRBC Program Office, under capable management and with strong policy support, particularly from the Department of Public Works, Transportation and Communications, the National Irrigation Administration, the Department of Agriculture and the Department of Agrarian Reform has developed and acquired a strong planning and management staff over the past twenty-two months of operation. This staff, supported by a Technical Assistance Group from the University of the Philippines and several local consulting firms, has completed, among others, three major feasibility studies (Libmanan/Cabusao, Secondary and Farm to Market Roads and a Land Consolidation Project), and has planned and initiated, on a concurrent basis, sixteen inter-agency projects ranging from basinwide land classification to compact farm technician and extension training programs.

While the staff has limited implementation experience in projects as large and as complex as this project proposed for A.I.D. financing, the Mission is confident that the Basin Program Office staff in conjunction with participating line agencies and the concerned municipal governments can successfully implement the Libmanan/Cabusao Integrated Area Development Project.

A unique and experimental feature of the Project is the creation of an inter-agency Area Development Team to carry out field implementation. The BRBC approved the ADT concept in December 1974 and provided funds for the creation of six Area Development Teams to be located in six sub-regions (Development Areas) of the Basin. Under this overall concept all field technicians from the major line agencies will be

brought into a sustained working relationship under the direction of an Area Development Coordinator. Basin management feels that it will be this field level coordinated effort that will ultimately distinguish the Bicol River Basin over time from other rural development projects. The ADT is seen as (1) a crucial link between Basin planners and the people, (2) a unit to effectively integrate the different sectoral agencies and their programs at the field level and in so doing increase the efficiency of government services and properly exploit program complementarities, and (3) as a unit to bring municipal governments serving the same economic sub-regions of the Basin into sustained and productive working arrangements with each other and with national and provincial level agencies.

The Libmanan/Cabusao Area Development Team will be the first to be organized as well as the first to receive major capital inputs. The BRBC has drawn up a satisfactory staffing pattern for the ADT and appropriate management control systems are now being installed to effectively tie the ADT to both the responsible technical agencies and to the BRBC Program Office as the responsible supervising office.

The Mission is of the opinion that the rural and local institutional development possibilities embodied in the ADT concept are sufficiently attractive to warrant USAID support in the form and in the amount as outlined in this Project Paper.

E. Project Implementation

1. Implementation Plan

(a) GOP Plan

After loan approval, the BRBC shall establish within three months the Area Development Team (ADT) and the Area Development Council (ADC), with the latter serving as the main organization responsible for project implementation.

The construction of irrigation and drainage facilities will be completed during the first three years. While physical work on these structures is being undertaken, project support services will be established (see Chart III).

The acceleration of operation land transfer and leasehold is necessary to create a psychological atmosphere conducive for the adoption of improve farming technologies which ultimately will result to increased productivity and farm incomes. The loan covenants provide that land values will be fixed during the first six months of the project and leasehold and land transfer certificates for all eligible project beneficiaries will be completed in approximately twelve months.

(b) Loan Disbursement Schedule

The following implementation schedule is within the range of reasonable expectations:

Loan Authorized (AID/W)	June 30, 1975
Loan Agreement Negotiated and signed (GOP/AID)	July 31, 1975
Conditions Precedent to opening letters of commitment met (GOP/AID)	Sept. 30, 1975
Letter of Commitment opened (GOP/AID)	Oct. 15, 1975
Request for S.L.C. (GOP)	Oct. 15, 1975
TD for disbursement request	Sept. 30, 1975

Chart 3

**LIBMANAN - CABUSAO INTEGRATED AREA DEVELOPMENT**

**IMPLEMENTATION SCHEDULE**

WORK ITEM	1975	1976	1977	1978	1979	1980	1981
	0	1	2	3	4	5	6
<b>A. ORGANIZATION OF ADT/ADC</b>	██████████	██████████					
<b>B. IRRIGATION AND DRAINAGE</b>							
1. PRE-CONSTRUCTION		██████████	██████████				
2. CONSTRUCTION		██████████	██████████	██████████			
3. TEST RUN				██████████	██████████		
<b>C. LAND REFORM</b>							
1. LISTING		██████████					
2. PARCELLARY MAPPING		██████████	██████████	□□□□	██████████		
3. OLT AND LEASEHOLD		██████████					
<b>D. COMPACT FARM DEVELOPMENT</b>							
1. TRAINING		□□□	□□□	□□□	□□□□		
2. ORGANIZATION		██████████	██████████	██████████	□□□		
3. EXTENSION SUPPORT DEVELOPMENT		██████████	██████████	██████████	□□□□	□□□□□□	□□□□□□
<b>E. APPLIED RESEARCH</b>							
1. TEAM ORGANIZATION		██████████					
2. IDENTIFY RESEARCH AREA		██████████	□□□				
3. RESEARCH OPERATION			██████████	██████████	██████████		
<b>F. IRRIGATORS ASSOCIATION</b>							
1. ORGANIZATION			██████████				
2. MGT / OPNS TRAINING				██████████	□□□□□□		
3. OPERATION / MAINTENANCE						██████████	██████████

## 2. Disbursement and Procurement Procedures

The A.I.D. loan funds will be disbursed according to the following procedures:

### (a) Acquisition of Construction Equipment

The GOP has proposed, in the interest of building local construction contracting capability, that up to \$1.8 million of the loan funds would be made available for direct procurement of required construction equipment by the winning contractor, tax free through the auspices of the BRBC and the National Irrigation Administration (NIA) whose project engineer will supervise the construction contractor(s). Use of loan funds in this manner would provide sufficient incentive for contractors to bid on the project, given the fact that they will gain access to a foreign exchange source to enable them to procure equipment for use on this and future projects. This disbursement procedure has been favorably considered by the Mission for two reasons. First, it will attract competent contractors to the Bicol area. The Mission (through the PDAP Project) and the BRBC, in conjunction with the construction of its land consolidation project, have had only limited success in attracting contractors to the Bicol area given its remoteness from Manila and the existence of considerable contracting work in more accessible areas of the country (e.g., Central Luzon). Secondly, equipment procured directly by the contractor and turned over to him in payment for services rendered, will insure that the equipment is properly maintained, since, as the property of the contracting firm, the incentive for proper maintenance will be present. This procedure represents a marked improvement over traditional loan financed projects where the Government procures the equipment for use by the contractor. In this case, the contractor generally neglects maintenance of the equipment, since the equipment will revert to the sponsoring government agency upon completion of the project. The loan funds for this purpose will be disbursed through standard A.I.D. Letter of Commitment (LOC) and Special Letter of Credit (SLC) procedures.

### (b) Project Support Equipment, Pump Sets and O&M Equipment for the Irrigators Association.

To support the office equipment, field equipment, and vehicle needs of the Area Development Team which will be responsible for implementation of the five component sub-project up to \$457,000 of the loan funds will be made available for the direct procurement by the BRBC of the required equipment.

To support the development of the Irrigators Association and provide the Association with the essential equipment necessary for

proper maintenance of the system up to \$150,000 in maintenance equipment will be procured by the BRBC, on behalf of the Irrigators Association.

A portion of the loan funds, up to \$140,000, will be used by the BRBC to procure the project pump sets and motor controls.

The loan funds used to procure these commodities will be disbursed through standard A.I.D. Letter of Commitment and Letter of Credit procedures.

(c) Fixed Amount Reimbursement

Up to \$953,000 will be made available to finance local currency costs of the project. These funds will be used to finance an agreed amount of direct costs of the project. Periodically, A.I.D. will reimburse the GOP for work satisfactorily completed by establishing a dollar credit in a Special Letter of Credit in a U.S. bank covering the dollar equivalent of the agreed upon reimbursement. The costs will be calculated in Philippine pesos and reimbursement by A.I.D. will be based on the official rate of exchange at the time the completed work is approved for reimbursement.

(d) Grant Technical Assistance

The A.I.D. grant funds will be allocated over a three-year period (FY 76, 77 & 78) and will be used: (1) for acquiring services of selected consultancy to assist in the final A&E design of the irrigation and drainage system, and (2) to enable the BRBC to enter into a contract with an appropriate institution to develop a total package of extendable rice technology for the Bicol covering on-farm water management, mechanization, farm management, and agronomic practices.

3. Project Monitoring System/Reporting Requirement

(a) BRBC System

The BRBC Monitoring System is designed to obtain data from various Project Managers on the status of projects in terms of time and cost overrun/underrun and to identify bottlenecks in implementation which constrain their timely completion.

With the assistance of Project Managers the Project Monitoring Information System (PMIS) Staff of the BRBC prepares a PERT-CPM network for each project. The network forms the basis for

subsequent scheduling of the project, monitoring the project and reporting on scheduled progress.

The Economic Development Foundation (EDF), a local management consulting firm, is currently on contract with the BRBC to assist in further upgrading the BRBC management system which also includes project monitoring. The upgraded monitoring system prepared by EDF will be applied to the project, with regular monthly progress and financial status reports furnished to all participating agencies, NEDA and USAID.

(b) Reporting Requirement

The following will be required:

1. Monthly progress reports reflecting the accomplishment of network activities, estimate time to complete activities in progress, and narrative discussion of any problem situations being encountered and action requested.

2. Quarterly report on disbursements and outstanding obligations.

3. Annual report indicating status of completion for prior and present years activities, and projected program targets for ensuing year. The reports will include detail on number of compact farms organized and farmers trained, status of leasehold agreements, number of amortizing owners, applied research conducted, etc.

4. Evaluation Plan

The Bicol River Basin Program was established by the GOP as a pilot project. As such, all aspects and projects of the program are considered by the GOP as pioneering efforts, the progress and results of which are to be carefully monitored, recorded and evaluated to enable transfer of relevant concepts, systems and component projects to other areas of the country if they prove successful in the Bicol and are judged to be replicable in other regions of the country. To date, the BRBC has made a major effort to establish the machinery for systematically evaluating the program over time. The most notable aspect of this effort has been the creation and professional operation of the Basin's Social Survey Research Unit (SSRU). The SSRU has completed the first Annual Panel survey of Basin residents, thereby firmly establishing the baseline data which will enable the SSRU to assess the impact of the Program's activities over time on the lives of residents living in the program area. While a

large volume of data already exists for the Libmanan/Cabusao area, Basin management has determined, given the pilot nature of the project, that an intensive evaluation effort should be built into the project. Quoted below is the Basin's evaluation plan, which the Mission strongly endorses.

"An Annual Evaluation shall be undertaken by the Social Survey Research Unit, thru random sampling of beneficiaries in the project area. These annual evaluations will determine first, whether component projects are achieving their objectives, and second, whether, indeed, integrated implementation is being achieved thru the Area Development Team/Area Development Council. The evaluation will be presented and discussed in one Area Development Council monthly meeting no later than 90 days after each survey to facilitate feedback and revision of strategies, if necessary.

A Mid-Project evaluation shall be done by SSRU at the end of Year 3, and a Terminal Evaluation at the end of the 6-year time frame. The Mid-Project and Terminal Evaluation shall be published and disseminated to the national agencies involved as well as to all interested parties."

The loan document will contain a Covenant formalizing GOP/AID understandings in this regard.

F. Conditions and Covenants

1. Conditions

The major conditions precedent (CP) required of the Borrower and/or the BRBC in addition to the standard CP's prior to any disbursement of loan funds, are recommended as follows:

- (a) A project implementation plan for the life of the project prepared by BRBC, including projection of funds available to finance the various elements of the project.
- (b) Written assurance from the Borrower that sufficient funds will be made available to the BRBC pursuant to (1) above in order to assure timely and orderly implementation of the project.

- (c) Written assurance with supporting BRBC Board resolution and other supporting documents as necessary, creating the Libmanan/Cabusao Area Development Team (ADT); providing to the ADT all staff and technician requirements on a full time basis over the life of the project; providing appropriate delegations of authority to and corresponding responsibilities of BRBC Program Office and ADT management.
- (d) Written assurance from the BRBC and the National Irrigation Administration that an Irrigators Association (IA) will be formed, properly chartered, and given responsibility for managing the system, including provisions for repayment of costs of construction in accordance with government policy and a plan for operation and maintenance of the system.
- (e) Written assurance from the BRBC and the National Irrigation Administration that appropriate management systems for the IA will be designed and installed and management and technical staff trained to insure proper management of the Association and efficient operation and maintenance of the system.
- (f) The BRBC will submit for A.I.D. approval final engineering designs and the proposed construction contract.

## 2. Covenants

The following are the covenants recommended to be included in the loan agreement:

- (a) The project will be managed on behalf of the Borrower, by the Bicol River Basin Program Office, with actual sub-project implementation to be carried out by appropriate line agencies working through the Area Development Team.
- (b) The Borrower, through the Department of Agrarian Reform, will determine and fix within six months from signing of the loan agreement, land values for all land in the project area subject to transfer under the Provisions of P.D. 27 and subsequent implementing instructions.

- (c) The Borrower, through the Department of Agrarian Reform, will, within twelve months from the signing of the loan agreement, issue Land Transfer Certificates or secure written registered leasehold contracts for all farmers eligible in the project area under R.A. 3844, P.D. 27 and subsequent implementing instructions.
- (d) BRBC will assure that Project Evaluation Procedures are implemented.

G. Issues

None.

PART III

ANNEXES

**Annex**

- A. Executive Order 412
- B. Logical Framework Matrix
- C. Checklist of Statutory Criteria
- D. Environmental Impact Statement
- E. USAID Director's Certification
- F. Draft Authorizing Document

ANNEX A

OFFICE OF THE PRESIDENT  
of the Philippines

EXECUTIVE ORDER NO. 412

CREATING THE BICOL RIVER BASIN COUNCIL

WHEREAS, it is government policy to promote integrated area development as a means towards a systematic regional development in the country;

WHEREAS, in the Bicol Region, the Bicol River Basin is an area of high growth potential where new investments in agriculture and infrastructure will yield maximum benefits in terms of production and agrarian reform;

WHEREAS, there is a need for a coordinating body that will oversee, unify, and integrate the administration and implementation of this pilot river basin development program of the government;

NOW, THEREFORE, I, FERDINAND E. MARCOS, President of the Republic of the Philippines, by virtue of the powers vested in me by law, do hereby create the Bicol River Basin Council, hereinafter referred to as the "Council", under the National Economic and Development Authority.

SECTION 1. Powers and Jurisdiction. The Council shall have the following powers:

- (a) To review and pass upon the programming and allocation of funds of agencies represented in its Board of Directors, for all projects within its geographical jurisdiction.

Unless otherwise decreed, the jurisdiction of the Council shall encompass that portion of the Bicol River Watershed within the province of Camarines Sur, covering the municipalities of Del Gallego, Ragay, Lupi, Sipocot, Calabangan, Cabusao, Libmanan, Pasacao, Pamplona, Bombon, Magarao, Carmoan, Camaligan, Naga City, Milaor, Gainza, Minalabac, San Fernando, Bula, Balatan, Pili, Tianmbac, Goa, Tigaon, Sangay, Buhi, Iriga City, Nabua, Ba-ao, Ocampo, and Bato.

- (b) To integrate and coordinate with implementing agencies of the government all plans and programs affecting the Bicol River Basin.

The decision of the Council in this regard shall be final.

- (c) To call on any department, bureau, office, agency and other instrumentalities of the government for assistance in the form of personnel, facilities, and other resources as the need arises in the discharge of its functions.
- (d) To do all such other things and to transact all such business as is directly or indirectly necessary, incidental to the attainment of the objectives of the Bicol River Basin Development Program.

SECTION 2. Board of Directors. The powers of the Council shall be vested and exercised by a Board of Directors, hereinafter referred to as the Board, which shall be composed of the following:

As Chairman - The Secretary of Public Works, Transportation and Communications

As Members - The Secretary of Agriculture and Natural Resources, or his Undersecretary

The Secretary of Agrarian Reform, or his Undersecretary

The Secretary of Local Government and Community Development, or his Undersecretary

The Director-General of the National Economic and Development Authority, or his Deputy

The Provincial Governor of Camarines Sur, and

The Executive Director of the Council, ex-officio

The Board shall meet at least twice a year or more frequently as may be necessary to discharge its functions. For actual attendance at each meeting, each member of the Board shall have a per diem of one-hundred pesos (P100), but the total amount of per diem a member may receive shall in no case exceed two-hundred pesos (P200) a month.

Four members of the Board shall constitute a quorum during meetings of the Council.

SECTION 3. Program Office. The Council shall maintain a Program Office which shall be headed by the Executive Director and four Deputy Directors -- for Plans and Programs, Social Infrastructure, Physical Infrastructure, and Budget and Administration.

This Program Office shall have its principal location in Camarines Sur.

SECTION 4. Duties of the Board. The Board shall have the following duties:

- (a) To prescribe, amend, repeal rules and regulations governing the manner in which the general affairs of the Council shall be conducted.
- (b) To appoint, suspend, or otherwise remove from office for cause the Executive Director or his Deputies.
- (c) To approve the annual and/or supplemental budgets of the Council which shall be submitted regularly.

SECTION 5. The Executive Director, Qualifications. The Executive Director shall be a natural-born citizen of the Philippines with demonstrated executive competence in the field of public administration, public infrastructure, or the management of agriculture, industrial, or commercial enterprises.

The Executive Director shall serve for a fixed term of four (4) years, unless earlier removed from office by a two-thirds vote of the Board.

The Executive Director shall receive an annual compensation which shall be charged against the appropriation of the Council for operating expenses. Provided, however, that in no case shall the compensation of the Executive Director be more than thirty-thousand pesos (P30,000) per annum.

SECTION 6. Duties of the Executive Director. The Executive Director shall perform the following duties:

- (a) To prepare the agenda for all meetings of the Board and to submit for consideration thereof the policies and measures which are necessary to carry out the affairs of the Council.
- (b) To execute and administer the policies and measures approved by the Board.
- (c) To manage the Program Office in consonance with the policies.
- (d) To submit for the approval of the Board the annual and/or supplemental budget of the Bicol River Basin Council.
- (e) To submit within sixty (60) days after the close of each fiscal year, an annual report, through the Board, to the National Economic and Development Authority.
- (g) To perform such other duties as may be assigned to him by the Board from time to time.

SECTION 7. Operating Expenses. There is hereby appropriated from the National Treasury not otherwise appropriated the amount of one-million, five-hundred thousand pesos (P1,500,000) to cover the operating expenses of the Council for the first year of operations. Subsequent appropriations and releases shall be based on the budget approved by the Board.

SECTION 8. Auditing Procedures. The Auditor-General shall appoint a representative who shall be the Auditor of the Council, and the necessary personnel to assist said representative in the performance of his duties.

The financial transaction of the Council shall be audited in accordance with law, administrative regulations, and the principles and procedures applicable to corporate transactions.

SECTION 9. Effectivity. This executive order shall take effect immediately.

Done in the City of Manila, this 17th day of May, in the year of our Lord, nineteen-hundred and seventy-three.

(SIGNED)  
FERDINAND E. MARCOS  
President of the Philippines

By the President:

(SIGNED)  
ALEJANDRO MELCHOR  
Executive Secretary

Annex 3

LIBMANAN/CABUSAO INTEGRATED AREA DEVELOPMENT PROJECT

PROJECT D LOGICAL

AID 1020-28 (1-73)

Project Title & Number: \_\_\_\_\_

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS																																																																																															
<p><b>Program or Sector Goal: The broader objective to which this project contributes: (A-1)</b></p> <p>Increased income, equitably distributed; increased employment opportunities and improved perceived quality of life among the Bicol River Basin population resident in the Libmanan/Cabusao project area.</p>	<p><b>Measures of Goal Achievement: (A-2)</b></p> <ol style="list-style-type: none"> <li>30% to 35% annual increase in average net farm household income (in constant prices) until FY 1981 which results in:               <ul style="list-style-type: none"> <li>513 farm families earning a net farm household income of P4,000 p/a by FY 1981</li> <li>1,820 farm families earning a net farm household income of P5,000 p/a by FY 1981</li> </ul> </li> <li>2,300 man years annually of induced on-farm employment at full development (FY 1979) due to increased cropping intensity on project lands.</li> <li>Measurable improvement in perceived quality of life for 14,000 (2,333 farm families) project beneficiaries by FY 1981.</li> </ol>																																																																																															
<p><b>Project Purpose: (B-1)</b></p> <ol style="list-style-type: none"> <li>To establish a viable organizational structure and management system which enables municipal leaders and residence of Libmanan and Cabusao municipalities, along with national and provincial level agencies, to meaningfully participate in the planning and execution of Bicol River Basin Programs which affect the socio-economic structure of the two municipalities overtime.</li> <li>Working through the ERBC/ADC/ADT (see 1 above) organizational structure, implement an Integrated Area Development Project covering 3,873 hectares which increases cropping intensity to at least two (2) rice crops per year and which measurably increases yield per hectare through the systematic interaction of improved irrigation, drainage, and water management facilities, improved farm level organization and farm practices, improved extension services, and improved transport and marketing services.</li> </ol>	<p><b>Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2)</b></p> <ol style="list-style-type: none"> <li>An Area Development Council (ADC) and Area Development Team (ADT) rationally organized and effectively promoting and executing the 3,873-hectare initial phase of the Libmanan/Cabusao Integrated Area Development Project by June 30, 1977.               <ul style="list-style-type: none"> <li>an Area Development Office (ADO) headed by an Area Development Coordinator established and effectively integrating and managing at the working level all line agencies, farmer organizations and municipal officials and leaders by June, 1976.</li> </ul> </li> <li>Management, administrative and budgetary controls in place and functioning which enable ERBC through ADC/ADT to efficiently bring line agencies, local government and farmer organizations into permanent working relationship required to carry out a sustained program of integrated area development in the Libmanan/Cabusao area by June, 1976 which results in:               <ul style="list-style-type: none"> <li>incremental annual production on 3020 hectares of IR land of 28,000 metric tons by FY 1981; - average incremental yield of 3.6 m.t./ha/season.</li> <li>incremental annual production on 833 hectares of 2R land of 7,000 metric tons by FY 1981.</li> <li>incremental annual production on 20 hectares of 3R land of 132 metric tons by FY 1981; - incremental yield of 2.5 m.t./ha. per season.</li> </ul> </li> </ol>																																																																																															
<p><b>Project Outputs: (C-1)</b></p> <p>A. <u>Irrigation, Drainage and Service Roads</u></p> <ol style="list-style-type: none"> <li>3873-hectare irrigation and drainage system constructed by 1978</li> <li>45.5 km. of service roads completed by 1978</li> </ol> <p>B. <u>Compact Farm and Extension Development</u></p> <ol style="list-style-type: none"> <li>Number of compact farms restructured</li> <li>Number of new compact farms organized</li> <li>Number of compact farm leaders trained</li> <li>Number of compact farm leader training sessions</li> <li>Number of compact farm members trained</li> <li>Number of field "echo" seminars for compact farm members</li> <li>Number of compact farm ditch tenders selected and trained</li> <li>Number of compact farms with power tillers and associated farm machinery</li> </ol>	<p><b>Magnitude of Outputs: (C-2)</b></p> <table border="1"> <thead> <tr> <th>Year</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>(Existing)</td> <td>-</td> <td>-</td> <td>3873</td> <td>-</td> <td>-</td> <td>-</td> <td>3873 ha</td> </tr> <tr> <td></td> <td>-</td> <td>-</td> <td>45.5</td> <td>-</td> <td>-</td> <td>-</td> <td>45.5 km</td> </tr> <tr> <td>37</td> <td>17</td> <td>20</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>37</td> </tr> <tr> <td>-</td> <td>57</td> <td>74</td> <td>92</td> <td>-</td> <td>-</td> <td>-</td> <td>223</td> </tr> <tr> <td></td> <td>148</td> <td>188</td> <td>184</td> <td>-</td> <td>-</td> <td>-</td> <td>520</td> </tr> <tr> <td></td> <td>4</td> <td>4</td> <td>4</td> <td>-</td> <td>-</td> <td>-</td> <td>12</td> </tr> <tr> <td></td> <td>445</td> <td>167</td> <td>146</td> <td>-</td> <td>-</td> <td>-</td> <td>758</td> </tr> <tr> <td></td> <td>9</td> <td>3</td> <td>3</td> <td>-</td> <td>-</td> <td>-</td> <td>15</td> </tr> <tr> <td></td> <td>25</td> <td>31</td> <td>30</td> <td>-</td> <td>-</td> <td>-</td> <td>86</td> </tr> <tr> <td></td> <td>-</td> <td>12</td> <td>105</td> <td>117</td> <td>-</td> <td>-</td> <td>234</td> </tr> </tbody> </table>								Year	1	2	3	4	5	6	Total	(Existing)	-	-	3873	-	-	-	3873 ha		-	-	45.5	-	-	-	45.5 km	37	17	20	-	-	-	-	37	-	57	74	92	-	-	-	223		148	188	184	-	-	-	520		4	4	4	-	-	-	12		445	167	146	-	-	-	758		9	3	3	-	-	-	15		25	31	30	-	-	-	86		-	12	105	117	-	-	234
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**TED AREA DEVELOPMENT PROJECT**

**ANNEX B**

**DESIGN SUMMARY  
FRAMEWORK**

Life of Project:

From FY 75 to FY 81

Total U. S. Funding D.L. \$3.5; T.A. Grant \$275,000

Date Prepared: May 7, 1975

MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>(A-3)</p> <p>Social Survey Research Unit field evaluation at the end of the 3rd year and 6th year to compare project progress toward goal attainment against bench mark survey data collected in November 1974.</p>	<p>Assumptions for achieving goal targets: (A-4)</p> <ol style="list-style-type: none"> <li>1. GOP price support program operative and effective in project area.</li> </ol>
<p>(B-3)</p> <ol style="list-style-type: none"> <li>1. Management evaluation of ADC/ADT organization and management effort conducted at 2-year intervals by consulting firm.</li> <li>2. Annual production verified by: <ul style="list-style-type: none"> <li>- ADT/ERBC records</li> <li>- BAECON surveys</li> <li>- SSRU special surveys</li> </ul> </li> </ol>	<p>Assumptions for achieving purpose: (B-4)</p> <ol style="list-style-type: none"> <li>1. Unified management structure of ADC/ADT proves acceptable to national, regional and local policy makers and is effectively sustained and supported.</li> <li>2. Project outputs are completed as planned and farmer institutions, particularly the Irrigators Association and the compact farms, emerge as viable farmer based management and production units.</li> <li>3. Marketing poses no constraint to increased production given improvement in secondary and farm-to-market roads in the area by BRBC and improvement of the Philippine National Railroad with Asian Development Bank financing.</li> </ol>
<p>(C-3)</p> <ol style="list-style-type: none"> <li>A. Physical verification by June 1978.</li> <li>B. ADT/ERBC Management Information System (MIS) SSRU Special Survey - June 1977 - June 1978</li> </ol>	<p>Assumptions for achieving outputs: (C-4)</p> <ol style="list-style-type: none"> <li>A. - No major technical difficulties are encountered in final A&amp;E design stage. <ul style="list-style-type: none"> <li>- Local contractors are willing and able to construct project at competitive rate.</li> </ul> </li> <li>B. - compact farming is acceptable to farmers. <ul style="list-style-type: none"> <li>- technical assistance and services of government are effectively coursed thru compact farm system.</li> <li>- compact farms effectively federate into national cooperative program sponsored by DLCCD.</li> <li>- additional qualified technicians are assigned as planned.</li> <li>- credit support for production and marketing loans is readily available on a sustained basis from FNB and rural banks.</li> </ul> </li> </ol>

Annex B3

- farm machinery
- 9. Number of compact farm tractor operators trained
- 10. Number of mechanization training sessions
- 11. Number of technicians assigned to project area
- 12. Number of technicians annually re-trained in Bicol (3-week session)
- 13. Compact farm technician ratio (# of C.F./Technician)
- 14. Number of farmers receiving supervised, non-collateral production credit through compact farm joint and several liability guarantee
- 15. Repayment rate
- C. Irrigators Association (IA)**
  - 1. IA organized, staff trained, and effectively handling system operation and maintenance by 1979
- D. Operation Land Transfer**
  - 1. Number of rice and corn share tenants converted to leasehold
  - 2. Number of farmers awarded Land Transfer Certificates
  - 3. Number of farmers processed for land titles (final)
- E. Applied Research and Demonstration**
  - 1. Number of cooperating demonstration farms on production technology and mechanization
- F. Area Development Council and Area Development Team**
  - 1. Cabinet level Formal Agreement covering integrated inter-agency project organization & participation by July 1975.
  - 2. Area Development Council (ADC) ADC formally and legally organized by December 1975.
  - 3. Area Development Team (ADT) ADT organized and staffed by September 1975. ADT office constructed and equipped by October 1975.

	12	105	117	-	-	-	424
	48	420	468	-	-	-	936
	2	14	16	-	-	-	32
11	22	-	-	-	-	-	33
	11	22	33	33	33	33	33
	7	13	10	8	8	8	-
	375	918	1341	1726	1776	2333	-
	70	80	90	90	90	90	-
	-	-	-	1	-	-	-
	354	204	-	-	-	-	558
	693	265	-	-	-	-	958
	-	693	265	-	-	-	-
	-	2	2	2	38	38	120
	X						
	X						
	X	X					

**Project Inputs: (D-1)**

A. Total Project Cost 1/ (P000)	Total (in P)	Total (\$ equivalent in P000) 2/
1. Irrigation, Drainage, and Service Roads	45,730	6,533
- investment		
- O&M 2/		
2. Land Reform	170	24
- investment	153	22
- O&M		
3. Compact Farm and Extension Service Development	444	63
- investment	779	111
- O&M		
4. Applied Research	441	63
- investment	568	81
- O&M		
5. Organization and Management	641	92
- investment	191	27
- O&M	3,277	468
- overhead		
6. Total	47,426	6,775
- investment	1,691	242
- O&M	3,277	468
- overhead		
B. GOP Contribution	23,027	3,290
1. Investment	1,691	242
2. O&M	3,277	468
3. Overhead		
C. AID Contribution	24,500	3,500
1. Development Loan		
- Equipment (Irrigation and Drainage)	(16,429)	(2,347)
- Construction Costs	(6,671)	(953)
- Commodities for ADT/ADC and support projects	(1,400)	(200)
2. Technical Assistance Grant	1,925	275
- A&E Services	(525)	(75)
- Rice Technology Contract (applied research in rice including mechanization and water management)	(1,400)	(200)

**Implementation Target (Type and Quantity) (D-2)**

YEAR	YEAR						Total
	1	2	3	4	5	6	
	27,913	11,206	5,773	838	(770)	(770)	45,730
	170						170
	34	23	23	23	23	23	153
	444						444
	175	179	179	82	82	82	779
	441						441
	87	86	89	100	103	103	568
	641					100	741
	36	30	30	30	30	35	191
	482	559	559	559	559	559	3,277
	29,609	11,206	5,773	838	-	-	47,426
	336	318	321	235	238	243	1,691
	482	559	559	559	559	559	3,277
	8,260	8,056	5,773	838		100	23,027
	336	318	321	235	238	238	1,691
	482	559	559	559	559	559	3,277
	2,347						2,347
	903	450					953
	200						200
	75						75
		100	100				200

1/ Aggregate summation of initial six-year costs  
 2/ Non-recur costs to be shouldered by Irrigators Association

Annex B4

C. Management evaluation by ERBC management with support of local consulting firms by June 1979.

D. ADT/ERBC MIS  
DAR Regional records  
SSRU Special Survey June 1976 and June 1977

E. Published research reports and number of published extension leaflets distributed.

F. Management evaluation by ERBC with support of local consulting firm by June 1976.

technicians and compact farm members.  
- farm machinery firms establish service centers in project area and have adequate staff, parts and operating funds to properly service compact farm mechanisation program.

C. - NIA agrees to turn over project to Irrigators Association.  
- Farmers are willing and able to pay water charges as determined by NIA.  
- Irrigators Association can attract a professional management team to manage IA and its functions.  
D. - The GOP at the national level fully supports OLT down to 7 ha. landlord retention limit and requires performance to enable completion of OLT by June 1977.

E. - applied research and demonstration projects are relevant to area needs.  
- information generated is effectively passed on to compact farm units.

F. ERBC Area Development Council/Area Development Team concepts prove viable and have authority to plan, direct and control all project activities.

(D-3)

ERBC Special Fund Account Records  
Line agency records on fund usage

Assumptions for providing inputs: (D-4)

1. All participating line agencies agree to follow ERBC UNIFIED budgetary and allocation process utilising the ERBC Special Fund Account.
2. GOP and A.I.D. provide the required capital, operating and overhead funds necessary to execute project per schedule.

AID 1240-2 (5-74)

CHECKLIST OF STATUTORY CRITERIA

**BASIC AUTHORITY**

1. FAA 103; 104; 105;  
106; & 107. Is loan being made

a. for agriculture, rural develop- a. Yes, agriculture.  
ment or nutrition;

b. for population planning or health;

c. for education, public administration;  
or human resources development;

d. to solve economic and social  
development problems in fields such as  
transportation, power, industry, urban  
development, and export development;

AID 1240-3 (5-74)

e. in support of the general economy of the recipient country or for development programs conducted by private or international organizations.

COUNTRY PERFORMANCE

Progress Towards Country Goals

2. <sup>s</sup> FAA S201 (b) (5) (7) & (8) ; § 208

A. Describe extent to which country is:

(1) Making appropriate efforts to increase food production and improve means for food storage and distribution.

(2) Creating a favorable climate for foreign and domestic private enterprise and investment.

(1) Food production is top priority of the Philippine Government with goal of achieving self-sufficiency in rice and corn and accelerated production of livestock, poultry, fish, fruits and vegetables. Plans for expanded warehousing and distribution of the increased output of grains are being prepared and carried out with help from an IBRD loan. The proposed project will contribute to this goal by increasing cropping intensity on project lands from one to at least two rice crops per annum and by increasing the average yield per hectare on project lands from 1.5 metric tons/hectare/season to 4.25 metric tons per hectare/season.

(2) See FAA 620(e)(1) Item No. 4, below.

AID 1240-2 (5-74)

(3) Increasing the public's role in the developmental process.

(3) The four-year agriculture program is increasing the productive capability of Philippine farmers. The Department of Local Government and Community Development carries out programs at the barrio (village) level throughout the Philippines. A Decentralization Act providing more autonomy to the Province was enacted in 1967. The Provincial Development Assistance Program is operating in seventeen provinces.

Additionally, in an attempt to redistribute income and raise the rural standard of living, the GOP has recently embarked upon an aggressive land reform program, and is well under way with a country-wide rural electrification program.

(4) (a) Allocating available budgetary resources to development.

(a) More than 70 percent of the national budget is allocated to social and economic development. One-fourth of the budget goes to education, nearly 10 percent to agriculture and natural resources, and almost 20 percent to transportation and communications.

(b) Diverting such resources for unnecessary military expenditure (See also Item No. 20) and intervention in affairs of other free and independent nations.) (See also Item No. 11)

(b) Less than 15 percent of the budget goes for national defense.

(5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

The GOP, ever since its establishment as an independent nation in 1946, has patterned its government after that of the United States, adopting the same democratic principles and strongly supporting a free and open society. On Sept. 22, 1972 President Marcos, citing a serious threat to their system from both the extreme left and right, invoked martial law and, ruling by decree, ordered an accelerated implementation of essential reforms long needed to improve the efficiency of the government, to reduce wide-spread crime and corruption, to speed development efforts aimed primarily at

AID 1240-2 (5-74)

17. FAA § 481. Has the government of recipient country failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in each country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully? 17. No.
18. FAA, 1973 § 29. If (a) military base is located in recipient country, and was constructed or is being maintained or operated with funds furnished by U.S., and (b) U.S. personnel carry out military operations from such base, has the President determined that the government of recipient country has authorized regular access to U.S. correspondents to such base? 18. Yes. (Presidential Determination No. 74-14 dated 1/20/74).

Military Expenditures

19. FAA § 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).) 19. Annual defense budgets average less than 15% of the national budget. Approximately one-third of this amount is for maintenance of peace and order. Philippine foreign exchange resources used to acquire military equipment are negligible. We know of no diversion of either development assistance or of PL 480 sales to military expenditures. We are not aware of any diversion of Philippine resources for unnecessary military expenditures.

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7. FAA § 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? 7. Yes.
8. FAA § 620(d). If assistance is for any productive enterprise which will compete in the United States with United States enterprise, is there an agreement by the recipient country to prevent export to the United States of more than 20% of the enterprise's annual production during the life of the loan? 8. N.A.
9. FAA § 620(f). Is recipient country a Communist country? 9. No.
10. FAA § 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? 10. No.
11. FAA § 620(i). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? 11. The GOP has taken all reasonable measures to protect U.S. property. On frequent occasion when damage has occurred, proper compensation has been made without delay.

improving the social and economic well-being of lower income groups. However, under Martial Law political activity and freedom of the press has been curtailed. In this regard President Marcos is inaugurating an all-encompassing nationwide land reform program. Over the last five years the GOP has increased revenues through improved administration and new tax laws.

- (6) Willing to contribute funds to the project or program. (6) 53% of Project Costs totalling approximately ₱28 million will be financed by the GOP.
- (7) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures. (7) As a result of the disastrous summer of 1972 floods, the Marcos Administration has embarked on a large scale reconstruction program with the help of USAID. This program is directly meeting the needs of the devastated communities of Luzon. Included in the program are: a school reconstruction and textbook program as well as on road building, irrigation and other infrastructure programs.

B. Are above factors taken into account in the furnishing of the subject assistance? B. Yes.

Treatment of U.S. Citizens and Firms

3. FAA § 620(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government? 3. No.

4. FAA § 620 (e) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?
4. The Parity Amendment, an Ordinance appended to the Philippine Constitution on March 12, 1947, and effective by its terms until July 3, 1974, permitted U.S. citizens, as distinguished from other aliens, to acquire and hold "public agricultural land" and to operate public utilities with the same rights and privileges as citizens of the Philippines. The Supreme Court of the Philippines, in a decision now being appealed, has held that the right of U.S. citizens to acquire and hold such property and to operate utilities will expire on July 3, 1974. The GOP and U.S. Embassy are currently negotiating on this point. At present there is no indication that the GOP contemplates any act contravening FAA § 620 (e) (1).

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5. FAA § 620(0); Fishermen's Protective Act. § 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing vessel on account of its fishing activities in international waters,

5. N.A.

a. has any deduction required by Fishermen's Protective Act been made?

b. has complete denial of assistance been considered by A.I.D. Administrator?

Relations with U.S. Government and Other Nations

6. FAA § 620 (a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba?

6. No.

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12. FAA § 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, in convertibility or confiscation, has the A.I.D. administration within the past year considered denying assistance to such government for this reason?
12. The Philippines has instituted an investment guaranty program with the full range of risk coverage.
13. FAA § 620(n). Does recipient country furnish goods to North Viet-Nam or permit ships or aircraft under its flag to carry cargoes to or from North Viet-Nam?
13. No.
14. FAA § 620(q). Is the government of the recipient country in default on interest or principal of any A.I.D. loan to the country?
14. No.
15. FAA § 620(r). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?
15. No.
6. FAA § 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget?
16. The Philippines is not in default with respect to its dues, assessments or other obligations to the U.N.

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CONDITIONS OF THE LOAN

General Soundness

20. FAA § 201(d). Information and conclusion on reasonableness and legality (under laws of country and the United States) of lending and relending terms of the loan.
20. The rate of interest is considered reasonable and repayment of the loan with interest is within the financial capability of the borrower. Interest through the grace period will be at the rate of 2% per annum, and 3% thereafter. This rate is not higher than the applicable legal rate of interest in the Philippines.
21. FAA § 201(b) (2); § 201(e)  
Information and conclusion on activity's economic and technical soundness. If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to A.I.D. an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?
21. An application has been received. Expected economic and technical soundness of use of funds is covered in Part II Section D of the PP.
22. FAA § 201(b)(2). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.
22. AID and other international institutions closely watch the GOP foreign exchange earnings and debt service requirements. It appears that currently and for the foreseeable future, the GOP will be able to repay this loan.
23. FAA § 201(b)(1) Information and conclusion on availability of financing from other free-world sources, including private sources within the United States.
23. Financing is not considered to be available from other sources on terms comparable to this proposed loan.

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and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (f) integrating women into the recipient country's national economy.

project, approximately 2,330 farm families will be benefited. Eighty-seven per cent of these farm families are currently in the lowest income class as defined by the Philippine Bureau of Census and Statistics.

28. FAA § 209. Is project susceptible of execution as part of regional project? If so, why is project not so executed?
28. No.
29. FAA § 201(b)(4). Information and conclusion on activity's relationship to, and consistency with, other development activities, and its contribution to realizable long-range objectives.
29. The GOP four-year plan (1974-1977) identifies major problem areas in the Agriculture sector which must be corrected. The leading factors of these problems are low productivity and farm income. This loan will directly address both these issues and test a new management system which has been designed to improve the dissemination of technology through government agencies to project beneficiaries.
30. FAA § 201(b)(9). Information and conclusion on whether or not the activity to be financed will contribute to the achievement of self-sustaining growth.
30. The project will have that effect by helping small farmers overcome problems on a collective basis.
31. FAA § 209; Information and conclusion whether assistance will encourage regional development programs.
31. This project does not lend itself to a regional program.

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24. FAA § 611(a)(1). Prior to signing of loan will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the United States of the assistance?

24. Yes.

25. FAA § 611 (a) (2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of loan?

25. All legislative authorities exist.

26. FAA § 611(e). If loan is for Capital Assistance, and all U.S. assistance to project now exceeds \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?

26. Yes.

Loan's Relationship to Achievement of Country and Regional Goals

27. FAA § 207; § 113  
Extent to which assistance reflects appropriate emphasis on: (a) encouraging development of democratic, economic, political, and social institutions; (b) self-help in meeting the country's food needs; (c) improving availability of trained manpower in the country; (d) programs designed to meet the country's health needs; (e) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives,

27. U.S. assistance places emphasis on encouraging economic, political and social institutions needed for a progressive democratic society. Through this loan, the economy of a depressed sub-region will be significantly improved. In addition, the project will be implemented through a new organizational framework (i.e., the Area Development Team and Area Development Council) which has been specifically tailored by the GOP to maximize participation of local leaders and project beneficiaries.

The loan is directed specifically at assisting small farmers. Through the

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32. FAA § Section 111. Discuss the extent to which the loan will strengthen the participation of the urban and rural poor in their country's development, and will assist in the development of cooperatives which will enable and encourage greater numbers of poor people to help themselves toward a better life.
33. FAA § 201(f). If this is a project loan, describe how such project will promote the country's economic development, taking into account the country's human and material resource requirements and the relationship between ultimate objectives of the project and overall economic development.
34. FAA § 281(a). Describe extent to which the loan will contribute to the objective of assuring maximum participation in the task of economic development on the part of the people of the country, through the encouragement of democratic, private, and local governmental institutions.
35. FAA § 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country: utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.
32. The project will directly impact on 2,330 agriculturally based rural families, 87% of whom are categorized by the Philippine Bureau of Census and Statistics as falling in the lowest income class. The project will organize 267 cooperative compact farm production units which will in turn be federated into the existing cooperative barrio associations in the project area. An Irrigators Association (IA) will also be organized in the project area. The IA, composed of project beneficiaries, will assume responsibility for amortizing project investments and will assume all system operation and maintenance expenses.
33. The economic development of the Philippines will be promoted. The project supports one of the important objectives of the country's economic development plan - rice self-sufficiency.
34. The loan supports a project effort which by design incorporates the combined participation of the farmers themselves, through the compact farm/Irrigators Association mechanism, and the mayors and residents of the two municipalities through the Area Development Team and Area Development Council to be organized in the project area.
35. The project enables small scale farmers of limited resources to do more productive and profitable farming by providing capital and organizational improvements which would be impossible to put in place without government assistance.

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36. FAA §201(b) (3). In what ways does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capabilities?
37. FAA §601(a). Information and conclusions whether loan will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions.
38. FAA §619. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriated?
36. The project will provide the physical information and organizational framework required to enable small scale farmers to grow two crops of rice in one year instead of one, and improve the unit yield of each crop through use of additional production inputs with assured water supply.
37. (a) The loan will help to increase agricultural production some of which may be exportable in time. Procurement of goods for the project will also increase the flow of international trade; (b) private enterprise, initiative and competition will also be encouraged since project facilities will be constructed under contract; (c) the loan will have a direct effect on cooperative organizations and an indirect effect on the use of credit unions and savings and loan associations; (d) this is not a factor in this loan; (e) the loan and project objective is to improve agricultural efficiency; (f) no effect is planned.
38. Philippines is not a newly independent country.

Loan's Effect on U.S. and A.I.D. Program

9. FAA § 201(b) (6). Information and conclusion on possible effects of loan on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving the U.S. balance of payments position.
39. All heavy equipment and other commodities to be purchased under this loan would have their source and origin in the U.S. Approximately \$2.0 million worth of equipment will be procured from U.S. sources.

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40. FAA § 202(a) Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or in otherwise being used to finance procurements from private sources.
40. Total of loan funds will be to private enterprise.
41. FAA § 601(b). Information and conclusion on how the loan will encourage U.S. private trade and investment abroad and how it will encourage U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).
41. Private enterprise is being utilized to the maximum extent practicable under this loan.
42. FAA § 601(d). If a capital project, are engineering and professional services of U.S. firms and their affiliates used to the maximum extent consistent with the national interest?
42. Yes.
43. FAA § 602. Information and conclusion whether U.S. small business will participate equitably in the furnishing of goods and services financed by the loan.
43. Small Business Notification procedures will be utilized.
44. FAA § 620(h). Will the loan promote or assist the foreign aid projects or activities of the Communist-Bloc countries?
44. No. The loan agreement will contain implementation control prohibiting such use.
45. FAA § 621. If Technical Assistance is financed by the loan, information and conclusion whether such assistance will be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis. If the facilities of other Federal agencies will be utilized, information and conclusion on
45. Services financed under the loan will be from private US engineering firms and other non-governmental sources.

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whether they are particularly suitable, are not competitive with private enterprise, and can be made available without undue interference with domestic programs.

Loan's Compliance with Specific Requirements

46. FAA § 110(a); § 208(a). In what manner has or will the recipient country provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the Loan is to be made? 46. The loan agreement will so provide and the planned administrative arrangements will assure it.
47. FAA § 112. Will loan be used to finance police training or related program in recipient country? 47. No.
48. FAA § 114. Will loan be used to pay for performance of abortions or to motivate or coerce persons to practice abortions? 48. No.
49. FAA § 201(b). Is the country among the 20 countries in which development loan funds may be used to make loans in this fiscal year? 49. Yes.
50. FAA § 201(d). Is interest rate of loan at least 2% per annum during grace period and at least 3% per annum thereafter? 50. Yes.
51. FAA § 201(f). If this is a project loan, what provisions have been made for appropriate participation by the recipient country's private enterprise? 51. The Philippine private sector will supply commodity and construction services for the project. The end recipients of the proposed aid are in themselves private enterprise.
52. FAA § 604(a). Will all commodity procurement financed under the loan be from the United States except as otherwise determined by the President? 52. Commodity procurement will be limited to AID Geographic Code 941.
53. FAA § 604 (b) What provision is made to prevent financing commodity procurement in bulk at prices higher than adjusted U.S. market price? 53. N.A.

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54. FAA § 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will loan agreement require that marine insurance be placed in the United States on commodities financed by the loan? 54. Yes.
55. FAA § 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? 55. N.A.
56. FAA § 604(f). If loan finances a commodity import program, will arrangements be made for supplier certification to A.I.D. and A.I.D. approval of commodity as eligible and suitable? 56. N.A.
57. FAA § 608(a). Information on measures to be taken to utilize U.S. Government excess personal property in lieu of the procurement of new items. 57. U.S. Government excess property is being utilized where practicable in lieu of new items. A separate procurement fund for excess acquisition will be established under the loan.
58. FAA § 611(b); App. § 101. If loan finances water or water-related land resource construction project or program, is there a benefit-cost computation made, insofar as practicable, in accordance with the procedures set forth in the Memorandum of the President dated May 15, 1962? 58. Yes.

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59. FAA § 611(c). If contracts for construction are to be financed, what provision will be made that they be let on a competitive basis to maximum extent practicable?
59. The loan agreement and implementation letters will so provide.
60. FAA § 612(b); § 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the United States are utilized to meet the cost of contractual and other services.
60. The GOP has requested A.I.D. financing which amounts to approximately 47% of total project costs. The loan agreement and implementation letters will provide the necessary assurances that GOP funds will flow into the project at the same rate as A.I.D. loan funds.
61. App. § 113. Will any of loan funds be used to acquire currency of recipient country from non-U.S. Treasury sources when excess currency of that country is on deposit in U.S. Treasury?
61. No.
62. Section 30 and 31 of PL 93-189 (FAA of 1973). Will any part of the loan be used to finance directly or indirectly military or paramilitary operations by the U.S. or by foreign forces in or over Laos, Cambodia, North Vietnam, South Vietnam, or Thailand?
62. No.
63. Section 37 of PL 93 - 189 (FAA of 1973); App. S 111. Will any part of this loan be used to aid or assist generally or in the reconstruction of North Vietnam?
63. No.
64. FAA § 612(d). Does the United States own excess foreign currency and, if so, what arrangements have been made for its release?
64. No.
65. FAA § 620(g). What provision is there against use of subject assistance to compensate owners for expropriated or nationalized property?
65. This will not be an eligible item financed by the loan.

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66. FAA § 620 (k). If construction of productive enterprise, will aggregate value of assistance to be furnished by the United States exceed \$100 million? 66. No.
67. FAA § 636(i). Will any loan funds be used to finance purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States, or any guaranty of such a transaction? 67. No.
68. App. § 103. Will any loan funds be used to pay pensions, etc., for military personnel? 68. No.
69. App. § 105. If loan is for capital project, is there provision for A.I.D. approval of all contractors and contract terms? 69. Yes.
70. App. § 107. Will any loan funds be used to pay UN assessments? 70. No.
71. App. § 109. Compliance with regulations on employment of U.S. and local personnel. (A.I.D. Regulation 7). 71. Yes.

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72. App. § 110. Will any of loan funds be used to carry out provisions of FAA §§ 209 (d)? 72. No.
73. App. § 112. Will any of the funds appropriated or local currencies generated as a result of AID assistance be used for support of police or prison construction and administration in South Vietnam or for support of police training of South Vietnamese? 73. No.
74. App. § 114. Describe how the Committee on Appropriations of the Senate and House have been or will be notified concerning the activity, program, project, country, or other operation to be financed by the Loan. 74. A description of the project was included in the FY 1975 Congressional Presentation.
75. App. § 601. Will any loan funds be used for publicity or propaganda purposes within the United States not authorized by Congress? 75. No.
76. App. § 604. Will any of the funds appropriated for this project be used to furnish petroleum fuels produced in the continental United States to Southeast Asia for use by non-U.S. nationals? 76. No.
77. MMA § 901.b; FAA § 640C. 77. (a) The Loan Agreement will contain a provision requiring compliance with this requirement.
- (a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed with funds made available under this loan shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates.
- (b) Will grant be made to loan recipient to pay all or any portion of such differential as may exist between U.S. and foreign-flag vessel rates? (b) No.

ENVIRONMENTAL ANALYSIS

In accordance with MC 1214.1, the following analysis of environmental impact is submitted:

PART I

DESCRIPTION OF THE PROJECT

The Libmanan/Cabusao Integrated Area Development Project for which this analysis is prepared is the first of a series of five sub-regional development projects proposed for the Bicol River Basin area. The scope of the project is comprehensive, including the supportive programs of land reform, cooperative farmer organization, applied agricultural research and an organization and management system to insure maximum benefits from the investment in irrigation and drainage. The project would be implemented by the Bicol River Basin Council through an Area Development Team composed of local leaders and appropriate government agencies.

The project area is a 4,664-hectare area within the two municipalities of Libmanan and Cabusao in Camarines Sur Province. The objective is to increase average net farm household income to ₱4,000 per annum for 523 farm families and to ₱5,000 per annum for 1,820 families within six years after project initiation. By the end of the second year, the project is expected to be operating effectively.

The proposed project involves the concurrent and coordinated implementation of five major sub-projects within the project area. The irrigation and drainage component consists in an 8.4 kilometer Flood-Interceptor Channel and a 6.7 kilometer Tide Protection Dike along the northern and southern boundaries of the project area, respectively. In between these flood control and saline intrusion prevention structures, an intensive irrigation and drainage system would be constructed, consisting of main canals, laterals and farm ditches.

In arriving at the technically and economically most viable irrigation and drainage scheme for the project area, three alternative development schemes were evaluated. The adopted scheme would utilize electrically driven pumps to divert water from the Libmanan River to the service area. The adopted scheme is described below.

(a) Diversion Works

A pumping station for water diversion would be installed on the left bank of the Libmanan River about 400 meters downstream of the highway bridge serving Sipocot munic-

pality. The pumping station would have four (4) sets of 36" propeller-type pumps each capable of delivering 1,450 L/S (23,000 GPM) at 6.5 meter TDH utilizing four 200 HP, 3-phase, 60-cycle electric motors. A reinforced concrete pump sump and motor foundation, together with a pump house, would be constructed for the station. Electric current for the motors would be provided by National Electrification Administration distribution lines from NPC transmission lines that are planned to be installed and operational by mid-1977.

(b) Canal Networks

The proposed canal system of the project would consist of a main canal 15.2 kilometers long having an initial capacity of 5.8 cms and terminal capacity of 0.58 cms along with laterals and sub-laterals with an aggregate length of 34.6 kilometers. The canal system relative to the irrigable area would have a density of approximately 10.25 meters/hectare, and would have capacities ranging from 3.98 cms to 0.14 cms.

(c) Canal Structures

Canal structures to be constructed would consist of head-gates, road crossings, siphons, and other related structures. The density of these structures would be about 2-1/2 structures per kilometer of canal.

(d) Turnouts and Farm Ditches

There would be about 90 turnouts using 12" or 18" R.C. pipes to be constructed for water distribution to the service area, or an average density of one turnout for about every 50 hectares.

Farm ditches would be located as practically as possible on boundaries of cadastral lots. These farm ditches (main and supplementary) were designed for rotational irrigation that would carry a water duty of 2.5 L/S/ha. One main farm ditch would serve an average of 50 hectares of land while supplementary ditches would serve areas varying from 7.85 hectares to 13.5 hectares.

(e) Drainage Facilities

78 kilometers of farm drains and 16 kilometers of lateral drains would be constructed. Also, about 25 kilometers of existing drainage-ways would be improved. The capacities of the drainage channels would range from 112 L/S to 11,220 L/S.

(f) Service Roads

Service roads would be constructed on one bank of the entire length of the main canal and all other canals except lateral C-2 which turns parallel and close to an existing road. These roads would be 5.00 meters wide on the main canal and 3.50 meters on the laterals and sub-laterals and would have an aggregate length of 45.5 kilometers. Together with the existing roads of 25.8 kilometers which would be improved, the road network in the service area would have a density of about 1 kilometer for every 55 hectares of service area.

(g) Drainage Channel and Flood Tide Protection Dike

An interceptor channel for localized flood control would be constructed along the left bank of the main canal from the pump site down to San Miguel Bay. The canal would intercept the sizeable storm flood run-off from a watershed area of about 23 sq. kms. in the north. The channel would have a bottom width ranging from 3.00 meters to 3.3 meters and would have an expected capacity of 34.55 cubic meters per second at the outlet.

An earth dike with top elevation of El 2.2 meters and a 2.5 meters wide berm and 6.7 kilometers long would also be constructed along the lower reaches of the Bicol River, from the municipality of Cabusao up to Barrio Concepcion, Libmanan, to serve as a tidal barrier. Flap gates would be installed at the mouths of the main drainageways to prevent salt intrusion during high tides. Supplementary steel slidegates would also be installed beside the flap gates to facilitate the evacuation of excessive surface run-off generated within the project area during storm periods.

A high flood protection dike about 2.00 meters high, with a 1.50 meters wide berm and 200.0 meters long to about high grounds at El 15.00 meters above the pump site would be constructed. This structure would protect the pump site from floodwaters rising to as high as 13.92 meters.

The AID loan will be used to finance the equipment, spare parts and construction costs for the physical infrastructure. This amounts to \$3.3 million which would cover all foreign exchange costs plus a portion of the peso cost of the project.

PART II

ENVIRONMENTAL IMPACT

A. Environmental/Resource Linkages

The project area is a well-established lowland agricultural ecosystem, long since modified by human activities, and managed as a monocultural system for rice. The major components of the ecosystem are the paddy fields, their surrounding bunds, the Libmanan-Sipocot River, seven creeks, a few marshy nipa areas, freshwater fish species, frogs, rodents, and birds. Although the creeks draining into Bicol Estuary are subject to saline intrusion daily during the astronomical tides, the fish of the creeks and marshy areas are freshwater species. The Bicol Estuary, a marshy, fluctuating-water ecosystem which is very productive for brackish water fish, affects the project area by saline intrusion but is itself outside the area of project impact.

Human population density within the project area is approximately 3 people for every one hectare of land. The constant out-migration from Libmanan-Cabusao in the last 10 years (due to which the annual population growth rate has been a low 1.87 percent) indicates that economic opportunity is low and that the land itself cannot support many more people except at a bare subsistence level. Assuming that the project goal of increasing employment opportunities thereby decreasing out-migration is achieved, at some point in the next six years the carrying capacity of the land (at the present low standard of living) will be reached. Obviously a concentrated effort to reduce the population birth rate both in the project area and in the rest of Bicol is fundamental to the long-term effectiveness of the total project. No amount of infrastructure and technological innovation can raise living standards for a constantly expanding population on a finite land base.

Radical changes in land use are not anticipated as a result of the project. The proposed irrigation and drainage system will reinforce the current paddy field arrangement. Furthermore, the area is highly suitable for rice, and because of being flood-prone and poorly drained it is unsuitable for diversified cropping. Urbanization, housing subdivisions and industrialization are entirely inappropriate uses for the area, particularly since there is such potential for high agricultural production.

No permanent migration into the project area is anticipated, although the construction stage and the double cropping pattern will require more seasonal farm laborers. The local unemployed and underemployed amount to some 7,000 people, which will be adequate for the projected increased employment. No significant shift in population density or distribution is anticipated either in the short or long run.

The project will promote the widespread use of the currently recommended agricultural technology. Through the Compact Farm organizations farmers will be able to invest cooperatively in farm machinery, take out loans to purchase agricultural chemicals, and request stocks of newly developed seed varieties. Farmers are expected to adopt the modern technology readily, as other Philippine farming communities have done.

The project area is considered to be, at the present time, a moderately stable ecosystem. However, it is vulnerable to certain kinds of disturbance which need to be kept in mind by project planners and residents alike. Because of being a monoculture system, the project area is vulnerable to pest infestations and rice diseases. Because of poor drainage and low stream gradient, it has a low capacity for assimilating or removing water pollutants (toxic chemicals) and wastes dumped into waterways (rice hulls, domestic sewage). The project is expected to have some effect on the water system biota inasmuch as agriculture chemical residues will decrease fish and algae like in paddy fields, canals, ditches and creeks. The considerable decrease in volume of the Sipocot River at the pump site (from 10.0 cu.m./sec to 5.8 cu.m./sec) may adversely affect the carp, tilapia and mud fish populations which are not considered abundant at this time. Downstream water quality will be affected by future saline intrusion up Libmanan River, possibly causing a change in fish and aquatic plant species to be the same as species now existing in the variably saline environment in the segment of river near Libmanan.

Although the soils in the project area presently have a low to moderate level of soluble salts, the proposed surface drainage system is considered adequate for excess salts to be leached down by irrigation and disposed of in the drainage water. After a few seasons of year-round irrigation, soils in the project should have less salt content than they do now.

It is not expected that new or exotic species will be introduced as a result of the project, however, a favorable environment for aquatic snails will be created by the year-round irrigation system, so that possibility of shistosomiasis eventually arriving in the area must be considered. (See Public Health) Although no data

concerning wildlife and bird migration routes and nesting habits is available for the area, it is assumed that the project can have little effect on them. It seems likely that the proposed drainage system will benefit the rodent population since the long-term flooding which presently curtails their population will no longer occur. Hence, a vigorous rat control program will be necessary.

An important long-term consideration is the management of the 23-hectare watershed above the interceptor channel. Active discouragement of annual cropping and burning vegetation on the hillsides would reduce maintenance costs due to siltation in the channel and at its mouth at San Miguel Bay. The Bicol River Basin Council should be aware of any changes from the present land use (primarily planted to coconuts) and take necessary step to minimize future erosion.

#### B. Construction and Operations

The detailed engineering design in preparation by the National Irrigation Authority will specify measures to protect flora and fauna and to prevent erosion during the construction stage of the project. Furthermore, the contract specifications will clearly state the need to use methods which minimize or eliminate objectional side-effects of construction, such as erosion, turbid water conditions, spoil deposits, borrow pits, and refuse dumps. The contractor will also be required to provide adequate housing including sanitation facilities, for laborers so that the construction camp will not become a slum area. Finally, the right-of-way acquisition program will be carefully administered to see that each ownership interest is compensated. It is not anticipated that families will have to be relocated because of the project, but should that become necessary, such families will be assisted financially to minimize the upset of relocation.

#### C. Public Health

Upon project approval and the formation of the Area Development Team, a health and sanitation study at the barrio level will be conducted under the supervision of the Area Development Team in conjunction with the Bureau of Public Health. This study will provide pre-project baseline data against which to measure future health conditions and will indicate whether there are any special cases that need intensive investigation for particular health impact problems.

Most serious among potential biological hazards associated with irrigation projects is the disease shistosomiasis (also called bilharziasis). This debilitating disease is caused by a tiny parasitic worm which spends part of its life cycle in a common tropical species of water snail (Onocomelania cuadras) and part in the human body. The construction of irrigation canals does not bring the disease; usually infected snails already exist in the area but their population is kept at a low level by the drying out of farm ditches every year. Year-round irrigation presents an ideal environment for the snails so their population multiplies, spreading the disease. The possibility of shistosomiasis appearing in the project area is distant, yet vigilant watch must be kept for signs of it since all that is necessary is for one person who was infected in Sorsogon or Samar, to urinate in a canal to start the disease in Bicol.

The labor requirements for project construction and operation are expected to be filled by the local unemployed, so no importation of new diseases by migrant labor is anticipated. The construction contractor is required to provide adequate sanitation facilities where workers are housed.

There is some likelihood that in the future domestic water supplies will be polluted by the widespread use of pesticides and inorganic fertilizers. Drinking water in the project area is drawn from wells; the water table is known to be high, so contamination is possible. No data on ground water is presently available, so the degree of danger cannot yet be estimated. Compact Farm Training will emphasize safety precautions for storage, use and disposal of chemicals, and technicians and farm leaders will be responsible for checking up on farmers' practices. Increased rice production will require new and expanded grain milling and storage facilities. Grain driers can be designed to be fueled by rice hulls so that hulls will not be dumped into waterways. Composting and otherwise recycling farm wastes will be encouraged through the Compact Farm organizations.

With a conscientious program of monitoring health, minimizing pollutant input and recycling organic wastes, sanitation and disease are not expected to become greater problems than they are now in the project area.

### PART III

#### ADVERSE PROJECT IMPACTS

##### A. Physical

1. Pumping freshwater out of Libmanan River at the proposed pump site is expected to increase the distance which saline water intrudes up the river for an undetermined distance.

Patterns of water use along the stretch of river made saline by the project will change and be limited in the same ways they are limited farther downstream near Libmanan.

##### Mitigation:

More saline intrusion up the river cannot be prevented but the benefit of area-wide irrigation throughout the year is considered to offset the cost. The Asian Institute of Technology is presently calculating the distance of inflow, so that people living along the river will be informed of the impending change in their water quality.

2. Concentration of inorganic agricultural chemical residues in water and soil will increase when two crops of rice are planted a year.

Fish populations have already declined in the project area due to contamination of the streams, canals and paddy fields and can be expected to decrease as more chemicals are used.

##### Mitigation:

In the short run, deterioration of water and soil can be slowed down by insuring that the least persistent chemicals are used, that they are used in appropriate doses, applied at the correct time and that residues are properly disposed of. Agricultural technicians will be effective in reaching each farmer with instructions about proper use of chemicals and calculations of dosages for each field. The project provides for the increase of agricultural technicians from the present number 11 to 33, making a ratio of one technician to every 70 or 80 farmers. The technicians will be responsible for observing and reporting to BRBC's environmental staff any problems related to agricultural chemicals. In the long run, damage to soil health and water quality from the extensive use of inorganic chemicals cannot be avoided in Bicol or anywhere else in the world. The Applied Research Project, using Compact Farms as experimental models, will test biological methods of pest control and organic fertilizer composting to provide acceptable alternatives to inorganic chemical use. Successful methods will be recommended to project area farmers.

3. The protective dike to prevent saline water intrusions at the eastern side along Bicol Estuary will also prevent the passage of fish and fingerlings which currently populate the creeks, paddy fields and marshy places of the project area.

The drainage scheme will dry out 397 of the 434.9 hectares of marshy area which exist during rainy season. A great deal of productive fish habitat will be lost.

Mitigation:

The loss of fish catches is a consequence of intensification of the area's rice growing capacity. The drained land, protected against saline water, will produce high yields of rice year-round which should reimburse farmers (in terms of cash for the sale of rice) for the loss of wet season fish catches. Whether farmers spend their extra income on a variety of nutritious foods or restrict themselves to rice depends on public education about nutrition, which is an ongoing campaign of the Philippine Government. The BRBC should consider instigating a pattern of combined fish and rice production in paddy fields as has been successfully undertaken elsewhere in the Philippines.

4. Water weeds, specifically the water hyacinth (Eichhornia crassipes) are expected to grow rapidly in the canals of the irrigation system.

Mitigation:

Manual control of water weeds will be one of the maintenance activities under the supervision of the Irrigation Superintendent to be hired by the Irrigators Association in the project area. Conscientious effort from the start will keep weeds at an acceptable level.

5. Construction activities will disturb soil stability and surface water quality. Excavating materials for the canals networks, ditches, drainage channel and protection dike will cause turbid water and eventual siltation. Service roads varying from 3.5 to 5 meters in width on one side parallel to main canals laterals and sub-laterals will be cut from the surrounding fields to provide maneuvering room for heavy machinery, resulting in some soil erosion and further turbidity and siltation.

Mitigation:

The contractor will be required to minimize erosion and siltation by compacting canal walls and restricting equipment movements to the service roads which, after construction, will be surfaced as permanent roads.

B. Health

By increasing irrigated area, the project increases the habitat favoring aquatic snails. There is potential danger that the parasitic disease schistosomiasis could eventually be transported from Sorsogon (80 miles from Libmanan, at the southern tip of Bicol) to irrigated systems within the Basin area, including Libmanan.

Mitigation:

The project includes a plan for monitoring the long-term health impact. The Regional Health Office for Bicol (Region 5) is responsible for monitoring and preventing the spread of any infectious diseases in the area. The Social Survey Research Unit will measure health impact along with other indicators of change in the quality of life due to the project through its Annual Evaluation. Between the efforts of the Regional Health Office and SSRU, the BRBC office would be alerted early to the presence of schistosomiasis or any other water-borne disease.

PART IV

SUMMARY

Based on the impacts listed in this Annex and on the mitigation measures described in connection with each, it is concluded that the proposed Libmanan/Cabusao Integrated Area Development Project meets the test of environmental acceptability.

PART V

RECOMMENDATIONS

In order to insure that the project is environmentally acceptable during and after construction, it is recommended:

1. That public health and sanitation conditions at the barrio level be investigated and documented by the Area Development Team in conjunction with the Bureau of Public Health as soon as possible after project approval and at regular intervals thereafter. (The scope of investigation is indicated by the sample research form included as an addenda to this section.)
2. That a brief baseline survey of economically valuable aquatic species be undertaken by the ADT with the Bureau of Fisheries so that the extent of loss once the project

is operational can be quantified for BRBC's information when planning succeeding drainage projects in the Basin Area. Consideration should also be given to initiating a program of cultivating fish along with paddy rice.

3. That ground water conditions be studied to assess what danger there is of contamination from agricultural chemicals.
  4. That the Applied Research Project experiment with biological methods of pest control and organic fertilizer composting to be able to recommend acceptable alternatives to inorganic chemical use.
  5. That the contract specifications for construction of the irrigation and drainage system clearly state the need to minimize or eliminate objectional side-effects of construction.
  6. That the contract specifications include the requirement that the contractor make adequate preparation for housing, including clean water supply and sanitary facilities for laborers.
  7. That family planning be actively encouraged to insure that the proposed project does in fact produce the expected long-term increases in per capita income and standard of living.
  8. That the watershed above the Interceptor Channel be managed to absorb as much rainfall as possible and to prevent erosion.
-

ADDENDA: PUBLIC HEALTH ASSESSMENT CHECKLIST

This addenda is submitted as a sample of the scope of investigation of the public health and sanitation conditions to be conducted by the Area Development Team in conjunction with the Bureau of Public Health in the Libmanan-Cabusao project area.

Barrio: \_\_\_\_\_

Municipality: \_\_\_\_\_

1. Will project involve draining swampland? yes  no   
If yes, what wetland resources will be affected? \_\_\_\_\_  
\_\_\_\_\_
2. Will construction of the diversion disrupt fishing or fish migration in the river? yes  no  unknown   
If yes, to what extent? \_\_\_\_\_
3. Will diversion of water for irrigation restrict or preclude present downstream use of water? yes  no  unknown   
If yes, list water uses and users affected: \_\_\_\_\_  
\_\_\_\_\_
4. Are anticipated sediment levels from irrigation water source expected to give canal maintenance problem? yes  no  unknown
5. Location of nearest health clinic: name \_\_\_\_\_ kms. \_\_\_\_\_
6. Have discussions with local health officials revealed any special health problems in the area? yes  no  unknown   
If yes, list: \_\_\_\_\_
7. Approximate malaria incidence in the area: < 1% ; 1-5% ; 5-10% ; > 10%

8. Approx. falariaiasis incidence in area: 0 ; < 1% ;  
1-5% ; > 5%
9. Approx. schistosomiasis incidence in area: 0 ; < 1% ;  
1-5% ; > 5% .
10. Proximity of village to proposed irrigated area: kms \_\_\_\_\_  
Village on higher ground  or same level ground
11. Source of drinking water for village: independent source   
or expected to be taken from irrigation canals   
If independent source: wells ; spring ; river   
above diversion  or below diversion
12. Washing, bathing and excreta disposal facilities for village:  
independent facilities  or expected use of irrigation canals
13. Will use of fertilizers, pesticides, fungicides, rodenticides, etc.,  
be introduced and used in the irrigated area? yes  no   
unknown   
If yes, briefly outline chemicals to be used, method of application  
and safety precautions planned for storage, handling and application  
\_\_\_\_\_  
\_\_\_\_\_

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT  
Manila, Philippines

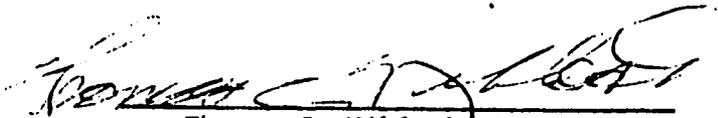
Ramon Magsaysay Center  
1680 Roxas Boulevard

Telephone: 59-80-11

CERTIFICATION PURSUANT TO SECTION 611(e)  
OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, THOMAS C. NIBLOCK, the principal officer of the Agency for International Development in the Philippines, having taken into account, among other things, the maintenance and utilization of projects in the Philippines previously financed or assisted by the United States, do hereby certify that, in my judgment, the Philippines has both the financial capability and the human resources capability to effectively maintain and utilize the proposed Libmanan/Cabusao Integrated Area Development Loan.

This judgment is based upon the project analysis as detailed in the Libmanan/Cabusao Integrated Area Development Project Paper and is subject to the conditions imposed therein.



Thomas C. Niblock, Director  
USAID/Philippines

May 21, 1975  
Date

CAPITAL ASSISTANCE LOAN AND GRANT AUTHORIZATION

Provided from: Food and Nutrition  
(Philippines: Libmanan/Cabusao Integrated  
Area Development Project Loan)

Pursuant to the authority vested in me as Assistant Administrator, Agency for International Development ("A.I.D."), by the Foreign Assistance Act of 1961, as amended, (the "Act") and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter I, Section 103 and Chapter 2, Title I of the Development Loan Fund, to the Government of the Republic of the Philippines ("Borrower") acting through the National Economic and Development Authority with the Bicol River Basin Council as the executing agency, of not to exceed Three Million Five Hundred Thousand Dollars (\$3,500,000) and a Grant not to exceed Two Hundred and Seventy-five Thousand Dollars (\$275,000).

The Grant proceeds will be used to finance: (1) consultancy to assist in the preparation and review of final engineering designs and the preparation of specifications and bid documents required for procurement of equipment to be financed under the loan and (2) a contract between the Bicol River Basin Council and an appropriate institution to develop and test in the project area a total package of extendable technology for rice covering on-farm water management, mechanization as well as the "traditional" package of inputs (i.e., HYV seeds, fertilizer, pesticides, etc.) appropriately adapted to the Bicol area. The proceeds of this loan will be used to increase the production of rice and in turn farm income in the project area through provision in an integrated and systematic fashion major sectoral inputs in irrigation, drainage, transport, technology, land reform and improvements in farm and farmer organizational structure. This will be accomplished by financing the foreign exchange component of the project and as agreed upon portion of the peso costs. The A.I.D. loan will finance approximately 47% of the total project cost.

The loan shall be subject to the following terms:

1. Interest Rate and Terms of Repayments

The loan shall be repaid by the Borrower within forty (40) years after the date of the first disbursement under the loan, including a grace period of not to

exceed ten (10) years. The interest on the unrepaid balance of the loan shall be from the date of first disbursement at the rate of (a) two percent (2%) per annum during the grace period, and (b) three percent (3%) per annum thereafter.

2. Currency of Repayment

Provision shall be made for repayment of the loan and payment of interest in United States dollars.

3. Other Terms and Conditions

Unless A.I.D. otherwise agrees in writing,

- (a) Goods and services financed under the loan shall have their source and origin in the Philippines or in countries included in A.I.D. Geographic Code 941 (Selected Free World).
- (b) The loan agreement shall provide that prior to the disbursement of loan proceeds, the Borrower shall submit or cause to be submitted, the following in form and substance satisfactory to A.I.D.
  - (1) A project implementation plan for the life of the project prepared by BRBC, including projection of funds available to finance the various elements of the project.
  - (2) Written assurance from the Borrower that sufficient funds will be made available to the BRBC pursuant to (1) above in order to assure timely and orderly implementation of the project.
  - (3) Written assurance with supporting BRBC Board resolution and other supporting documents as necessary, creating the Libmanan/Cabusao Area Development Team (ADT); providing to the ADT all staff and technician requirements on a full time basis over the life of the project; providing appropriate delegations of authority to and corresponding responsibilities of BRBC Program Office and ADT management.
  - (4) Written assurance from the BRBC and the National Irrigation Administration that an Irrigators Association (IA) will be formed, properly

chartered, and given responsibility for managing the system, including provisions for repayment of costs of construction in accordance with government policy and a plan for operation and maintenance of the system.

- (5) Written assurance from the BRBC and the National Irrigation Administration that appropriate management systems for the IA will be designed and installed and management and technical staff trained to insure proper management of the Association and efficient operation and maintenance of the system.
  - (6) The BRBC will submit for A.I.D. approval final engineering designs and the proposed construction contract.
- (c) The loan agreement shall contain the following special covenants by the Borrower:
- (1) The project will be managed on behalf of the Borrower, by the Bicol River Basin Program Office, with actual sub-project implementation to be carried out by appropriate line agencies working through the Area Development Team.
  - (2) The Borrower, through the Department of Agrarian Reform, will determine and fix within six months from signing of the loan agreement, land values for all land in the project area subject to transfer under the Provisions of P.D. 27 and subsequent implementing instructions.
  - (3) The Borrower, through the Department of Agrarian Reform, will, within twelve months from the signing of the loan agreement, issue Land Transfer Certificates or secure written registered leasehold contracts for all farmers eligible in the project area under R.A. 3844, P.D. 27 and subsequent implementing instructions.
  - (4) BRBC will assure that Project Evaluation Procedures are implemented.

- (5) Such additional covenants as A.I.D. may deem advisable.
- (d) The loan agreement shall include such other terms and conditions as A.I.D. may deem advisable.

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Arthur Gardiner  
Assistant Administrator for East Asia  
AID/Washington

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Date